# DESIGNS FOR LEARNING 2012

3rd International Conference
Exploring Learning Environments
25-27 April 2012
Copenhagen, Denmark

# CONFERENCE PROCEEDINGS

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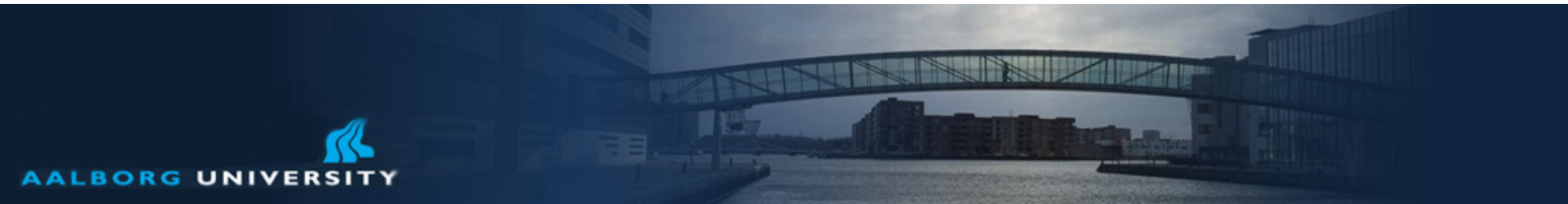

## Editorial / Welcome statement

*Dear reader,*

The following proceeding contains extended abstracts for the Third Designs for Learning Conference, DfL2012. The conference is held on the 25th-27th April 2012 in Copenhagen, Denmark and is preceded by a Master Class for all PhD-students on the 24th-25th April 2012.

The conference and the journal, which both bear the name Designs for Learning, was originally initiated by Professor Staffan Selander from Department of Didactic Sciences and Early Childhood Education, DidaktikDesign, at Stockholm University in 2008, as an intertwined and ambitious exploration of the research field of designs for learning. In 2010 the Swedish group lead by Professor Staffan Selander invited the Danish research group from Aalborg University (formerly affiliated with Aarhus University) lead by Professor Birgitte Holm Sørensen into collaboration regarding the conference as well as the editorial board of the journal. It was decided that the location of the conference should shift between Stockholm and Copenhagen every second year and the 3rd conference is the first one held in Denmark.

The peer-reviewed journal *Designs for Learning* (ISSN 1654-7608) is an academic international online journal, which is published by Stockholm University, Department of Didactic Sciences and Early Childhood Education, DidaktikDesign, Sweden. The editorial staff represents members of both the Swedish and the Danish research groups. The journal is at the crossroad of theoretical development and empirical examples related to learning resources, transformation processes, learning environments, and digital resources. The subject areas covered include learning designs and resources, multimodal texts, didactic science and pedagogy and the target group is mainly researchers. In conference years the journal dedicates an issue for selected papers from the conference.

The First Designs for Learning Conference was held in Stockholm with the theme: Defining the field. The second conference was equally held in Stockholm in 2010, where the theme was a new conceptualization of learning in terms of media, arenas, artefacts and spaces used for learning. This year's conference held in Copenhagen by Aalborg University and Stockholm University in partnership explores learning environments. The conference has been organized around empirical research methods and theoretical development in relation to designs for – and in – learning. The submissions are directed towards three categories:

1. Completed research projects
2. Research and development projects in progress
3. PhD projects

These proceedings contains 62 extended abstracts, written by 112 authors, representing various approaches to exploring learning environments. Just over 100 participants registered so far and the conference is organised around 4 parrallel paper sessions, includes 5 workshops, a PhD poster presentation including a PhD presentation madness/firehose, and last but not least 5 keynote presentors in 4 keynote presentations.

*We hope you enjoy reading the proceeding, we wish everyone a happy conference and hope that the conference will bring you new and interesting high quality inputs.*

*From the organising committee:*
Rikke Ørngreen, Birgitte Holm Sørensen, Karin Levinsen, Mie Buhl, Thorkild Hanghøj, Anette Eriksen, Charlotte Weitze, Staffan Selander, Anna Åkerfeldt, Eva Insulander, Tore West, Eva Svärdemo-Åberg, Anna-Lena Kempe, Frederik Lindstrand

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# Keynote Abstracts

## **Design for Learning,**Exploring Learning Environments

KEYNOTE*Wednesday 25. April 2012*

*By professor BIRGITTE HOLM SØRENSEN (1) & professor STAFFAN SELANDER (2)*
*1. Department of Education, Learning and Philosophy, Aalborg University*
*2. Department of Education, Stockholm University*

When using ICT in schools, different didactic elements such as content, organization, relation between the actors and learning environments are challenged. The new learning space can be seen as a hybrid environment with a complexity of psychical and virtual spaces, local and global dimensions, formal and informal contexts. This hybrid environment is focal point of the presentation. We will also outline a design-theoretic and multimodal perspective concerning how we can analyze and understand learning as inter-active design.

## Who 'designs' the home as a site for learning?

KEYNOTE*Thursday 26. April 2012*
*By* Principal Research Fellow, Dr. *JULIAN SEFTON-GREEN*
*Department of Media & Communication, LSE*

Currently there is intense global interest in learning outside of the school and in this new educational order, the 'home' has become a vital 'new' terrain for all sorts of learning – formal, informal and semi-formal. Based on on-going research exploring the connected learning lives of a class of young people in London, this presentation will question what it means to talk about the home as a site for learning. It will describe the 'educational bricolage' that goes on in domestic environments as parents and children negotiate the pressures of commercial interests in opening up these spaces amidst an intensification of the pedagogicization of every-day life.

## **The Learning Designer:** Supporting teaching as a design science

KEYNOTE*Thursday 26. April 2012*
*By* Professor *DIANA LAURILLARD*
*London Knowledge Lab, Institute of Education*

The presentation will introduce the Learning Designer, a research prototype for a learning design support environment for teachers and lecturers. The aim of this digital design tool is to enable teachers to become experimental designers of the learning process, and to collaborate on discovering how best to exploit technology for learning. The tool is based on an ontology for learning and teaching developed from the Conversational Framework, with functionality for the teacher to articulate and analyse their learning design.
*But*: is the approach viable? That is what we are interested in testing.

## The Nature of Design

KEYNOTE *Friday 27. April 2012*
*By* Professor & *Interaction Designer JONAS LÖWGREN*
MEDEA Collaborative Media Initiative, Malmö University, Sweden

I am an interaction designer, which means that I shape digital things for people's use. For me, there are five things that characterize the design process and the design practice.

- Changing situations (for the better) by shaping and deploying artifacts.
- Exploring possible futures.
- Framing the "problem" in parallel with creating possible "solutions."
- Thinking through sketching and other tangible representations.
- Instrumental, technical, aesthetical and ethical aspects are all in play.

In the talk, I elaborate on these five characteristics and give examples from interaction design. The intention is to provide some insights into my practice in the hope that they are relevant and inspirational to designs for learning and designs in learning.

# Completed Research Projects

# **Designing Interaction in Interaction Design:** Using Interactionaries in Order to Understand Student Use of Interaction Design Concepts

*By ARTMAN HENRIK[1], KARLGREN KLAS[2], RAMBERG ROBERT[3] & STRÅÅT BJÖRN[3]*
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*[3] Stockholm University, Stockholm, Sweden*

*Interaction design is about designing interaction. But how do first year students of interaction design understand and use concepts of interaction in their design processes? By interaction analysis of video material we analyse how students used concepts adhering to interaction. The aspect most frequently used was interactivity. Interaction was mainly handled by using spoken language. While working with physical materials, talk about interaction decreased.*

**Keywords:** Interaction design, interactionary, concepts, use of concepts, design

## BACKGROUND

Good design of digital tools and applications has become increasingly important, as these have become an integral part of our everyday life, including our work, leisure and education. As compared to other fields of design such as industrial design, interface design and graphic design, interaction design puts its emphasis on the design of the interaction between users and computational artifacts. Such work often includes design of user interfaces as an important element, but as e.g. (Löwgren & Stolterman, 1998) have argued, interaction design is about more than designing a user interface; it's about designing *interaction* between users and the use of artifacts. Interaction design is further often about proposing novel ideas about *future* interaction, i.e. creating representations of the final artifact and its use.

Sketching is an integral part of all design disciplines but how is *future interaction* sketched and how is this taught? A sketch can generally be characterized as a not fully specified drawing often made as a brief preliminary account or outline of a design. But how can a static sketch represent the abstract qualities of *future* and *interaction*? Sketching is useful in many respects but has limited power to represent the essentials of what interaction designers' should focus on, namely interactionitself with its dynamic and temporal aspects. As complementary means, professional designers seem to use other means such as domain specific talk, moving around pointing and gesturing to build their design (Tholander et. al., 2008; Artman & Arvola, 2006). The complex manner in how interaction is planned is not well researched and furthering our understanding regarding these issues has consequences for how to think about and develop support for collaborative design practice as well as for design education.

Therefore, in this paper we report on results from a study investigating how interaction design (IxD) students relate to and handle a number of specific issues regarding *interaction* in interaction design tasks performed during 'interactionaries'. Originally, in an attempt to create a fun way to teach interaction design, Scott Berkun came up with the concept of Interactionary (http://www.scottberkun.com). The goal was to create an alternative way to demonstrate collaborative design technique, and for presenting design concepts in a conference forum. The goal was to expose the dynamic intangibles of design in progress, and allow an audience to listen in on teams and observing how they work. An interactionary is a pseudo game show type format that allows teams to work on the same design problem, live on stage. Each team works one at a time, and is given ten minutes to work through the problem. Berkun and colleagues who organized interactionaries at CHI 2000, picked four categories to be focused on; teamwork, process, final design, and user focus. In our work we built upon this

concept and adapted it to fit an educational setting. Our interest was to understand how first year students addressed and pursued a number of aspects regarding interaction: namely dynamics, temporality, interactivity, sequentiality and context of use.

## METHOD

In order to investigate this we set up two design briefs where eight groups of self-selected students participated. The groups were meant to consist of between four to five students. The design groups were provided with several different design resources (whiteboard, clay, paper, plastic paper, paper, scissors, pencils etc.) to use in their design. The students were informed they would do a presentation of their proposal, they were told to focus on making something with the resources (sketching, models etc.), and to have fun. At the start of the design session, they received a document presenting the design brief as well as general design concepts relevant to the brief. They were informed they had five minutes to read, pose questions to the teachers/researchers or discuss within the group. After that they had 25 minutes to both distribute tasks and design their proposal.

The design brief reported on here focused on physical twittering and the task was to elaborate on and to come up with concepts and a design idea that embraced instant messaging with some physicality. Using questionnaires, students were asked to rate their understanding of the concepts before and after the sessions. The design sessions were video recorded from two different angles. Video data has been transcribed and analyzed using interaction analysis (Jordan & Henderson, 1995). The analysis directs particular interest towards how aspects of interaction were handled, shaped, and acted out when designing but also when demonstrating and exemplifying the use of the interactive artifacts designed by the student teams. Moreover, quantitative analyses of how frequently the various aspects were addressed are presented. The students' use of these five core aspects about interaction were independently rated by three trained raters based on an assessment protocol defining the characteristics of each aspect (inter-rater reliability coefficients were 91% (group1) and 96% (group2)).

## RESULTS

The aspect most frequently addressed by the students in both groups was interactivity. This was also the concept rated as the most familiar by the majority of the students.

In their design work the students used spoken language, gestures, various physical materials in sketching (clay, white board, paper and pen, etc.) but while addressing interaction they mainly used spoken language. Now and then, the students bring up topics related to interaction. Occasionally interactivity is described in a narrative way in the form of user scenarios.

Notably is also that when students worked with a physical material (such as clay, sketching on paper, etc..) their addressing of aspects and concepts decreased and focus of the physical models and prototypes was largely on appearance and physical features rather than interactivity. Further, the students typically did not draw interaction in sketches on paper nor on the whiteboard. E.g., states and modes are not illustrated visually.

Also noticed is that when the students were directly asked about aspects of interaction during their presentations, more focused discussions about interaction were held. This indicates a need for more feedback and debriefing or interventions during their design work.

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# **U-CrAc Flexible Interior Doctrine**, Agile Learning Environments

*By SØREN BOLVIG & CLAUS A. FOSS ROSENSTAND*
*Department of Communication & Psychology, Aalborg University, Aalborg, Denmark*

*The research domain of this article is flexible learning environment for immediate use. The research question is: How can the learning environment support an agile learning process? The research contribution of this article is a flexible interior doctrine. The research method is action research related to a specific workshop held by the authors in September 2011 (U-CrAc). Data has been collected as pictures and video, which has been supported by participant observation.*

**Keywords:** Agile learning, flexible interior, learning environment, student empowerment

## NEED FOR AGILE LEARNING ENVIRONMENT

U-CrAc (The User-driven Creative Academy – *www.ucrac.dk*) was founded in September 2008. It is a three weeks interdisciplinary workshop about user-driven design with students from e.g. Industrial Design, Experience Design, Interactive Digital Media, Nursing, and Occupational Therapy – across Aalborg University and University College North Jutland. The workshop consists of three phases describing the pedagogical process (Bolvig & Rosenstand 2009):

- Observation & analyse – method: Video poker
- Synthesis – method: Video sketching (Ylirisku& Buur 2007)
- Realization – method: Video concept (examples at: www.ucrac.dk/koncept)

The workshop involves close interaction between teachers and students on the one hand, and between students, clients, and users on the other hand. It is a pedagogical process characterised by close interweavement of theory, practical methods, and concrete tools together with user-driven and agile practice. The pedagogical model is case-based learning, which include the pedagogical model of Aalborg University: Problem-based learning (Rosenstand 2011)

In the beginning of 2008 the process was mainly linear, ending one phase before beginning the next. In order to increase the students' innovation capacity the process is now inspired by The Manifesto for Agile Software Development, which empowers software developers. The U-CrAc Manifesto empowering students is:

- Individuals and communication over processes and tools
- Continuous prototyping over comprehensive storyboarding
- Client negotiation over client requirements
- Responding to change over following the plan
- The whole body over exclusive mind reflection

In order to make it possible for the students to be as agile as described in the U-CrAc Manifesto, it was important with a flexible interior that both facilitates, provokes and adapts to the students designerly way of working in the agile process.

## U-CRAC FLEXIBLE INTERIOR DOCTRINE

To communicate the principles of the agile learning environment, a *U-CrAc interior doctrine* has been formulated and communicated to the students:

*It is the students' environment (Picture 1)*
It is of great importance that the students feel comfortable in the environment from an early stage in order to take ownership of the spatial space. On the practical side a simple thing

supports this as for instance a locker for every student, which offers an opportunity to bring and store work related tools. The notion of ownership is strengthen as the students are allowed to alter the spatial space with temporary materials as for instance paper and posters on walls and floors. The spatial space should also invite to creative behaviour by for instance offering a place with e.g. a green screen for video production.

Picture 1: It is the students' environment

Picture 2: It is important with mixed furniture

*It is important with mixed furniture (Picture 2)*
The learning environment should acknowledge that learning does not only occur sitting right up and down, but instead learning take form in different pace and in different environments. During the workshop the students experience great learning in an open space without furniture, where bodystorming (Oulasvirta et al. 2003) can take place, while students a other points are in need of a quiet space for in-depth reflection in a lounge setting.

*Academic and social activities must take place in the same environment (Picture 3)*
The learning environment should embrace the life of students and the students should embrace the learning environment. The learning environment should facilitate a fluid integration be *private life*, where project related discussion can take place during a table football match, and the *educational life*, where it's okay to breaks with games and a Friday bar. Their learning environment should become their living lab, where they can study, have social fun and even prepare food in an associated kitchen.

Picture 3: Academic and social activities together

Picture 4: There will be teachers

*There will be teachers (Picture 4)*
It is important to have fluid interaction between teachers and students during the project work. In order to have the desired interaction it is favourable to have the teachers office closely to the environment where the students are working. In addition the teachers bring their academic work into the students environment to work side by side. This allows the teachers to be pro-active in the facilitation of the students learning.

## U-CRAC FLEXIBLE INTERIOR DOCTRINE

The U-CrAc Flexible Interior Doctrine was formulated during the workshop held in September 2011, and the workshop was executed as formulated. The Doctrine was established to articulate the need for the learning environment to support the activities that unfolds within them.

It was observed that the flexibility of the learning environment supported and maintained the students in the agile process. The flexible learning environment offered stages for both practical hands on experiments with video sketching and comfortable lounge areas for reflecting on own solutions and practice.

The learning environment should embrace the students as people and not as 'less filled container', which knowledge can be poured into. The learning environment should therefore offer locations for private and social interaction.

The learning environment is in the case of U-CrAc supported by a fluid interaction with the teachers offering an opportunity for coaching and supervision to take place when there is a need rather than at a fixed and predefined time and place.

The Doctrine is one of several initiatives in the effort of empowering the students to not only take responsibility for own learning, but also to implement an agile practice in their handling of student projects and in the adaption to new theories, methods and techniques.

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# **Designing For Creative Learning,** Models of Integration of the Arts in Curriculum

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*The current paper presents the findings of the research project Artfulness (2009-2011), which has involved several Danish Public Schools in the description of arts projects in learning perspectives. Findings from this project show both emotional and cognitive benefits of the integration of the arts in teaching and in curriculum. In this paper I will sum up on the Artfulness project's research findings, focusing on positive emotions and cognitive intensity, and I will present two specific cases. The latter will be practical examples on how schools can integrate the arts in curriculum, using design and animation.*

**Keywords:** Arts, creativity, innovation, learning, curriculum

## ARTS-BASED LEARNING PROCESSES

The present article addresses the distinctive and complementary relationship between positive emotions, learning and the arts, when educational programmes are designed artfully in schools. I will present the findings of my research project, entitled *Making the Ordinary Extraordinary: Adopting Artfulness in Danish Schools*. This project has been part of a larger Danish study (Mange Måder At Lære På, MMALP "Many Ways of Learning Project"), which commenced in 2008, and whose purpose was to observe the many ways of learning and the qualities of well-being in schools. The larger study involved an entire municipality on Jutland, in order to give the whole school system an opportunity for research-based development and to contribute to the debate on engaging learning and teaching practices with development-based research.

This comprehensive study has contributed to a broader and more nuanced understanding of the ways in which public schools provide teaching and learning, and has coordinated many different perspectives, among them the Artfulness Research, which I am going to present here. Specifically, the Artfulness Study has documented what happens in schools when the arts are integrated into teaching routines or strategies, and how schools foster good learning and teaching with specific focus on artistic, aesthetic, creative-learning and teaching methods.

The theoretical background for this study is strongly influenced by John Dewey's pragmatism and learning theory (Jackson, 1998). Dewey's progressive education is the primary conceptual framework used here. Gardner's Multiple Intelligence theory strongly inspires my understanding of learning as complex and diverse (Gardner, 1994).Moreover the understanding of learning as social constructed integrates with the pragmatic cognitivist approach that has in recent years inspired several research efforts in the direction of the artistic learning processes. These studies are admirable as good examples of research-based development and development-based research: the Visible Thinking and The Artful Thinking frameworks represent a specific interpretation of Gardner, and constructivist theories. Among the theoretical frameworks of understanding, the research framework Cultures of Thinking has conceptualized the "cultural forces", which are the areas, that research has identified as crucial in order to create optimal learning processes (Ritchhart, 2002).

The Artfulness-study's theoretical approach leans on the above theoretical perspectives, and on original empiric data, collected in 2009-2010 at several Danish K12 Public Schools. These data are qualitative, based on ethnographic observation and interviews, with a minor contribution of quantitative data, which were essentially flow-questionnaires.

Findings from the Artfulness project show a large body of reported benefits, both in the emotional and cognitive domain. Both students and teachers feel challenged by the tasks and at the same time report a wide range of positive emotions, going from enjoyment to excitement, feeling of meaningfulness and positive social relationships. A challenging cognitive task and a positive emotional response, when in balance resemble a flow experience (Csikszentmihalyi, 1990), and strengthen each other in a learning perspective. Children who are able to crack the nuts of at challenging task, and have fun with it at the same time, are able to develop a sort of "learning resilience", in the sense that the more they enjoy the learning task, the more they are motivated to stay concentrated even thought the task is complex or difficult. The cracked nut results in a positive experience of achievement, and therefor more positive emotions related to learning experiences.

This positive self-strengthening synergy is the core of the Artfulness project's findings, and I will argue that the arts, the artists involved and the artistic tasks had made a difference in the participant's experience.

The arts build a complex environment, a complex system of messages, which must be decoded. By doing so, they put up a network of meanings, which are simultaneously complex –and therefore challenging- and safe –therefore prone to generate positive affects. Learning environments in the arts are and feel "safe", because the arts offer us an extraordinary experience, different from the ordinary, everyday life. These environments are safe because they are make-believe, where being different is allowed; being someone else, being extreme. The experience within the arts is safe because, in spite of its intense emotional impact, it is still extra-ordinary.

## BEST CASE: DESIGN AND ANIMATION IN CURRICULUM

The cases I wish to shortly present are based on the application of design and animation in two different school projects. These descriptions are meant to be research reports but also inspiration for further experimentations in the field of integration of the arts in curriculum.

In 2009 the Danish Minister of Education started an experimental effort based on a new school subject, design (or material design), which was supposed to embrace the existing subjects of handcraft and woodwork. To these two subjects the Minister suggested the possibility of adding a third, visual arts. The year before about 24 experimental projects took off to be evaluated, a small school in the Danish province had designed a project with the elements suggested by the Minister. Engum School since 2009 is still offering handcraft and woodwork as a combined subject, and focusing on design thinking and innovation. In 2009, my evaluation showed great learning opportunities, few challenges and an engaging response from both teachers and students. The formers reported the recovery of engagement at work and excitement for school subjects; the latter showed and reported high levels of flow, intrinsic motivation, interest, curiosity and wide gain in learning. The learning achieved included not only literacy and numeracy, but also "softer" areas of development, such as creative thinking (brainstorming, product development), interpersonal interaction, team-work. Moreover the structure of the project and the tasks at hand made possible few out-of-task innovations, which however went unnoticed. Teachers involved in this kind of projects need to be consistently re-trained in the skills of being aware, attentive and appreciative of new-thinking, new ideas and out-of-the-box (or even out-of-task) innovations.

The tasks within the project had all a link to design and architecture and were carried on by the students working in teams and with a large degree of independence. Unfortunately, the project in 2009 didn't systematically exploit all the possible connections to school curriculum, resulting sometimes in a waste of optimal learning opportunities.

Regarding a more systematic integration of academic subjects with the arts, I can mention the animation workshop project at Nørup School. At this school two teachers established collaboration with The Animation Workshop and experimented on how to teach basic grammar and math topics to 4th grade students by means of animation. Once again, the benefits reported were numerous. Both teachers and students mentionedboth emotional and cognitive benefits, which can be summarized as follows:

Within a positive emotional response studentsmention the social dimension, the being together in solving a task, but also a number of academic or near-academic dimensions, such as the arts and arts-mediated dimension, eg. what is specific in creating works of art; the didactic-pedagogical, eg. theappreciation of a different way to learn and be thaught, and the expression-based, eg. the unique opportunity to express themselves.

Within a more cognitive or learning-related dimension, the pupils at Nørup School mention a number of learning achievements: they think they learned a lot about Danish and mathematics (academic issues), they learned technical and artistic tools of animation art, they have learned to think like an animation artist (Mindset).

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# The (im)possibilities of using smartphones in upper-secondary education, a critical case study

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*The paper presents findings from the R&D-project M-learning in upper-secondary education conducted 2009-2011. The analysis focuses on a design sequence applying the Flashcard app. The sequence is analyzed from two perspectives, one is a didactic analysis highlighting the participating teachers' evaluations and the other is a social semiotic analysis demonstrating traditional and non-traditional patterns of communication.*

**Keywords:** mobile teaching and learning; didactic design; social semiotics

## INTRODUCTION

The empirical focus is on a 'critical' case; more specifically, a team of teachers teaching a Danish upper-secondary education class located at a higher commercial examination school (hhx). The school sponsored free iPhones and use of telecommunication for the teachers, the students and the researcher involved in the study; moreover, the project was co-funded by the Danish Ministry of Education.

The research design is a small-scale study combining an ethnographic approach and an intervention approach. Research methods include interviews in the form of conversations and document collection complemented with participant observation, questionnaires, and a researcher's log.

The study combines two theoretical perspectives. One is design pedagogy and social semiotic concepts and tools for analyzing design processes and mobile learning (e.g. Gunther Kress & Staffan Selander; Carey Jewitt; and others). The other is didactic analysis in a comparative perspective (Ellen Krogh; Frede V. Nielsen; Sigmund Ongstad; and others).

The research aim is to explore didactic and learning oriented potentials and barriers of the integration of mobiles and other ICT's in the context of formal schooling in the 21st century.

## FINDINGS

The presentation foregrounds how participating teachers formulate *the purpose* of a specific design sequence which integrated a 'Flashcard' app, and how they *actualize* and *evaluate* it in the course of *transformation cycles* (cf. Kress & Selander).

The didactic analysis of the experiment suggests that teachers far from adopting naïve ict booster attitudes struggle with the didactic questions of 'how, what, and why' to adapt iPhone apps in pragmatic and situated ways that make sense in relation to the teaching of subjects and the students participating in the study.

No consensus is found among the participating teachers. Rather, the evaluations demonstrate a broad variety of possibilities and impossibilities related to mobile teaching and learning, some of which are contesting each other. Such evaluations are shaped by the teacher's prior didactic and professional knowledge of one disciplinary domain, and his or her knowledge of and interests towards mobile teaching and learning and other ict's.

One didactic finding does apply to the team of teachers as a whole, and that is the experience of a *paradox* in the relation between technology and didactics. As a starting point, all participating teachers *intended* to focus on how technology could support didactic development within subjects and in a comparative perspective, hence making didactics prior to technology. However, teachers *experienced* that the tempting world of new technology

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became overwhelmingly prior to didactic development. This 'mobile fetichization' (Pachler, Bachmair, & Cook, 2010) was an important constraining factor in the first phase of the development project.

In a social semiotic perspective focusing on the interplay between communicative, disciplinary and social patterns of teaching and learning, we find that teachers differ between designing 'traditional' and 'non-traditional' lessons (Cazden, 2001). Some teachers would emphasize a traditional focus on communicative *closure* characterized by IRE-structure (Initiation, Response, Evaluation), whereas others, as in the case of the math teacher experimenting with Flashcard, actualize non-traditional ways of teaching and learning characterized by communicative *disclosure*.

## DISCUSSION

In the final part of the paper presentation it is argued that non-traditional teaching and learning could be related to didactic aspects other than those suggested by Cazden. This would include the reconfiguration of *place*, *time*, and *participation.*

These aspects relate, in a broader theoretical perspective, to a competence-oriented socio-cognitive view on learning 'not grounded in individual accumulations of knowledge but, instead, generated in the web of social relations and human artefacts'(St. Julien, 1997).

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# **Playing With Boundaries,** A Ph.D. project studying location-based games

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*This paper is an abstract of a Ph.D. project that has inquired about the interaction between users and their physical environment through digital solutions. The topic is location-based games, and it is shown how these games mix digital and physical media, are played on the threshold between playfulness and seriousness, and how in play authentic and fictional content is mixed.*

**Keywords:** Location-based games, design-based research, design, mixed media, (physical) interaction

## LOCATION-BASED GAMES

In the Ph.D. project (Ejsing-Duun, 2011), it has been explored which prerequisites are necessary in location-based games (LBGs) to make meaningful the meeting between players and spatial locations. This is particularly with an emphasis on physical locations. Throughout the Ph.D. project, it has been shown that LBGs affect players' perception of and behavior in everyday spaces, as the games reside on the boundaries between the continuums of play and ordinary, authentic and fictional, and as they merge physical and digital media. These are termed the six dimensions of LBGs. LBGs let the player explore the boundaries between these dimensions and the dimensions are related through play.

The LBG acts as a mediator for the meeting between the player and locations through the boundaries between these six dimensions. The motivation of the Ph.D. project is to push the development of and research in LBGs toward actualizing the potential for expanding LBGs' spatial aspect even further and to contribute with a cohesive framework on LBGs.

The Ph.D. project presents case studies of LBGs created for a learning setting but also LBGs that are not intended for learning. An advantage of using LBGs is that the topic being taught is contextualized. For instance in the LBG Land of Possibilities? students learn about Danish history while running between historical buildings, or in Frequency 1550 students learn about the history of Amsterdam (Admiraal, Akkerman, Huizenga, & Zeijts, 2009). LBGs are not only useable for teaching history. They can be used to simulate changes in a scene e.g. through augmented reality showing how pollution will have consequences in an everyday scene. They can also be used to provoke by for instance showing how spaces are inviting some excluding others commenting on the legitimacy of a space.

The Ph.D. project consists of a review of previous research and existing LBGs, and a theoretical discussion of the elements of LBGs encompassing: 1) Spatiality: space and place, digital space, mediated spaces (physical and digital), locations as play-spaces. 2) Structure: rules, frames, fiction and authenticity, and uncertainty and ambiguity. 3) Interface: Location-aware devices, seams, and objects and players. 4) Player experience: Motivation, mobility, meaning, and finally, a discussion of flow, immersion or incorporation. The combination of these elements is used to conceptualize LBGs.

The theoretical point of departure for the Ph.D. project is Maurice Merleau-Ponty's phenomenology of perception (Merleau-Ponty, 2002) and Michael Apter's theory on motivation (reversal theory) (Apter, 1989, 1991). The phenomenology of perception contributes with a framework describing our experiences of being in the world and the creation of meaning. The theory on motivation defines what motivation consists of and how it relates to our actions. This theory has been combined with theories concerning play and play culture, digital media, (digital) games, (optimal) experiences, landscape architecture, every

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day practices (related to walking in the city), and the existing theories on LBGs as well as pervasive games.

The methodological approach incorporates design-based research. It combines and aims at improving design, research, and practice concurrently. A design of an LBG – Visions of Sara – has been created and implemented. It evolved out of the initial observations and participation in three LBGs (DJEEO Education, Land of Possibilities?, and Fruit Farmer), the review of the literature, and relevant theoretical models. After creating Visions of Sara, three more LBGs were played and they are included as part of the empirical data – Ghost Patrol, Spy in the City, and Foursquare. These seven games, interviews, and observations, along with my own experiences both playing and designing are included in the analysis of the relation between locations and LBG; the ways in which players use them to create meaningful experiences; and of the prerequisites of a meaningful meeting between players and locations.

The Ph.D. project contributes to the field of LBG research by offering an enhanced understanding of LBGs, and LBG player experiences, as well as providing an expanded vocabulary describing LBG elements. In addition, the Ph.D. project provides design knowledge concerning creating LBGs that uses certain emergent opportunities when combining location-aware technologies with game mechanics to make use of the six dimensions of LBGs and to involve the player's body – i.e. make a meaningful meeting possible.

The practical contribution in relation to the Ph.D. project is the LBG Visions of Sara. People continue to play this game in Odense more than two years after its launch, and DJEEO uses it as a showcase, enabling the company to sell similar LBGs.

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# Exploring meaning-making in multimodal learning environments through processual methodologies

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*This abstract presents results from the research & development project "Innovative Energy Education". The projects overall purpose is to improve energy education in schools by exploring interactive and multimodal learning environments, using processual methods in a mixed methods study. The processual methods have given a more realistic insight into the learners activities and dialogue, and the importance of scaffolding the experiences to maintain the learners focus in complex learning environments.*

## Keywords:

Learning environments,Science education, Processual methodologies, Multimodal literacies.

## BACKGROUND

The overall purpose of the project is to improve energy education in schools by exploring innovative learning environments in a mixed methods study. It is of societal importance that the education in energy related subjects, not only provides the learners with a cognitive knowledge but also with an affective learning experience by using multi-modal methods, and anchoring the subjects in a relevant context. Therefore we have chosen to explore the learner's experiences with different learning environments, and look at how it may affect learning in science and attitudes towards energy conservation in their daily lives. The project is comprised of four different learning environments:

- Visit to a science center with a permanent energy exhibition
- Digital storytelling on an energy conservation subject
- Students developing their own flash-based computer-game on energy conservation
- A simulation game ElectroCity, which is an existing New Zealand on-line game.

In this paper we mainly concentrate on the methods used at the science center.

## METHODS

We have used a mixed methods design for the data collection in 15 classes grades 7 - 8. We used processual methods (Gjedde & Ingemann, 2008) at the science center, with one student in each group wearing a set of video-glasses, e.g. glasses with a built in video-recorder, which recorded whatever the student wearing them was looking at, and the dialogue between the students in the group.

Fig.1 Learners wearing the videoglasses at the science center.

This was followed up with subsequent interviews at the school with students and teachers. We also conducted web-based pre- and post-tests on their knowledge about energy and their attitudes to energy conservation.

## RESULTS

There are many assumptions about how learners make use of and learn from science centers (Phipps, 2010). We found that the groups of students who had not received a proper briefing and preparation quickly dispersed themselves from the energy exhibition to the edutainment parts. It is contingent on the learners multi-modal literacy's that they are able to make full use of the complex learning environment at the science center, which comprises different modes of knowledge and communication. Kress, explain that ’Mode is the name for a culturally and socially fashioned resource for representation and communication’ (Jewitt & Kress, 2003; Kress, 2003). The learners are drawing on different modes in order to make sense of the exhibit. These modes are linked to the different semiotic domains that are present at the Science Center (Gee, 2003). Through the dialogue of the learners and how they explored the exhibits, recorded on the video-glasses, we have gained insight into aspects of the learning.

Our findings are that guiding questions influence the learners’ way of using the different exhibits, depending on the learner’s background, their knowledge about science and their self-conception as learners in school.

## CONCLUSIONS AND IMPLICATIONS

The research design of our study has yielded important knowledge in terms studying learning and user interaction at Science Centers. This gives a more realistic insight into the actual activities of the learners, since they forget they are being observed. The dialogue of the learners is seen as pathway to understanding the collaborative process of learning and the

social construction of knowledge. Therefore the usual bias that can be found in most science museums studies where the learners are directly observed by the researchers are eliminated. We have thus found that having data registrations of this type, combining sound and video, gives a much better understanding of the students dialogues and enables registration of the non-verbal dialogue.

In a similar manner we focused on the learner-learner interaction with the media in a collaborative setting when exploring the other learning environments, and how experience from daily life could be integrated. Especially the digital storytelling environment provided an environment where daily life experiences were integrated with the science using the media. Therefore we recommend that use of these learning environments in schools should be prepared by enabling the learners to master the subject and the different domains involving in making sense. A scaffolding process is needed to maintain the focus of the learners in a complex and potentially distracting environment.

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# Teaching With Game Scenarios: Outlining a Theory for Game-Based Education

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*The aim of this paper is to outline a theory of how games can be understood and used as a form of scenario-based education within the context of formal schooling. This is done by presenting games as scenario-based models for possible actions and game-based education as an interplay of four different domains with particular knowledge practices that may lead to the development of scenario competence.*

**Keywords:** game-based teaching, game scenarios, scenario competence

The starting point for this paper is that I wish to demystify the phenomenon of "games", which is often at the risk of being seen as either self-containing black boxes presumably able to engage all students or reduced to instrumental learning machines, which can deliver narrowly defined forms of content. By emphasising the scenario aspect of games (i.e. how games can be used as *scenario-based models*, which calls for meaningful choices), I argue that it becomes easier to understand how games can be linked with and promote valuable practices in the school curriculum.

Next, I assume that games can be used as scenario-based models within educational contexts, which allow participants/learners to make meaningful choices related to four sets of domains with corresponding knowledge practices: 1) subject-related or specialised knowledge practices, 2) pedagogical or "school only" knowledge practices, 3) scenario-related knowledge practices (i.e. the game's narrative and projected identities), and 4) everyday or non-specialised knowledge practices. One of the key points here is that game scenarios can be used to provide dynamic "translations" across these four knowledge aspects, which may both create challenges and opportunities when matched with particular learning objectives within a school context.

This duality is illustrated through examples of game-based teaching. On the one hand, using game scenarios within an educational setting may easily "clash" with students' expectations of what it means to play a computer game - i.e. when playing the educational computer games in the *Global Conflicts* series. On the other hand, I also describe how game scenarios may be used by teachers to provide a meaningful framework for becoming engaged with subject-related content - i.e. when using the horror-adventure game *Penumbra* for teaching linguistic awareness and genre knowledge within the context of Mother Tongue Education. As these examples show, it is crucial that teachers are *game literate* as they must be able to align or meaningfully translate the goals of a particular game scenario (with a small "s") into the goals of an educational Scenario (with a capital "S") - cf. Gee's similar distinction between games/Games (Gee, 2011).

My third assertion is that games can be used to develop *scenario competence*, which is defined as the ability to imagine, enact, and reflect upon the relationship between possible outcomes and their consequences within particular game-related practices. The notion of scenario competence is inspired by Dewey's theory of inquiry-based learning, which is interpreted as a theory of scenario-based learning by drawing on Dewey's related notion of "dramatic rehearsal" (Dewey, 1922). Moreover, scenario competence also involves the capacity to engage in the framings and roles of social interaction (Goffman, 1974) as well as the ability to build identities by integrating game narratives with personal narratives (Bruner, 1990). In summary, scenario competence involves three dimensions, which I term *problem*

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*scenarios*, *social scenarios* and *identity scenarios*. These three dimensions are all illustrated through empirical examples of games being used within formal school setting. The examples primarily focus on the use of two Danish educational games, the ICT-supported role-playing game *Homicide* and the ICT-supported debate game *The Power Game*.

The paper concludes with a discussion of the relationship between gaming and schooling. I argue how the notions of game scenario, teachers' game literacy and scenario competence may contribute to new and more valuable ways of integrating games with the curriculum. Finally, I discuss how scenario competence may be seen as the aim of game-based education in terms of helping students to become better problem-solvers, collaborators and self-reflexive agents in a changing world.

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# The fluidities of digital learning environments and resources– opening up their educational development spaces

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*The research project "Educational cultures and serious games on a global market place" (2009-2011) dealt with the challenge of the digital learning environment and hence it's educational development space always existing outside the present space and hence scope of activities.With a reference to Vygotsky's concept of the zone of proximal development, Hasse's concept of the relational zone of proximal development, inspiration from actor-network-theoretical conceptualizations of the ontological multiplicity and fluidity of technology, and empirical studies of the emerging circulations and establishments of the virtual universe called Mingoville.com, the research shows a need to include in researchers' conceptualizations of digital learning environments and resources, their shifting materialities and platformations and hence emerging (often unpredictable) agencies and educational development spaces.*

**Keywords:** Fluidity, digital learning environment, digital learning resource, educational development space

## INTRODUCTION

Mingoville.com is an example of a cloud-based digital learning resource designed as a virtual universe – an environment – for beginning English learning. However, understanding and approaching engagements with Mingoville as a matter of being enrolled in a particular universe, a particular ontological and epistemological environment for learning English, may in fact keep us from understanding both the ontological and epistemological multiplicity of Mingoville (Hansbøl and Meyer, 2011) and beginning English education, teaching and learning situations, and also from understanding their fluid and ephemeral characters. The research shows, that a consequence of conceptualizing information and communication technologies (ICTs) like Mingoville.com as platforms to act *in* and *from* may be that we miss out on fundamentally grasping and conceptualizing the shifting agencies and platformations of such technologies (Hansbøl, 2010) and what I will here call their *emerging educational development spaces*. Applying science and technology studies (STS) and actor-network-theoretical (ANT) conceptualizations (e.g. De Laet and Mol, 2000) of the fluidity of technologies, combined with learning theoretical inspiration from among other the cultural-historical theory of Lev Vygotsky and his concept of the zone of proximal development, the further development of his concept into the concept of a relational zone of development and creativity made by Cathrine Hasse (2001), the research tries to open up further: how can we as researchers learn to be better at becoming affected by digital learning resources like Mingoville.com, and hence to effectuate its emerging educational development spaces?

## BACKGROUND AND METHODOLOGY

The research project was a two year postdoc project (2009-2011) where the author, as part of the Serious Games on a Global Market Place project (2007-2011), followed (ethnographically) the emerging circulations and establishments of Mingoville.com, as it became engaged with teachers, parents and children in among other schools and homes in different countries around the world (e.g. Norway, Finland, Denmark, Portugal). Methodologically the inspiration for this method of "following Mingoville.com" rather than for example setting up and following *experiments* with Mingoville.com in schools, came from

a variety of STS/ANT resources and my PhD thesis (Hansbøl, 2010) where I suggest that adding a *science 'of' movements* approach to the field of researching relationships between ICTs and education is needed. The methodological approach, which I shall here refer to as an *entanglement approach*, has been developed in Hansbøl (2010) and further elaborated and discussed in Hansbøl and Meyer (2011). In brief the suggestion is to look at relationships between ICTs and education as allways *momentary*, emerging and shifting, sociomaterially generated effects, rather than looking at the effects *of* ICTs, as if they *in themselves* can be generators of anything. With this approach is furthermore added the suggestion that researchers aiming to understand how relationships between ICTs and education are made in *everyday ways of living* must also include ICTs and other non-human actors as *serious actors* in our studies. This means concretely acknowledging and being genuinely concerned with the ways that ICTs acquire agency, competencies and become actors *in and across* their constitutive entanglements (Orlikowski, 2010). Furthermore, what is added here is that also *educational development spaces* associated with concrete ICTs evolve with these entanglements. Historically speaking, in litterature (in Denmark and internationally), ICTs have generally been treated as generators of the 'new' (e.g. Knowledge Age society) and hence also new educational potentials (Hansbøl, 2010). As a consequence, research on relationships between ICTs and education has for several decades been generally learning strategically driven and focused on ICTs as ways to bring about wished for educational revolutions. This quest for 'the new and better' has been followed by a lack of interest in the everyday (dis-)engagements made with ICTs and the *complex* movements associated with these in everyday living.

## RESULTS AND CONCLUSIONS

The research shows that rather than opening up the educational development spaces of Mingoville, Mingoville and it's educational development space becomes *partially* restricted and contained in particular ways, when analytically approaching Mingoville as an autonomously existing object which can be analysed *in itself* through learning strategic approaches e.g. manifested by the three metaphors of learning (Sfard, 1996 and Paavola, S.; Lipponen, L. and Hakkarainen, K., 2004) each representing different conceptualizations of knowledge and what should be the educational aims with Mingoville and beginning English teaching *per se*.

If we instead introduce the STS/ANT inspired concept of "fluidity of technology" and engage with empirically understanding the many differently constituted *processes of agentizations* (Hansbøl, 2010) of Mingoville, produced and performed as Mingoville actually becomes engaged in schools and homes, then the educational development spaces of Mingoville appear much more complex, multiple, momentary and varied.

In line with Hasse's (2001) further development of Vygotsky's concept of a zone of proximal development into a *relational* zone of proximal development, this research further develops an entanglement approach to understanding and opening up the educational development spaces relating to Mingoville and other digital learning environments and resources. An entanglement approach contributes to understanding and seeing the *ontologically multiple* constructions of emerging educational development spaces 'of' digital learning environments and resources, here examplified with Mingoville and English teaching for beginners.

One result of this entanglement approach is that it has become possible to see that engagements with Mingoville – developed for and with a reference to general education aims - seem to transcend conventional boundaries of general and special education, and of home and school. As it turns out, many times Mingoville becomes engaged with children with 'special educational needs' (here understood in a very broad sense). Furthermore, following Mingoville has opened up unexplored areas of research and educational development spaces

'of' digital learning environments and resources relating to the periods where children for various reasons (e.g. illness, home schooling) are not in school or at 'level' with school. Also, following (dis-)engagements with Mingoville in schools and homes in countries around the world opens up a different understanding of *the shifting constitutions of educational development spaces* 'of' digital learning resources and environments. This provides new grounds for understanding how (dis-)engagements with digital learning environments and resources like Mingoville can not simply be boiled down to being a matter of either – in this case - Mingoville's educational value (in singular) or *the* (right/wrong) educational culture surrounding or built into Mingoville. Instead we must engage with the *emerging and manifold passages* between beginning English education and Mingoville that appear with various (dis-)engagements under shifting sociomaterial circumstances. In other words, we must engage with the many different constructions of *valuing* Mingoville. From these we can learn that what might appear (too) simple in relation to one educational, teaching and learning situation takes on an entirely different appearance when entangled with another educational, teaching and learning situation. This is something else than *merely* shifting the scenery of Mingoville (as *a* platform engaging with various contexts of activity). It is a matter of opening up the shifting platformations of Mingoville's and hence it's shifting processes of agentializations. This leads to other kinds of awarenesses of the educational development spaces 'of' Mingoville.

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# Concepts of E-learning

*By JENS JØRGEN HANSEN*
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*In this paper I present some of the results from an e-learning project, focusing on the development of new educational design and didactic design of learning and teaching.*

**Keywords:** E-learning, didactic design, educational design, learning environments

## DOMAIN

The background for this paper is the ELYKproject (2009-2012). ELYK stands for e-learning, peripheral areas and cluster development.One of the goal of this project is to develop innovative educational concepts for educational institutions. The case in this project is NetAu – a 100% online educational organization.

E-learning in the education policy discourse is frequently linked to an understanding of effective and flexible skills development, innovation and competitive optimization. But it's not clear what is meant by the term "e-learning". This project develops an understanding of e-learning concepts at two levels: e-learning as concepts of learning environment, and e-learning as concepts of didactive design.

E-learning as learning environment describes the organization and design of education in time and space. An e-learning concept describes here the organizational choice made by an educational institution is doing in order to provide and implement education and training paradigm that underlie this choice. E-learning concepts are expressed as the institution's mission, organization and learning environment and support certain e-learning paradigm (Duus 2004). In this context e-learning concepts aims to support educational leaders and institutions to develop their offering and organizational set up of an education.

E-learning as didactive design describes the principles, models and concepts underlying the organization of teaching and learning in an e-learning environment. These principles, models and concepts have as function to support leaders and teachers to reflective to plan, manage and develop teaching and learning processes in an e-learning environment. Didactive design anticipates a series of educational activities and may therefore tribute to create new framework for teaching and learning.

## GOAL

The project purpose is to develop concept that bridges the gap between theory and a practical, pedagogical practices. New technology is a catalyst for new e-learning concepts and opens new opportunities and pathways in the supply and implementation of education. But technology is not in itself a "driver" in relation to qualifying new opportunities. What matters is how individual institutions are thinking about e-learning and what strategies, language and concepts they use on the development of e-learning.

## THE EMPERICAL FOUNDATION

Methodologically this project is based on the principles of Design-Based Research (Cobb et. al., 2003). Through an iterative process with phases of "inquiry", "prototyping", "experimental" and "deployment" the project have develop some prototype of new didactic design and concepts of e-learning.

## THEORETICAL PERSPECTIVE

The theoretical perspective in the project is focusing on didactive design. ‘Didactics’ refers to the "practical organization process associated with teaching and learning in formal learning contexts in particular" (Andresen and others, 2008, 9). ‘Design’refers to a "concrete, pedagogical practice and a number of pedagogical actions, and mental models, we can study and reflect on in order to create a new framework for teaching and learning"(Ibid. 10). Didactic design is here on how to include can utilize and clarify digital media learning potential in learning contexts.

## RESEARCH CONTRIBUTION

The development of concepts of e-learninghave different purposes:

1) Education Policy: E-learning concepts provide a response to the global spread formation challenge which is to promote lifelong learning.
2) Organizational Policy: E-learning concepts can be used by institutions to strategically support the development of e-learning pedagogy, competence of staff and collaborating with external partners.
3) Teaching development: E-learning concepts can be used by teachers to didactic reflection and action tools for planning, implementation and evaluation of e-learning based education.

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# **CategorizingEducation:** Developing a metadata standard for the description of learning material, competence and content

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*This paper presents a new Danish Educational Vocabulary Framework (DEVF),that is vocabularies for pedagogical description and annotation of learning materials. The most important ones of these are: 1) learning resource type, 2) competencies developed, 3) themes (or "ideas") touched on, 4) educational methods used, and 5) skill level.*

**Keywords:**digital learning materials, metadata, repository, learning object metadata

## METADATA AS A DIDACTICAL CHALLENGE

One of the biggest challenges for teachers wanting to use digital learning material is finding good and usable material for their specific purposes. The answer to this challenge has been to develop repositories of learning material. But soon the problem reappears, because the repositories end up being a huge pile of poorly sorted material. The question is: According to which standards should the material be organized and sorted?

The Danish company KMD has undertaken to develop a repository that makes access to all kinds of digital learning material easy and swift. The platform rests on principles from social media websites, integrating user ratings and reviews, suggesting materials on the basis of data about user behavior etc. Our task in the project has been to further develop a metadata standard for categorizing and rating digital learning material. With this paper we will introduce the results of the project and reveal a part of the problem solving process. It has become clear that describing types and learning potentials of digital learning material entails a lot of theoretical and didactical challenges.

The task is to develop an accessible and usable terminology that matches the prototypical way of using leaning materials on the one hand, and on the other hand is consistent and encompasses pedagogically valid categorizations. Thirdly a design principle has been that it is not enough to give users what they are searching for, both because the world of digital learning material is unfamiliar to most people, and because a usable description of digital learning material could support teachers' professional development, giving them a terminology of learning materials and knowledge of the affordances of the learning materials, i.e. the pedagogical potentials and constraints.

As a basis for the design of an educational metadata standard, we have studied the metadata standards available which are used in relation to educational repositories. The advantages of typical standards for tagging documents with metadata are among others, that it makes search, acquisition, and use of learning objects easier. Another important aspect is, that it facilitates reusability of learning objects and the sharing and the exchange of learning.

On the basis of comparative studies we have chosen the IEEE Learning Object Metadata standard (IEEE LOM, http://ltsc.ieee.org/wg12/index.html), which is intended to be used by learning management systems to help manage, locate, and evaluate learning objects, and as a format for exchanging metadata between systems.

In IEEE LOM, a learning object is defined as any entity digital or non-digital that may be used for learning, education or training. According to a comparative study of Roy, Sagar & Ghose a metadata instance for a learning object describes relevant characteristics of the learning object to which it applies. Such characteristics are grouped in G*eneral, Life cycle,*

*Meta-metadata*, *Educational*, *Technical*, *Rights*, *Relation*, *Annotation*,and C*lassification* categories. Each category takes one or more values either from a vocabulary or as free text (Roy, Sagar & Ghose 2010: 105 f.).

One of the challenges is that IEEE LOM relies on a quit abstract vocabulary which have some shortcomings when it comes to educational implementations, because it does not say much about pedagogical usability.Implementation of IEEE LOM can be done as so-called Application Profiles, that is subsets of the LOM, and categories can be extended and vocabularies detailed out. Our work has mainly consisted in development of *Danish Educational Vocabulary Framework* (DEVF) that is vocabularies for a number of core properties of the pedagogical description of learning materials. The most important ones of these are: a) learning resource type, b) competencies developed, 3) themes (or "ideas") touched on, 4) educational methods used, and 5) skill level.

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# **The Empty Exhibition:** Opportunities and Crisis in Digital Presentation in the Museum

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*Museum exhibitions traditionally provide opportunities for learning through their displays. Can an exhibition with no objects still have an educational function? Through a case study of the Hatta Yoichi Exhibition Hall, this research explores how an exhibition can exercise the empty exhibition concept through digital presentation and other activities that do not require the use of physical displays and still perform an educational function.*

**Keywords:**museum exhibition, digital presentation, museum education, empty exhibition

Museum exhibitions traditionally provide good opportunities for learning through displays. Itcould be very difficult for curators nowadays to plan an appropriate learning environment which does not utilize objects on display, butin which museum visitors cannevertheless gain knowledge and experience aesthetics.

To answer the curators' difficulty, a new concept, the "empty exhibition", is introduced. The premise behind the empty exhibitionis that, even with no objects on display,one can still create a place in which people can learn happily. The Hatta Yoichi Exhibition Hall in Taiwan is a good example. It opened in May 2011, and its unique venue was completed based on the empty exhibition concept. A "narrative exhibition"was presented through multi-media, digital images, fiction characters, plotting, and oral history, to tell the story of a Japanese engineer, Hatta Yoichi, and his great achievement: the building ofthe Wushantou Dam in Taiwan 80 years ago. The aim of the exhibition is to enable each visitor to understand, and also to remember, the history of Hatta Yoichi and the Wushantou Dam.

Will the gradual shortage of artifacts cause the empty exhibition to become a trend in the future?Could the "empty exhibition" become an effective substitute for the traditional concept of exhibitions?Does the"empty exhibition" have deficiencies such that it cannot effectively carry out the traditional functions of museum education?Can an alternative, i.e., a "Plan B" be found? The authors have reviewed related literature, especially literature about digital exhibition in Taiwan, to investigate the development and challenges of museum exhibitions. The main objective of this research is to utilize the case study of the Hatta Yoichi Exhibition Hallto analyze how, through the planning of the exhibition hall, the "empty exhibition" concept is exercized and howthe exhibition maintains the function of museum education under the circumstances. A secondary objective is to provide a potential vision of future museum exhibition planning.

Foucault's heterotopias has defined several possible situations, such as the mirror or the exhibitions in the museum. When you look into the mirror, you see your reflection but the reflection is not real you. The same principle also refers to the museum exhibition, all objects are removed from their original settings and juxtaposed in a display with a new meaning. This is often called 'decontextualization' and 'recontextualization' of exhibiting artefacts as well as objects, by museum professionals or scholars. The idea of "empty exhibition" is based on the heterotopias and aiming at creating an alternative space for visitors. Anyone in the exhibition hall will encounter all digital images and animations, almost like being 'Alice in the wonderland': everything seems so real and so interesting, but none of the exhibits he or she sees is authentically real. This experience is unique, however, it is also dangerous. The core debate is how real is the "empty exhibition"? Can they learn from the digital

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presentation and acquire enough knowledge about the truth? Dewey emphasised that education comes from experience, although some experience could lead to mis-educative result(Hein, 1998: 2). Our concept of “empty exhibition” hopes to challenge and stimulate visitors to produce proper understanding of the content of narration and furthermore to gain better knowledge of the story of Hatta Yoichi and his contribution to the land, converting a dry plain into a fertile and productive rice field for the island and the people living on it.

The challenge the Hatta Yoichi Exhibition Hall faced was that the Chianan Irrigation Association, which owns collections on Hatta Yoichi, suddenly and severely refused to lend any of the artifacts, scripts or objects. Because the Association’s refusal occurredat the time when the research for the exhibition was almost completed, it presented the curatorial team with a very difficult dilemma. After repeated discussion, the curatorial team boldly decidedto use multi-media and images to create an interesting narrative. The “empty exhibition” concept therefore became the theme for planning of the Hatta Yoichi Exhibition Hall.

The Hatta Yoichi Exhibition Hall is composed of five sections. Taking the fate that brought Hatta Yoichi to the Chianan Plain in the southwest of Taiwan as the theme, each section has its own topic describing different characters. The exhibition begins with an orientation room(Figure 1), depicting the four seasons in Kanazawa, Hatta Yoichi’s hometown in Japan, and introduces people to that remote place as well as making the connection between the two places.The second section proceeds to tell the visitors about Hatta Yoichi’s school days(Figure 2). In this second room there is less concern about the lack of objects because it presents fascinating animation. Entering the third venue(Figure 3),the visitor is surroundedbya scene of Gliricidia Sepium in full bloom, and presented with a narration of the love story of Hatta Yoichi and his wife. Before entering the next section, visitors walk through a time tunnel established by nearly one hundred digital photo frames playing images of the Wushantou Dam in the Japanese colonial period, producing an atmosphere of nostalgia(Figure 4). Hatta Yoichi treated his subordinates kindly, and was getting along well with local villagers living in the Chianan Plain. His selfless personality can be observed in the fourth section(Figure 5). Here one can also see the techniques utilized in building the Wushantou Dam through three-dimensional animation.Finally in the fifth venue(Figure 6), a film shows thefertility and records arecent harvest of rice field in the Chianan Plain.Oral history from local farmers and their grandparents present the changes that have taken place over the past eighty years. Using lots of old pictures becomes the most unique characteristic of this exhibition in order to make up for the disappointment of the lack of real objects(Figure 7). Most people feel impressed and know much more about Hatta Yoichi after their visits. Since the narrative primarily using images and animation, it is not limited by country boundaries or language. Many visitors from Japan are so moved by the exhibition as well. It might be said the digital display is successful, but does it really satisfy every visitor?How does an “empty exhibition” influence people? Are there opportunities to make it better?

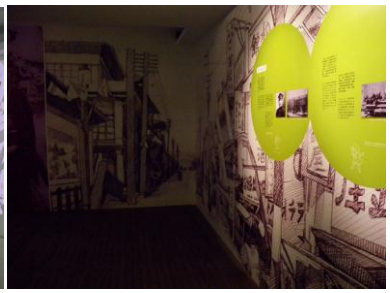

Figure 1: The orientation Figure 2: The 2nd venueFigure 3: The 3rd venue

Figure 4：A time tunnelFigure 5：The 4thvenueFigure 6：The fifth venue;

Figure 7：Using old pictures to make up for lack of objects

The curatorial team expected an “empty exhibition”to be seriously restricted by its heavy reliance on multi-media and digital displays. For instance, if an electric power failure or amechanical breakdown occur, the stories and narratives in the exhibition will disappear;under such circumstances, the empty exhibition becomes true to its name. Furthermore, the concept is also by the definition of the exhibition without real objects, hence, an “empty exhibition”. Either way, how to create a unique experience for visitor to understand and to be inspired has become the focus and concern of any curator team.To face such a situation, supplemental educational activities and guides could be powerful tools. It is important that digital media and friendly narrators support one another to tell stories continuously.

In conclusion, in the concept of the “empty exhibition”, digitization is only a method. On one hand, it vitalizes the display venue, breaks down the conventions of the object-oriented exhibition, and is not limited by age, country, language oreven culture.On the other hand, unlike the traditional display, an empty exhibition cannot provide visitors with the experience of seeing physical objects or artefacts, instead, visitors have to use their imagination for inspiration. The high-tech digital exhibition without objects can also be short of vitality and friendly communication.Therefore, the “empty exhibition”muststrike a balance between object-oriented exhibition and digital display. It will then truly benefit the public and make ‘empty’ as beautiful as philosophicalZen.

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# **Proactive Reviews** - A method for organisational learning and individual competence development

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*The Proactive Review ensures learning at all levels in the organisation: the individuals learn consciously from their personal experience and extend the approximate zone of learning. The teams evolve their competences by sharing repertoire, joining enterprise and establishing mutual engagement. The management learns from the Key Topics that mirror strategic issues in the organisation. Solving these issues, the organisation undergoes double-loop learning.*

**Keywords:** Proactive Reviews, knowledge sharing and creation, innovation, individual competence development, organisational learning.

## PROACTIVE REVIEWS – GOAL AND PERSPECTIVE

”Proactive Review is a method of knowledge sharing, knowledge creation and knowledge implementation that results in learning at three levels: the learning of the individual, the learning of the team as well as organisational learning. The method is based on dialogue between people who have completed a task together. AProactive Review is a way of conducting adialogue with a certain structure and a given time frame. Using this structure ensures that the group creates a result within the given time of the Proactive Review.” (Kolbaek, 13)

The goal of inventing and implementing Proactive Reviews was to improve business results by enabling individuals, teams and the organisation to consciously learn from their experience in a fast growing company (Oracle) in the very competitive IT-industry. A Proactive Review consists of seven points phrased as questions that are designed to reveal individual and shared experiences by opening up for reflection and dialogue between the people involved in the Proactive Review.

## METHODOLOGY

Proactive Reviews are rooted in After Action Review (AAR) which was developed by the US Army as a method for debriefing military actions. An AAR consists of four questions.
The military debriefing procedure suffered from a lack of direction of the conversation, sharing the learning with peers, organisational learning and individual meta-reflection on the review. Consequently four more questions were added and two of the original questions were combined into one.

When the process of Proactive Review was defined, the delivery system had to be in place to meet the requirements. In the following years, more than 300 facilitators were trained in more than 40 countries within Europe, the Middle East and Africa (EMEA). The facilitators suggested Proactive Reviews in their working areas which raised the awareness of the process throughout the organisation. This was a bottom-up strategy. A special application was developed to keep an overview and to gather the tangible results: The action-&communication plan and the Key Topics. Later a top-down strategy was implemented by addressing the Key Topics to senior management and by convincing the top management to define the PR-Triggers, which tell WHEN a Proactive Review is appropriate in the line of business. The globalization of Oracle and the development of social networking tools enabled the development of Remote Proactive Reviews, which let to Proactive Reviews across lines of business as well as across geographies. During 2011 more than 100 Proactive Reviews were

conducted, most lines of business have defined the PR-triggers, facilitators are available in more than 35 countries, and 75 remote facilitators are willing to run remote-PRs. Each month Key Topics are addressed to senior managers, leading to changes in working processes, services etc.

## THEORETICAL PERSPECTIVE

The Proactive Review is based on the assumption that we learn in a social context. When the context is "doing the job", the context is the working place meaning the organisation. A Proactive Review starts with the individual learning which may be conscious or unconscious: While carrying out his work, the person selects data, gathers information and makes decisions – he constructs knowledge. Nonaka and Takeuchi point out that some of this knowledge may be tacit or explicit. The Proactive Review enables the delegates to reflect consciously on their experience and put it into words – they make some of the tacit knowledge explicit. The delegates create a mutual understanding of the past followed by the construction of the preferred future. They are not informed of any problems or any solutions; they build up personal experience and creativity. A Proactive Review allows the delegates to evolve their individual zone of approximate development (in a Vygotskian sence).

The delegates in a Proactive Review have worked as a team to achieve a goal they could not achieve on an individual basis. Working together they have had a joint enterprise and a shared repertoire, and during the Proactive Review they establish mutual engagement; according to Etienne Wenger they act as a community of practice and "thus key to an organization's competence and to the evolution of competence" (Wenger, 241). The Proactive Review enables the team to construct new knowledge that the individuals could not have constructed on an individual basis.

Nonaka and Takeuchi point out that organisational knowledge creation is a spiral process moving from individuals through expanding communities of interaction. The Proactive Review is an example of how to make this happen by identifying and addressing the Key Topics. When the management changes procedures, products or services as a result of the addressed Key Topics, the organisation undergoes what Agyris calls double-loop learning "that results in a change in the organisation's strategies and assumptions."(Agyris, 21)

## PROACTIVE REVIEWS – THE SEVEN STEPS

The starting point is setting the objective for the particular Proactive Review. The next step is to turn to the situations that the participants have shared in the case. They then move on to come up with solutions to the problems they have just uncovered, and they define an Action

The 7 questions in a Proactive Review

1. What is the purpose of this PR?
2. What was the goal of the case?
3. What happened and why?
4. What should we do next time?
5. Who else needs to know our findings
6. Which of our topics are key to the management?
7. What was your personal highlight from this Proactive Review?

and Communication Plan with a view to implementing these solutions. They identify the most important topics for management and finish by reflecting on their personal outcome from the Proactive Review. The tangible outcome of the Proactive Review is firstly the action and communication plan and secondly a few key topics. The purpose of the action and

communication plan is to ensure that solutions created in the Proactive Review are implemented and communicated so that all relevant employees know about changes in due time. The action and communication plan documents the outcome of the Proactive Review and is the plan which the Sponsor follows to implement the changes suggested. The purpose of the Key Topics is to ensure that issues that cannot be solved by the Delegates in the Proactive Review are pushed forward and up in the organization. Looking at the action and communication plan, the Delegates are to identify the tasks that seem important for the management level.

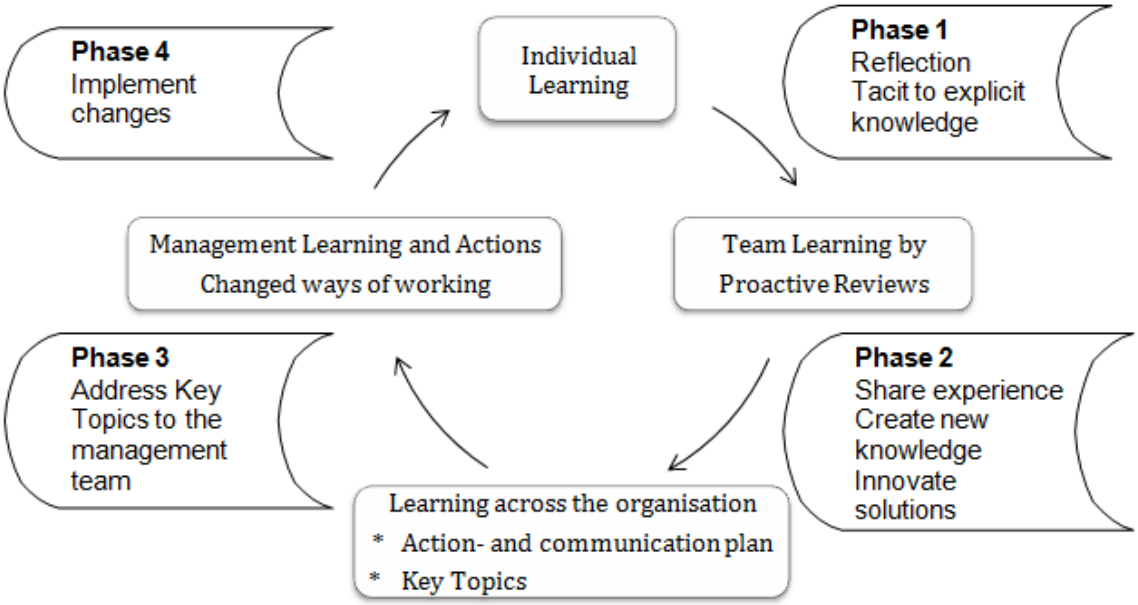


*Fig.2 The Organisational Learning Spiral*

The Proactive Review is the starting point for organizational learning: The Delegates create common ground by sharing experience, they come up with new solutions to common issues, and they broaden the perspective from themselves and their line of business to the partners they work with on a regular basis. The Proactive Review leads to learning and has a ripple effect: The first wave results in Delegates learning from their experience on an individual basis, the second wave results in the Delegates learning as a team; the third wave results in the colleagues close to the Delegates learn in accordance with the action and communication plan and the fourth wave results in other parts of the organisation learn as a result of the changes that are implemented due to the Key Topics addressed to the management.

## RESEARCH CONTRIBUTIONS

It is new to frame Organisational Learning from a collaborative learning point of view. The Proactive Review is a result of action research based on Nonaka & Takeuchi's work, where they ask for a concrete way of making the organisational learning happen; and based on various learning theories from Agyris and Shon to Wenger and more individual views on learning which the limited space prevents me from digging into.

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# **Learning on Location,** QR-Codes in the Classroom

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*In this paper we present some of the results from a mobile learning project, focusing on the development of new didactic design of learning and teaching, involving QR-codes and Smartphones.*

**Keywords:** Didactic design, user generated designs, mobile learning, learning environments, educational media and multimodality.

## DOMAIN

The starting point for this paper is experiences of user-driven innovation processes gained from The ELYKproject (2009-2012). ELYK is a Danish acronym for e-learning, peripheral areas and cluster development.The goal of this project is to develop innovative training concepts for small and medium sized enterprises and educational institutions in regional peripheral areas in Denmark.

A partnership with a vocational college was established in order to develop a course on “Working environment”. The course is compulsory for students at the entrance “Transport and Logistics”. Since the students are highly motivated by "hands-on" learning, it is at present a major challenge for the teacher to keep them engaged in this strictly theory-based course.

The new didactic design allows the students to combine theory and practice: In the experiment the students completed a workplace risk assessment, using QR-codes that provided information on location, and they also created small instruction videos that transformed theoretical work environment material into instructions that other students receive.

## GOAL

The goal of this experiment was to promote situated learning and to make the students producers of knowledge, not merely recipient of knowledge.

## THE EMPERICAL FOUNDATION

Methodologically the ELYK project is based on the principles of Design-Based Research (Cobb et al., 2003). The innovation processes of this project went through four phases which are outlined as iterative processes.

In Phase 1, the key activity was "inquiry". In this first phase, a number of classic ethnographic methods (interviews with teachers and students, participant observation of the lessons) were applied in order to establish familiarity with the domain. In Phase 2, the key activity was "prototyping”. In this phase the process was characterized by reflective processes with users, where these users were presented with the researchers' observations of their practice. Towards the end of this phase agreement was reached regarding the principles of the new didactic design. Phase 3 is the experimental phase with tests and evaluation of the teaching-situations based on the new didactic designs. In this phase ethnographic studies was repeated. Phase 4 is labeled "deployment" and the aim was that the new didactic design becomes part of a new practice.

The empirical material also includes instruction videos created by the student, and assignments handed in by the students.

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## THEORETICAL PERSPECTIVE

By adopting theories of educational media we apply a micro perspective on the teaching and learning designs. Educational media are everyday objects that aim to facilitate teaching and learning.

According to Kress and Selandermeaning-makingandlearningcan be seen astwosides of the sameactivity. *The differencebetween them(...) is, rather,that learningcan be understoodas the differencebetweenmeaning-makingrepresentationsat two different times.*(Selander &Kress, 2010:p.33, our translation).Consequently, when the students transform information, and when they create representations themselves, they show how they perceive the world, and the students' signs and representations thereby become signs of their learning. The extent to whichstudents havethe opportunity to createtheir ownrepresentationsdepends onthe didacticdesign, including the educational media involved.

In the experiment we explore the potentials of multimodality. Different modalities hold different affordance compared to how they represent phenomena. One of the didactic limitations of using video (e.g. as vodcast) used to be restricted interaction and hardly any communication concerning the incorporated information (Fibiger 2008). However, in connection with the mobile phone, video offers the opportunity of students becoming producers.

## RESEARCH CONTRIBUTION

Mobile learning is to a great extent defined by flexibility and portability, multifunctionality and multimodality (Kress & Pachler, 2007). Our study indicates that flexibility including independence of time and space should not necessarily only be considered over long distances – it might also refer to the creation of alternative learning spaces at campus. Thus, the expansion of the traditional classroom may be considered in several ways: outside school – in a biotope or in connection with the internship – and as new learning spaces created through new didactic designs.

Thus, the educational media becomes a catalyst for new teaching methods that moves away from the more traditional teaching structures and towards learning environments which will enable teacher and students to take on new roles.

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# Designs For Learning,Image-based conceptual inquiry: a DBR research project

*By NATASA LACKOVIC & CHARLES CROOK*
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*There has been a long tradition of mobilising images for purposes of supporting effective educational practice. This paper presents a design-based study which aims to engage postgraduate students with reflecting on and discussing taught concepts via self-selected images.The research finely tunes the nature of the pedagogical processes in the interest of creating a framework for Higher Education teaching and learning with and from images.*

**Keywords:**Image-based inquiry, student agency, Higher Education, productive thinking, design-based research

## EXTENDED ABSTRACT

This study adopts the perspectives of critical and creative thinking theories (Lipman, 2003) and multimodal and semiotic approaches to learning and meaning making (Kress and van Leeuwen, 1996). It implements the ”autodriving” method of photo elicitation(Heisley and Levy, 1997) and the conversational framework for learning in higher education (HE) (Laurillard, 2002) as models informing the design of activity structure.

Two main questions remain underexplored in literature and research on photo elicitation, which this research illuminates:

- How can photo-elicitation serve as a method to support learning in HE ?
- What are the properties of a novel photo-elicitation strategywherebystudentsnot only make photos butselect them using image search tools?

The aim is to engage postgraduate students with reflecting on and discussing taught concepts via self-selected images. The project identifies three processes important for student learning when images are used as tools for private reflection and as discussion prompts. The three processes in the pedagogic scenario are images for: (1) private *reflection, (2)*group *discussion and (3)* learning *consolidation.* The research finely tunes the nature of the three processes to create a pedagogical framework for HE teaching and learning with and from images.

The study encompasses two cohorts of postgraduates participating in a sustained longitudinal pedagogical activity across two academic years. This activity was performed in the tradition of design-based and action research with persistent iteration in order to examine students’ behaviour and their understanding of the task. This iteration led to a confident description of a specific ‘image-based conceptual inquiry’process in HE: a topic which has been neglected and under-researched.

First, recruiting images for reflection involves students selecting images they judge to represent some feature of the target concept.They then write personal reflections on their choice, which forms their learning artefact and a specific mediating tool.Second, recruiting images for discussion involves providing them as a resource for the cohort to discuss and critique. Third, the prior two components of the scenario are ‘consolidated’ by (i) individual feedback on image choice via a blog shared between student and tutor, and (ii) a plenary session after each discussion in which the process of image-based concept critique is scaffolded.

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It became apparent that students could readily by-pass the demands of serious conceptual critique. A variety of modifications to the basic scenario were conceived under a process of participant exchange with the students, coupled with close scrutiny of the records of reflection and discussion. However, there were cases of extraordinary activity engagement which surpassed expectations. As far as students' attitudes and opinions wereconcerned, the image-based conceptual inquiry was unanimously evaluated as beneficial and unprecedented in their educational experience. Certain interesting findings stem from the task to *select* photography, drawings or clip art from Google images. The student becomes a selector and new image author. An interesting issue around authorhip arises when one takes into consideration the re-authoring process of digital image selection. Re-authoring means that the student becomes a new author by selecting a digital image found on the internet. However, the autonomy of autorship varies depending on the student 's search strategies.

This presentation will outline these findings and, thereby, the nature of the trajectory towards an effective form of pedagogical design that positions images as a key resource within student-centred inquiry.

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# Learning Processes and Robotic Systems, – design of educational tools and learning processes using robotic media and using children as co-designers

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**Keywords:** Educational tools, learning, participatory design processes, digital design, and robotics

Educational robotic tools have a large, untapped potential for motivating learning and making it more effective. This is because robot technology creates tools which are more vibrant, faceted, and physical in their user interaction than traditional paper or screen-based media. The key to exploiting this potential lies primarily in developing an understanding of how robots can support the learning process.

This abstract is based on the dissertation "Learning Processes and Robotic Systems – Design of Educational Tools and Learning Processes using Robotic Media and Using Children as Co-designers"(Majgaard, 2011).The objective of this study is to improve existing strategies for the development of learning processes and educational tools using the medium of robotic systems. This dissertation therefore addresses the experimental development of educational robotic tools and discusses the learning processes that take place both during development and during the actual use of the tool. We gain an insight into development processes occurring when the target group of children participates actively in the design of specific educational robotic systems. A multi-level structure for a design process for digital learning and teaching resources is also suggested.

The technology used is a modular robotic system, consisting of multiple embodied, intelligent and situated robot agents; their available actions; and their interaction with the environment (Brooks, 1991; Pfeifer, 2006; Hallam, 2006). Being embodied intelligent means that the robot can interpret the environment using sensory input, for example light, sound or touch. Being situated means that it can relate specifically to time and space and give immediate feedback in the form of motion, light or sound.

My main research question is: How can learning processes be enriched by the experimental development of educational robotic systems? This includes the question of how to organize design processes in order to best exploit the inherent potential of this technology for the benefit of the target group.

Learning processes are designed and evaluated based on the understanding of learning as a social practice where the learner is an active participator, co-creator and critic (Wenger, 1998; Bateson, 2000; Schön, 1991). This social, active interaction, with participation and reflection, is also the basis for being imaginative, creative and innovative (Scharmer, 2009; Nonaka, 1995).

Robotic systems are a new context for educational tools, where the learning process can be observed in the direct interaction between the learner and the tool, and where the robot is the medium around which this interaction takes place.

The research question is explored primarily in the light of two robot-technological design cases where the children in the target group are active participants and co-creators. The focus is on the design process and on how an iterative design approach can generate an educational tool which has well defined learning goals and flexible didactics. Two prototypes have been developed for primary schoolchildren within the field of mathematics:

1) Fraction Battle. This educational tool allows the learner to add and subtract simple fractions, see figure 1(a) (Majgaard, 2009).

2) Number Blocks. This tool teaches about the place value system. The system supports the pronunciation of numbers in Danish, see figure 1(b) (Majgaard, 2010).

Figure 1: (a) Fraction Battle; (b) Number Blocks

In order to treat the two cases uniformly, it is necessary to use a research method that can be adapted for different design cases. The method chosen also needed to support the inclusion of the target group as active participants and co-creators. The research method chosen was a combination of Action Research and Design-based Research named Design-based Action Research. The method is iterative and based on interventions in each iteration where the target group, developers, and researcher perform an activity, e.g. brainstorming, or testing the educational tool (Lewin, 1946; Barab & Squire, 2004; Sharp, 2007; van den Akker, 2006).

During the design and research process several points came to light regarding how learning processes are affected by the use of robotic tools. These points can be summarized as follows:

Points in relation to learning:

- *Anchoring of academic knowledge in bodily experience*. Userinteraction with the robots enables a more bodily experience e.g. the user senses the rhythm of the pronunciation of large numbers or the proportions of fractions. This experience is a form of tacit knowledge which anchors future learning.
- *Bodily experiences and conceptual knowledge.* The bodily experience and the tacit knowledge acquired transforms into more explicit and conceptual knowledge through the didactic practice. Learning arises in the interplay between bodily experience and conceptual insight.
- *Experimenting and exploring competences.* In interacting with the robots, children learn to explore new topics and to combine different bodily, participative, and reflective approaches. In this way the children develop experimental and exploratory competences.
- *Co-creators.* The children are involved in designing the didactics as well as the educational tool. This co-creative role nourishes the learning process.
- *Teachers, didactics, and educational robotic tools.* The didactic has to be rethought when new technology is brought into the classroom, and it is important that educators take an active part in this process.
- *Play, learning, and robotic systems.* Robotic technology offers opportunities for playful interaction between children and educational tools, and this supports both exploratory and experimental learning processes.
- *Learning through design*. The technological design processes introduced new ways for the children to participate and this meant new ways of learning.

- Multiple forms of participation, diverse learning. Diverse forms of participation creates multiple ways of learning.

Overview over points in relation to robotic systems and design processes:

- Robotic educational tools make abstract concepts such as fractions concrete and tangible for the children.
- Modular robots are particularly suitable for use with flexible learning goals due to their adaptability. They are also suitable for design processes which involve users, since interacting with them is so appealing. The more complex and finalized a robot is, the less suited it is as a medium for educational design, because a more complex robot is more complicated to adapt to diverse learning goals and didactics.
- User involvement demonstrated the potential in the target group and in the technology, e.g. it was motivating and fun for the children to pronounce large numbers and that potential could be used in the didactics.

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# Digital games and signs of learning outcomes

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*It is often suggested that digital games may not only motivate students for learning, but also that students' learning may be enhanced when students engage in situated action involving various genres during play. From a case analysis of students in upper secondary school it is shown that students may develop competencies for handling complex environmental issues by playing a digital simulator game (Energispillet) in school.*

**Keywords:** digital gaming, wiki, mixed genres

In this case study, we have explored if it is possible to build on youth's attraction towards digital technology for learning science in school. The approach investigated consists in letting students get the opportunity to use tools and strategies similar to those young people choose in their dealings with media in their spare time. The study is based on data from a classroom of vocational students (Electricity and electronics) who were offered an instructional design where switching between different digital resources, a wiki (Nordby, 2010) and a simulation-based strategy game, Energispilet.no, was central.

Energispillet is a pedagogical game, intended to offer students an opportunity to learn about environment and energy supply. The wiki was designed to support students in an autonomous exploratory process, and to assist students in transformingaction and talk into written signs of meaning (Selander & Kress, 2010, p.113). Students were thus offered a learning environment in which different practices and genres could meet, resulting in opportunities for learning across genres (standardized norms and patterns of behavior in similar situations) belonging to game and school practices, respectively.

Two groups of students were followed closely. One group was selected because the students were considered to be academically strong in a traditional way. The other group was selected because the students were talkative with varying academic levels. The data was collected during a four weeks period, and consists of a motivation survey (multiple choice, pre and post), written knowledge assessment (pre and post), videos of the student's gaming (about four hours recording), interviews with students after playing, assessment of the students' written wiki products, interview with the class teacher, and own observation.

Our analysis centers on video recordings of students playing Energispillet. By an *inductive* approach and the categories, *involvement* (frustration, joy) and *disciplinary statements* (facts, claims, arguments, questions), we selected interesting events for further analysis of genre traits. Hanghøj (2011, p. 25) argued that educational gaming can be understood as an inter-play of various knowledge forms or genres.

Both groups used game strategies to explore the challenges in Energispillet. The verbal students' play was characterized by action, and they explored quite one-sided. By using leisure players' knowledge and everyday language they attacked the missions in the game. Later, after leaving the game, they approached the discipline knowledge and the traditional way of "doing" school through inquiry scaffolds (Knain & Kolstø, 2011, p. 85) in the wiki and conversation with the teacher. This group needed help to reflect on their approach to gaming. At the end of the project the verbal students were far more deliberate in their choices

in the game. The analytical students were also captivated by the game, but they were also able to shuttle between and take advantage of all the different resources offered. They unsolicited discussed solutions for how to do better in the game, and they related their experiences in the game to experiences in real life. They were able to commute between and draw on the different genre norms and patterns of behavior to engage in communication during game play, make appropriate choices and to express scientific knowledge during gaming and afterwards.

Energispillet and the dialog related, seemed redemptive for the students' desire to approach the subject. The wiki structured the work for the students. It made goals and content for the lessons clearer to the students, allowing them to some extent to be able to control the progress and focus. The analysis point towards an important learning outcome which is difficult to measure; the students have become aware of the need for balanced actions while dealing with complex issues.

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# Designing for social – the role of social in web-based learning environments

*By LINDA RENELAND-FORSMAN*
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*This study tries to break away from the normative status of speech underlining computer-mediated communication by asking how social talk is manifested in web-based learning environments. The on-line communication of 55 students were analysed during 18 weeks of on-line communication in a web-based teacher training program Results show that social talk implicitly negotiates protocol for studying and enhances student autonomy.*

**Keywords:** meaning making, mediation, social talk, student autonomy, teacher training

The interactive potential of computer-mediated communication has proved more difficult to realize than expected. In a review of the field of Computer Supported Collaborative Learning (Kreijns et al. 2003) the authors find several studies indicating that failures in social dynamics may cause more disturbance than technical failures and that social interventions aimed at socio-emotional processes are often ignored or forgotten by teachers. Although a few years ago nothing indicates that these results are history now. This suggests a need for research aimed at exploring social and affective features of learning situations.

This study explored how social talk was manifested in web-based learning environments and how it could be traced to students meaning making processes.

Social, economic and technological changes have brought about major changes in the landscape of communication and in the way we write and make meaning from text (Kress 2003). These changes have resulted in theory building, involving relations between what a culture makes available as a means for making meaning and how a culture produces these messages in different representational modes (Kress 2003). The new means with which we signal meaning bring forth the question of how means interfere in interaction.

Here the asynchronous communication of 55 students was studied using mediated discourse analysis. Students were all new to each other and training for pre-school teachers in 4-years program. Although 2 years into the program students' ability to create a group culture seemed significant for how they developed group autonomy and were able to handle unexpected incidents or a loose framing during these 18 weeks. Communication was narrative and lengthy in character. Trusts and confidences were dropped off as part of a constant construction of group culture. There were indications of sharing private concerns and information from other practices in life as a conditional aspect of participation.

All students were women and the fact was sometimes referred to by the students themselves, as enhancing meaning-making processes. More likely it was related to the roles they took on and the nexus they thereby brought into the educational practice, a nexus partly familiar to many of them. This familiarity seemed to help them in trusting and supporting peers and sharing experiences when trying to take on course content.

## TOWARDS A BROADER UNDERSTANDING OF SOCIAL IN WEB-BASED COURSES

Mediation is a core aspect of this study. By considering the character of mediation we can seriously compare and discuss research and policy attempts concerning technology mediated learning environments. Narrow notions of mediation can result in a deterministic view of technology for learning. To characterize physical meetings as "shared contexts" to distinguish them from "mediated contexts" could be problematic. The problem lies in the normativity thereby ascribed to the physical meeting, without discussing its character. This I mean blocks

efforts to see the working and interrelated processes in different educational practices. Chouliraki and Fairclough (1999) talk about "reduction" when describing mediated discourses, with a "narrowing range of symbolic resources" available for making and interpreting meaning. In face-to-face communication resources include intonation and non-verbal communication which are absent in the mediated discourse and have to be "compensated for" in various ways (Chouliaraki and Fairclough, 1999)(c.f. social presence theory, Short et al, 1976). Limitations follow the concept of digital tools for understanding these complex processes. Talking about web-based communications in compensating ways when discussing conditions for meaning-making takes for granted the full representation of meaning-making processes in physical interactions. This study was an attempt to broaden the scope. The manifestations of social in web-based environments showed an elaborated mix of expressions through language, time and space. The concepts of mediation and meditational means seems like one way of describing the complexity of social talk on-line as well as the importance to study actions as trajectories to capture the recipients reaction and the construction of culture.

One of the things that affected my choice of data was the sometimes spoken opinion that social talk in computer mediated "classrooms" is a waste of time and is important to separate from more task oriented communication. By pointing towards the making of meaning in a web-based context maybe we could see more of a discussion of what also constitutes meaning and what thereby also might be "missing" or "absent" in all contexts, even physically "shared contexts". Acknowledging the social character of learning means that it has to be considered by teachers in higher education and not reduced to methodological considerations. Its' implications are wider.

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# **WOFIE,** linear to agile learning design

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*Wofie: A four-day Workshop For Innovation and Entrepreneurship at Aalborg University. Area of interest: Agile learning design. The research question: How to design an agile learning process with both progression and empowered students? The work method is action research framed through on-line evaluations (data) and development of the Wofie learning design. Main contribution: An agile guide-map.*

**Keywords:** Wofie, agile, learning, innovation, entrepreneurship

## WOFIE CONTENT

Wofie is a simultaneous workshop on the Aalborg, Esbjerg, and Copenhagen campuses connected by video conference. It is an annual event held in 2008, 2009, 2011, and 2012.

Wofie is always placed the week before Easter, and the main target group is all 8th semester students at Aalborg University, however 10th semester, Ph.D. and master's students are also welcome. Moreover, partners are also welcome to send students – University of Southern Denmark, Roskilde University, University College Northern Jutland, and University College South Denmark.

Wofieis held in English and is equivalent to 2 ECTS credits. For most students, Wofie is a voluntary activity, however some studies have incorporated it as a part of the curriculum. Each time a theme is chosen, and in 2012 it is social innovation and entrepreneurship. It is important that students from all faculties and partner institutions are able to contribute to the theme.

The primary focus of the first two days of Wofie is innovation, and the last two days focus is primarily entrepreneurship. The overall progression is illustrated in Figure 1.

Figure 1: Overall progression of Wofie

Students are mixed across disciplines, faculties and institutions.The last day ends with all groups in Wofie competing with each other presenting their business concept to a preliminary jury.A final jury with both business and university members evaluates the individual presentations based on idea, documentation, value, and presentation format.

Besides the academic activities, social activities are incorporated as a conclusion to each day.Friday ends with a small ceremony, where 1st, 2nd and 3rd place in the competition for the best business concept are announced.There are sponsored prizes – in 2012 the 1st, 2nd, and 3rd prize are respectively DKR 15.000, 10.000, 5.000; moreover tickets for Roskilde Festival are given to a group selected by the students through mobile votes (*students' choice*).

The multi campus video conference is used for shared instructions, inspiring talks, the finale, and the small prize ceremony, which supports the experience of a joint workshop.Business and information experts are located at the campuses; they can be contacted by the student groups on campus, and starting in 2012 on Facebook.

## WOFIE ORGANISATION

Wofie is a scalableconcept regardingnumbers of campuses, locations, clusters, groups and students, and about 400 students have been enrolled per event (see table 1).

| Year | 2008 | 2009 | 2011 | 2012 (*Target*) |
|---|---|---|---|---|
| Campuses | 3 | 3 | 3 | 3 |
| Locations | 7 | 4 | 4 | 3 or 4 |
| Clusters | No | 10 | 12 | 12 |
| Groups | 90 | 80 | 70 | 70 |
| Group members (target) | 5 | 5 | 6 | 6 |
| Enrolled students | 452 | 370 | 409 | 400 |

Table 1: WOFIE: Statistics

The Wofiesteering committee has representatives from the four faculties andthe university library. The project management is run by *SEA*(Supporting Entrepreneurship at Aalborg University), which also provides support with secretary assistance, marketing, execution etc.The steering committee constitutes smaller working committees (e.g. pedagogic, social activities, sponsors, marketing, technical).

Wofie is executed by a staff organized as project management, location managers and supervisors responsible for clusters with up to 6 groups (6 students per group). The workshop is also supported by business, informationand pedagogical experts. Supervisors are prepared through amandatory one-day seminar.

## LINEAR LEARNING DESIGN

To ensure a coordinated workshop with aligned activities a storyboard was designedfor Wofie 2008 and 2009. The storyboard was designed asa timeline with synchronized activities. It was beneficial for the video conference setup, it was easy to control, and the supervisors were easily instructed. Evaluations of Wofie 2008 showed more focus on innovation than entrepreneurship. This was balanced in the learning design for 2009.

However, evaluations from 2009 showed too much focus on process and a too tight schedule. The pedagogical working committee recognized this as counterproductive in an innovative and entrepreneurial process. The linear process limited thepotential innovation and entrepreneurial capacity. The groups only worked in a synchronized manner because they were forced to.

## AGILE LEARNING DESIGN

In general, an agile learning process is characterized by empowering a development team through the use of principles, such as ‘people and interaction over processes and tools’ (Appello 2011). At Wofie, agility is also about empowering the groups. The students should be free to choose the activity most beneficial according to the challenge at hand. However, the dilemma is also to ensure pedagogical goal-oriented progression with a fairly equal balance between innovation and entrepreneurship.

To address this dilemma, the storyboard was discarded and a guide-map (see Figure 2) was designed for Wofie 2011-12 with both a progression and an activity dimension.

| ASYNCHRONY LEARNING ACTIVITIES | WOrkshop For | | | |
|---|---|---|---|---|
| | Innovation | | Entrepreneurship | |
| | DAY 1: UNIQIFY | DAY 2: VERIFY | DAY 3: BUSINESSFY | DAY 2: CONVINCIFY |
| UNIQIFY | Ideation | Value | Business concept | Desire |
| VERIFY | Need | Research | Critique | Potential |
| BUSINESSFY | Business Idea | Market | Organization | Strategy |
| CONVINCIFY | Pain | Cure | Profit | Presentation |

Figure2: Wofie guide-map (Asynchrony learning activities are added here)

The systematic work method behind the guide-map design is to understand *uniqify*, *verify*, *businessify*, and *convincify* as both progression and asynchrony learning activities. The horizontal dimension is the outlined progress, and the vertical dimension is the learning activities resulting in 16 aspects on innovation and entrepreneurship.

An example is the cross tabulation *uniqify* $^{activity}$ x *verify* $^{progress}$, which results in the aspect *value*, with the related methods *ideation4value* and *compose concept*.

Every aspect relates to one or more methods (totally 36) described as a procedure, and each step of each procedure is exemplified by the re-invention of the wheel. The guide-map is designed for interactive use on the Wofie webpage, and the groups use the guide-map throughout the workshop in order to work with their cases. The pedagogical model behind Wofie is case-based learning, which includes Aalborg University pedagogical model of problem-based learning (Rosenstand 2011).

Experience from 2011 showed that the agile learning design placed a higher demand on the supervisors – they need to facilitate agile group processes, and supervise the students according to a non-linear guide-map; they cannot follow a linear time-fixed storyboard. This has resulted in a new recruiting/training strategy of supervisors for 2012.

## CONCLUSION

The Wofie guide-map complies with an agile learning process. Moreover, the evaluation shows that overall student satisfaction rose increasingly from 2008 and 2009 to 2011 (45%, 46%, 68%).

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# Using music to design the Jympa group training experience

*By JOHNNY WINGSTEDT & RONNY LINDEBORG*
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*This extended abstract describes a pilot study that was a collaboration between the Royal College of Music in Stockholm and Friskis & Svettis, Sweden's largest organisation for physical training. The objective of the study was to explore functional relationships of music and movement in group training.*

**Keywords:** Music, physical exercise, social semiotics, multimodality, metafunctions.

## PHYSICAL EXERCISE AS A WAY TO MUSICK

The musicologist Christopher Small (1998) introduced the term *musicking*, arguing that music is to be seen as an activity rather that as a thing – that "to music is to take part, in any capacity, in a music performance, whether by performing, by listening […] or by dancing" (p. 9). In everyday life, new opportunities for musicking are continuously evolving. In most cultures and historical eras, moving to (or with) music is a basic way of interacting with the musical sound – in dance or rituals, in work and play. A common activity in contemporary society is to do physical exercise with music.

This paper describes a pilot study, exploring the relationship between music and physical training from a multimodal and social semiotic perspective. In 2010, the Royal College of Music in Stockholm (KMH) collaborated with Sweden's largest organisation for physical training, *Friskis & Svettis* (F & S), in a research project financed by *The Knowledge Foundation* (KK-stiftelsen). The objective was to develop theoretical tools, concepts and methods for investigating the relationship between physical exercise and music. The project focused on the kind of group training that F & S themselves call *Jympa* – simple and (usually) rhythmical movements to music.

In Jympa, the instructor/leader will prepare for classes by putting together a series of functional moves, designed to improve fitness and physical strength. This will be done taking inspiration from music. Recordings of songs, that are considered appropriate for each set of exercises, are selected by the leader. In the class setting, the music will then serve as a tool for communication. By listening to the music and watching the instructor's movements, the participantswill know what to do. A minimum of oral instruction is therefore needed.

The objective of the study was to explore functional aspects of the relationship between music and movement, based on three basic questions:

- What are the dominant relationships between music and movement in the Jympa situation?
- What semiotic resources are involved in establishing music-movement relationships?
- What musical communicational functions are salient in the Jympa setting?

## METHODOLOGY AND RESULTS

The methodology was performed following two major approaches. The first approach was to analyse video recordings of 16 different Jympa classes at different levels. These were authentic sessions, previously recorded by F & S for documentation and evaluation purposes. Our focus was put on describing the relationships between music, leader and participants. The analyses were followed up with interviews with several Jympa instructors.

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The second approach was to have three students, enrolled at the *Music Design* master program at KMH, compose music for video recordings of Jympa exercises. The composers were given one short movie each, with the soundtrack removed, showing an instructorperforming a series of moves. The task was to compose, record and synchronize the music to picture, with the purpose to, as much as possible, support the physical movement. The composers and the involved Jympa instructors then met on several occasions to discuss revisions of the music, suggested by the instructors, to further fine-tune the musical expression and form. In this, it became necessary for the instructors to verbally define and motivate their design suggestions. The conversations were observed by the researchers. When consensus was reached,after several iterations of musical adjustments, the composers, instructors and researchers met to discuss the musical design process and results.

In attempting to describe what constitutes thefunctional relationships between music and movement in a Jympa setting, a systematic description of available semiotic resources was made. For semiotic resources of music (such as tempo, pitch, timbre etc) references were made to previous work by e.g. van Leeuwen (1999) and Wingstedt (2008). As for describing the moves, a catalogue of resources was commenced. Examples of such resources are: frequency, direction, fluctuation, softness and weight. In order to be able to describe relationships between the two different modes, the concepts of *energy* and *time* were used as "common denominators" to which available meanings potentials of the various semiotic resources could be mapped.

For describing salient communicational functions of music in the Jympa class, Halliday's (1978) three *metafunctions* of communication were taken as a starting point. Examples of *textual* functions are here predominantly based on *temporal* organisation – such as music contributing structural and formal aspects of the movements and establishing a sense of continuity. Music communicates *ideational* (content) meaning by providing *information* – e.g. about which exercise to perform and when to change movement. *Descriptive* aspects of the music also relates to the quality and expression suitable for the performed moves. *Interpersonal* functions include music's ability to inspire and motivate physical activity, *emotionally* contribute expressional qualities of the movements and to urge the participant on.

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# Research and Development Projects in Progress

# Expectations, Practices and Rituals – Explorations of Transition between Elementary and Primary Education by the Example of Eating Rituals: A Qualitative Research Project of Trier University

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*This BMBF (Federal Ministry of Education and Research) -project, starting in November 2011, undertakes research on the transition between elementary and primary education and focuses, doing so, eating rituals. We see both pedagogical fields representing different interests and professional practices concerning eating and eating-situations in their allday-work. Against this background we focus on eating-situations as specific learning environments and in this especially regard if there is a potential to create a successful transition.*

**Keywords:** Elementary and Primary Education, Transition, Rituals, Eating, Qualitative Research Project

## EXPECTATIONS, PRACTICES AND RITUALS – EXPLORATIONS OF TRANSITION BETWEEN ELEMENTARY AND PRIMARY EDUCATION BY THE EXAMPLE OF EATING RITUALS

Our project focuses on the transition between elementary and primary education and thereby we make a point of researching professional ways of arranging eating situations in associated institutions. We see both areas as fields, which show a different interest on eating and have, especially in Germany, a differing history of establishing this topic in their workaday life. Compared to the tradition in primary-school, a warm meal has been arranged in the kindergarten for a long time and it is seen as an important learning situation. In primary-schools on the other hand eating and eating-situations have been established since the recent debate on allday-schools. According to this, we want to find out if you can see eating-situations as a specific learning environment and if there is a special potential in eating rituals to make the transition easier for the kids.

In Germany the transition between primary and elementary education has gotten a special attention since PISA-studies (cf. Deutsches PISA-Konsortium 2001 and 2002). The debate concentrates on different points: connectivity, the organization of transition and the development of “Bildung” (Education) and its sustainability on the part of the institutions of primary and elementary education and their cooperation. A desideratum of research in this case is food, eating situations and rituals.

According to Georg Simmel (1908/2001) and Pierre Bourdieu (2010), eating is a complex social and cultural phenomenon. On the one hand it is absolutely and directly confined on the individuum. On the other hand it is basic for community-building-processes and as such gets a relevance in aspects of socialization (Simmel) and elementary source of distinction practices (Bourdieu). Following these perspectives food and eating-rituals in pedagogical arrangements may hold some potential of important aspects with regard to the transition between elementary and primary education and could function as a learning environment in this respect. These aspects however have not yet been discussed. Concerning this desideratum of research some main questions can be raised: How do professionals in both institutions frame and what do they expect from eating-situations? Can eating situations be seen as specific learning situations? What do kids learn in those situations and which influence on their transition do things have, they’ve learned there? How could professionals use those situations to facilitate the transition for the children?

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Our project aims at researching on expectations, practices and rituals as explorations in elementary and primary education in conjunction with eating and eating situations. In the light of the complexity, our study contains a multidimensional account that focuses on existing practices and rituals of preparing and giving food and associated conceivabilities and sights in both pedagogical institutions.

With to content this evaluation research bases on the (elementary/primary education-) cooperation-programme "Humbolde – kids explore natural science" that has been developed by Trier University and the German Children and Youth Foundation. This programme has installed learning-factories offering children from both institutions to work together on certain themes such as magnetism and gravitation. Evaluation studies of this program elaborated that the project created new learning-rooms as "transition-corridors". We deliberate eating situations could have potentials as similar functions and question:

Can eating situations function as learning-rooms, as a specific learning environment? Which educational processes take place during a meal at the institutions? In which way do both institutions use it – are they seen as formal or informal learning-rooms?

Our input aims to explain the educational context of the subject food and eating rituals as a Design for Learning. We focus on eating situations as a possibility to make learning efforts concerning the transition between elementary and primary education. This research thereby allows a view on different learning arrangements and environments. It tries to resolve professional practices in connection with eating and wants to clarify the importance of eating and eating-situations as a specific learning environment and as learning situations. A special attention is thereby put on eating situations in the view of aesthesiologic and aesthetic education. In which way can kids use a common meal to shape their perception?

Additionally the Second part of our input will be a description of our methodological design including group discussions, ethnography and camera-ethnography and a triangulation during the whole research process. Basically the research is conceived as a responsive evaluation. As such the results are presented the stakeholders in feedback-discussions. This specific kind of response will thereby be discussed as a strategy to professionalize. All in all the research includes six cooperations between kindergarten and primary-school in Rhineland-Palatinate, Saarland und Luxembourg.

## RESEARCH APPROACH

Group discussions: in the context of the group discussions and the documentary method different actor groups (administration, personal, parents) will be analyzed. Based on their chosen issues and experiences collective orientations of the stakeholders can be reconstructed. So their implicit knowledge can be systemized and explicated. All in all there will be 18 group discussions in six cooperations between elementary and primary school.

Ethnography: as a second access to the field ethnographic methods (participant observation / camera-ethnography) are chosen. They show the possibility to notice the practice of the actors and to focus their bodies in its relation to the room. In total there will be two sampling periods in four cooperations between elementary and primary school.

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# Design of Collaborative Peer Feedback with Self-assessment for Online Learning

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*This paper focuses on how online course outlines can be designed to improve the impact and added value of collaborative peer activities in distance education. Data were collected from 22 student teachers' peer feedback with self-assessments during two consecutive 15 credit web-based courses. The result shows that the quality in the collaborative peer feedback is developing between the two courses, but there is a lack of reflections in their self-assessments.*

**Keywords:** Peer Feedback; Self-assessment;Collaborative Learning; Interactive Learning; Online Learning

## INTRODUCTION

The backgroundof the study is that collaborative online peer feedback with self-assessment can promote students' learning and development, and their critical ability. University assignments such as reports, articles and project presentations are more complex work; therefore students need to have emphasis on the learning processes in writing, inquiring and problem solving. A practical benefit of implementing collaborative peer feedback is that the feedback becomes available during the learning process and in much larger quantities, than the teacher could ever provide alone. Peer feedback uses as a dimension ofstudents'appreciations with aspects of each one's understandings; as well alternative strategies and solutions based on literatureto promote theabilitytogive and receivefeedback. These processes foster meta-reflection on the quality of their assignments and the input of others, and develop awareness of effective and qualitative contributions to the discussions. Self-assessment is as a way to help students to improve their attention on the meta-cognitive aspects of their learning when they monitor their own assignments and online peer feedback and compare to other fellow students. Six main topics of self-assessment describes in the literature: the influence of different abilities, the time effect, the accuracy, the effect of self-assessment, methods of self-assessment and the content of self-assessment (Dochy et al., 1999).Adams and King (1995) suggest a systematic approach or framework with student activities such as: setting own criteria; assessment exercises; self-assessment and peer assessment. These processes are conducivefor students to make judgement about their own learning outcome and to consider the characteristics of competent work and how to apply these criteria on their own work. They can also use their reflections as input for self-assessment after completing the assignment; as well to improve next learning assignment based on that assessment. In this collaborative context, enablesself-assessmentreflectionson the quality of personal contributions and the input of others and develops awareness of effective and qualitative contributions to the discussions online (De Wever et al., 2009). In order to shed more light on the impact and quality of collaborative peer feedback with self-assessment online, the research question is: What impact and added value can be identified in students collaborative online peer feedback with self-assessment between the two courses?

## THE STUDY

Data was collected from the 22 student teachers' (women=15, men=7) online peer feedback with self-assessment processes with one assignment in each course, which was given as part of the first two consecutive 15 credit web-based courses called ***Teacher Assignment*** and *Learning and Development*. In the start of the first course the students had worked with

assessment exercises (Adams & King, 1995) how to provide peer feedback in their groups with own criteria as follows: as they read each other's assignments they should start with capturing text focus or purpose, then indicate interesting or unclear summary, and finally formulate briefly in their own words what they consider most important, ask questions or explanations and clarifications or suggest alternative solutions and/or advice and discuss problems on the basis of literature and theories.

The study focuses the second course assignment in course 1, where the students worked both individually and collaboratively with cases of teacher leadership, one official case and one from each student. In course 2, the students worked both individually and collaboratively with own cases of bilingualismand second languagelearning. They had observed teaching situationsin schooland in the assignment they should analyze the circumstances and providedidacticproposals. The students first submitted their own particular contribution to the course assignment. Afterwards, they had to give collaborative peer feedback in their groups with the same criteria as above over a period of a week and after this activity self-assess the quality of their own peer feedback in course 1 and in course 2 both self-assess the quality of their own and others peer feedback with didacticproposals. The students were asked to notcritically examine how well the cases of others were presented and evaluate them in a personal way. The purpose of the collaborative activities was to develop awareness of qualitative and reflective contributions and to improve next learning assignment based on that assessment concerning different solutions to the underlying problems in the content of the assignments and relate to own experiences and literature.

## ANALYSIS OF PEER FEEDBACK WITH SELF-ASSESSMENT

The analysis was conducted in two-phase analysis. The first phase involved discovering and identifying the students' meaning content in the online peer feedback with self-assessment by Toulmin's argument pattern (1958). Toulmin (1958, pp. 98, 101, 103) describes how writers and readers can deal with texts, and how they can use the resources of texts to determine what they mean – or rather, some possible meanings – and how it can be achieved with an argument model containing six elements. Three elements are mandatory, while the remaining three are more voluntary or optional, since they occur often, but not always. The basic argument model consists of three mandatory elements: C (*claim*), D (*data*) and W (*warrant*). The extended argument model includes three more optional elements; Q (*qualifier*), R (*rebuttal*) and B (*backing*). The task is to show students how to present their ideas in an understandable and coherent manner, based on these data and the claims of the original opinion. A revised version of Toulmin's argument pattern with the mandatory and optional elements is used.

In the second phase of analysis and interpretation of the students' peer activities was Hattie and Timperley´s (2007) four levels of three effective feedback questions used. The three questions of effective feedback are: Where am I going? (What are the goals?); How am I going? (What progress is being made toward the goal?); and Where to next? (What activities need to be undertaken to make better progress?). The questions correspond to the design of *feedback*, *feed up* and *feed forward* and are closing the gap between where students are and where they are aiming to be, that leads to the power of feedback. According to Hattie and Timperley(2007) there is a distinction between feedback about the task (FT), about the processing of the task (FP), about the meta-cognitive ability with self-regulated actions (FR), and about the self as a person (FS). These processes are partly dependent on to reduce the gap across the level of task performance (FT), the process level of understanding how to do a task (FP), themeta-cognitive level (FR), and/or the self-level (FS).

## RESEARCH CONTRIBUTIONS

The results of the studies show that the combination of what students do together with the tasks assigned to them as collaborators; and the roles and responsibilities the students assume as collaborators; and the interactive structure underlying the activity in their peer feedback with self-assessment; offer the potential to develop and expand the space of learning and understanding in an online context. In course 1, half of the students skipped the self-assessment of own peer feedback. Perhaps they were unsure of how they would self-assess them or how to evaluate their levels of understanding and strategies and/or feelings of *self-efficacy* (the belief in one's own ability to perform course activities successfully). In course 2 nearly all students had self-assessed others peer feedback with didactic proposals and compared them with their own proposals. This use of self-assessment with concrete suggestions was leading to more reflections on one's own work and promoted their critical ability (Dochy et al., 1999).These peer processes are conducivefor students to make judgement about their own learning outcome and to consider the characteristics of competent work and how to apply these criteria on their own work (Adams & King, 1995). The implications for educational practice online is that the accuracy of the self-assessment improves over time and that the feelings of *self-efficacy* are important mediators in all feedback situations (Hattie & Timperley, 2007).

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# **Growing Wild and Being Managed,** Mobile Communication and Internet Use in Public and Private Spaces in Vietnam

*By LARS BIRCH ANDREASEN*
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*This paper discuss the use of mobile communication and the spread of internet cafés, which areboth growing rapidly in today's Vietnam; at the same time the government tries to manage or control the development. Daily life in Vietnam is a complex mix of modern and traditional, public and private; the use of mobile phones, internet, and other communication possibilities fit into this mix, while at the same time pushing it to a new balance.*

**Keywords:** Mobile phones, internet use, networks, public and private spaces, Vietnam.

## A NETWORK SOCIETY

Vietnam is maybe best described as a network society. Knowledge is spread rapidly through network communication. Everybody talks at street kitchens, *bia hoi* (pubs), in offices at lunch hours, and very often on mobile phones, which is a growing market in Vietnam, in cities as well as in remote areas. Virtually every Vietnamese citizenowns a mobile phone, and internet cafes are mushrooming. Communication is happening everywhere anytime, and mobile phone and internet use seem to fit well into the network-organized daily life in Vietnam.

The mobile phone is the first ICT tool that has reached even remote areas in low- and middle-income countries. The coverage of mobile networks is increasing rapidly. This growing coverage provides possibilities to address problems of accessibility and quality of education, health care, as well as other areas.

The discussions in this paper are part of a research in progress on young people's mobile and internet use. The paper builds on observations of daily life and interviews that I carried out during a research stay at Vietnam Institute of Educational Sciences in Hanoiin 2010-11.

The mobile phone is a personal device that people tend to bring with them always. During my observations of daily life in Vietnam, I noted different habits of where to use and where not to use the mobile phone. For instance, in Vietnam the mobile phone is generally accepted in many situations where in a Danish context it would not fit in. When people attend a theatre, a cinema, or a formal meeting, it is not perceived as inappropriate to keep the mobile phone turned on, and people will often answer the phone if it rings. Thus a number of conversations are constantly going on, and the public and the private is mixed in various ways.

## THE VIETNAMESE CONTEXT

Vietnam is an economically rapidly evolving Southeast Asian country. It has a population of more than 85 million people (the world's 13th largest), and the high population densityis experienced especially in the bigger cities, where all available space seems populated or used for a purpose. This is discussed further below.

Just 25 years ago, Vietnam was one of the poorer countries in the world, but after years of a continuing annual economic growth of 5 to 10%, Vietnam is now on the verge of being categorized as a middle-income country.The developing wealth in Vietnam is taking place with a growing difference between rich and poor. Public wages are very low compared to living expenses, and two jobs or extra income from various sources are often necessary.

Politically, Vietnam is a socialist country. Economically however, Vietnam is anever more market-oriented country, since the economic reform, *doi moi*, in 1986, when the first

acceptance of private ownership started. In official terms, the system is called a "socialist-oriented market economy". Researcher in Vietnamese education, Jonathan London,with a wordplay on the marxist-leninist ideology, has described the system as a "market-leninist" political economy characterized by "a specific and, in some respects, contradictory mix of state-socialist, neoliberal, and corporatist principles and institutions" (London 2010: 76).

## RELATIONS OF RESPECT EMBEDDED IN LANGUAGE

In the Vietnamese social life, through tradition and today, a certain respect is always attached to the senior in a relation. This has roots partly in the Confucian philosophy, and it permeates the very way language is spoken. Each of the personal pronouns, which we know as e.g. 'you' and 'I', are in the Vietnamese language expressedthrough different words, depending on whether you are younger, equal, older, very much older, or very much younger than the person(s) you are talking to.

When speaking Vietnamese, you always explicitly address your utterance to someone, and must therefore always choose a corresponding personal pronoun. In this way, the structure of family relations are mirrored in the language, in a way where the word you use states whether you are e.g. 'older like an elder brother', 'older like a father', or 'older like a grandfather', and the degree of respect is tied to this. This applies as well when talking between siblings as when talking between colleagues.

## THE SPREAD OF INTERNET CAFÉS

The economic situation of Vietnam means that only some households have private computers or hi-speed internet connections. Therefore, there has been an expansion of internet cafés and online gaming cafés all around the cities, where young people gather to play, surf, get news, and talk.

In a recent study from Hanoi, Norbert Wildermuth describes how groups of young people integrate digital media in their daily practice through chatting, e-mailing, netsurfing and playing games. Compared to other kinds of media use, the young people experienced the internet as a mode of activity with fewer restrictions and with more possibilities of developing their own interests.Often their night hours were used online, while taking care of other duties during the day (Wildermuth 2008: 187-88). These young people have been growing up with digital media and have developed competences in using the internet for social interaction.

The public discussions on new technologies, as seen through articles from the officially controlled English language newspapers *VietNamNews* or *Thanh Tien Weekly*, often focus on the promising possibilities of using computers for developing the current practices of teaching and learning; practices that are often criticized for being too teacher-centred and too focused on rote learning. The positive attitudes to new technologies are mixed with concerns about the negative effects of using computers and internet. One of these concerns dealt with the growth of internet cafés and online games cafés, which caused worries that students would use all day and night playing games or surfing the internet, and would not be able to attend their classes properly. And in 2010 an official ban was approved prohibiting internet cafés from being located closer than 200 meters from schools. It wasfurther decided to shut down the internet connections of internet cafés at night time.

As with internet cafés, authorities are also struggling to find ways of dealing with, or controlling the social network site Facebook. Officially, the access to Facebook is banned in Vietnam. But as it appeared in my observations, the ban is not implemented strictly; only the main page or the main domain seems to be blocked. Thus, it is in various ways possible to access the content of Facebook andmany young people use it without much secrecy.It does not even appear to be a publicly sensitive or tabooed topic, as e.g. articles in the English language newspapers often refer without further explanations to people using Facebook.

## COMPUTER AND INTERNET ACCESS AT SCHOOLS

The double attitude of supporting and restricting is also present in the Vietnamese Ministry of Education and Training, MOET, in its support for the use of ICT and development of online games, while at the same time "warning that ICT should not be overused" (interview with a deputy director general at MOET). As discussed in Meyer et al. (2011) the Ministry has been establishing internet connections to all schools and computer labs for secondary schools. But to establish computer labs at primary schools, private funding from parents or local companies is needed. This may become a competitive advantage between schools when attracting good teachers, or when parents are choosing schools for their children.

In general, there is a fairly large amount of private financing of education in Vietnam. Basic school education is free, but schools are allowed to collect some amount of fees to cover expenses on heating etc., and there are continuing debates over this. Other private expenses come from children needing to have "extra classes", which are paid privately (Ha et al. 2005). In total it is estimated (London 2011: 86) that private expenditures on education in 1996 accounted for as much as 43% of the total expenditures on education in the Vietnamese society, due to the cost of school fees, books, extra lessons and other expenses. In an economically stratified society, this may constitute a big challenge for a number of families.

## PUBLIC AND PRIVATE SPACES

Young people's use of Facebook, mobile phones, and internet cafes to continually keep networks available and functioning can be seen in relation to the complex interplay of what is public and what is private in current Vietnamese daily life. As in other Asian city-scapes, people in Vietnam are living very close. Large populations live in small areas, houses are built with only little space between them, and in each household you often find many generations living together. The extended family is considered a usual way of living.

As a young person in this Vietnamese social life, attaining an individual private space when being at homecan be difficult. In this situation many young people locate part of their private space outside in the street, where they meet and drive together on motorbikes around the streets of the city. The motorbike and the street itself thus become private spaces to them; the crowded traffic may seem more anonymous and thereby private than the family home.

As another result of every inch of the city space being used for working, gathering, family life, setting up temporary shops, etc., people develop a habit of treating small urban spaces as private. Two people sitting involved in each other on a parked motorbike at the side of the road are being respected or goes unnoticed as having a private space, even though situated right on the side of the street. There might actually be quite a number of pairs on motorbikes along the streets, but since they usually do not have private spaces elsewhere, it is generally accepted. Thus the public and the private mix in various ways in the Vietnamese urban life.

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# Classroom blogging - a genre of writing into knowledge

*By SOL-BRITT ARNOLDS-GRANLUND; RIA HEILÄ-YLIKALLIO; HANNAH KAIHOVIRTA-ROSVIK; DAN ÅKERLUND*
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**Keywords:** media literacy, digital literacy, blogging, multimodal learning

## CLASSROOM BLOGGING – AGENRE OF WRITING INTO KNOWLEDGE

This paper starts and derives from empirical data from the ongoing research and development project *Pekplattans pedagogiska potential, PPP (En. Learning Potential of Touchpad in Education).* The data has been collected among teacher students at the Faculty of Education at Åbo Akademi Unversity in Finland and among pupils in basic education in Vaasa (Finland) and in Karlstad (Sweden).

In the last ten years initiatives have been taken in order to empower European citizens by formulating the fundamental competences of everyday life. The *new competences* articulated for the 21st century are media- and digital literacy. Media literacy is herein understood as the ability to develop cultural, critical and creative competences. Digital literacy is understood as the use of digital media to retrieve, assess, produce, and exchange information, and to communicate it in collaborative ways. In the corresponding project the blog is regarded as a social activity as well as a writing genre where media- and digital literacy are linked to the classroom learning environment in an educational design defined as *Classroom blogging.* The phenomenon *Classroom blogging* as contemporary literacy learning is the uniting research theme for the four scholars in this presentation.

In her instruction of teacher students, lecturer in media education, PhD, Sol-Britt Arnolds-Granlund, has explored the educational potential of touchpads (e.g. iPad). Besides instruction, data has been collected by questionnaires, observations, and texts of student blogs, notes in touchpad history, pictures and teacher and student logbooks. The research ambition is, from as many perspectives as possible, to explore the use of the touchpad as a means of instruction and learning. Arnolds-Granlund directs her research focus at blogs, which can be considered as expanded texts and multimodal expressions of teacher students' cumulative knowledge. As an academic in media literacy education, Arnolds-Granlund focuses here on the use of multimodal media texts as communication of students' knowledge and expertise.

Professor Ria Heilä-Ylikallio investigates how pupils in grades 7 and 8 (13-14 years) through blogging respond to their reading experiences of a youth novel. The novel was distributed to the pupils on touchpads, and during their reading pupils were encouraged to create literary comments in school context blogs. Heilä-Ylikallio will in this paper comment on media literacy in education by using pupils' blogs as examples of literacy learning in contemporary school. The pupils' reader instructions and combinations of alphabetic text, photos and other images are key factors in her investigation.

Hannah Kaihovirta-Rosvik's research interest focuses on how art literacy is brought to view in pupils' blog productions. The conceptions of timing, rhythm and composition are used as the crux in her research for recognizing pupils' use of aesthetic formations in blogs. Kaihovirta-Rosvik's field of interest is questions concerning how pupils communicate learning stories that are not just entertaining but immersive in school. Does new media literacy contrast traditional linear storytelling in school? Is there an unarticulated knowledge of art literacy involved in narration when natives to the Internet create blogs? The pre-understanding to Kaihovirta-Rosvik's research is that told through many media at once in a

nonlinear fashion, blog narratives encourage pupils not merely to watch but to participate in aesthetic production, often engaging in the same way that computer games do.

During 2010-2011 Dan Åkerlund has initiated a study regarding classroom blogging were four classes in basic education, grades 4 and 5 made regular use of blogging in school assignments. By combining texts and photos the pupils have communicated their learning processes in several school subjects in individual blogs. According to the pupils, it has been the visual work with photos that have made the school assignments interesting, meaningful and real. These were also the key element, which brought visitors to their blogs. Åkerlund´s research interest starts from the implication that students' relationship to multimodal texts differs from pupils' analog production of images in school. Åkerlund's interest is also the investigation of how, for pupils, photo documentation has probative value (instead of using personal drawings) when presenting assignments based on reality narration in blogs.

# Participatory challenges in organizational learning processes

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*Participation is a defining characteristic of action research. Is participation in its full sense - co-producing the purpose, co-designing the processes, co-evaluating and co-communicating the results - possible in dialogic, organizational action research? Whose reality counts when it comes to deciding the space for learning in organizational action research processes: the employees', the management's and/or the action researcher's?*

**Keywords:** action research, learning, participation, dialogue, dissensus.

## TO PARTICIPATE OR TO CO-DETERMINE?

The purpose of the article is to discuss some possibilities and limitations of participation in learning processes within dialogic, organizational action research. Action research is often understood as being based on and promoting participation, involvement, empowerment, dialogue, and democracy. However, the other or the cooperating project partner is sometimes conceptualized as an informant or a practitioner delivering data to the action researcher, while he or she is understood as being provided with the monopoly of interpretation and feeding back analyses to the other/the practitioner. This understanding of participation seems to reflect a traditional concept of communication as information transfer or dissemination of knowledge from the more knowledgeable (researcher) to the less knowledgeable (practitioner) thus reproducing an elitist tendency in the Enlightenment philosophy positioning the researcher as 'upper' and the other as 'lower'. This understanding of participation points, too, at action research being practiced as traditional qualitative research.

Our dialogic, organizational action research projects take their point of departure in a different understanding of communication which is not seen as transfer but as co-producing meaning, relationship, and context. Participation is conceptualized as co-determination, i.e., as co-production of purpose, co-design of processes, co-evaluation and co-communication of results (Kristiansen & Bloch-Poulsen, 2012, in press). The article problematizes this radical understanding of participation questioning the prefix 'co' in action research, in particular the "co" in co-designing of processes, i.e., in designs for learning.

The theoretical perspective is to discuss a broad continuum of definitions of participation from a minimalist understanding of 'to participate' meaning to take part in to a maximalist understanding meaning 'to co-determine' (Carpentier, 2011). The discussion will include questions like these: Does the other participate in the researcher's project? Does the researcher participate in the other's project or do they participate in a shared project with common and/or different knowledge interests? Who owns and benefits from the project: the researcher, the management, and/or the employees?

## DIALOGIC DISSENSUS APPROACH

The empirical point of departure of the article is a dialogic, organizational action research project on Employee Driven Innovation in Teams (EDIT) in a Danish kindergarten that has not been completed yet.The research is practiced as project cooperation between two groups of professionals, pedagogues and action researchers who have different kinds of knowledge, but at the same time trying to facilitate learning for both parties through participation. The project is designed as a string of 8 3 hour long, tape-recorded Dialogic Helicopter Team Meetings (DHTM) within one year. At the first meeting, the pedagogues decided which goals

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to pursue during the year long cooperation where the action researcher contributed with competences in designing Dialogic Dissensus Approaches (DDA) inviting disagreements and tensions as possible learning and innovation facilitators. The hypothesis of the project is that every employee has an innovative potential, and that this potential might be unfolded collectively in dialogues. These are defined as a quality of conversations characterized by sharing, daring, and caring co-producing three kinds of results: practical results, i.e., employee driven innovations valuable for the organization, the organizing their daily work, and their work life quality; process organizing results, i.e., new ways of designing arenas of learning improving the DHTMs; and theoretical results, i.e., new ways of understanding the relation between designs and practical results.

## PARTICIPATION AS EMPTY RHETORIC?

The project contributes to new action research knowledge highlighting some of the challenges in these messy processes. On one hand, the project has produced results that managers, employees, parents, and the action researcher consider valuable, e.g., a new dialogue model of cooperation between pedagogues and parents. On the other hand, seen from an action research perspective, did we avoid that participation meant that the pedagogues participated in our project and in the learning arenas designed by us exclusively? Did we avoid participation to be used as a managerial tool? In the so-called participatory turn, can you avoid that participation will become empty rhetoric (Jørgensen, 2008), a buzz word where dialogue is reduced to a legitimatory device?

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# Exploring the Design Space of Genre Pedagogy and Virtual Learning Environments

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*This paper explores the design space of genre pedagogy and virtual learning environments. This is done by examining the cornerstones of genre pedagogy and the main activities they give raise to, and how the activities are transformed when they are partly or completely moved from the classroom to virtual learning environments, and what implications for interaction design they give raise to.*

**Keywords:** Virtual learning environments, genre pedagogy, Systemic Functional Linguistics, academic writing, interaction design

## INTRODUCTION

The current learning landscape with very easy access to information is changing the relationship between teachers and learners. This change impacts teaching and learning in general and writing in particular. Writing has in the last years emerged as a socializing activity that has been diversified into different practices that have developed exponentially through the use of chats, short-messages services, and social media. It is a fact that what we write is nowadays produced, shared and discussed for a variety of purposes and audiences. But for writers expected to compose academic texts it is not always easy to understand what the outcomes of academic texts should be, for which purposes they are writing or what type of tool or communication channel they have to use to share their texts and messages. In fact the use of virtual learning environments, often presented as alternative modern platforms for learning, are actually challenging learners' relationships with teachers, other peers, their writing and themselves.

In this contribution we focus on writing practices associated with academic texts. We argue that genre pedagogy is an interesting candidate to be considered for the design of digital learning environments (VLEs) including writing. Why? Because, this pedagogical method, which has mainly been used in traditional classroom teaching, presents specific features such as the concept of genre which, among others things, raises learners' awareness of texts and thereby their ability to write according to demands in different contexts and for different audiences.

## SYSTEMIC FUNCTIONAL LINGUISTICS AND GENRE PEDAGOGY

The so-called genre pedagogy (Martin & Rose 2005) is a pedagogy mainly focused on writing and development of disciplinary knowledge, but also reading. Its basis is M.A.K. Hallidays groundbreaking work on human language and language development in the theory of Systemic Functional Linguistics (SFL). The aim of genre pedagogy is to help students develop meta-linguistic tools for handling genres on different levels, through support or *scaffolding* (Macken-Horarik, 1996) by the teacher. One of the main concepts in SFL is *genre*. According to SFL, genre is a goal-directed staged process (Martin, 1993); some examples are observation, description, and argument. These genres are important for writing in school and academic contexts. That is, to succeed as a participant in an academic setting, you have to master genres related to socio-cognitive activities such as observing, describing and arguing. Genre pedagogy is designed to support students into these activities and written genres.

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## DESIGN OF VIRTUAL LEARNING ENVIRONMENTS AND GENRE PEDAGOGY

There are four main activities/tasks in the genre pedagogy approach (Martin & Rose, 2005) to design for. Giving some examples of design possibilities for each activity, we aim to conclude on general issues.

**Building field**: This phase concerns building up the knowledge including activities mainly based on reading of multimodal texts. The new technology infrastructure based on the Internet has and could really change this phase by having all kinds of information resources available side by side with the VLE. The problem for designing a VLE here could lie in the possibilities to restrict the information, to choose a smaller amount of information and to apply a critical stance upon the sources.

**Deconstruction of text**: De-constructing a model text is something that students should carry out together with teachers. This could be done using a VLE, such as using the wiki tool in the VLE. However, questions of authority, and who is in control, together with transparency are important design issues here.

**Co-construction of a new text** in the same genre as the model text is an activity that at first looks easy to transfer. However, if the VLE are really to function as a tool for genre pedagogy, it must be designed with interactivity, and openings for teacher scaffolding. For instance, prompts can pop up saying, "What is an appropriate title for a text like this?" and "Now we should decide on how to conclude".

**Independent construction of text**: teachers scaffold the students own writing in the genre practiced in the previous phases. For instance, automatic text analysis can be applied, so that when a student writes "I think that", the VLE could propose a change into a phrase with a grammatical metaphor, a noun instead of a verb, thus reminding the student that academic texts usually consists of more nouns than everyday speech. If the assignment is to write an argument, the VLE could react if the student uses too many questions. Generally, the SFL concepts, used consciously and consistently during a full course, can act as powerful tools for teachers and students to develop a shared understanding of how language make meaning in certain contexts.

## CONCLUSION

Our discussion shows that the main issue when designing virtual learning environments supposed to support students' writing development is how to get the social scaffolding into the design. Since scaffolding works through social interaction, the social interaction has to be transferred into the VLE. Of course, digital media have much to offer when it comes to interaction through chats, fora etc. However, if the teacher's role of scaffolding writing of a specific text should be transferred into the VLE, we claim that the use of a) language technology tools and b) interactive prompts are necessary in order to aid students and teachers. One important trap to avoid is that of a computer program being a tool with a correct answer, a normative voice. Interaction design plays an important role here finding a combination of computer, teacher and peer interactions.

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# **Ludic Engagement Designs for All (LEDA):** Non-formal Learning and Rehabilitation

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*This paper reports on a developing 'design for learning' research and application platform that has evolved from two mature bodies of ongoing work. Non-formal learning and (re)habilitation result from exploration of virtual interactive environments that catalyst ludic user-experiences. The created environments are flexible to needs, adaptive, and profile-determined whereby learning goals influence design. LEDA platform collaboration is invited.*

**Keywords:** Interaction Design for UX, Non-Formal Learning, Processes Environments.

## INTRODUCTION

This contribution introduces the concept of 'Ludic Engagement Designs for All (LEDA)' that evolved out of two bodies of mature research. Each body of work has emerged models for intervention that transcend and cross-inform in learning and rehabilitation situations. The term 'Ludic' relates to the designed for fun/playful user-experience (UX) for both end-user (learner/disabled person) and facilitator (teacher/healthcare professional). 'Engagement' refers to the targeted immersion of the end-user that is achieved through the adaptation of the available environment design parameters so that profile-matching is optimised. 'Designs for All' refers to the inclusiveiterative inductive strategy where facilitator learning influences subsequent session design, and how the LEDA concept is context independent, thus 'all encompassing', and applicable across users and fields, i.e. in education, in healthcare, and beyond.

Petersson's early work in conceiving and defining 'Non-Formal Learning' cumulated in the development of dynamic models as presented in her doctoral dissertation. These models questioned existing traditional formal education models that increasingly are reflected upon by contemporary scholars as being redundant as advances in ICT evolve curricula, classroom activities and strategies.

Brooks' body of work is titled SoundScapes. It began in the mid-nineteen eighties as field studies in institutions for disabled people. The ability and age range was wide and non-selected as the institutions 'volunteered' the end-user participation. Testing was of bespoke sensor-based apparatus and multimedia content whereby residual physical gesture control music making and image generation/manipulation. Later, control of video games and robotic devices was added. Creative expression and playful interactions to promote a ludic user experience to motivate participation in rehabilitation is a goal as well as a tool and method to supplement traditional intervention.

In a similar way that SoundScapes proved a suitable vehicle to explore non-formal learning in rehabilitation, so did non-formal learning offer a framework for arguing the SoundScapes research. Such use of gesture-sensitive apparatus, interactive systems, and virtual environments is increasingly reported in healthcare as such methods as posited in these works are adopted in contemporary practices. In this way LEDA, as a 'design for learning' research and application platform, is considered as an evolving trans-disciplinary entity that is open for collaboration to develop to its fullest potentials. Illustrating the work, a model from each body of work is presented; namely Petersson's non-formal learning and Brooks' ZOOM (Zone of Optimized Motivation).

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Petersson's non-formal learning model (figure 1) illustrates a holistic overview of a complex situation focused upon qualities integral to the design of user experiences leading to desired learning. The learning within and the design of a learning (or therapeutic) situation constitutes a situated activity with inherent actions and interventions. The profile influences the facilitator's decisions on how to set up the attributes of the environment relative to the desired learning process and the expected outcome of that process. The model was developed relative to the development, use and evaluation of interactive environments targeting learning. However, the model has proven to have a more generic value as it has been used in learning situations where other forms of resources and/or methods have been used. These are issues that will be further developed and discussed.

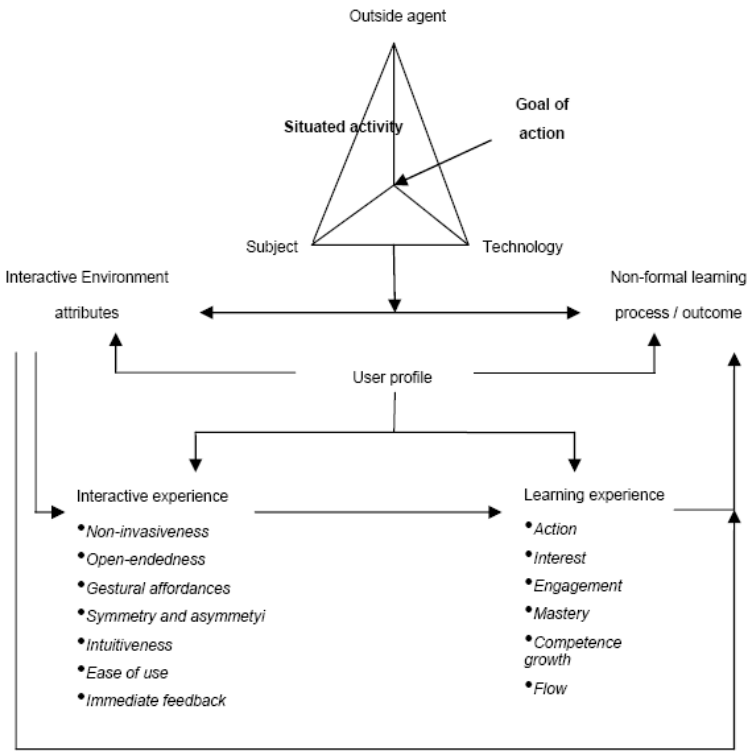


**Figure 1: The composition of learning and design in interactive environments**

ZOOM (figure 2) is an intervention model where participant/learner ability is ideally matched by a challenge to achieve an interactive experience in line with Flow (Csiksczentmihalyi, 2002). The challenges are planned according to a dynamic programme design to increment participant microdevelopment (Battro et al. 2008). The unit of analysis assessing the system is participant action in the designed interactive environment, in this way it is also in line with Vygotsky's ZPD (Zone of Proximal Development) and activity theory (1978). However, ZOOM differs from ZPD by the primary inter-subjective entity being the mediating technology in the form of the interactive system supported by a secondary inter-subjective entity, i.e. the facilitator. This dynamic non-formal approach questions facilitator intervention time (t) in respect of parameter change to incremental challenge (δ). Planned is an automated ZOOM in line with the Artificial Intelligent (AI) concept of Dynamic Difficulty Adjustment (DDA), i.e. where change is matched to performance.

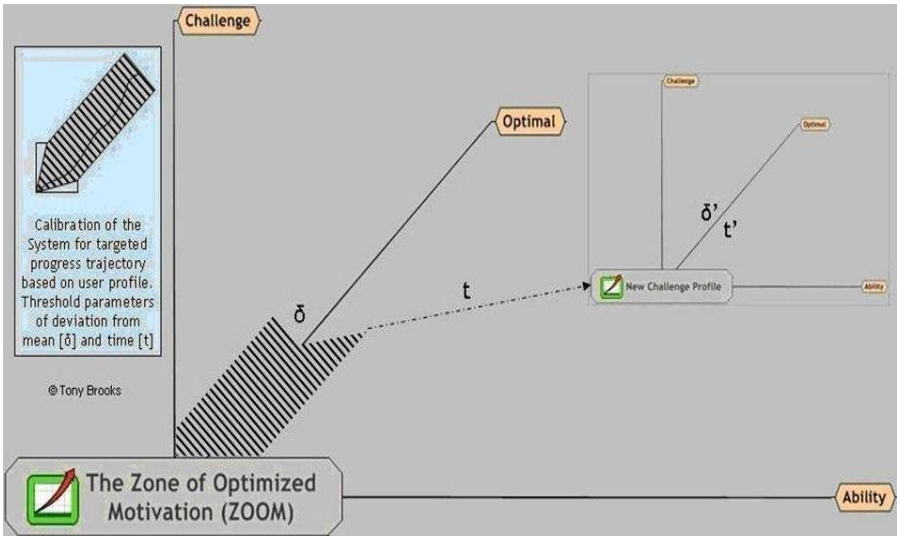


**Figure 2: ZOOM (Zone of Optimized Motiavtion)**

## CONCLUSIONS

LEDA is a research platform that is influenced by the learning models presented in this contribution. The author's models of non-formal learning and ZOOM intertwine to promote (and provoke) discussions on the potentials of non-formal rehabilitation and how the apparatus and methods involved cross-migrate to education of traditionally developed humans. We end by stating that whilst Petersson's non-formal learning model is a fit as a theoretical framework in alternative rehabilitation, it is still debateable to what extent sensor-based virtual interactive space environments will contribute to traditional curricula. These discussions will be further developed.

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# A Design Perspective to Learning

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*This study suggests a design thinking approach to encourage innovation and participation in creative learning situations. Project-organised design activities were implemented in order for 116 secondary school students to learn from specific project themes. Outcomes were dependent on the student's interest in the project theme and the sense that the student was able to make of the design situation based on expert input, facilitation and group dynamics.*

**Keywords:** design, learning, innovation, facilitation, secondary school

## DESIGN THINKING AS A RESOURCE FOR NON-FORMAL LEARNING

In this paper we report on a study aimed at introducing design thinking in secondary school education and transforming the learning environment to a creative and innovative practice. Our definition of design thinking is process oriented emphasising design actions (Löwgren & Stolterman, 2004). In this way, we consider the classroom setting as a design-like practice, which, in line with Schön (1987), is learnable but not teachable (p. 157). Our goal is to investigate characteristics (benefits and constraints) and facilitator interventions by implementing project-organised design activities in order for the students to learn from specific project themes. The students select the themes themselves, for example: "Future green transportation"; "How to improve the everyday life for people with disabilities"; and "Human-Computer Interaction". This is to create informal conditions for creativity and innovation in learning situations that normally have a formal lecture format.

Learning in secondary school is not just about acquiring knowledge, but also about the way students handle that knowledge through a sequence of activities; the learning process. Dewey (1913) emphasises the importance of individual interest in learning situations characterised by having high personal meaning. Furthermore, he addressed this question by stating that education should offer a generic understanding of how knowledge is created. Through hands-on activities students are offered opportunities to create generic skills possible to transfer to different conditions and situations. Dewey is aware that there is always a danger when teaching remotes from everyday life and thereby becoming technical and artificial.

Besides contextual attributes related to the physical setting, this paper takes into account students' prior knowledge, enjoyment, and interest. This is to reinforce non-formal-based experiences and achievements; a process which we have termed non-formal learning. Having enjoyable experiences means being engaged and that the individual is offered possible choices of action. This kind of interest can be characterised as persuasive and associated with increased knowledge and desire to learn more.

## DESIGN THINKING CREATING PARTICIPATORY IN-ACTION LEARNING SITUATIONS

Starting from these theories and methods, we defined a new learning scenario for secondary school students. The intervention took place over three days and was based on the model of an iterative design cycle, specifically focusing on the phases of discover, design, sketch and prototype, and thoughtful reflection (Schön, 1987; Löwgren and Stolterman, 2004). The primary tools for the design thinking approach were expert presentations related to the chosen project theme, brainstorms, sketches, and low-fi prototypes. The students' choice of project theme was based on their interest, which constituted the base for the creation of project groups. This means that the groups were mixed in terms of age and education line. Each group was designated two facilitators (university students) to facilitate the process (Figure 1).

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The task for each group was to create a concept idea of a product, service or process related to their specific project theme.

**Figure 1:** Dialogue between facilitator and student

Empirically the study was based on a field study including 116 students (89 females and 27 males) between 15 and 20 years of age. The students were divided into 12 groups of various size (between four and twelve participants in each group), where the data collection was based on video observations, interviews, follow-up questionnaires to students, photos and sketches from the learning situations.

A major concern was the experienced gap between the creative (open-ended and chaotic-like) character of the design thinking based learning situation and students' expectations on a more lecture-format-like structure of teaching and learning. Many of the students experienced that the situation was unstructured, chaotic, and sometimes too challenging. Schön (1987) underlines that students learn to fill this gap by engaging in such a design activity. This is to say, that the experienced lack of structure related to this paper, does not necessarily emerge from misunderstandings or from an imprecise introduction to the learning activity, but from the creativity inherent in the design thinking actions and interactions. We argue that the facilitation as a reflective design practice might improve learning conditions generally applicable to several kinds of learning situations. Cross-disciplinary and age-mixed groups where interest was the unifying factor, elicited experiences of ludic engagement and collaborative learning.

In conclusion, we claim that introducing design thinking to encourage innovation can turn learning situations into creative action and participatory based opportunities to generic skills and competencies. The learning outcomes were dependent on the sense that the student was able to make based on expert input, facilitation and group dynamics. These and other factors will be discussed on the basis on a model for 'designs for learning and innovation'. This project is part of an extensive study on the intersections of design, learning and innovation in different practices where we, also, further investigate the concept of non-formal learning (for example, Petersson, 2008).

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# Mixed artefacts as mediators for collaborative learning

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*eLearningLab at Aalborg University conduct teaching and research in the intersection between Human Computer Interaction (technology), Information architecture (organization) and learning and development (human action). Inspired by the lay out of workshops spaces at architecture schools, eLearningLab has build a lab with both tangible materials and digital touch technologies arranged in a room with various forms of furniture to stimulate movement and ways of positioning the body other than sitting on a conventional chair. The overall purpose of this design lab is to facilitate teaching-through-construction as part of the Problem Based Learning pedagogy, and to increase students' awareness of the role of embodied interaction in learning. Simultaneously the Lab facilitates design of prototypes and exploration of use situations within the fields of Human-Computer Interaction, Computer Supported Cooperative Work and Computer Supported Collaborative Learning. This paper presents the ideas behind the eLearning Lab's DesignLab.*

**Keywords:** design, learning space, concept construction, touch technologies and setting.

## INTRODUCTION

Today's professional roles mix analytic and constructive competencies, making it important that academic teaching enables also humanistic students to acquire core competencies of construction - not to become designers, but in general to make them problem solvers, who understand the web of stakeholders in a project, andable to guide and facilitate informed decisions - an increasingly paramount challenge in today's global and multidisciplinary world. Case based teaching, project based teaching, and problem based learning are ways to make analytical and constructive skills merge into a professional competence, described by Schön under the heading 'the reflective practitioner' (Schön 1983).

While web 2.0 technologies are widely integrated and promoted in university settings (Ryberg et al., forthcoming) to augment learners' construction and problem solving activities, the physical layout of learning environments still seems stuck in an old format. Lecture halls and the other spaces, which universities at most dedicate to teaching, do not support the development of construction skills, and even though Problem Based Learning is a central part of our pedagogical framework at Aalborg University, teaching is still based on teacher led lectures with limited student activity and construction. Fortunately, a lot of inspiration can be found in the way architecture schools lay out workshop spaces.

## THE RESEARCH OBJECTIVE

In order to create an environment where to explore learning potentials across digital and physical borders, we focus our research on touch technologies' and tangible materials and how they affect perception, cognition and habituation, and influence interaction, collaboration, and knowledge sharing.The teaching/learning environment "eLearningLab's Design Lab", www.designlab.ell.aau.dk, supports concept construction employing Smart boards and a surface table, social software like Twitter, Prezi, Google docs, and tangible objects such as a sandbox, Lego Serious Play, as well as a "theatre" corner. With these artefacts in place, we explore activities such as storytelling, scenario building, Forum theatre,

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classification and categorization, and concept-development. Organized around a case or problem, and using data from field studies, students are invited to engage in problem formulation, development of conceptual solutions, and ways to provide stakeholders with a common ground for making informed decisions. We wish to transform some of the traditional characteristics of university teaching by employing a more neutral and reconfigurable setting. Hence, we also invite students to become active and engaged in a negotiation and reconfiguration of the lab setting, in terms of materials, activities,as well as in the ways we employ digital technologies.

## EMPIRICAL FOUNDATION OF THE RESEARCH

In our research we try to make lab-activities part of our action research methodology. We conduct field studies on the ground in collaborative learning environments, school settings, health informatics practices, and knowledge sharing in business and administration, as well ason the use of smart utility interfaces in households. We collect data in the form of videos, logs, and interviews. We try out our interpretations in the vicarious settings in the DesignLab by employing touch technologies and tangible materials in storytelling, scenario building, prototypes and concept-development.

## PEDAGOGICAL PERSPEKTIVES

Supported by related research,weargue what distinguishes scholastic and experiential learning in terms of requirements to physical-haptic support and kinaesthetic interaction: the main differences being in relation to the power over codification: of space, of content, of means of communication and of outcome. Emphasising doing and discovering, we seek to lay the foundation for learning-by-doing and learning-to-reflect-in-and-on-action through kinaesthetic feedback.

Theory-wise we build our design principles on Dewey's, Kolb's and Vygotsky-Engeström's models of learning as cycles going from the outside to the inside to the outside/ from the social to the individual to the social, all the way mediated by the utilization of mixed artefacts. Regarding the design of the re-configuration of learning environments, we draw on Luckin (2011), who emphasizes metaphors for learning environments takinginto account inherent limitations of space as well as place. The lay out of theDesign Lab supports students in exploring concepts through movement and language provoked by various materials and artefacts. Here we build on Sheets-Johnstone (2009), who argues that moving and touching form a basic kinaesthetic memory for humans. The key to change from traditional academic schooling producing analytical skills to collaborative learning to become reflective practitioners, we – as mentioned above – see as a shift in power over codification. Based on theory and experience we believe that a more softcoded (Szulevicz, 2010) learning environment with a variety of mixed artefact's can produce collaborative learning with students and teachers as mutual learning partners.

The lab is still in the making; only one semester of teaching has taken place here so far. Through longitudinal research over the next couple of years we hope to be able to find, which among the open coded facilities offers the best support for construction and concept development processes with high level of student involvement. Our goal is to arrive at some guidelines in line with what has been developed in the UK, the so-called Design Quality Indicator (DQI), which has proved to be helpful also as a tool for thinking about design of environments for teaching and learning (Gann, Salter & Whyte, 2003)

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# **Representation of toys through a curator's discourse,** Child's play or adult collection?

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*Toys play a crucial role in fostering children's playful learning and creating meaning in their everyday life. The representations of toys in a toy museum are not necessarily presented in a manner that recognise and invite to manipulation and transformation. We propose that an increased understanding of representation providing a broader awareness of the historical and cultural setting created by curators would advance opportunities for identity shaping and learning.*

**Keywords:**toys, discourse, multi-modality, cultural representation, ludic engagement designs

## INTRODUCTION

According to Brougere (2008), the toy should be considered as a medium produced by adults for children. Through its design, a toy conveys values, rules, use principles and makes sense to children when it is used in ludic activity. Children are both "readers" of toys (in that they have to decode its sense) and "users"(in the sense that they produce a meaningful action from their reading) (Brougere, 2008, p. 1). Toy museums represent a material culture offering opportunities to create informal and active learning spaces bridging generations. Yet, representation of toys in museums does not usually convey the idea of play, instead they tend to reflect staid collections of adults.

Museums have the power to shape identities. The museums ability to shape identity centers on the ability of its audience to learn, and in the case of toy museums, a place where learning is fun and enjoyable. Museums have a difficult challenge in presenting cultural artefacts in such a way that allow the visitor to expand their current knowledge and provide reflection on it. In this way, museums represent semiotic actions and practices (Kress & van Leeuwen, 2001) including multimodal challenges of design and learning.

This paper investigates representation and ludic engagement as domains specifically from the exhibiting viewpoint, with some emphasis on its relationship to the interpretation. As the curators' are the source of the representation, focus is placed on discourses that influence the curators design of the exhibition, specifically as it applies to representation of toys as cultural artefacts. Hence, the questions: (i) what is the "story" communicated; (ii) for whom; and (iii) what resources have been used for the realisation of the design?

## THEORETICAL FRAMEWORK

Discourse surrounding cultural representation centers on the curator, yet his or her voice is not the only echo heard within the walls of the museum. Discourse also resonates from input of various stakeholders, *i.e.*, organizational level, educators, members, government agencies (national or local), and the building itself. The combined influence of multi-discourses has implications for the curators' intended message through the exhibitions. The results of the curators' exhibit are part of their interpretive process, which represents the relationship between material objects and people.

Toys play a crucial role in fostering children's playful learning and creation of meaning in their everyday life. Toys are characterised through their opportunities for manipulation and forms of play. In this sense, toys are multimodal. In this paper, the different modalities are

considered as multimodal semiotic resources, which are organised as potential choices for the child to manipulate. The toys in a toy museum are not necessarily presented in a manner that recognise and invite manipulation and transformation. This is reflected in research by Moira Simpson in her book on *Making Representation* (1996) where she states thatthe subjects of exhibits –the original makers or users-have been traditionally passive informants excluded from the planning process. Children's toys are typically represented as collections for adults-not as children's playthings with children being the "culture" in focus.

## EMPIRICAL FOUNDATION

The information in this paper is empirically based on a series of field studies, where the design was based on informal and in-depth interviews with curators, and data collected from two museums, which, consist of photographs, observations, and mapping of the exhibits in order to understand the meaning through representation and as pathways for learning. The data was analyzed using the theoretical framework of social semiotics as developed by Kress & Van Leeuwen (2001) with focus on framing and multimodality. Within the analysis historical context will be addressed via the dynamic relationship between narratives and people. Sketches are directional, subject to interpretation and highlight strands to further explore. Accordingly, the sketches produced were communicated with the curators for them to make sense and situate the relevance of the interpretations and envisions and to increase the extensibility of the use of the results.

## RESEARCH CONTRIBUTION

The contribution of this research will provide qualifiers for curators to assess how and what is represented in their exhibits- specifically from a cultural standpoint. Though a better understanding of meaning-making through representation curators will have the tools needed to consider whose culture is being represented and how that culture is represented. The intended result is hoped to be a more authentic representation of the culture represented by the artifacts on display. A main point in this paper is that toy museums constitute a space where playful learning offers an opportunity to enhance children's shaping of identity, to foster historical and cultural knowledge and awareness and scaffolding performance. We define such processes as non-formal learning, deriving from children's interest and enjoyment (Petersson, 2008).

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# Three approaches to integrating learning games in business education

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*This paper processes three didactic designs for integrating learning games into business education, using Kolb's circular model as a framework for integrating practical game-based elements with more theoretical and reflective processes. The purpose of this framework is to aid practitioners in integrating game-based processes into particular syllabus and curriculum-based activities.*

**Keywords:** Learning games, business simulators, didactic design, game-based learning

## LEARNING GAMES IN BUSINESS EDUCATION

Learning games and business games have a long history of being used as a tool for bringing practical elements and experiences into business teaching, but little knowledge is available on how to use such games in manners that facilitate a learning process that combines the practical component with theory. When looking into how consultants use learning games, they rarely use such games as a self-contained learning process. Instead, learning games are most often deployed as a part of a didactic design, comprising of presentations, reflections, game-elements and other exercises, all designed and aligned to optimize the learning process.

On basis of studies of practical game-application (Henriksen, 2010; Lainema, 2003), three key challenges can be identified: 1) Integrating game-based processes with theoretical perspectives, 2) facilitating beneficial participant processes, and 3) handling the diversity of perspectives that emerge from participation. This paper presents three models on how these key challenges are being handled when using games for business education. The three models presented in this paper are based on empirical studies on how consultants are using three particular learning games, which are presented.

## INTEGRATING GAMES WITH THEORETICAL PERSPECTIVES

The integration of games and syllabus activities proposes a major challenge when using games for business education. A study of the EIS Simulation, a French learning game on change-management proposes a rather simple model on how to integrate learning games with particular theoretical perspectives (Henriksen, 2010) by combining the practical, game-based experience with theoretical intros and outros. This 1-2-1 model is illustrated as figure 1.

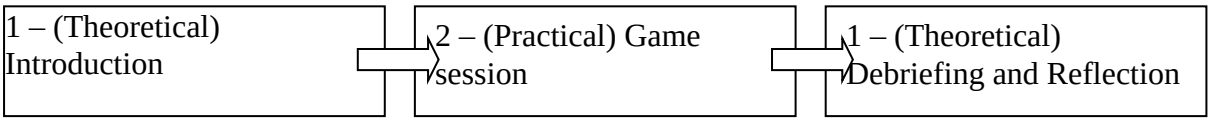


Figure 1: The 1-2-1 model for integrating games with theoretical perspectives

Rather than merely playing a learning game, the model show how game-facilitators tend to present particular theoretical perspectives before allowing the participants to play, and subsequently how the game is succeeded by theoretical and reflective processes. This use of learning games is interesting as it defies the common reading of Kolb's (1984) model as it, rather than beginning with a practical experience, starts the learning process with theoretical abstractions, for then to allow participants to take a round and a half in the model. The 1-2-1 model thereby proposes a very activity-including perspective on game-deployment, allowing theoretical perspectives to be integrated into the game-based process.

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## GENERATING BENEFICIAL PARTICIPANT PROCESSES

The purpose of using learning games is to generate and facilitate processes beneficial to the participant's learning process. Learning games have been criticized for generating singular processes among its participants (Henriksen, 2008). However, studies of Mindsetter, a Danish game on change management, shows how games can be played as interrupted processes called, rather than, as seen with the EIS, as an uninterrupted process. By providing theoretical introductions and reflections, not just prior to the game, but also as interruptions to the game, these provide opportunities for making the learning process cyclic in terms of Kolb; as the 1-2-1 facilitated one round in the model, the TiA allows for several iterations to take place during a single game (Henriksen & Lainema, In press). This model is called the Theoretically Informed Approach (figure 2).

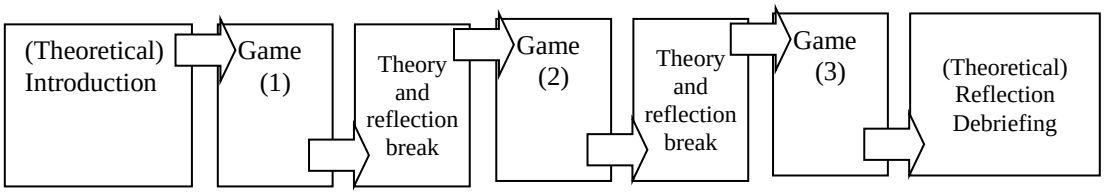


Figure 2: The TiA model for generating particular participant processes

## HANDLING THE DIVERSITY OF EMERGING PERSPECTIVES IN LEARNING GAMES

When using highly complex learning games, participants often experience different trajectories through the game, and consequently end up with different experiences of the game. This is often the case with group-based participation, in which participants take on different roles and manage different aspects of the game-provided problem. This case was found in RealGame, a Finnish business strategy simulation, which runs as a clock-driven, highly complex learning game that encourages participants to manage different parts of the simulation (Lainema, 2003; Lainema & Makkonen, 2003). This participant behavior caused their game-experience to diversify, generating a cloud of different, iterative learning processes, here illustrated on basis of Kolb as individual learning cycles (see figure 3).

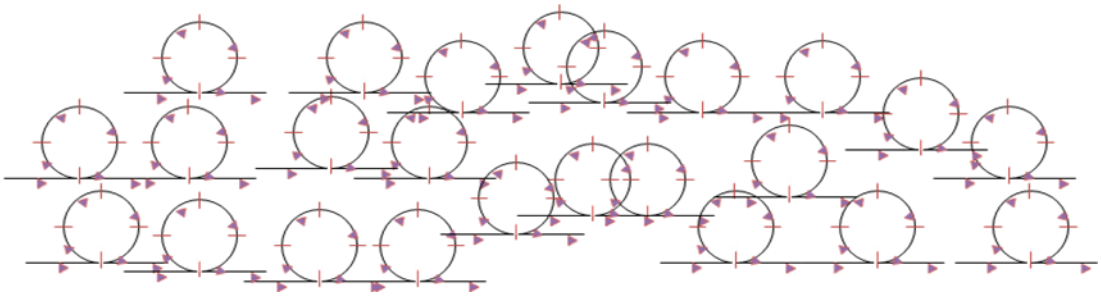

Figure 3: The cloud model on perspective diversity in complex learning games.

As ongoing studies of RealGame shows, facilitators have to cluster topics, address group interaction issues and strategic perspectives to be able to intervene in this cloud of learning processes.

## DISCUSSION

The three models presented in this paper are considered work in progress for developing tools for consultants and learning game designers. The aim is to explore how different didactic designs contribute different to particular, game-based learning processes, and in particular how processes can be designed to better comply with particular learning objectives.

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# Method for tracking reflected reading and multimodal learning of pupils with various abilities

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*We present a novel method for tracing reflected reading and multimodal learning, based on a combination of eye tracking and cued retrospective verbal protocols. With the help of this method, we can trace pupils' problem solving, their integration of text, pictures and graphics, connect the process of reflected reading to the product (scores, learning outcomes) and uncover pupils' reading strategies.*

**Keywords:** eye tracking, retrospective verbal protocols, task-oriented reading, metacognition & learning strategies, adaptive learning materials

## INTRODUCTION

In our contribution, we will present a novel method that we developed in a project on 8 grade pupils' interaction with multimodal textbook materials (science books in chemistry and biology). The method is based on a combination of eye tracking and cued retrospective verbal protocols. Eye tracking research has shown how readers attend to information from multi-representational sources, how they choose entry points and reading paths in printed and digital materials and how they integrate text, pictures and graphics (Holmqvist et al. 2003, Holsanova et al. 2006, 2008, Holsanova 2010). Eye movements reflect human thought processes and can provide information about perceptual and cognitive processes underlying a variety of tasks (Scheiter & van Gogh).

Figure 1 illustrates the use of eye tracking measurements in our project on task-oriented reading and multimodal learning. After having solved the task, the pupils are watching a recording of their own interaction with the educational material in form of a dynamic scanpath. With this external memory aid, they are asked to comment verbally on the process: what they did, how they did it and why.

*Verbal protocols* or think-aloud protocols (Ericsson & Simon 1980) have traditionally been used to uncover underlying thought processes. Subjects were asked to verbally report sequences of though during different tasks. Verbal protocols have been used to reveal steps in reasoning, decision-making and problem-solving processes and applied as a tool for design and usability testing. We use cued retrospective protocols since they do not disturb the process and give memory support during verbalization. Here are some examples, translated into English: *I continued reading in the box but it did not seem to be relevant.– I checked the image and then I re-read the piece of the text that was about photosynthesis so that I would remember it. – There was a word that was difficult, I have never heard it before.*

A combination of eye movement data and retrospective verbal protocol data offers us two windows to the mind. With our extended method, we can trace pupils gaze behaviour when they solve various tasks in digital textbook materials and analyse their verbal comments on their activities. We can study also how pupils integrate information from text, pictures and graphics while solving various tasks. Moreover, we can follow the process of reflected reading and connect it to the product (scores, learning outcomes). Finally, we can uncover pupils' multimodal textbook reading strategies and investigate, how these strategies can be used as a pedagogical tool to enhance pupils' learning. Pupils' strategies are extracted from

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both the eye tracking data and from the cued verbal protocols. On the basis of both types of data, we are able to identify distinct temporal and functional phases in pupils' interaction with the materials. In sum, this method enables us to gain detailed insights into the underlying cognitive processes of pupils' reflected reading of multimodal learning materials.

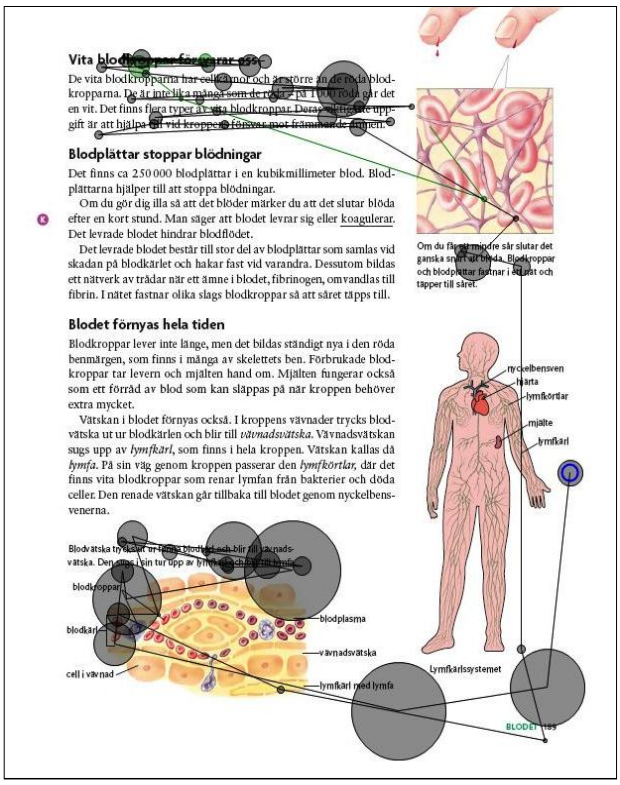


Figure1:Thepictureillustratesthedistributionofvisualattention,informationprocessingandtext-pictureintegrationduringtask-orientedreadingofan8-grader.Theringsrepresentfixations,thelinesrepresentsaccades.

## EXPERIMENTAL SET-UP & PROCEDURE

Pupils read digitalized textbook materials in chemistry and biology presented on a LCD screen at their own pace (Figure 2), Their interaction consists of task-oriented reading of the materials and answering questions. After they have finished the tasks, they watch a video instruction of how to perform a cued retrospective protocol (as a training phase). Finally, they perform cued retrospective protocol themselves on one of the tasks. They are shown dynamic scanpaths of their previous interaction with the materials and encouraged to reflect and comment on the process while watching their gaze path at a slower speed (25%).

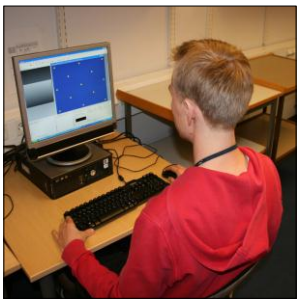

Figure 2: Experimental set-up.

## DATA ANALYSIS

The data are analysed in three steps: (1) A *quantitative analysis* of gaze behaviour is aimed at investigating how high and low ability pupils integrate information from multiple information sources. The materials are divided into areas of interest and rated concerning their relevance for the particular question. Gaze behaviour is analysed in terms of dwell time on text & pictures, dwell time on relevant areas of the text and pictures, and number of transitions between text and pictures (Ek, forthc.). (2) A *qualitative analysis* of the retrospective verbal protocols is aimed at extracting functional units and phases in the task solving process and explaining quantitative results through pupils' comments in verbal protocols. The transcripts are segmented and coded following the system described in Holsanova (2001, 2008). (3) The third step of analysis is based on a *combination of the first two analyses*: the quantitative analysis of eye movement behaviour and the qualitative analysis of verbal protocols. The aim is to align functional units and gaze behaviour and uncover individual strategies.

## RELEVANCE OF THE METHOD

In result, we can see how pupils utilize text and images and relevant parts of the learning material to answer questions and solve problems. We can find out whether there are differences between different ability groups concerning attention on text, images, integration of both, as well as reading strategies. By using ICT and the new methodology, we plan to (a) extract examples of successful and less successful problem solving strategies that can be used as a pedagogical tool in schools, (b) develop adaptive teaching materials according to pupils' ability level and improve the design of digital text books and (c) provide support for low ability pupils: enhance their metacognitive abilities and studying technique. The new methodology has a large potential for teachers, pupils, book producers and researchers since it can trace the details of pupils' reading and learning process that is not visible in the products (scores, learning outcomes).

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# **REMAKE: Representations, resources and meaning-making.** The Middle Ages as a knowledge domain in different learning environments

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*This paper discusses the outline and implications of a research project, with the intention to investigate representations of the Middle Ages in different learning environments: in preschools, in compulsory schools and in upper secondary schools. The theoretical background is based on a design-theoretic, multimodal perspective on learning and communication. There is an emphasis on the resources used by teachers and learners, in their desire to design and re-design the subject content.*

**Keywords:** Designs for learning, semiotic resources, representation, transformation, knowledge domain

## INTRODUCTION

This paper discusses the outline and implications of a recently initiated research project, ”REMAKE: Representations, resources and meaning-making. The middle Ages as a knowledge domain in different learning environments”, funded by the Swedish research council. A starting point for the project, is the assumption that a given knowledge domain is being realized in different ways in different learning environments, due to the choices made by the participants involved concerning modes and media of representations. There is not a given core or consensus of what this domain *is* or what parts or aspects the subject area *should* encompass. The project runs between 2012 and 2015.

Designs for learning (Rostvall & Selander, 2008; Selander & Kress, 2010) articulates learning as sign-making, transformative processes and knowledge representations in learning environments of different design. Questions of how knowledge domains are realized in teaching and learning have been addressed differently, due to the methodological approaches used by scholars. From a socio cultural perspective, Jakobsson, Mäkitalo och Säljö (2009) have studied pupils’conceptions of knowledge concerning the greenhouse effect and global warming, focusing on texts and mediating tools. From a social semiotic and multimodal perspective, Kress et al (2001, 2005) have examined how different school subjects are represented through the configuration of semiotic resources. The present study has a focus on how specific designs for learning shape the possibilities for how one can learn and engage with a certain knowledge domain.

## PURPOSE OF STUDY

The aim is to study the complex interaction of selections, interpretations, representations and actions that shape the basis for how a knowledge domain are being realized in a specific learning environment. Here, we look at history as a subject, with an emphasis on ”the Middle Ages”. The Middle Ages is a popular theme today and occurs in a variety of contexts: in films and computer games, in festivals and in live role-playing. In school curricula, the purpose of education is to widen, develop and make deeper the students sense of history, while the use of history as leisure, is based on other principles of engagement.

In this project, we will investigate a) teachers didactic design; b) different (physical and digital) representations of the middle ages and c) how children/pupils interpret, transform and design their conception of the knowledge domain. By doing this, we deal with questions of the uses of history in different contexts, agency and cultures of recognition (what is acknowledged as history). On a more comprehensive level, the project aims at comparing the

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differences within the educational system. We ask ourselves: How does the representations of the middle ages differ in pre-school, compulsory school and upper secondary school? Research questions are:

- What aspects of the Middle Ages are given a prominent position within the different contexts? How is the Middle Ages made?
- What do the different contexts offer, in terms of activity, representation and resources?
- What meanings are made of the Middle Ages, by participants/students?
- What is acknowledged as knowledge within the different environments?
- Is a subject related progression noticeable in terms of the produced meaning of the Middle ages?

## METHODOLOGICAL CONCERNS AND RESEARCH CONTRIBUTION

The empirical foundation of the project consist of classroom observations, where all instances of teaching around the Middle Ages will be documented in a selection of groups and classes. Our aim is to study the conceptualization and representation of the Middle Ages. This may include oral presentations by the teacher, teaching media like textbooks and digital learning resources, visits to museums and so on. However, we choose not to define those in advance, since it is the context and the use that determine what will become a resource for meaning-making. All resources will be analysed based on how they are used, what they add to the representation of the historical epoch in focus, and how they affect the learners' possibility to make meaning.

This research will have implications for educational research as well as for research in teaching and learning in history. Our intention is to apply some central notions of a design theoretical approach to learning, to an empirical investigation of how a certain subject content is being represented and transformed, in learning design sequences in different environments. We will make visible how subject specific questions are being interpreted and treated in relation to the resources that are at hand. This study will contribute to the understanding of learning as a process of sign-making and meaning-making activities in pre-school and school.

Questions that will be addressed in the paper, concerns the selection of schools and groups to take part in the study. Our intention is to collect data from schools with different educational approach, so that a comparison can be made. The project data will mainly consist of video documentation. Principles for the selection of data will also be discussed in the paper.

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# Combating Educational Disadvantages: Exploring Learning Environments and Designs in Upper Secondary Schools in Denmark

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*This abstract draws on ongoing research studies in upper secondary school settings in Denmark. The purpose of this article is to explore 'good examples' and to provide theoretical explanations of how schools' characteristics and structures are connected to the challenges and opportunities that different kind of students face in upper secondary schools in Denmark. The research studies will give priority to the youth's perspective on learning, and promote the idea that laboratory schools are called for.*

**Keywords:** Educational disadvantage, learning environments and designs, upper secondary education, youth studies

## RESEARCH QUESTION

One urgent challenge for Western countries is the increasing number of youth that leave upper secondary schools before completion. It can be difficult for young people to find a job without a school diploma, when faced with an increasing knowledge and skill based globalized labor markets. In Europe and elsewhere youth with non-academic backgrounds and from ethnic minorities tend to drop out from upper secondary schools, which is most visible in the VET-system (Johannesen et al. 2010, Humlum & Jensen 2010).

In earlier studies, the authors focused on the classroom learning environment, and conducted studies of youth without a completed secondary education (Jensen & Jensen 2005), ethnic minority youth (Jensen & Jørgensen 2005), academically successful students from families with limited educational resources and no tradition of graduating from high school (Elsborg, Jensen & Seeberg 2005/2006), and learning environment and good class room practice (Fink-Jensen, Jensen, Mørck & Kragh-Møller 2004, Vestergaard et al. 2010, Ulriksen & Holmegaard 2008, Katznelson et al. 2011, Katznelson & Brown 2011, Louw 2011 (in press)). The studies explore 'good examples' and identify structures and characteristics in the classroom learning environment that leads to improved learning opportunities and equality in education. Drawing on these studies and ongoing research, we focus on the youth perspective on classroom level observations and ask how upper secondary schools can create 'good learning opportunities' for different students?

The aim is to provide theoretical explanations of how characteristics and structures in learning environments are connected to different kinds of students. This is done through identification of successful learning environments and designs in the classroom in different forms of secondary educations in Denmark.

The primary concern is students' experiences and their situated practice in the classrooms learning environments. This concern is based on the view that learning is fundamentally linked to the social and the cultural context and not just a cognitive process and the understanding that knowledge is situated within the practices of the community of practice (Lave & Wenger 1991, Wenger 1998). This leads to an understanding of learning processes as participation in activities that allow for 'learning by doing' or learning by actively combining the known with the unknown and learning from peers.

The theoretical perspective is phenomenological, and the theoretical concepts represent different levels in relation to school practice, the sociological and anthropological social level, group and relational levels, and the individual subject level. Bernstein's theory is used to

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describe and analyse the characteristics of the power and control structures in schools, with practical concepts of classification and framing. Lave and Wenger's concept of participation is used as an underlying conception of how learning is situated in classrooms. Similarly Bourdieu's concept of embodied knowledge and taste, or habitus (Bourdieu 1997), is also applied.

The individual students and their supposed inherent deficits were not the object of the observations. Although the understanding of their life circumstances, traditions and culture and their families can serve as a frame of understanding, the schools are accountable for the students'achievements. Therefore, the findings concern structures in the secondary level schools' learning environments and the challenges and barriers that different kinds of students meet when they try to navigate the tasks and demands of everyday life in school.

Our preliminary findings indicate that the larger the differences between the school context and the home context, the larger the challenges to the students' competences for recontextualization. With examples from both academic and vocational education, our research shows that successful learning environments are characterized by supporting the students in their recontextualization processes. The design of the learning environment is essential and our research provides a suggestion for a theoretical explanation and analysis of the structures and design in the learning environment.

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# Musical learning and artistic performance in music teacher education – a study of how jazz vocal and ensemble lessons are designed

*By RAGNHILD SANDBERG JURSTRÖM,*
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*This paper highlights the artistic practice displayed when music education teachers in jazz vocal and ensemble lessons introduce variousapproaches to handling, performing, creating and teaching music in an individual as well as a collective way.*

**Keyword:**music teacher education, music performances, multimodality, design

## INTRODUCTION

The aim of this paper is to describe how different aspects of *musical learning* and *artistic performance* are handled, performed and expressed in individual jazz singing lessons and ensemble lessons in the music teacher education from a multimodal, social semiotic and design theoretical perspective. The relation between musical learning and artistic performance has only been explored to a certain point in previous research. Some studies show that there is a divide between these aspects and that they do not always co-exist. Other studies show that musical learning and artistic performance are closely interconnected. However, there is a lack of studies on how the relation is handled in different types of classes in the music teacher education. What performance and theoretical perspectives are emphasized, clarified, and problematized? What conceptions of musical quality are articulated, and how can a composition be learned, performed and communicated? The purpose of this study is to increase the knowledge and understanding of how these aspects of learning and performing can be handled in the music teacher education and the learning opportunities these processes create.

## THEORETICAL APPROACH AND ANALYTICAL TOOLS

The study is based on video recordings of some jazz singing and ensemble lessons and analyzes how different resources such as speaking, singing, and instrument playing are used. The *multimodal*, *social semiotic* and *designtheoretical* perspective with its focus on semiotic resources, sign-making, transformations of signs, the creating of representations, and the importance of the social context (Kress & van Leeuwen, 2001; Kress, 2010; Selander, 2008) has provided a fruitful theoretical frame and a useful tool for analyzing the data. The multimodal perspective principally centres on the interplay and coordination of different resources, and how these function as representations of different ideas, perceptions and experiences in terms of interest and motivation. The social semiotic perspective pays special attention to the social dimension of the communication, that is, how meaning-making is dependent on and influenced by the context of the activity, and the events, ideas and feelings that the socially and historically shaped resources represent. From a design theoretical perspective on communication and learning, the choice of performance, its execution and the resources used to shape content in relation to the social framing are seen as formative for the learning opportunities created in a specific context.

The data consist of *videorecordings* of two students in the new music teacher education, and their teachers, including a total of six individual jazz singing lessons and eleven ensemble lessons. On the basis of detailed transcriptions of how teachers and students use semiotic resources, such as gestures, speech, singing, instrument playing and printed score in their musical communication, different characteristic and salient features have been described. The

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teachers have also been interviewed about their teaching focus. The analysis of the data illustrates what teachers and students do in order to handle, perform and create the music, and how they "talk" about the technique of instrument playing, interpretation, expression and experiences, and the technical and structural aspectsof the music by means of body language, verbal language, singing voices and instrument playing.

## PRELIMINARY RESULTS

Preliminary results show that the teachers in various ways practice a rhythmical and improvisation-based music pedagogy as a foundation for playing music, partly with a focus on practical-theoretical knowledge, partly with a focus on practical-personally performed knowledge. The teachers all share the aim of teaching the students to learn and perform music in an individual as well as in a collective way on the basis of personal choices and feelings, whereas the ways to achieve this aim vary. The variations show how the teachers in different ways work with and present music to the students, thus activating the processes of learning, performing and creating music, as well as providing opportunities for the students to choose how to teach their future pupils.

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# Design Research on Media Tools for Reflection in Learning

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*This paper presents research-based design experiments of three media tools to support reflective practices in a classroom. The experiments build on the discussion about the role of slow and reflective technology in learning. The paper presents three media tools for personal, group and community reflection.*

**Keywords:** reflection, new media, slow technology, ambient display, classroom

## INTRODUCTION: REFLECTION, LEARNING AND NEW MEDIA

The importance of reflection in learning has been widely discussed by scholars. Reflection is an essential concept in cultural-historical psychology, developed by Lev Vygotsky and his colleagues in the 1920s and 1930s. For Vygotsky individual development happens in interaction with others, and through conscious reflection on that interaction. Key question in a learning process is: What was experienced and learned? (Vygotsky 1978) In his seminal book on the Reflective Practitioner, Schön (1983) discusses experts' ability to reflect on their activity in and on action.

We consider that carefully designed new media tools may support reflection in learning. Using technology for reflection can present potential advantages: media technology can be used to record dialogue, to categorize contributions and to step back, reconfigure, evaluate and compare them.

## RESEARCH BASED DESIGN

In a research-based design the design forms an essential part of the outcome of research activities, which acknowledge that the design will be embedded in the everyday context and activities of people. The process is iterative and phases may happen side-by-side. Research-based design takes place in close collaboration with people concerned with the design. (Leinonen, 2010)

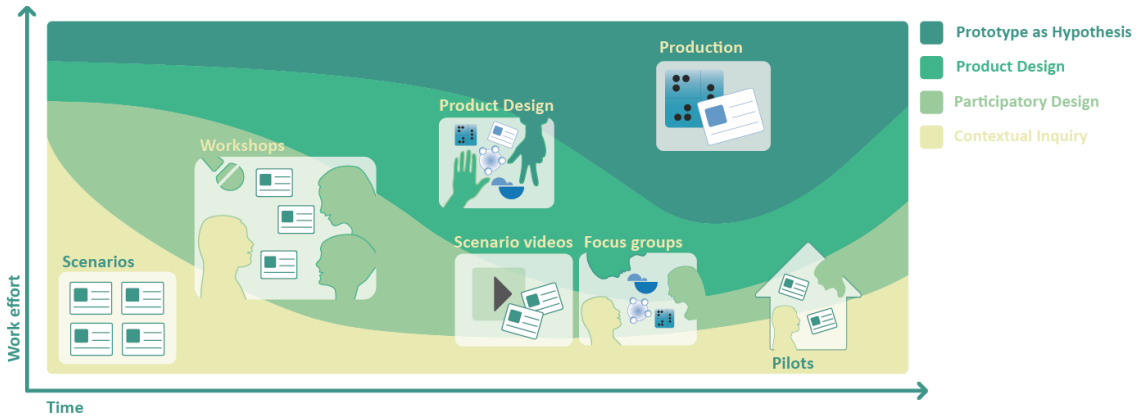


Figure 1: The four phases of the research-based design process (based on Leinonen, 2010)

The phases of the iterative process are illustrated in relation to theparticular design experiments in Figure 1. The first phase, **contextual inquiry**, is formed around understanding the context, in which it is aimed to place the design. Here, classroom teaching and learning. In the **participatory design phase,** teachers and students across Europe were asked to participate in workshops and focus group sessions to gather their input on preliminary defined challenges, opportunities and prototypes. Through pre-pilots and pilots prototype designs

were tested with teachers in classrooms across Europe. The prototypes were designed in the **product design** phase. The insights gained from the workshops and sessions with teachers and students were translated into concrete design ideas by the researchers and design professionals without the teachers and students. The **production of software as a hypothesis** phase represents the development of non-functional and functional prototypes that are thought to improve the way in which learning activities are performed in the classroom.

In the following, we present three new media prototypes that were designed in the context of this design research, and we discuss the tools' afforded levels of reflection.

## THREE NEW MEDIA PROTOTYPES

The main contributions of this research are the prototypes, the illustration and the analysis of three tools that are expected to support reflection in learning: ReFlex, TeamUp and Ambire.

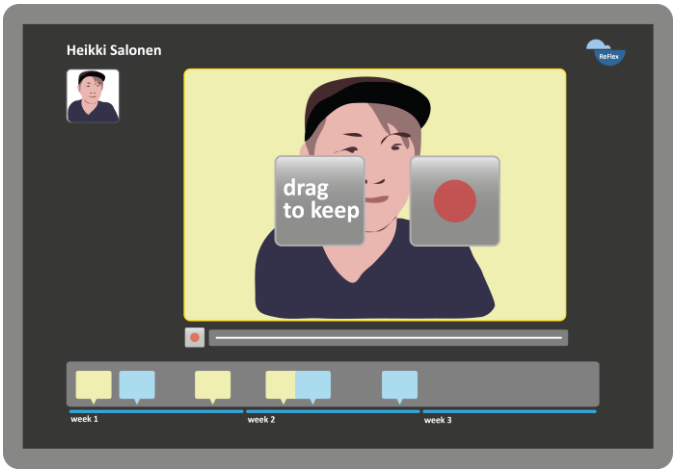


Figure 2: Illustration of ReFlex

**ReFlex** is a tool prototype (non-functional) for learners to record and share 1-minute audio updates of their personal learning experience (see Figure 2). The time limit is intended to support learners in practicing meta-cognition, presentation skills, and teachers to receive updates about the learners' progress in a compressed form.

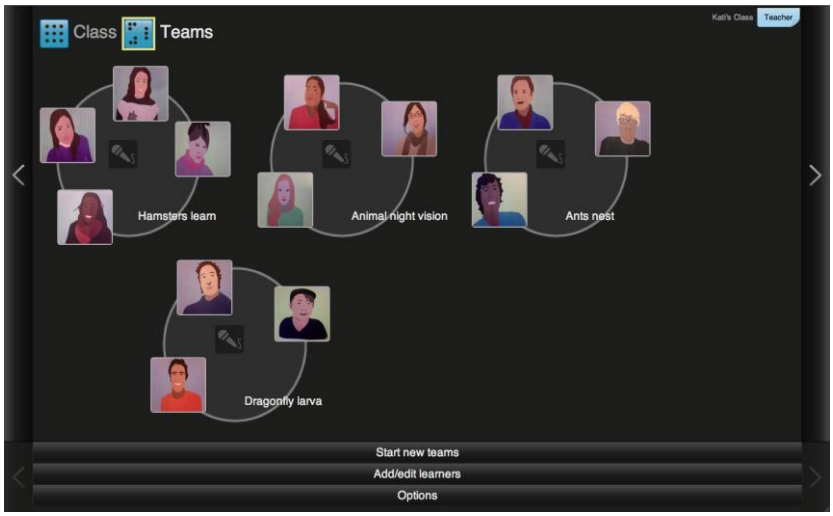


Figure 3: TeamUp interface

**TeamUp** is a web-based and open source software tool (functional) for forming teams based on interests, and for recording teamwork progress (see Figure 3). Teams can record 1-

minute audio updates about their inquiry group work progress, challenges and planned next steps. The recordings can be revisited; also by members of other teams and by teachers.

Figure 4: Illustration of Ambire in use

**Ambire** is an ambient display for 1:1 laptop/tablet classroom reflection, in which the content of each learner's screen rotates continuously on a large screen in the classroom (see Figure 4). The tool is promoting transparency, commons, sharing and reflection. Transitions and exact information about whose view is on the large screen are intentionally difficult to notice in Ambire.

On the basis of Fleck and Fitzpatrick's research (2010) and Focus Groups with teachers and students, the media tools' afforded reflection levels were analyzed. The interaction design and use of the tool support all five levels of reflection (see Figure 5).

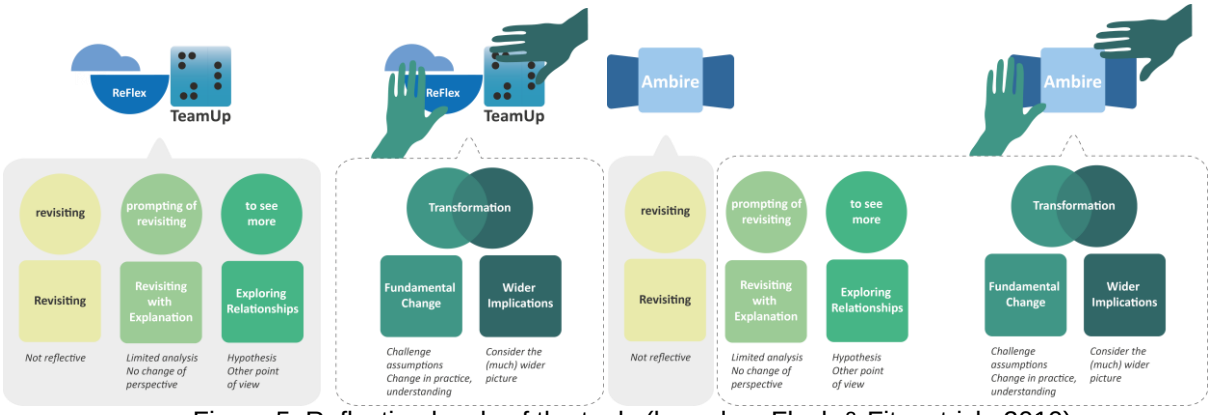


Figure 5: Reflection levels of the tools (based on Fleck & Fitzpatrick, 2010)

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# The room in higher education – a space for learning?

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*This paper presents an ongoing postdoctoral research project with the ambition to contribute with knowledge on the interplay between space, interaction and learning in higher education. What kind of rooms do students meet in formal campus activities and how are they designed? How are students and teacher interacting using resources afforded by the room? These are some of the questions that the project aims to examine.*

**Keywords:** space, interaction, learning, higher education, Designs for Learning

## INTRODUCTION

This postdoctoral research project focuses the interplay between space, interaction and learning in higher education. Traditionally on-campus education is associated with lecture theatres and tutorial rooms and the physical room as such is often taken-as-given. Thus the performance of the room in higher education as a place for learning is open to question.

Space, place and room are familiar words, denoting common experiences. Space is used to discuss the room the interplay between interaction and learning. Spacecan also refer to a physical organization of the environment while place refers to social aspects, that is, we are located in spaces but acting in places. In this early stage of the postdoctoral project I am using space for both the physical and the social room.

Space, interaction and learning in higher education areunder-researched topics compared to similar research with focus on schools.Literature reviews (cf. Temple, 2008) illuminates that studies on higher education tend to focus on either architecture or design of learning environments in connection to digital media or e-learning. There is, however, a field in multimodal studies focusing on the interplay between human interaction, space and learning in schools. A multimodal approach also highlights how physical environment, as part of the setting, constitute an essential element in communication (cf. Jewitt, 2008). My own thesis (Leijon, 2010) connects to the field discussing interaction in a teacher education context, where the setting plays an important part. By focusing on both space and learning in higher education the ambition with my postdoctoral project is to further contribute to the field.

## PURPOSE OF THE STUDY

One could discuss space as a conveyor of meaning and interaction as dependent on the affordances in a room. The design clearly communicates what is possible and allowed to do. Space shapes interaction, but interaction also shapes the space. It is essential to think about space in relation to negotiation and transformation. Even a strong setting is open for change (cf. Leijon, 2010).

Thus, a point of departure for my postdoctoral project is to examine space in higher education in relation to interaction and learning. I am doing this by following two groups of students during one course in their formal campus learning activities. I am also interested in the informal spaces that are shaped by students in connection to the formal activities. The study is guided by the following research questions: What kind of rooms do the students meet and how are they designed? How are students and teacher interacting using resources afforded by the room? What resources do the participants bring into the room and how are they used? What kind of informal rooms connected to the formal activities are designed by the students?

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## DESIGN

For theoretical anchoring, the research preliminary draws upon a design theoretical perspective called "Designs for Learning" (cf. Selander & Kress, 2010) to understand the activities in the room and space as a part of a setting, all in relation to the concept of design. This will be connected to Goffman and his concept on interaction and framing.

The projectcombines video observation with interviews. Video observation affords a multimodal perspective in combining visual and auditory information connecting to the idea that humans use a variety of semiotic resources including speech, gesture or text, in order to communicate. I am also inspired of "stimulated recall" and will meet some of the participants shortly after the recording to discuss interaction in the room. Data is gathered from two different settings within higher education,including a group of students and teachers in teacher education and a group of students and teachers in specialist nursing education. In the first step of my postdoctoral project I have followed the teacher education group at four occasions, first observing the empty rooms, then the interaction in the formal spaces. I have then conducted interviews with both students and teachers.

## FINDINGS

This is very much a project in progress. The design for the postdoctoral project and some preliminary findings will be presented and discussed. Furthermore examples will be given from different video observations and interviews from the initial phase of the project.

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# Health Educational Potentials of Technologies

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*The field of health promotion technology has been in an exponential growth in recent years and smart phone applications, exer-games and self-monitoring devices has become part of fitness activities and health education. In this work-in-progress-paper theoretical perspectives for categorising and analysing health educational potentials of technologies are presented.*

**Keywords:** Health education, health promotion technology.

## INTRODUCTION

Information and communication technologies are generally viewed as new and promising tools for innovative reformation of health care systems (WHO, 2005). Where information technology in health care has received great attention there has however been less focus on use of technologies in health promotion. Technologies such as game-based fitness platforms can potentially be new tools in health promotion offering new settings and types of participant control over health activities especially for young participant groups. Whereas we have seen the first studies on effect of these technologies on various health conditions, there seems to be a lack of theoretical framework for understanding potentials of health promotion technologies as part of health educational designs. When designing health education we thus lack a toolbox for understanding what approaches and potentials the various technologies offers in various settings and with different groups of participants. This paper introduces health educational principles for categorising and analysing health educational potentials and challenges of various types of health promotion technology designs.

## HEALTH EDUCATIONAL PRINCIPLES

The perspectives on health promotion technologies are based on the following health educational principles. ***Participation*** is a core element of democratic health promotion (Jensen, 2009). To create permanent changes in behaviour actively involving the target group is necessary to create action competence as well as a sense of personal ownership regarding the changes.Participation is closely linked to the notion of empowerment, which has its root in the influential work of the Brazilian Paulo Freire.***A broad and positive concept of health*** includes wellbeing and quality of life, as well as an absence of disease (WHO, 1947). This conceptacknowledges that health is influenced by behaviour and lifestyle as well as living conditions, which are often not addressed in health campaigns (Jensen, 2009). Health promotion research points to the ***importance of involving multiple settings and stakeholders in the communities*** of the target group to promote sustainable health changes (Algazy et al., 2010). Settings are often defined by a combination of physical boundaries and/or organisational features.

## CATEGORISATION OF HEALTH PROMOTION TECHNOLOGIES

With the aim to understand health educational potentials of technologies the following categorisation of health promotion technologies are introduced. ***Exercise instructing technologies*** are specifically designed to instruct or facilitate specific forms of physical exercise. Recent examples are the digital exergames such as sports and dance games which has become highly popular within the past 10 years. These types of health promotion

technologies are often designed based on elements of positive health concepts such as play and competition which is seen as the prime motivation factor.In a participant perspective users have influence on how and in what settings to use these games in but have no influence on the design.

***Didactic health promotion technologies*** are technologies designed specifically for formal educational purposes. Example of this areweb-based or computergame-based educational portals where students can interact with other users or virtual characters to solve quests or participate or debate health ethical dilemmas. In the participant perspective students have little or no influence on the design of the health games as this technology due to complicated development processes allows little space for participant co-development. Didactic designs including online gaming platforms and social media however opens for participant peer communication, planning and interaction of health activities as an integrated part of the health promotion education.

***Self-monitoring technology*** covers a category of technologies designed for monitoring of physical data. Self-monitoring tools for exercise range from simple pedometers that purely measure number of steps taken, to applications for GPS equipped smart phones where movement, pulse and location are registered and shared with peers though central websites. In a health educational perspective these types of technologies can both be used in formal settings where for example physicians prescribe them to patients, as part of rehabilitation, and in informal settings where participants independently decide how to integrate self-monitoring technologies into their daily life and home settings.

***Networkhealth promotion technologies*** are designed for facilitating social networking in relation to health promotion initiatives such as sports activities or patient wellbeing. Examples of this are Facebook groups or multiplayer online games where users can meet in virtual spaces to form communities, solve task together and share different types of information. In these types of spaces participants potentially have a high degree of control with the forms of interaction and related activities, but there are little control with what they learn and if health activities continues to be part of the interaction.

## HEALTH EDUCATIONAL PERSPECTIVES ON TECHNOLOGIES

This paper focuses on developing a toolbox of health educational principles for understanding potentials of technologies in health education drawing on the three principles of: 1) Participation and empowerment, 2) Multiple approaches for multiple settings, 3) A broad, positive health concept. **Participation and empowerment** are core elements of health promotion (Jensen, 2009) and inbuilt elements of social technologies such as facebook. Here participant ownership is supported by providing media for participant planning and control of activities. On these platforms participants with common interests are able to share everything from personal experiences, opinions, pictures or links to useful sites. Users can also connect thorough applications on GPS equipped smart phones that register position and physical activity which makes it possible for them to live update data on running, cycling hiking or other sports activities on the community site or other social platforms. Integration of social technologies and mobile self-monitoring equipment can potentially challenge the traditional role of health professionals as the controlling factor by making design and monitoring of activity available to participants. They also open for a whole new range of understandings of **the settings perspective**. Health education is no longer limited to formal settings such as schools or workplaces with instructor's presence, but can take place in the many other settings of the participant's every-day life. Play- and game-based technologies also offers approaches for concrete integration of **principles of a broad and positive concept of health**by offering platforms for gaming and competition on home consoles and in after-school settings. By introducing highly uncontrollable aspects of gaming and play the integration of play-based technologies can however also challenge health education project.

Conclusively health promotion technologies have great potentials in health education, but also challenge the traditional role of health professionals and researches by offering new approaches for participant co-design and interaction.

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# Moments of Play, Digital technology and museums as playful learning environments

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*This paper presents an investigation questioning how to enhance primary school age children's learning and engagement in a guided tour of a Museum. Preliminary studies indicated playful activity during a tour enhanced the interaction between the guide and the children. Building on this is an in-depth enquiry involving totally 48 children visiting the Viking Museum in Ribe, Denmark's oldest town. Conclusions highlight how 'moments of play',designed as integral milestones of a Museum guided tour, act as a catalyst to augment, enhance and indicate children's learning and engagement.*

**Keywords**: playful learning, digital technology, emergent interaction, museums.

## MUSEUMS AS LEARNING ENVIRONMENT

Guided tours are a complex socio-material practice, an entanglement of social interaction and material objects (antiquities, reconstructions, and the exhibition space) (Olikowski 2007). The tour situation involves a guide as an expert delivering specific information on each exhibit to the Museums' visitors. Typically, the visitors passively receive the information at each milestone on the tour, i.e. a form of segmented mobile lecture. A formal, single-dimensional monologue evolves that is considered delimiting to the transfer of knowledge from the guide to the children. This format is also not optimal for a guide to understand the learning impact on the children so as to possibly adapt to their needs where and when appropriate.

Our preliminary studies indicated how children's interactivity with an ICT-based exhibit may enhance a learning situation. Furthering this line of enquiry, and taking advantage of how ICT can be tailored as a playful Museum exhibit, this investigation questions how *moments of play* designed as integral milestones in a guided tour may evoke the children's learning via planned activities that are perceived as non-formal. Thus, enquiring the learning from playful interactions where peer learning supplements the expert authority input.

## TOWARDS PLAYFUL LEARNING ENVIRONMENTS

A 1-year participatory design process was carried out, based on qualitative methods, in cooperation with an after school centre and the Viking Museum in Ribe (Denmark). The outcome of this process is MicroCulture, a mixed-reality, playful learning platform, aimed at facilitating learning of historical processes through play, intended as a rich communication form. The Micro-Culture game is based on a biological metaphor with experiments and observations of bacterial cultures. A low-fidelity prototype has been developed and tested twice; a working prototype is currently under development. The technical set up includes a webcam and a computer. The game is implemented in Python and with ReacTIVision, a system including a set of markers and software to develop tangible interfaces (http://reactivision.sourceforge.net/). The markers are placed on Micro-Culture tangibles, so that they can be traced and recognize by a webcam and through the software. In this way, the simulation and population can be programmed to respond to the tangibles and provide direct feedback to players' actions. For instance, if a player places a bridge on a river, the bridge will appear in the simulation and people may start crossing it. The platform represents urban development in history and the players should act as landlords from the Viking Age, placing

infrastructure on the territory to allow their community to grow into a town. The idea was to create an augmented, playful version of a diorama displayed in the museum, showing the original settlement of Ribe. This installation seems to attract visitors' attention and guides use it to describe how the original settlement was built. Starting from this installation and games like Simcity and Monopoly, a new learning platform was created. Visitors and guides can jointly experience the implications of landlords' territorial actions, more specifically placing of infrastructures, on urban development.

Activity-based learning in line with and Vygotsky (1978) is designed into a Museum guided tour for children between the ages of 9-12. According to these theories, children learn by engaging in goal-oriented activities that are supported via adult intervention. Optimally, this results in achieving the *zone of proximal development* (Vygotsky 1978). In this study, the approach emphasises children's learning progress via enjoyable and successful experiences resulting from overcoming a play-based challenge. Reinforcing this strategy is a tactic of offered choices of action to motivate participation and joyful experience. This procedure has been coined as non-formal learning (Petersson, 2006). Reinforcing this process is aspects of how curiosity, actability, and common goals achieved through interaction with others, evolve as internal motives to learn.

The results from this recent study suggest how a new learning scenario for museums becomes available by using ICT-based exhibits as *moments of play* during a guided tour. Theoretically and methodologically, the mediating technology provides grounding to abstract notions thereby eliciting play as a non-formal (Petersson, 2006) and multimodal (Kress, 2010) activity. Essentially, the emergent non-formal communication evidenced how the children's curiosity, engagement and interest were augmented via the freedom to play. Thus they learnt through playful activities where they had an influence and could dialogue with the guide as well as their peers. As a result the guides could provide meaningful information, according to the children's individual needs. To achieve such openness, the concept of multimodality (Kress, 2010) appears as closely interconnected benefiting from the insight that children have different orientations to modes, specific preferences for temporal or spatial, image or speech, bodily movement. Multimodality combines these different modes providing a framework allowing different forms of sensorial explorations and openness in the form of extended forms and choice of interaction mode.

The board game configuration, Micro-Culture, facilitated social and object-mediated interaction. The absence of specific rules, which are typical in board games, allowed the children to decide for themselves, they could decide to engage with others in cooperative play but also to create some space for themselves and their imaginary world, or even to shift from one modality to another.

**Figure 1:** The Museum guide answering a question at the ICT-based exhibit

## CONCLUSIONS

This investigation illustrates how, asintegral milestones of a Museum guided tour, *moments of play* acted as a rich catalyst for augmenting children's learning. Both the Museum guide and the children responded positively to the concept offering constructive insight. This work highlights how new paradigms of learning can emerge from a non-formal approach where active participation through promoting playful interactions between expert authority and visiting children.

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# Designing games for preschool language learning

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*This paper will focus on the design of learning material for preschool teaching and learning through the example of a game-based platform for learning English called Mingoville.com. Mingoville has been studied in connection with the project Serious Games on a Global Market Place (2007-11), where a number of games were studied in classroom environments across nations. Currently, the developers of Mingoville are working on a platform version that targets preschool learners and works on tablets as well as pc and smartboards.The paper will discuss the implications of redesigning the platform for preschool teaching and learning and how this affects language teaching and learning.*

**Keywords:** language learning, game-based learning, design for preschool learning

## BACKGROUND AND THEORETICAL PERSPECTIVE

The teaching of English is a growing focus of many nation states as English is considered to be a key competence in the information society. Consequently, many nation states focus on teaching English to children at the early stages of schooling. In addition to this preschool levels are increasingly under pressure – from political actors as well as from parents - to introduce children to basic literacies such as reading, writing and understanding languages. This calls for new learning designs and new learning materials for preschool and primary school levels.

Mingoville, the platform studied in this paper, has recently been developed in a number of ways to address the learning needs of primary school children, but also to target the market for serious games, for instance by adapting the platform to new technologies such as smartphones and tablets. The growing role of tablets (e.g iPads) in education has inspired the company to develop the pre-school version of Mingoville, as tablets are thought to support more intuitive navigation than pc's and to enhance the learning of English for children who are not yet confident users of the written language.

This paper will draw on a number of theoretical sources, including studies in game-based learning and game-based language learning (Hansbøl & Meyer 2011, Egenfeldt-Nielsen, Sørensen & Meyer 2011) world systems of schooling, and designs for learning issues (for instance Sørensen 2009). The focus of the paper will be on the proliferation of educational design seen through the case of Mingoville.

## EMPIRICAL FOUNDATION

The paper is based on data collected in connection with the project Serious Games on a Global Market Place (2007-11). Data consist of interviews with educational actors such as teachers, pupils, school leaders, policy makers and platform developers, as well as observations in classrooms. In 2012, an additional interview was made with a company representative who is a significant actor in the development of the platform for preschool learning.

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## RESEARCH CONTRIBUTION

The role of game-based learning for preschool language learning purposes is not yet developed in research, as game-based learning is still an emergent field of research. Existing studies often focus on implementation or on the relationship between game activity and learning. This paper will contribute with perspectives on game design and its relationships with English education for beginners.

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# Creative Digital Mathematics

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*This abstract describes results from the research and development project "Creative Digital Mathematics". The project aims to develop a new approach to the introduction of digital mathematical tools to introductory and middle schools students. The research shows potentials in using the children's creative competencies as a vehicle for teaching skills with mathematical tools. Furthermore the intervention challenges the students' conception of teaching and learning of mathematics, towards a more free and student driven situation.*

**Keywords:** Design, Learning Games, Mathematics, Teacher development.

## TECHNOLOGY AND THE TEACHING AND LEARNING OF MATHEMATICS

The increasing use of technology challenges mathematics education in several ways. Many mathematical tasks can be solved using computer based tools, but the introduction of such tools are often done through tutorials, where the pupil follows specific guidelines in order to "practice" how to solve mathematical tasks with a certain software. This leaves the question of how to introduce digital tools in a way that are mathematical genuine and pedagogically justifiable. This abstract describes a R&D project that introduces the digital tool GeoGebra in a way that taps into middle school students' creative competencies and build on their own ideas following the ideas of Papert (1980). It is our aim to develop mathematical learning environments that allows pupils' to work with digital media and mathematical representation allowing them to appropriate GeoGebra to their own need.

## THE PROJECT: CREATIVE DIGITAL MATHEMATICS

The project has been running since March 2011, and been through 2 cycles of design and intervention (grade 5 and grade 3). In each intervention, students have developed board games using the tool GeoGebra. GeoGebra is a dynamic mathematical software that provides a close connection between symbolic manipulation, visualisation capabilities, and dynamic changeability of geometrical constructions (Hohenwarter & Jones 2007).

The pupils' work is organised by a simple web based interface, and start with a few simple drawing tasks, continues to solve a number of mathematical tasks before they start developing their project, a mathematical board game designed in GeoGebra.

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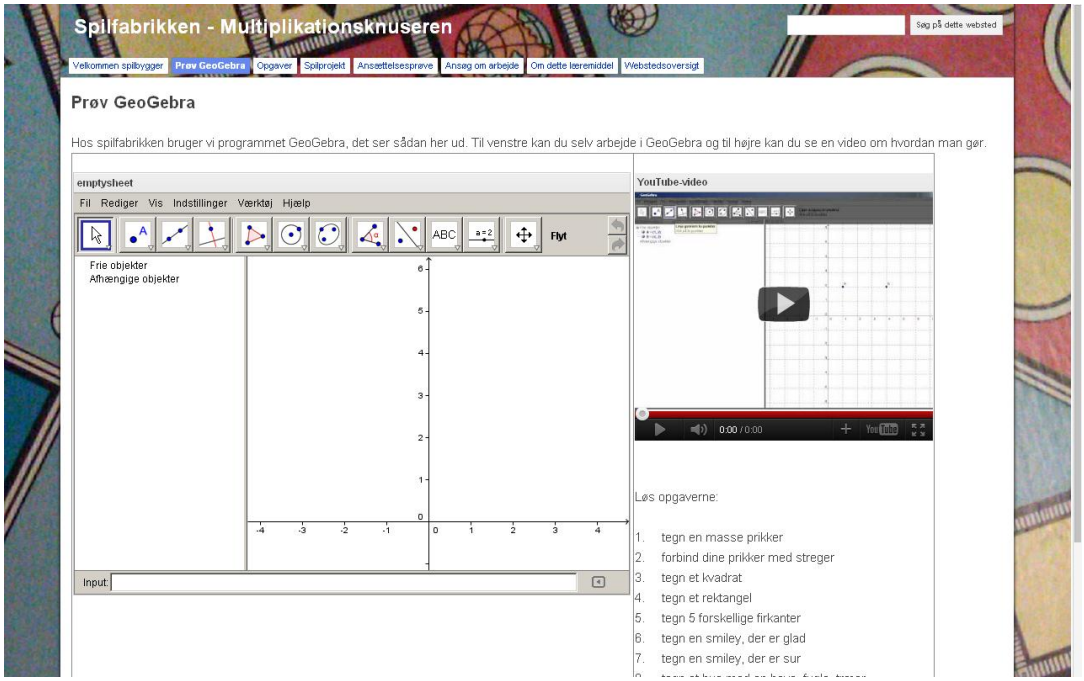


Figure 1: Screenshot from “multiplication crusher” with tasks (text field, bottom left), video-introduction (top left) and an embedded GeoGebra workspace

.

The material is collaboratively authored between the involved teachers and researchers. One researcher participated in most of the lessons while another researcher interviewed some of the pupils, about their experience after the interventions.

## RESULTS – TEACHERS AND LEARNERS AS DESIGNERS

The pupils were able to take control over the software and appropriate it to their needs. Given that this intervention was the first meeting with the GeoGebra for most pupils, the age of the pupils (grade 3 and grade 5), and the time used with the project (approximately ten lessons), we do consider this a good result.

In both design/intervention cycles all pupils developed a game. Most, but not all, games had some mathematical theme. The investigations showed great enthusiasm amongst the pupils and pointed to a learning potential in using the children’s creative competences as a vehicle to develop their skills with GeoGebra. Designing board games was accepted as a meaningful activity by almost all children.

The interviews (Krabbe, in preparation) revealed that the pupils considered their work as mathematical work. The pupils in general felt that the mathematics classes where much freer, building more on their own ideas.

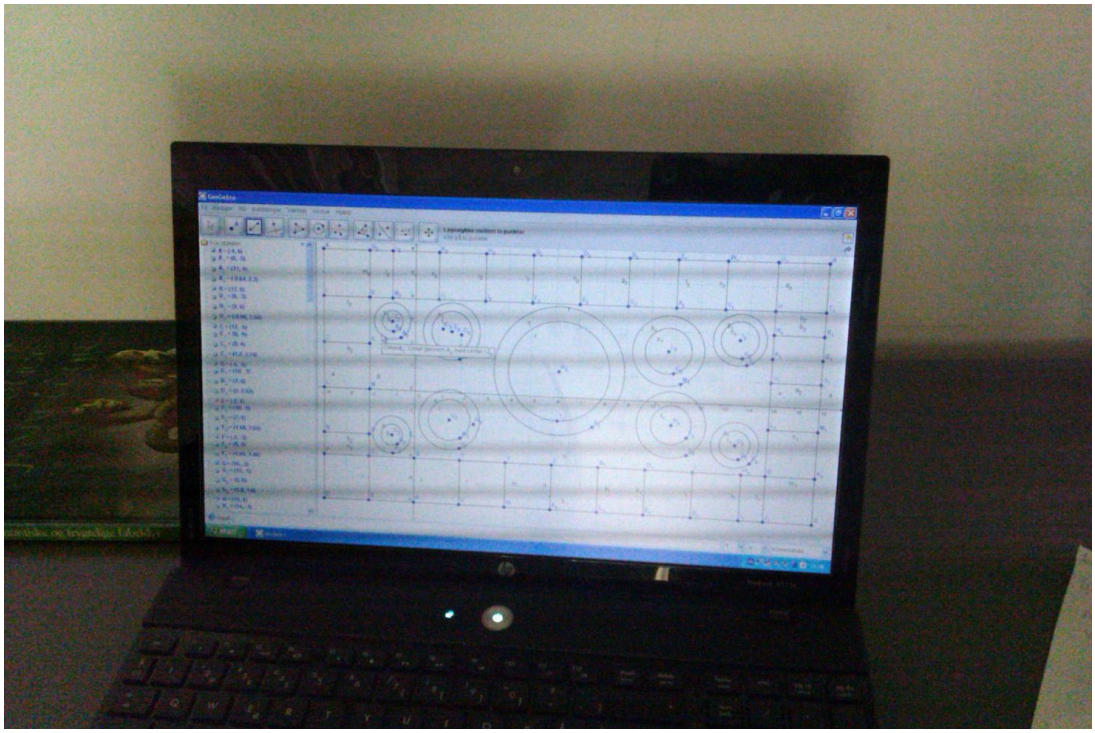

Figure 2: Pupils developing board-games with GeoGebra.

Through the interventions we have realised that there is a strong benefit from structuring the students' work with a digital learning environment. In the second cycle of intervention we have chanced the digital learning environment in a way where the GeoGebra workspace is embedded in the environment. We experienced the positive effect that the pupils work with the mathematical tasks seemed more focused.

The project also uses the teachers competencies as didactical designers as a vehicle to introduce ICT in mathematics teaching. Since the teachers take part in the design of the learning environment the project attempts to capitalize on teachers' creativity in order to change teaching and learning of mathematics towards including digital tools.

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# Designing for informed group formation

*By HANNE WESTH NICOLAJSEN, ALICE JUEL JACOBSEN* & MARIANNE RIIS*
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*A new design "project preparation" preparing for the group formation in problem based project work is proposed and investigated. The main problem is to overcome group formation based on existing relations. The hypothesis is that theme development and group formation are somewhat counterproductive. Following research based design methodology an experiment separating the two was initiated.This was to provide for more openness and creativity in contrast to a design in which existing relations seem predominant.*

**Keywords:** Project work, Group formation, Project theme development, Research based design, Moodle

## SEPERATING DEVELOPTMENT OF PROJECT THEMES AND GROUP FORMATION

The aim of the new learning design is to enhance group formation processes, which are both informed by elaborated thematic choice and openness towards creating new collaborative relations rather than relying at existing relations and thematic headlines. This is not to say that social relations are without importance or should be disregarded – social relations in university are important as in any other practice that people engage in. However, pre existing knowledge of potential group mates seems to be limited and sometimes based on accidental assumptions.

The main problem seems to be that a lot of potential group constellations are not considered at all due to the entangled processes of theme development and group formation. This entanglement leaves to little time and room to develop elaborated and focused project themes. Likewise it undermines the need to support openness towards new collaborative relations as the students are to eager to find "secure" groups. Creating relaxed opportunities for interaction providing insights into peer students' competencies and interests are needed. This may be accommodated with rather little effort by separating the development of themes and the group formation process and secondly by stretching the theme development over time. Our main hypothesis are 1) developing sound project themes takes time and 2) separating theme development and group formation allows students to be more open and creative with regard to elaborating on themes with a broader group of peer students, which results in better project themes and extended knowledge on peer students.

## BACKGROUND

At Aalborg University Problem Based Learning (PBL) and the use of project work in groups are founding learning elements (Kolmos et al., 2004). Each semester the students prepare a semester project in groups of up to six students through which the majority of their courses are relieved. The reports have a size (20 pages per student) allowing for different perspectives and analysis to be elaborated.The project work starts in the middle of the semester and the groups have around two months to work on their project finalised in a report. The reports are marked and the mark counts for approximately two thirds of the semester marking. The group process and the group constellation are important. The group process affects student life very much and the outcome of the work is crucial to their future possibilities. As a consequence the students are rather anxious about the group formation process, which is a big puzzle of different interests, ambitions, and relations to and knowledge of fellow students – all of which are informed by earlier performances, alliances, gossips etc. Laursen (2008, p.65) refers to the

group formation process as a "collective self-sorting and hierarchy creating process" being brutal and ruthless.

Group forming processes often run over a day or two with themes as the main point of negotiation. Apart from thematic interest two other principles should guide the process according to Kaae (2009) namely active openness towards others and no groups should be final before everybody is in a group. From earlier experiences and talks with students on how best to arrange for groups it appears that the processes of theme development and group formation are highly integrated. A student told that it is of great importance who suggests which themes, meaning when taking the first rounds of discussing themes, the themes you involve in are highly dependent on the hierarchy and groupings in class. Secondly the short time between initiating theme discussions, choosing themes and forming groups is rather narrow, leaving very little time to develop project suggestions and investigate whether given suggestions are feasible. Likewise many students participate with limited preparation considering themes they would like to work with.

Our aim is to change this by creating a new design, which will make students spend more time and integrate more resources in brainstorming and elaborating on project themes and last but not least challenge their existing knowledge on peer students by developing new knowledge on their peer students as possible project partners.

Further hypothesis guiding the design:

- **Earlier attention** to project themes will generate more and elaborated themes (having in mind that it takes time to make inspiration and reflection flow)
- **Awareness of multiple resources** will inspire the development of project themes
- **Timely activityfix points** are important for engaging students and other actors to keep the process flowing
- Use of an **online resource** can help support information exchange, knowledge building, interaction and secure overview
- Working with **random groups** of 4-6 students make room for active interaction with peers stimulating creative thinking and peer knowledge

## METHODOLOGY

Following a Research Based Design approach we see our work as an interdependent process of both instructional design and research (Ejersbo et al. 2008). We are therefore both running an experiment trying to work out a better practice for project preparation (as the project is called) and at the same time we build theory on the matter following the cycles of theory generation and artefact generation as described by Ejersbo et al (2008). Our "Project preparation" design is worked out based on the hypothesis above and further informed by material obtained on the way eg. from the Future Workshop (see the following).

## THE DESIGN

A so-called Future Workshop (JungK & Müllert) was used to make students express their needs and wishes and identify resources of their own and of others. A *room was set up in Moodle* with different types of information and material on eg. earlier project themes, presentation of semester supervisors, supervisors' theme suggestions, and a forum with students' suggestions allowing for further elaboration. A three hour workshop - brainstorming and discussing project ideas was conducted. After the first round the students were regrouped to present their favorite ideas and further elaborate on these ideas or upcoming ideas. The ideas were written into Moodle for further exchange and communication among the students. A group of students arranged a *company day*(The Company Day was only part of the design

at the fifth semester), here selected companies were invited to the university to present "challenges" which could be used for projects.

The "Project preparation" design was implemented and adapted at the third and the fifth semester of Humanistic Informatics engaging 77 and 44 bachelor students. A number of different data such as the outcome of the different phases, immediate reactions at the end of the group formation day, e-mails, two student assistants log on student comments, the oral semester evaluation, online survey developed for the purpose of evaluating the design, the students from the third semester repeating the new artefact (theme development and a company day) on their fourth semester on their own. All this material serves to evaluate and further inform the design of the practice as well as build theory.

## EVALUATION OF THE PROJECT PREPARATION DESIGN

The evaluation is about to be made. The set up seemed to work better at the third semester than the fifth semester, which needs to be further investigated. The process was in general found less filled with emotional tensions. Most students liked the group formation part being shorter, but some found it to short and hasty, which needs further elaboration. We find indications that the new design has potential to help the students create new collaborative relations. However, to big a time span between the theme development and the group formation seems to work towards undermining the openness created. On the conference we will present further material and analysis on the design evaluation.

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# Multimodality and video observation in "Collective Academic Supervision"in the Master Program in Guidance, Aarhus University, Denmark.

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**Keywords:** Video observation, multimodality, counselling analysis, group supervision.

## INTRODUCTION

How come that the practice of guidance appears to be so simple and yet so vastly complicated. What could be simpler than being and interested interviewer and listener? Still, the complexity of what is involved in professional interaction practices can be difficult to pinpoint. In this presentation we argue that an analytical approach to the professional's own practice provides valuable knowledge of how to practice guidance and counseling. Furthermore, we argue that this must be addressed as an active part of the master programme's pedagogy. We propose an introduction of video observation as a tool to bridge the practical experience and analytical distance where collective academic supervision process is brought in to enhance the transformation processes. In our discussion we draw on findings from a recent developmental project and video observations of group supervision sessions at the Danish Master Program in Guidance.

## RESEARCH INTERESTS AND METHODOLOGY

Our research interests revolve around how multimodal aspects come into play and form a rationale for reflection when students are confronted with their own practice on video. From that we can identify how the students choose to relate to the video and to what extend the multimodal nature of the video recalls and maybe renegotiates embodied experiences from the guidance situation. This is investigated in a methodical two-step process: Firstly, the students make video recordings of their own practice, which is shown and discussed in their study group and with the teacher participating as supervisor. Secondly, a video is recorded of this group supervision situation. This second video observation of the group supervision serves as empirical data for our analysis which takes a multimodal approach. This methodological approach is supported by previous studies into the use of video to qualify career guidance practices (Young et al, 1994) and it is argued that by introducing video researchers - in the present case the students - can extend the investigation of career guidance and development (ibid.).From that we discuss the potentials of video observation as a method to develop sensitivity to the significant multimodal, unexpected and unplanned aspects of interaction practices.

## VIDEO OBSERVATION AND MULTIMODALITY

Guidance practices are dominated by many different models for the ways in which guidance and also counseling ideally speaking should be performed. A majority of the students at the Master Program in Guidance in Denmark are working as guidance practitioners. The ambition of the master program is to qualify the students´ academic approach to practice by improving their analytical skills in observing and arguing systematically for relevant observations and potential actions. The students write individual reports but are supervised in groups in which they are asked to present and discuss their work. We call this supervision model for "Collective Academic Supervision" (CAS) (Nordentoft and Thomsen). The pedagogical rationale behind this model is that students' participation and learning are interconnected. CAS provides possibilities for systematic interaction not only between individual master

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students in their writing process. In the 3rd course, the master students produce and analyse videos from their own practices - i.e. conversations with clients.

Our study suggests that the process of producing and analysing the video has the potential to develop the students' sensitivity to significant aspects of their interaction practices. We observe a double perspective of recalling being in the situation and what it felt like on the one hand; on the other hand the possibility of repeating the situation reveals new insights in the development of the interrelations between counselor and counselled and a critical distance to one's own behaviour. It becomes possible to make a distance to one's own preferences and behaviour. Facial expressions, embodied utterances, toning of voice become possible to observe as actors in the complex situation of what is 'said' in a situation.

Moreover, the illumination of different perspectives in the supervision group on this multimodal approach provides a multifaceted perspective on the students´ interaction practices (Buhl). Multimodal approaches offer a toolbox to understand interactions as a complex practice of semiotic and embodied utterances and serves as a toolbox for students as well as for our study.

In multimodality the interplay between various modalities creates a synergy in knowledge-building - including dimensions of a spatial and temporal nature in videos. Kress & Leeuwen argue that meaning of signs is negotiated in social practices. This supports the idea that video sequences may be interpreted as legible signs, i.e. their meaning can be translated into written or oral language (Kress and van Leeuwen 2001). Specifically our study reveals that video observation and -analysis has the potential to create dialectic relations between normative discourses/ models and situated embodied experiences.

There seems to be a tension between how practitioners think they act and what they actually do. In the paper we advocate that this tension stimulate the development of students´ analytic skills and at best extends their distance to and understanding of the multifaceted guidance practice. At worst, the students are not capable of adopting an analytical approach to the video observation because the self-confrontation they experience in the learning process appears to be too disturbing for them.

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# **Emergent Forms of Peer-Mediated Learning:** A Case Study of Role-Playing on Scratch

*By JOANNA LUZ SIEGEL*
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*Philadelphia, PA, USA*

*This paper examines emergent learning opportunities created by youth participants in an active online role-play group. Players employseveral key mediating practices—textual, visual, pop cultural, and collaborative or leadership-based—to afford themselves and their peers valuable learning experiences in a voluntary out-of-school space.*

**Keywords:**Scratch, multiliteracies, out-of-school learning, collaboration, creativity

## ABSTRACT

Educators who are eager to create networked learning environments are increasingly asking, "How can I mediate my students' online activities to foster active learning?" Meanwhile, the internet is ripe with young people spending the bulk of their out-of-school time collaborating on creative activities in which abundant forms of learning take place—many of which overlap directly with educators' teaching goals. These organic activities appear to be successful and sustained precisely because they are self-motivated and participatory, in contrast to the compulsory nature of in-school engagement with the web. The goal of this paper is to analyze how participants in a highly active online collaborative space facilitate their own and their peers' learning through creative role-play and social interaction.

This paper presents one dimension of an ongoing research project observing members of a fan-based role-play group called Warriors of the Blue* (WOB), formed on a larger website called Scratch (Scratch.mit.edu). MIT Media Labs designed Scratch as a youth-friendly introduction to computer programming, game design, and animation. Because the administrators of the site worked to cultivate a culture of open creativity, many unexpected uses of the site have emerged; WOB is a particularly active and long-lasting example of emergent phenomena on Scratch. WOB's members engage in improvised, text-based, real-time collaborative role-playing, accented by digital images and simple animations documenting the characters players invent. The emergence of hundreds of groups like this, given the lack of design affordances on Scratch to mediate such activity, provides a lesson in its own right to teachers: an appropriate degree of designed structure must be balanced by the freedom for peers to design and mediate their own online communities, if they are to remain genuinely engaged and involved over time.

Taking a multiliteracies approach (New London Group, 1996) to this active subsection of participatory culture (Jenkins et al, 2006), the paper groups focal data into four main forms of peer-mediated learning observed in WOB. First, the *complex textual practices*developed and mastered by players offer a performative technique for engaging deeply with literature and composition. WOB is fan-based, in that it draws inspiration from a series of young adult fantasy novels called *Warriors*; role-players therefore ventriloquate (Bakhtin, 1981) the books stylistically, while building plots, developing characters, and crafting their own themes by imaginatively "remixing" the books. Second, players' *multimodal literacy practices* generate new interpretive possibilities and serve to organize the dynamic relationship between written words and accompanying images. Third, players develop *critical media literacies* through artful references to and pointed conversations about elements of popular culture, cultivating alternative "media identities" that contrast with the mainstream, gender-normative identities they describe as being forced upon them in school. Finally, players have co-constructed an

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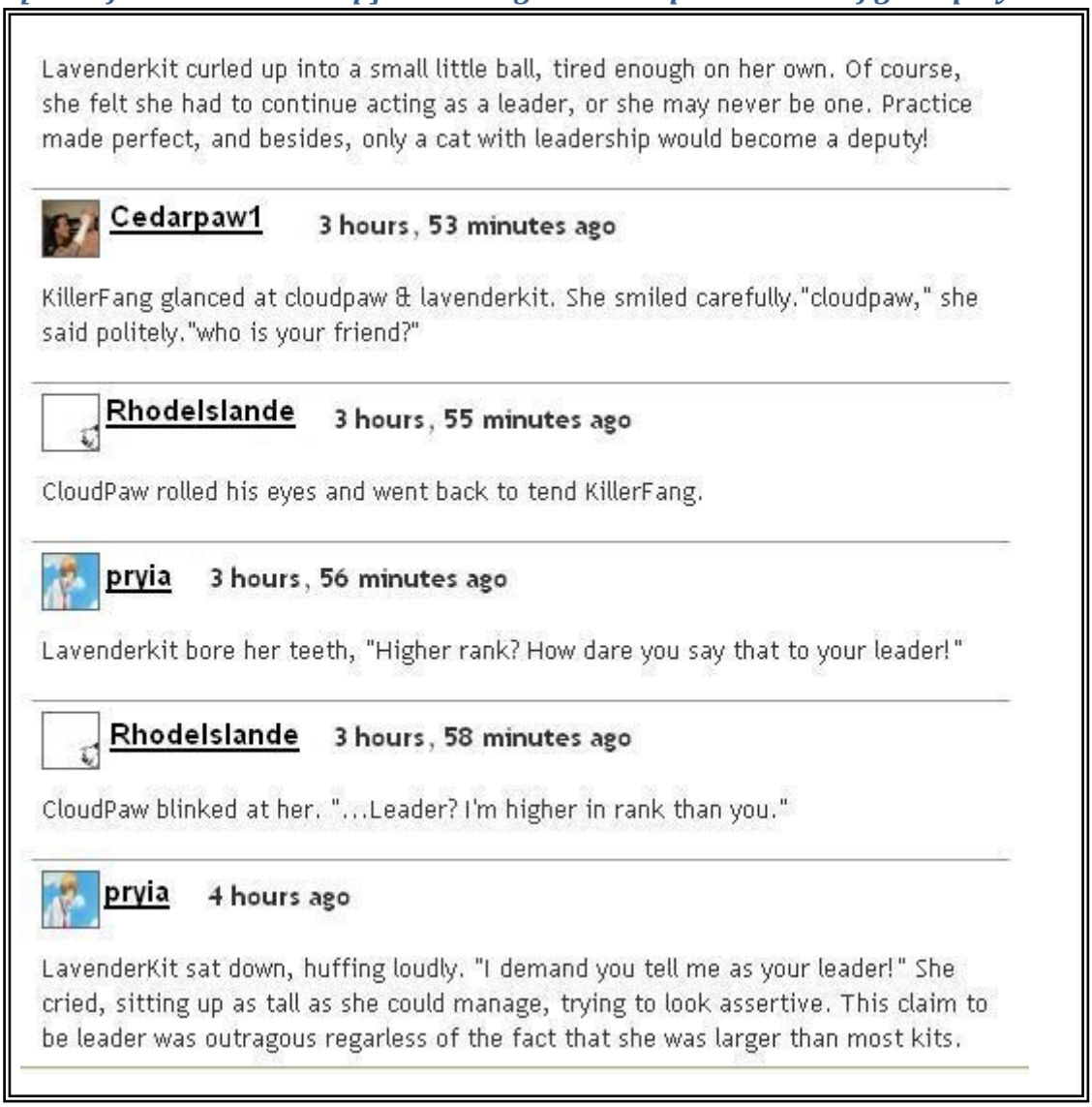
elaborate *social structure* that determines both the rules and privileges of game play, and general social status in the group. The latter form of mediating the WOB space cultivates rich opportunities for developing leadership skills and creatively negotiating one's position.

Focusing intensively on literacy practices and communicative strategies on WOB, the paper illuminates valuable forms of peer-mediated learning emerging online, while providing a case study for educators interested in designing successful online collaborations among students.

***[Read from bottom to top] Practicing leadership in and out of gameplay****



Lavenderkit curled up into a small little ball, tired enough on her own. Of course, she felt she had to continue acting as a leader, or she may never be one. Practice made perfect, and besides, only a cat with leadership would become a deputy!

**Cedarpaw1** 3 hours, 53 minutes ago

KillerFang glanced at cloudpaw & lavenderkit. She smiled carefully."cloudpaw," she said politely."who is your friend?"

**RhodeIslande** 3 hours, 55 minutes ago

CloudPaw rolled his eyes and went back to tend KillerFang.

**pryia** 3 hours, 56 minutes ago

Lavenderkit bore her teeth, "Higher rank? How dare you say that to your leader!"

**RhodeIslande** 3 hours, 58 minutes ago

CloudPaw blinked at her. "...Leader? I'm higher in rank than you."

**pryia** 4 hours ago

LavenderKit sat down, huffing loudly. "I demand you tell me as your leader!" She cried, sitting up as tall as she could manage, trying to look assertive. This claim to be leader was outragous regarless of the fact that she was larger than most kits.

*players and group names have been protected with pseudonyms

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# **A Learning and Interaction design framework,** from a study on formulating principles for the design of engaging music learning games

*By CHARLOTTE L. WEITZE & RIKKE ØRNGREEN*
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*Based on a preliminary action research study investigating the design of digital music games and years of experiences from interaction design processes of learning resources, this extended abstract presents a framework that mixes designs for learning principles and game design with a process view using a simple interaction design lifecycle. Though the first outset was to design engaging music games, the resulting framework has a more generic character.*

**Keywords:** interaction design, serious games, engagement in games, learning design, game design.

## RESEARCH AREA AND METHOD

Current research shows that development of digital resources for learning is a complex area to approach. There seem to be two trends. Many of the resources focus primarily on learning theories or on the concrete issue of: "what has to be learnt". The consequence of this is often poor interaction design. Others are developed to look appealing or apply game mechanics from leisure games, but then fail to take the learning purposes into account. (Levinsen & Ørngreen 2011, Weitze 2011)

This work is a collaboration between the authors that takes the empirically based research of a Master thesis a step further, by abstracting it to a more general frame of designs for learning that builds on both interactions design, didactical design principles, learning and motivation theories, and experiences from serious and leisure games.

## INTERACTION DESIGN – IN A PROCESS PERSPECTIVE

Based on observations of design processes, Sharp, Rogers & Preece (2011) has designed a simple interaction design model that describes some of the activities, which can be expected to take place in interaction design processes (see Figure 1). They emphasize the involvement of users at every stage.

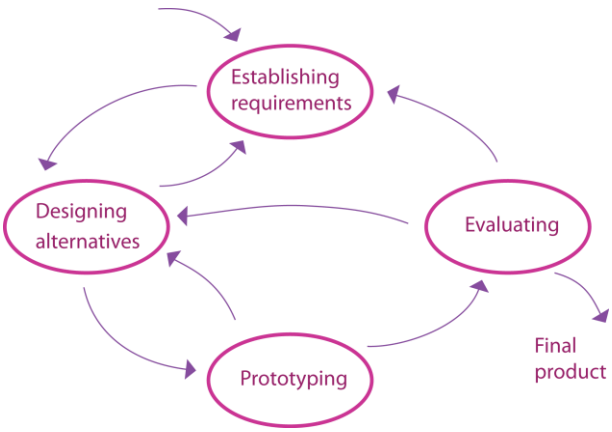


Figure 1: The simple interaction design lifecycle model (Sharp, Rogers & Preece 2011, Fig. 9.3)

When designing a learning concept, one must create space for and accept a dynamic and iterative design process. It has to be accepted that the goal is unclear in advance. As a concept developer, part of the task is to subject the concept to a divergent process, to try out new

perspectives and different ways of designing the same thing, informed by both empirical data and theory. The challenge is to overcome and not to be fixed in one's own ideas and preconceptions. In designs for learning many destinct roles are vital. Both the subject matter experts, the didactical and learning design experts, as well as the interaction/game designers needs to work together as concept developers, and to provide input to the design.

## FORMULATING PRINCIPLES FOR THE DESIGN OF ENGAGING MUSIC LEARNING GAMES

The Master's thesis investigated: Which parameters and elements are important when designing a music learning game for 6-9 year olds that teaches children to play piano using sheet music, which is also fun and engaging to play? This was investigated through a review of the six points from Hiim and Hippes (1997) didactic frame model. The analysis was carried out through use of specific and general learning theory, theories about children, culture and media, as well as empirical analysis of Weitze's own music teaching practice. Motivation and engagement in music learning games was investigated through a) an analysis of various theoretical and empirical approaches to implementing learning in a learning game, b) study of motivation theories c) analysis of theory of play and existing experiences on dissemination of learning in games in fun ways d) analysis of motivating and engaging game elements, and e) analysis of similar music learning games. In the thesis development of the game concepts took place in collaboration with users, through participatory design workshops with paper, 3D and video prototyping, as well as through observation and qualitative interviews. The results from the user involvement techniques was used in the iterative prototyping throughout the concept design process, which also applied cognitive walkthrough / peer review of the prototype from experts. One of the thesis products was the development of a design manual on how to develop engaging and motivating music learning games.

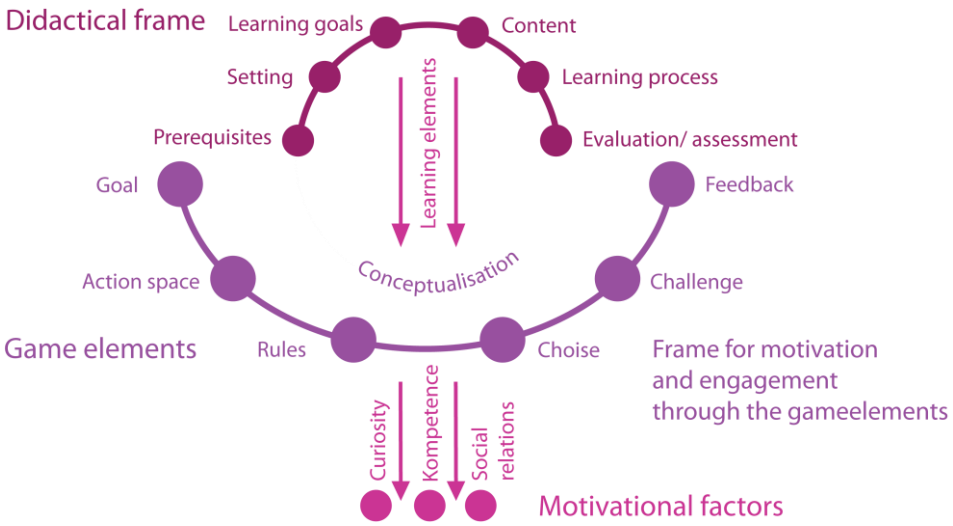


Figure 2: Parameters in a motivating and engaging game for learning

Figure 2 shows the model, which was the outcome of the thesis, where the titles refer to the various educational, motivational, and engaging elements of the design manual. In brief, the model can be explained as: If you want to learn a subject area through a game, then the designs for learning involve exploring the didactic elements from Hiim&Hippe (the target group's prerequisites, etc). From this the learning elements are generated and are conceptualized with the game elements (target, action space, etc.). The objective is to provide a scaffold for thinking through all these concepts, and if this is done in a nuanced and thoughtful way, you will be able to initiate the learners´ curiosity, to build skills and to gain from social relations. Thinking through these three motivational factors with the end users in mind should support initiating inner motivation to play the game and thus learn to play piano

(or whatever the objective is). It's the nuances of and interaction between the different parameters that determine if the game will provide learning and an engaging experience.

## A FRAMEWORK FOR AN INCREMENTAL DESIGN FOR LEARNING PROCESS

In consultancy, research, and teaching Orngreen has often applied the Hiim & Hippe didactic framework to the interaction design cycle (figure 1). As the next stage of this work, we argue that it is possible to merge it with Weitze's model (figure 2), in a step-by-step, but still iterative proces; Ensuring a multitude of elements are investigated, as shown in figure 3. When a subject or situation is selected to be communicated through computer supported products or processes, the didactic frame is explored in the activity: Establishing requirements, in a participatory or user-centred way. The results are the learning elements that must be conceptualized in the design. The learning elements are put into play through the gaming elements in the design / redesign activity. This part of the design process is interaction design at the conceptual level. The elements of motivation are permeated throughout the model and all elements are explored so that they inspire and/or provoke to use, by trying various design alternatives (with users). When the development of prototypes are evaluated, using in the first iterations easy production and easy- adjustable methods, the evaluation should be up against the whole learning model (figure 2). We are currently exploring the use of this model.

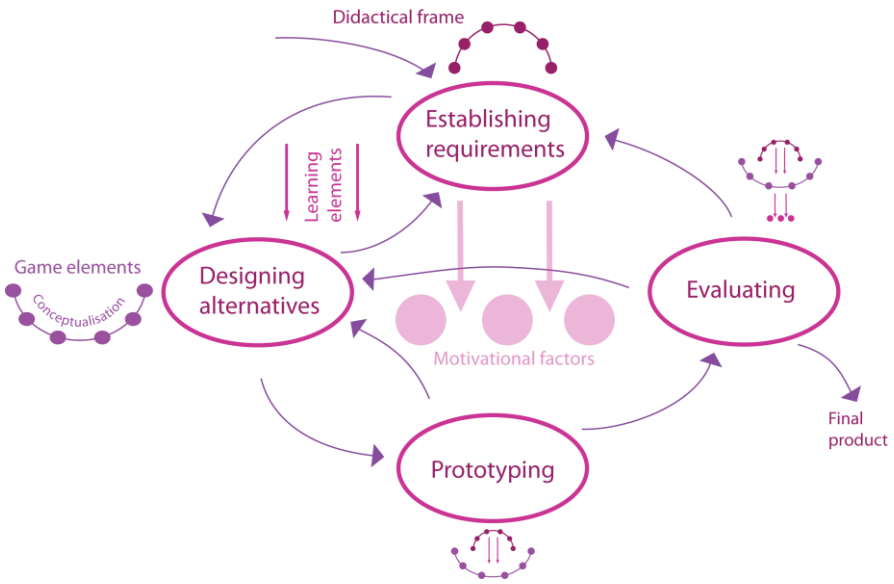


Figure 3: Getting Learning into Design and Design into Learning

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# Designing Teacher Education through scenario development

*By SANDY SCHUCK[1] and KEVIN BURDEN [2]*
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*This presentation develops understandings of some future designs for learning in Teacher Education. It does so through scenario building, in which possible trends for Teacher Education are investigated and scenarios are developed for the different possibilities. The discussion considers two fields of change: digital learning environments; and outcomes of teacher preparation in terms of readiness to teach .*

**Keywords:** scenarios, teacher education, complexity,digital learning environment, standards and outcomes.

## USING SCENARIOS TO DEVELOP DESIGNS FOR LEARNING

Teacher Education is undergoing change in conception, location and purpose in many countries. What will or should it look like in ten years' time? What trends will be influential in determining its structure? How best can teacher educators prepare their students for schools of the future? The use of scenarios is a helpful way of conceptualising the impact of different issues and trends on Teacher Education. Scenarios provide a means of reflecting on, and imagining different futures for Teacher Education (Snoek, 2003). A process for using scenarios to conceptualise future education involves identifying the major fields in which significant change is envisaged to impact on that future, and select those fields in which the change and impact of the change can be modulated or controlled to some degree.

Two major fields of change are identified here and these are used to imagine different futures through the use of a 2-dimensional model (Linde, 2003). The extremes of each field of change are described to highlight the possible characteristics of the field and the possible impacts that could occur.

One field of change regards the digital learning environment. At one extreme, learning derives from current practices and routines in Teacher Education. Digital technology use is structured, formalised and teacher-controlled. At the other extreme, learning is emergent, decentralised and student-centred. Digital technologies are prevalent in the learning, and students choose how, where and which technologies to use.

The other field of change concerns Teacher Education program outcomes. On the one hand, outcomes consist of standards tightly prescribing teacher knowledge, practice and professional engagement. Standards are dictated by state rather than institution. On the other hand, outcomes are negotiated and signal the complexity of teaching, the value of doubt, uncertainty and the unbounded nature of knowledge.

This paper sets up these two fields of change in a two-dimensional model (see figure 1), creating four possible future scenarios for Teacher Education as depicted by the four quadrants. We use this model to reflect on possible trends.

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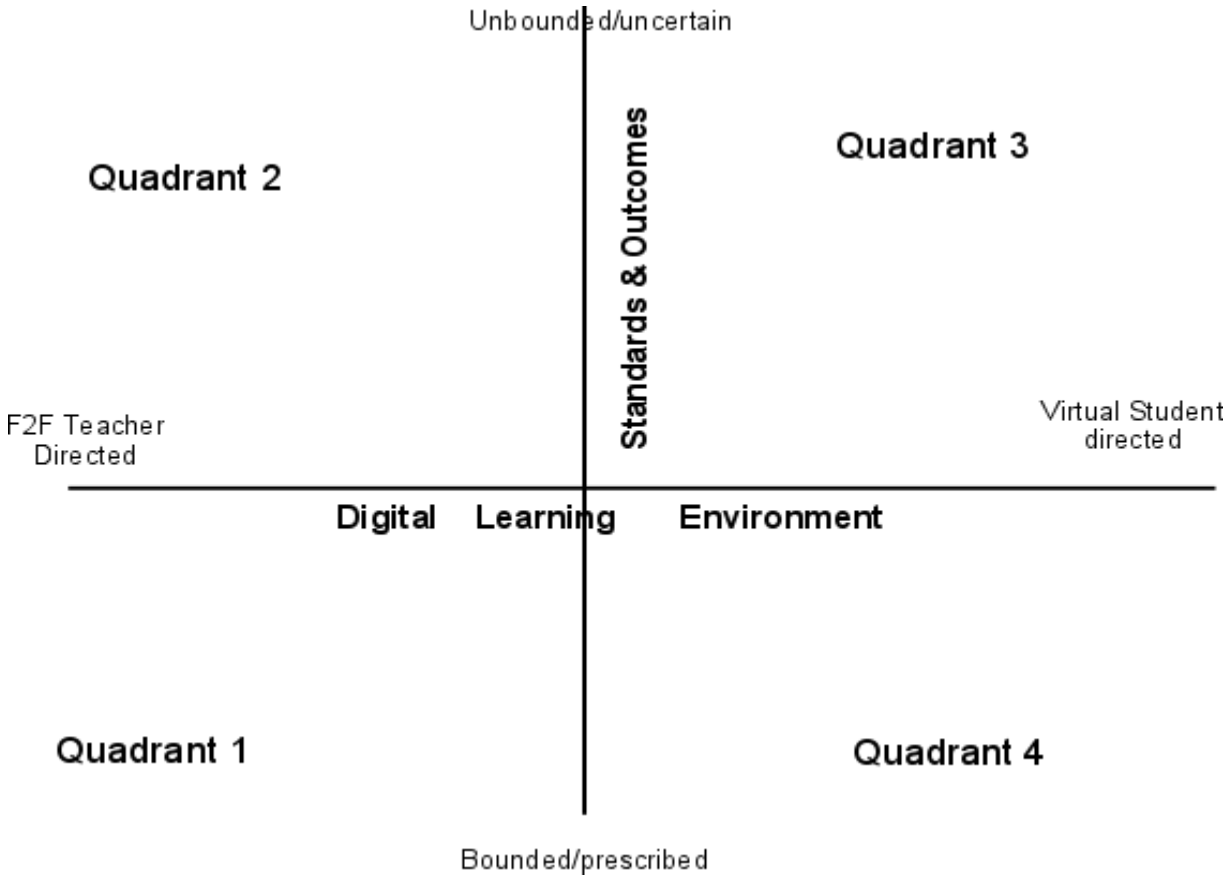


Figure 1: Two dimensional representation of Teacher Education scenarios

## SCENARIOS FOR TEACHER EDUCATION

In Scenario 1 (see Quadrant 1 in figure 1), Teacher Education prepares student teachers for what is known now, and for what has worked in the past. Standards are developed by government authorities to reflect that which is quantifiable, measurable, and reflects current visions of 'best practice'. Teacher education takes place in tertiary institutions, classes are timetabled and lecturers choose suitable presentation technologies. Learning management systems are used to provide controlled environments for students to interact with each other and the lecturer. Content addressing the standards is taught and assessed. Content covers both subject matter and pedagogical content matter.

In Scenario2 (Quadrant 2), Teacher Education prepares student teachers through physical participation in the institution. Inquiry approaches are used to investigate questions in class time with the use of available technologies. Students do a needs analysis to choose the areas they wish to study. The curriculum is negotiated between students and the teacher educator to provide a personalised curriculum which addresses student needs. Students attend classes to work collaboratively, discuss possible issues and trends, and prepare for teaching in schools of tomorrow. Technology is provided by the teacher educator and reflects teacher choice of most suitable tool for task.

Scenario3 prepares teachers to thrive on uncertainty and doubt and to use these concepts as the basis of an exploratory, student-centred, problem solving curriculum, facilitated by ubiquitous connectivity and rich, de-centralised technology resources. This scenario is characterised by flexibility and independence and students negotiate their own learning outcomes. They utilise the affordances of ubiquitous, mobile digital technologies, to engage in authentic problem-based activities which encourage them to consider diverse perspectives

and solutions. Choice of learning technologies is made by the student from a bank of technology resources with universal access. Learning can occur anywhere, any time, and in any way chosen.

As with Scenario 1, the scenario in Quadrant 4 prepares student teachers for what is known now, and for what has worked in the past, based around centralised standards. Subject content is important and teaching competencies are emphasised. Technology allows learning to take place virtually which saves costs, and allows 'classes' to be unlimited. Students choose how best to interact and connect to acquire the necessary knowledge base. The scenario mirrors a consumer enterprise model.The institution provides the virtual infrastructure, the curriculum, the credentialling and the staff.

The presentation will explore the characteristics of these four scenarios to investigate their possible implications for the future design of Teacher Education. The discussion will highlight strengths and weaknesses of each possibility and investigate where the extreme positions for each field of change might take Teacher Education. The presentation will also consider the value of scenarios for helping to understand and design Teacher Education. The authors suggest that scenarios are a first step in developing a design for future Teacher Education: they identify the possible trends and factors and by so doing, indicate how teacher educators might influence these factors.

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# **Text-making and recognition of text in new media landscapes.** A study of pupils' design of texts in six project assignments within upper secondary schools.

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**Keywords:** Designs for learning, digital resources, education, multimodal, social semiotics

## INTRODUCTION AND BACKGROUND

Research on writing has been conducted in many disciplines and from different perspectives. In the last decade the research field on writing or text making has been drawn from an individual psychological analytical approach towards a more social semiotic and literacy oriented tradition. There are some research studies (see for example Blashi & Nichol 2005, MacArthur 2006, Gee 2007) that focus on how writing can be influenced by the use of new digital media such as the use of e-mail, chat and games. These studies show that writing is becoming more of a complex multimodal way of communication, a change from a traditional way of using printed text to a more multimodal use of texts.

According to this background, this paper will present a research study which aims to explore how texts are designed in digital learning contexts in six different project assignments within two upper secondary schools in Sweden. The study explores:1) the pupils written representations (e.g. log writing and final reports, 2) assessments practices and cultures of recognition. The main research questions are: How do pupils use different media and learning resources in order to communicate their understanding and engagement in the project assignments? How can learning resources shape the pupils´ sign-making? What is recognized as knowledge by the teachers and the pupils?

## METHOD AND THEORETICAL FRAMEWORK

The empirical data derives from pupils' activities and engagements with different digital learning resources (eg. face book, PowerPoint, Internet texts, images) and from interviews with teachers/supervisors and pupils. We will employ both a social semiotic multimodal perspective and a design for learning perspective as an analytical framework (Selander & Kress 2010). Communication and learning are seen as multimodal and sign-making activities, where traditions and norms shape the way and the possibilities for pupils to make meaning in an educational setting. Learning resources are viewed as something that mediate and shape physical and intellectual activities, resources that influence pupils´ communication and learning process.

## EMPIRICAL MATERIAL

The empirical material on which this study is based on were collected from two upper secondary schools in a large city in Sweden. Use of ICT to support subject oriented learning, as well as enhancing pupils´ ICT competence was highly prioritized by the selected schools. The two schools (school A and school B) were both concerned as rather well advanced in relation to the use of digital learning resources in general. School A was well equipped with computer related facilities (hardware and software) and all pupils had their own laptop for all school activities. School B was also well equipped concerning digital learning resources but instead of a personal computer (1to1) the pupils had access to shared computer laboratories. Both schools had access to Internet, Learning Management System (LMS) and municipal technical support system. Together with the teachers in the subjects we handpicked a number

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of project assignments at each school on the basis of variation of subjects, skills of technology and gender representation.

We gathered data from totally six project assignments. All of the pupils were over eighteen years old and they all did their last year at program within the upper secondary school. At school A, we selected two project assignment within Social science: anti-bullying plan and life coaching. In the project assignment anti-bullying plan in school there were two female pupils and in the project assignment life coaching there were four male pupils. At school B, we selected four project assignments, two projects within Biology and two within Chemistry. In biology there were social media and carbon dioxide which involved one male pupil and the other project food waste involved two female pupils. In chemistry, the two projects antibiotics processed from fungi and preservation, involved two female pupils each project.

## FINDINGS

We are still in the process of analysing data. Preliminary results will be presented at the conference. The study will describe and analyse how writing can be used in different learning contexts.

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# Videoconferencing in Music Education at the Conservatory Level

*By RIKKE ØRNGREEN[1], KARIN LEVINSEN[1], MIE BUHL[1], THOMAS SOLAK[2], MARIANNE LØKKE JAKOBSEN[2], & JESPER ANDERSEN[2]*
*ICT and designs for learning LAB, Aalborg University, Ballerup, Denmark[1]*
*The Royal Danish Academy of Music, Copenhagen, Denmark[2]*

*This extended abstract presents preliminary findings from an investigation of the complex challenges and potentials of using video conferencing in connection with teaching and learning processes in the domain of higher music education at the conservatory level. The project and the initial findings is presented, leading to further research questions, which the partners are currently being involved in exploring and preparing future research projects in.*

**Keywords**: videoconferencing, music education, multimodality, teaching, designs for learning

## THE PROJECT

In 2009 the Royal Danish Academy of Music (RDAM) launched a development project on distance learning in which instrumental teaching takes place in a new video conference environment featuring advanced technological equipment. For RDAM the aim is to develop a sustainable teaching practice, which provides excellent competence building opportunities for teachers and technicians. RDAM sees video conferencing as a means to expand the academy's international cooperation, to share expertise and to establish networks and new performance spaces for joint high profile master class teaching.

In early 2011, RDAM chose to involve a group of researchers, with expertise in IT supported learning designs in general and in use of video conferences specifically. This have let to the establishment of a tight partnership between research and practice in this field. The combined research and development project rests on the assumption that implementation of video conferencing as a teaching methodology is a process of organizational change and adjustment that challenges traditional pedagogy and the everyday practices of students and teachers. The next pages presents 1) key concepts from literature about distance learning, which forms the basis of our preliminary investigations 2) results from pilot studies of distance learning sessions at RDAM, where student musicians where instructed via videoconference. From an explorative approach the research group wanted to identify pedagogical issues emerging from these sessions, focusing on how issues of musical qualities were handled and addressed by the actors in situations where sound would be mediated. The research group made observations of the distance learning sessions which were organised as announced events with participation of different stakeholders (other teachers, experts from academia with experience in the field). The sessions were followed by a short group dialogue, where students, teachers, technicians and other experts participated.

## KEY CONCEPTS FROM LITTERATURE

Some papers on video conferencing relates primarily to areas that depend on high visual quality, as surgery and nursing, sound is not well explores. Others focus on students' reflexivity and ability to solve problems, or to advantages such as immediate feedback, a repertoire of multimodal sign systems and sense modalities, synchronous communication and social closeness. There is a lot of literature on desktop videoconferencing and less on classroom, campus to campus, teaching. Even with the present speed of transmission, delay affects dialogue functions such as turn-taking, sequencing and repair, which in turn affect the experience of trust and telepresence, and that people try to avoid situations affected by delay

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(Ruhleder & Jordan 2001). In most cases, the technician becomes the facilitator who handles both technical and collaborative breakdowns (Hedestig & Kaptelinin 2005). According to our initial observations, these findings seem to be general to video conferencing no matter the subject.

The literature concerning music education is scarce and represents mainly case reports, and seldom addresses the conservatory level, which is confirmed in a recent study (Nissi 2011). There is a recent quantitative study, which provide examples of typical behaviours in music education and the empirical analysis of video conference classes examined: "sequential patterns of instruction, focus of attention, amount and type of performance, eye contact, and other nonverbal behaviors" (Orman & Whitaker 2010, p. 4). It is interesting that these researchers found that students played more frequently (22%) and that eye contact increased during video lessons.

In general, the literature does not address the special needs and circumstances that are relevant to high level music education via videoconferencing from a pedagogical perspective.

## INITIAL ACTIVITIES AND FINDINGS

In March 2011 RDAM hosted a seminar on distance learning in collaboration with MSM. This seminar marked the peak so far of the test phase for the implementation of the newly acquired technology. Here, several teaching and technical calls between MSM and RDAM was made, and the seminar provided a scene for the researchers' initial observations (see figure 1). Each session was followed by discussions amongst teachers, students and researchers. Apart from the immediate surprise of the test participants at how comfortable they felt with the situation, the discussion revolved on the pedagogical and interpersonal challenges, as well as talks about the technical limitations/opportunities connected to the issue. In August 2011 RDAM hosted an international conference, with several teaching calls and oral presentations, which formed the basis for knowledge sharing. During the autumn/winter session 2011, the researchers have witnessed a few other teaching calls, and every event (the March, August and winter calls) have been video recorded.

The majority of the participants had never tried this kind of dedicated video conference set-up before, whereas a few had tried Skype as a teaching platform, and it turned our several use recordings of their teaching sessions. All participants expressed that they perceived a potential and that it worked surprisingly well. However, it became obvious that available space in terms of arrangement, distance and visual direction are factors of importance as are monitor size and position. Also, vocal soloists differ from instrumental soloists as they use the body as their instrument, and type of instrument (from organ to viola) place different demands to the setup (pedagogically and technologically). The teachers had to let go of physical interaction such as conducting, counting the beat or playing simultaneously due to the slight delay. The teachers modified their practice and adjusted to the conditions of the technology by verbalizing their body language.

The participants experienced that telepresence depends on collaboration between technicians at both ends as well as between musicians and technicians and that the teachers must be able to instruct the technicians about their specific needs. For example, an unacknowledged difference in sound experience may lead the teacher to instruct students to adjust their technique or expression/interpretation of the music in ways that may appear "wrong" in an analogue performance.

Figure 1: From the March workshop between RDAM, Denmark and MSM, New York

## FUTURE PERSPECTIVES

Based on these findings the shared goal is to produce knowledge that may enhance the competence building of teachers and technicians and develop adequate pedagogical theory and practice for video conference-based music teaching.Due to the nature of the field and the lack of knowledge, future research will be conducted as participatory action research. This means that the research takes its point of departure in the context and the practice and needs of the participants in the project. For example the researchers, RDAM project members and teachers meets in February 2012 to discuss three teaching models, which could be explored in more detail in the near future. It also means that research analysis and results is seen as a mutual learning experience, where all participants contribute. For example based on a music theoretical perspective, quality and context of sound may be understood differently according to different historic cultural understanding of what is a “correct sound”. The interaction between RDAM practitioners and the researches has led to an understanding of that preference towards dry and clean a-contextual sound, understood as how the instrument sounds, or more contextual sound, understood as how the instrument is experienced in the room where it is performed, may have significant pedagogical consequences. These are assumptions that needs to be explored in the future.

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# Workshops

# How does didactic design contribute to game-based learning processes for adults?

*By THOMAS DUUS HENRIKSEN*
*Aalborg University, Campus Copenhagen, Denmark*

Learning games have long been available for facilitating adult learning processes and organizational development. Since the early 1950, learning games have been designed and used for helping teachers and consultants in providing an operational understanding of particular theories and processes to both employees and university students (Graham & Grey, 1969; Henriksen & Løffvall, In Press). However, much emphasis has been placed on designing those games, while less emphasis has been placed on the didactic activities that surround the game to facilitate the learning process.

During the late 1980s and early 1990s, emphasis was extended to encompass briefing and debriefing activities, thereby acknowledging the idea that the full extent of the learning process was not taking place during the game. This development embraced Kolb's (1984) idea of learning as an iterative process of combining practical experiences with various kinds of exploratory reflection. In 1992, the journal Simulation & Gaming actually celebrated the idea of post-game activities as learning facilitators by devoting a whole issue to the concept of debriefing. During the same period, Csikszentmihalyi's (1975) notion of flow became predominant in understanding the participant sensation of immersing into the game's story and mechanics. This understanding was reflected in a particular didactic design for using games, namely a design, by which the learning game ran as an uninterrupted process, preceded and followed by other learning activities. This design can be exemplified as a process, which starts with a theoretical presentation to a subject, e.g. organizational change, then followed by a practical game-experience, which is rounded off by a theoretical debriefing, a classic 1-2-1 design (see Henriksen 2009; Henriksen & Lainema, In press). Other didactic designs make an effort to orchestrate the process differently, e.g. by providing participants with a theoretically informed approach to their current challenges by interrupting the game-experience with relevant reflections or theory presentations (ibid).

While the mere orchestration of how and when different didactic elements as a tremendous effect on how learning games affect their participants, several other factors seem to influence how participants learn and to what aim. The early learning games, e.g. the logistic games like Monopologs (See Graham & Gray, 1969), were played in groups, which allowed participants to use each other as opponents or reflection partners. With the introduction of computers in learning games, first as main frames, the computer was able to take over the role of the opponent, and later as the PC, the computer allowed for learning games to be played in solitude. However, social learning theories like social constructivism has pointed out, that learning is not a matter of pouring knowledge from the game into the participant, but rather a process of personal and interpersonal construction of meaning and understanding (see von Glasersfeld, 1995). In addition, learning game business models and elearning efforts has made it attractive to game-designers to make 'all inclusive' games available, both to ease distribution, as well as to eliminate both consultant costs and the cost of bringing all the participants together at the same time and space.

The question is; what is lost in this process of eliminating co-participants, game-consultant interventions and facilitation when using learning games to facilitate adult learning processes?, and; How can analogue components like tangible game-objects, in-room facilitators and co-participants contribute to the game-based learning process.

During the workshop, we will be playing a Danish designed learning game called Mindsetter on change management and psychological resistance against change. By using Mindsetter in various didactic designs, the aim is to stage a discussion on how to integrate various didactic opportunities, which can be handled by ict, but can be reintroduced in more tangible forms to facilitate the learning process even further.

## ABOUT THE ORGANIZER

Thomas Duus Henriksen, PhD and Associate Professor in Digital Learning Games at Aalborg University, focusing on how to employ game-based processes in adult learning and organizational development.

# Designing learning through full-body activities, technology and play practices.

*By HELLE SKOVBJERG KAROFF*
*Aalborg University, Campus Copenhagen, Denmark*

Learning through full-body activities has become common practice in schools all over the world, both by introducing "brain breakers" in the class room, where "traditional" learning activities are paused for 3 minutes and filled up instead by movements, like dancing or acrobatics, with the aim of making the students more ready for learning. And also by combining movements with learning the alphabet or numbers – for example "jumping the alphabet" or "shouting down numbers" in order to optimise the learning potential. More and more often also technology is brought in to the learning-through-movement activities.

The objective of this workshop is to discuss and try out the possibilities of creating learning activities by combining movements and technology.

By introducing two cases: The interactive trampoline and the interactive swing SON-X (www.son-xplay.com), the aim of the workshop is to make the participants create different learning activities by combining knowledge of learning and the technology cases.

Motivation for and continuation of the learning activities are always a challenge. In order to grapple with the challenge the workshop will introduce different play metaphors as inspiration for the creation of learning activities.

## ABOUT THE ORGANIZER

Helle Skovbjerg Karoff is Assistant Professor at Aalborg University/Copenhagen and a part of Research Lab ILD.

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# **Mathematical Tools:** Learning potentials and influence on mathematics curriculum

*By MORTEN MISFELDT*
*Aalborg University, Copenhagen, Denmark*

This workshop will give hands on experience with the tool GeoGebra that is currently used in primary and secondary schools. we will explore the creative potentials in the tool and discuss more broadly the challenges that such tools pose to curriculum developers. Participation requires interest in how tools influence learning and curriculum but experience with mathematical tools is not necessary. Bring an on-line laptop, or install the tool from www.GeoGebra.org in advance.

The workshop will consist of:

1. Hans on experience with GeoGebra for making creative constructions and for solving mathematical problems.
2. Presentation of findings from an intervention project where 8-10 year old students use the tool for developing board games.
3. Discussion of triangle calculations in secondary school; we will compare two technology enhanced approaches to calculating sides and angles in a triangle (one of the approaches is allowed in Danish secondary school - the other is not).
4. A discussion of the challenges that technology poses to mathematical curriculum.

## ABOUT THE ORGANIZER

The workshop is run by associate professor Morten Misfeldt, Aalborg University/Copenhagen and who is participating in the Research Lab ILD.

# **The Theory and Practice of Design for Learning**: New Approaches Integrating Methodologies, Representations and Tools

*By YISHAY MOR[1]; GRÀINNE CONOLE[2]; THOMAS RYBERG[3]*
*1: The Open University, Milton Keynes, UK*
*2: University of Leicester, Leicester, UK*
*3: Aalborg University, Aalborg, DK*

*This extended abstract describes a proposed interactive workshop, which gives the participants (educational practitioners and researchers) the opportunity to explore and discuss current trends in Learning Design (LD) methodologies, representations and tools, while gaining first hand experiences with these. We will outline the state of the art and the grand challenges, and then explore these though several specific tools and educational scenarios.*

***Keywords:*** Learning Design, Representations, Social Media, Tools, Methodologies

## WORKSHOP DESCRIPTION

The rapid evolution and widespread use of advanced technologies offer educators and learners unprecedented opportunities to create, organise, share and access knowledge. Such technologies create potent learning environments, which are constantly shifting with escalating complexity. The challenge of education is no longer about the delivery of knowledge; it is about designing learning environments, tools and activities for learners to construct knowledge.

In order to influence the practice of education, there is a need to acknowledge and develop the role of educational practitioners as designers of learning and establish their role as design-researchers in the context of their daily work. The onus of learning design is shared between three communities: researchers engaged in design-based research, developers producing learning design tools, and practitioners facing the daily challenge of creating learning opportunities. All three communities acknowledge the need for dialogue between them, yet rarely has there been an opportunity to engage in such discussions productively.

The Learning Design Grid (http://www.ld-grid.org) is a STELLAR network of excellence theme team, dedicated to exploring these issues. Over the last year, we have examined a variety of resources, tools and approaches to learning design, and attempted to identify the key promises and challenges in this field. This workshop will present and discuss a new holistic approach that integrates innovative methodologies, tools and representations for learning design (LD). This approach aims to establish structure and provide guidance in the creation of learning interventions and resources. One important aspect involves bridging learning design theory and practice, coupled with a state-of-the-art analysis of existing practices, tools and visual representations.

This highly interactive workshop gives participants (teachers, educational practitioners, educational researchers) the opportunity to learn and discuss about the current trends in learning design (LD) techniques, representations and tools.

The main questions/topics to be addressed will be:

- Connecting research and practice, enabling educational practitioners to design and develop high-quality activities, resources and tools for learning and teaching.
- Consolidating the diverse traditions of design-based research in education and making them accessible to the widest audience possible.

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- Identifying effective practices, representations and tools for evidence-based learning design.

## SUGGESTED SCHEDULE FOR THE WORKSHOP

The proposed length of the workshop is 110 minutes. We will start with a general introduction of the workshop and the Learning Design Grid. This will be followed by hands-on group activities which will guide participants in the use of some of the Learning Design Grid resources, in support of their professional practice. Before the workshop, we will ask participants to draft a learning design scenario in their domain of practice.

**Pre-workshop task**:

Please visit http://cloudworks.ac.uk/cloud/view/6220 and follow the instructions there, to draft a design scenario in your domain of practice. This scenario should describe the context in which you work, a pedagogical challenge you face, and any initial ideas you have as to how to address this challenge. If you have any questions, please email: dfl2012@ld-grid.org

## WORKSHOP SCHEDULE

**13:30-13:45**: Introduction to the workshop and the Learning Design Grid (LDG):

Aims, previous events, and products, and a short review of the open resources available on the LDG site.

**13:45-14:15**: Scenario foundations: context, challenge, and techno-pedagogical approach.

Participants will work in groups to draft a Learning Design Scenario in their domain of practice.

**14:15-14:45**: Storyboard / course features

Participants will use tools and representations from the LDG site to develop an initial solution for the challenge they had identified in their scenario.

**14:45-15:00**: Prepare poster

Participants will prepare a poster, portraying their challenge, the context in which it is situated, and their proposed solution.

**15:00-15:20**: Poster presentations and discussion

We have set up a cloudscape for the workshop:

http://cloudworks.ac.uk/cloudscape/view/2401

Participants are advised to visit the cloudscape prior to the event, register as attending, and familiarize themselves with the resources there.

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# Which methods for studying the dynamic nature of learning across contexts?

*By Staffan Selander, Anna Åkerfeldt, Teresa C-Pargman and Ola Knutsson.*
*Stockholm University*

Learning has, with the wide spread use and adoption of portable devices and high speed internet connectivity, become ubiquitous (Cope & Kalantzis, 2009). In Sweden, for instance, more than 180 out of 290 municipalities are planning and/or implementing the 1:1 computing program. To provide each child with a computer definitely changes the dynamic of learning in the classroom and challenges teachers to adapt traditional pedagogies to the new teaching conditions. In this context, researchers deal thus with the problem of studying the very nature of learning processes that it actually exceeds classroom boundaries.

The objective of this workshop is to discuss methodological implications for the study of learning across contexts (i.e. indoors and outdoors the clasroom). More in particular, the workshop invites researchers to present and discuss data collection and analytical methods for the analysis of learning processes unfolding inside and outside the classroom.

The workshop will be organized towards the following questions:

- How do we study learning activities when classrooms are divided into small groups at different places, indoors or outdoors, as is the case with mobile learning?
- In what ways do we actually co-construct the learning environment when we do close video-studies of group-work?
- How do we construct our object of analysis in the study of learning across contexts?
- Which are the types of data we need to collect for the study of learning across contexts?
- What tools, concepts, models do we select for the analysis of collected data and what are their implications?

## ABOUT THE ORGANIZERS:

Staffan Selander, PhD and professor in "Learning designs and knowledge formations" ("Didaktik") at Stockholm University.
http://www.suforlag.se/200/201.asp?id=197

Anna Åkerfeldt, Ph D candidate at “Institutionen för pedagogik och didaktik”. Anna collaborated with the International Journal “Design for Learning”.
www.designsforlearning.nu

Teresa Cerratto-Pargman, Ph D and associate professor of Human-computer interaction at Dept. of Computer and Systems Sciences, Stockholm University.
http://tessy.blogs.dsv.su.se/

Ola Knutsson, Ph D, Senior Lecturer in the field of Human-computer interaction at Dept. of Computer and Systems Sciences, Stockholm University.
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# PhD Projects

# Experimenting with Learning Activities based on Social Media or a Web 2.0 approach

*By LILLIAN BUUS*
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*This abstract is based on the research done in relation to my PhD looking into how teachers integrate and use different social media or web 2.0 tools to support learning activities that lean upon some of the web 2.0 ideologies. The learning design could be around integrating a blog functionality using a Moodle forum, using a Facebook group for supervision or give students the possibility to do online 'in site' comments during lectures using Etherpad.*

**Keywords:** Social Media, Web 2.0, Learning Activities.

## INTRODUCTION

This abstract relates to my PhD research around "The Learning Potentials integrating Social Media or Web 2.0 in a Problem Based Learning (PBL) approach". The PhD is based on research going on at Aalborg University (AAU) within the Faculty of Social Science, as the scenarios presented will be placed there. This also means that the learning approach taken in this paper is based on the AAU PBL model (Kolmos, Fink, & Krogh, 2004; Kolmos, 2009).

Further the research has been taking point of departure in a collaborative design method called "the Collaborative E-learning Design method" (CoED) used as a kick-off workshop method to support teachers in their design for learning and making them reflect on their teaching and learning practices. The method and my approach for this is described in other related articles (Buus, 2011; Buus, Georgsen, Ryberg, Glud, & Davidsen, 2010; Georgsen & Nyvang, 2007).

The kick-off workshop and the process in the follow-up and the intended method for data collection in this research are illustrated in Figure 1.

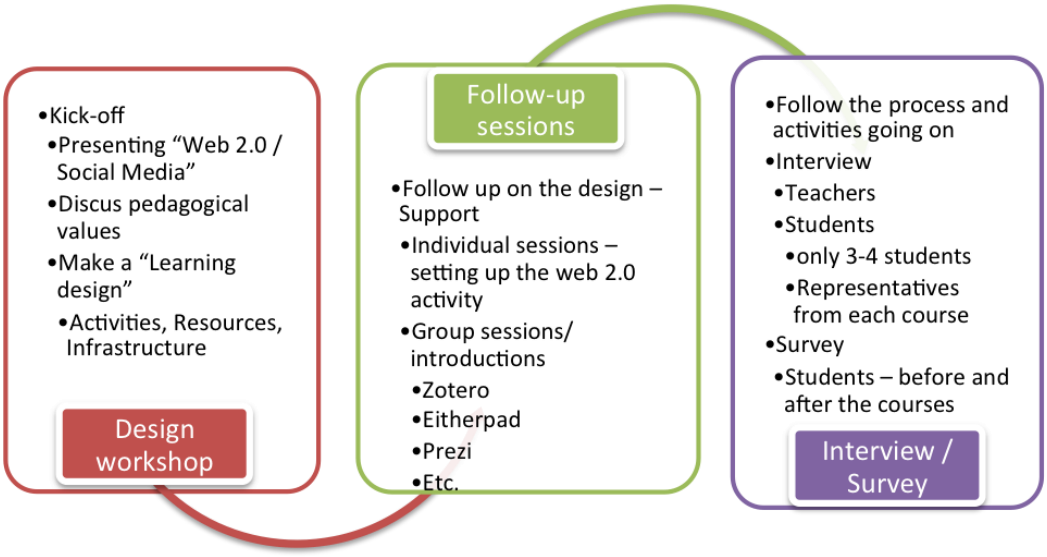


Figure 1: The flow for the research

From the kick-off workshop emerged three scenarios, which are the ones I would like to shortly touch further upon in this abstract.

## THREE DIFFERENT SCENARIOS ON INTEGRATION OF SOCIAL MEDIA OR WEB 2.0

The first scenario, the teacher integrates a blog into their lectures to support the students in collaborating and sharing work connected to the lecture content. This is preparing the student for using the blog at the final joint workshop session during a two-day period, where students in groups had to apply different theories to the same case and discuss these theoretical issues on the blog. Such collaboration potentially is beneficial for all students.

The second scenario actually consists of two activities in parallel. In scenario 2a students are offered unlimited supervision in relation to a small group project. The supervision takes place using group feature,which supports sharing and collaboration among students, and Facebook was chosen among the students as the platform. A Facebook group was established for supervision, and students had one and a half week unlimited supervision before handing in their group project.

Scenario 2b is giving the students a presentation to two web 2.0 tools for sharing and collaboration, enabled to support them in their sharing and collaboration as a group (class) and as smaller groups. The tools presented were Diigo (a social bookmarking tool) and Zotero (a social reference tool) as two tools among others similar tools, students could benefit from in their collaboration both in courses and project work.

The third scenario deals with online on site commenting on theoretical questions and issues coming up during lectures using a same time web 2.0 tool called Etherpad (http://ietherpad.com - is a web 2.0 based tool given multiple people the possibility to edit the same document simultaneously, any changes are instantly reflected on everyone's screen). This activity is going on during the course and gives the teacher a view of where the students have issues related to the theories or methods introduced during lecture.

## DISCUSSION

Interesting perspectives on how to integrate social media or web 2.0 into ones learning has emerged from this research, and I am just about to do my analysis on the data I have gathered up until now. One of the issues in common in the three scenarios is the aim to practice such a collaborative approach and thereby support the students in gaining an understanding of what knowledge sharing means.

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# **Caught in the web.**Multimodal texts, feedback and learning in the subject Danish in Danish secondary school

*By VIBEKE CHRISTENSEN*
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*In the subject Danish in Danish secondary school teaching is based on a broad variety of texts. The digital progress leads to the development of new types of texts. These texts are able to communicate through multiple modalities. This project investigates how students make sense of mono- and multimodal texts, and furthermore the influence of feedback on making sense in multimodal texts within 8th graders in Danish secondary school.*

**Keywords:** Multimodal text, feedback, learning, secondary school

## RESEARCH SUBJECT

The project is going to investigate how students at the age of 13-16 years establish meaning in their multimodal texts compared to their monomodal texts, and what influence feedback has in the process on the students learning, as it is expressed in their text.

The research questions are:

1. How do students make meaning in their multimodal texts? What resources do they use and how do they do?
2. Are there differences in extent and character of the meaning making when comparing mono- and multimodal texts from the same student?
3. What sort of feedback does the student receive when creating a text? From whom? Does the student give any sort of feedback to others?
4. When and how should the student get feedback when aiming to provide learning for the student? And what sort of feedback?

## THEORETICAL FOUNDATION

The theoretical foundation is in social semiotics. Text appears in context and meaning is produced and understood in context. The textual conception is broad and makes use of different sign systems or semiotic resources such as writing, pictures and sound. When analysing both the student texts and the student process of creating meaning in text, the theories of multimodality especially Kress and Van Leeuwen {{43 Kress,Gunther R. 2003; 45 Kress,Gunther 2006}}will be applied.

Regarding to feedback the research is based on Hattie and Timperleys works {{50 Hattie, J. 2007}}

The student's text is to be seen as a sign of learning. Learning is a dynamic process which occurs in the process creating the texts and learning is to be understood in the context of teaching which is seen as multimodal. Selander and Kress' {{42 Selander,Staffan 2010}}multimodal perspectives on learning are formal and the teaching is mainly a responsibility of the teacher. However the students' role is changed with the new media. Students are finding own teaching materials and can be seen as didactic designers too. This will be discussed.

## RESEARCH DESIGN

Data collection takes place in two 8th grade classes and will be conducted in two phases. When comparing texts there will be a special focus on four students in every class.

First phase is an observation phase aiming to describing the feedback that occurs in the class, when students produce texts. The main method is video observation. Maybe it's necessary to add a questionnaire and interviews to get information about the students' thoughts of feedback.

The aim of the second phase is to develop some principles for feedback which supports learning and meaning making in texts. Depending on the results from the first phase the key methodological approach will either be action research or design based research. The process of making meaning, the materials used in meaning-making process and the feedback will be captured and preserved by a sort of video observation. Texts in different stages of the process will be gathered to show the influence of feedback. Earlier produced monomodal texts from students in focus will be gathered and compared to their multimodal texts. Furthermore, there will be a teacher interview and collection of her documents describing how she planned the lessons, which is part of the context. Finally, interviews with the students in focus will be done.

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# **Curators Process of Meaning-making:** Connecting our Cultural Past with the Present.

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*Based on previous research this extended abstract of my thesis project presents an investigation of the role of discourse surrounding the curators' role in providing meaning in their exhibitions. Specifically this relates to inter-National museums and exhibits on indigenous people. This research aims to provide an in-depth study using the framework of social semiotics to analyze the various multimodal aspects of the curator's process of meaning making.*

**Keywords:** discourse, curators, representation, indigenous people, social semiotics

## RESEARCH AREA

Museums actively shape knowledge by presenting cultural and social identities through the representation of their collections, which create visual histories of the past and their relations to the present. A museum environment is meant to communicate meaning with its public, thus creating communication that is a process wherein a semiotic product is produced, presented, and then interpreted. It is a multimodal environment that goes beyond language to include visuals, sounds, narratives, and tactile objects. It is an environment where many modes are integrated in the meaning-making process: the architecture of the building, the design of the exhibit, the manner the 'tags' are written, the flow of the visitors through it, the colors, lighting, and sounds all influence how meaning is made (Marstine, 2010). Meanings are not made to simply suit the individual-they must be shared for communication to work. Several researchers such as Mansen, suggest that "meaning is not fixed within objects, images, historical resources, or cultural sites, but it is produced out of the combination of the object/the image/ the site itself, the mode of presentation, what is known about its history and production, and visitor interaction"(2005:203). The method of representation of the objects-cultural symbols-in museums is vital to how visitors receive meaning. This is especially important in the context of tangible cultural history, such as rock art and indigenous artifacts, and how the context that surrounds them creates meaning.

The combination of the various aspects of museums allows them to actively shape cultural knowledge with exhibitions reproducing a cultural past. The question becomes, is there any connection to the present or are the displays simply a representation of a culture without any social identity? Such identities are created through the relationships and associations implemented by the curators. Their choices shape different identities and meaning through their implied framework (Hooper-Greenhill, 1992). Hence, understanding how curators formulate exhibitions and the displays within them should provide insight into what factors are taken into account and which ones are not. The representation created by a curator is often taken from Eurocentric or white mans perspective, a throw back to colonial times, which is anything but inclusive. It is not uncommon for researchers to state that many national museums were created for the colonial population about indigenous people. With a focus on indigenous artifacts and rock art this research should reflect whether this perspective is still valid, and if the interpretation of heritage resources by indigenous people have been ignored, or suppressed.

## AIMS, THEORETICAL AND METHODOLOGICAL FRAMEWORK

Inquiries to be pursued are: What is the role of the curator, and how do they create meaning within the relationship of the space, time, subject, and objects they place in exhibitions?; What are the most appropriate means of communicating these intended meanings?; What goes into a curator's decision for how a collection is displayed, and what does this process entail?; and Are there possibly other methods that could provide curators an alternative, perhaps more reflective process of meaning making?

Social semiotics will provide the theoretical framework to explore this process with additional blending from theories of organizational culture and intercultural communication. These theories place a combined focus on the multimodality of meaning-making that affect how they are understood. Kress and van Leeuwens' framework places emphasis on multimodality and how representational and interactive meanings of images are related through each other within at least three interrelated systems. These three systems provide a method to examine both museum exhibits and information pertaining to rock art within them: 1) information value referring to how elements are placed provides specific informational values that are attached to various areas of the exhibit; 2) salience or how the elements are put together (foreground, background, size ratios, contrasts in color, etc.) to attract the visitor; and 3) framing, concerned with the presence or absence of devices that create lines or frames that connect or disconnect elements in the exhibit. Multimodality questions whether it is better to analyze the products of these various modes separately or as interacting and affecting one another (Kress and van Leeuwen, 2006:177).

This research will be achieved through empirical investigation and qualitative analyses. Data will include in-depth interviews with curators, photographs of the exhibits, mapping the exhibits layout, and information from upper management and visitor's interpretation (through annual reports, and visitor surveys done by the museum).

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# Touch technologies in primary education: Patterns of coordination, collaboration and participation in children's activities in an ict-intensive learning environment

*By JACOB DAVIDSEN*
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*This paper presents findings from a longitude project on children's use of interactive touch screens in classroom-settings. By exploring and analysing interaction among pairs, children's collaborative activities are under study, and it is highlighted how touch technologies invites for a more symmetrical interaction partnership in terms of power over workspace, control, method and solution.*

**Keywords:** touch technologies, peer learning, participation patterns, collaboration, ict-intensive environments

## INTRODUCTION

Touch technologies are pervading many aspects of our lives. Many schools in Denmark and many other countries invest in tablets, interactive tables and Interactive Whiteboards (IWB) to augment teaching and learning. Through the last decade some people have suggested that the IWB would transform and revolutionize education (lately this enthusiasm has been directed towards iPads). However, most of the enthusiasm was produced without really knowing if and how IWB's could facilitate change (Gillen, 2007). Slowly and steadily the field of educational technology research has begun focusing on pedagogical practices, when integrating touch technologies in classrooms, but most of these studies primarily scrutinize teachers' use of technologies for teaching (Mercer et al., 2010). Hence, we are lacking knowledge about how children interact with touch technologies in classroom settings and if such an environment promote and afford new learning possibilities for children. Recent studies from classroom settings where students work with ICT show that teachers often help with technical issues and to a lesser extent are involved in a learning dialogue with the pupils (Davidsen & Georgsen, 2010; Klerfelt, 2007). Kennewell et al. (2007) state that (touch) technology's potential for children's learning depends on the teacher's guidance in the learning situation. Furthermore Kennewell et al. argue that a higher degree of learner control creates space for reflection, activity and participation among students (2007). Because students' independent and self-directed learning with touch technologies has not been scrutinized in detail in any of the before mentioned publications, it is relevant to explore the implications of touch technologies in learning environments. Especially, it is important to analyse if touch technologies augment children's learning, collaboration and concept development.

## AIM AND FINDINGS

By analysing extracts of a large video data corpus this paper highlights how the children interact with the touch screens (see (Davidsen & Georgsen, 2010) for further details).Researchers have collected more than 150 hours of video, where 41 learners aged 8-9 and 3 teachers have worked in an ict-intensive classroom throughout one school year. In each classroom eight interactive touch screens and an IWB have been placed. Teachers and learners work within the same technological work space with similar software tools (Davidsen & Georgsen, 2010). Hence, children have exactly the same design for learning at hand (only on a smaller screen) when they team up in pairs in front of the touch-screens. A rule of thumb in this context is to keep the designs for learning as simple as possible and promote more

advanced interaction patterns between the learning pairs e.g. minimise computer guided interactivity and feedback.

Analytically this work is inspired by Conversation Analysis and Multimodal Analysis (Norris, 2004), which combined forms a basis for understanding human computer interaction in depth and detail both in terms of language and bodily interaction.

At this stage findings suggest that:

- Touch technology invites for a more symmetrical interaction partnership between children in terms of power over workspace, control, method and solution.
- Over time children develop new sophisticated ways of coordination, participation and collaboration by actingwith the touch screens and in the design for learning.
- By repairing, negotiating and shaping in both language and actions children guide and disturb each other in the learning process.

These are some of the most significant findings, which illustrate interesting perspectives on learner centred activities with touch technologies. By being challenged in collaborative settings throughout the school year the children develop competencies to master this sort of setting; in the beginning children were negotiating and coordinating every step of the activity, while some of the final videos show higher levels of collaboration, where students primarily focus on negotiating about the task.

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# Persuasive Learning Designs

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*This PhD abstract presents some initial reflections and considerations regarding the definition of persuasive design and the exploration of the cross field between persuasive design and digital learning.*

**Keywords:** Persuasion, Persuasive Design, Learning, e-PLOT, Kairos

## INTRODUCTION

In this PhD project I explore, analyze and develop the notion of applying persuasive design principles to the development of learning technologies, in order to create technologies which facilitate and motivate the students' interest in and comprehension of a specific topic. More precisely, I aim to define the theoretical and methodological foundation for the development of persuasive learning designs. The literature on both learning designs and persuasion are vast, yet these areas have not previously been combined in a systematic manner.

## PERSUASIVE DESIGN

In exploration of the concept of persuasion, and in the aim of extending the theoretical basis of Persuasive Designs, the challenges regarding a theoretical foundation are approached from a foundation in classical humanistic traditions such as rhetoric, logic and ethics. To a great extent, focus is aimed at the development of theory and methodology which will facilitate and improve the relatively newly established research area, which is referred to as Persuasive Design.

Persuasive Design as it is approached within this project, is based upon the original perspectives presented by BJ Fogg when he defined and introduced the notion of Persuasive Technology (Fogg 2003). This taken into account, a few distinctions have been made to Fogg's original framework, in order to facilitate not only the humanistic perspective to Persuasive Design, but also to enable the immediate establishment of an overlap between persuasion, didactics and pedagogy. In particular, Miller's more nuanced definition of persuasion is applied in the definition of the concept (Miller 2002), and the rhetorical concept of Kairos is argued to be a requisite for persuasion to take place (Hansen 2009). Kairos is often described as timing, or the ability to perform the appropriate action at the right time and in the right place. In term of appropriate, the performed action is required to be not only effective but also ethical. The concept sums up the principle that any rhetorical approach is based upon the specific situation, and that comprehension of the context as such is one of the most vital resources when deciding upon rhetorical means to apply to a given argument. The fact that Kairos includes reflections regarding not only appropriate time and manner but also place, has on several occasions led researchers to argue that location- and context-aware technologies may be particularly advantageous for the execution of persuasive designs (Fogg 2007).

## EURO-PLOT

The objective of this project springs from the already established EU funded research project, Euro-PLOT, which aims to develop a pedagogical framework for active engagement, based on persuasive design, as well as to demonstrate its value by creating tools and exemplars of adaptable, reusable learning resources. As a result, theoretical considerations developed in relation to Euro-PLOT, constitute part of the foundation for this PhD project, and data gathered within Euro-PLOT may be included in the PhD to exemplify specific points. The

PhD distinguishes itself from Euro-PLOT by aiming to develop a more generally applicable theoretical foundation, and by focusing upon technologies which go beyond those developed and advanced within Euro-PLOT.

## FUTURE RESEARCH

Ongoing research has demonstrated that both in theory and in practice, persuasive principles are already applied within the development of learning technologies (Gram-Hansen, Schärfe et al. 2011; Gram-Hansen, Schärfe et al. 2011). As a result, careful consideration is required concerning the contradictions between learning and persuasion, and the implications these may have not only for the Euro-PLOT project but also for the research on Persuasive Learning which is to be carried out within this PhD. In order to fully argue that persuasive design may be an asset to the more established field of digital learning, it must be clarified how we can distinguish between persuasive learning technologies, and enriched digital learning resources.

The research questions to be answered within this project include but are not limited to:

- Are persuasive learning designs a possibility when considering the theoretical differences between persuasion and pedagogy?
- What is the contribution of persuasive design within the more established field of learning technologies, when persuasive design principles are already being applied within this field?
- To what extent can mobile and context-aware devices advance the execution of persuasive learning designs, in consideration of the rhetorical notion of Kairos?

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# Design for Game Based Learning in a class situation

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*Assistant Professor at Hedmark University College, Hamar, Norway*

*This paper describes a research project and an implementation where game development is used in a class situation to increase the student's interest and motivation for learning programming, mathematics and physics. The project partly builds on learning by making games and partly on gamification.*

**Keywords:** Games and Learning, Gamification, Fun in learning.

## THE THEORETICAL PERSPECTIVE

Don Tapscott (Tapscott, 2011), writer of the book on The Net Generation, points out the fun factor in what this generation wants. "They want to have fun. In fact, 58% of them say that having fun with a product or service is just as important as what that thing actually does. They want to collaborate and have relationships. They want innovation and creativity. They want speed. They want to customize everything." The students we now teach are belonging to this generation.

The potential for having fun and learn by games have been seen and discussed for years by academics like James Paul Gee (Gee, 2007) and Willamson Shaffer (Shaffer, 2007). Phrases like "learning by doing", "learning just in time", cross-disciplinary learning, creativity and innovation and learning in groups are all over their papers and books. And games do assessment too, here is how Gee describes what a game is: "Games are about solving a set of problems to win. And the game does assessment all the time, no test is necessary when the game is completed to check whether the gamer have learned, its proven throughout the game that he has".

This situation can be rooted in pedagogical practice inspired by well-known theoretical traditions; the social constructivist Piaget-Bruner, the sociocultural Vygotsky and the practical oriented Dewey. Also newer pedagogical methods like Problem Based and practice Based Learning forms comes to mind. These methods have been proven and tried often in natural science.

## THE PROJECT

The project was carried out over a 5 year period at Hedmark University College for first year students in three art bachelors, and occasionally teacher students from 3rd or 4th year of their teacher education. During the period up to 95 students joined the class.

In the course the students develop a complete Computer Game through a number of Problem Based Learning (PBL) cases. They work in groups with eight to ten participants with a tutor. As tutors we use second and third grade students. The cases are solved individually, and each student develops both a visual and a technical solution, which they present for the group at the end of the case-period. When the student face problems that require basic knowledge of mathematics or physics, we teach relevant theory. By teaching this "just in time" we hope to create motivation (and even enthusiasm?) for subjects that students often see as theoretical and dull. Throughout the course both the groups and each student develops wiki-pages and write blogs to document and present their project. Adobe Flash CS and Actionscript are used as the programming environment.

Main goal. The projects seeks too develop research based knowledge on how developing of computer games can be integrated with problem based learning as a pedagogical method to

learn basic programming and motivate for further learning of science. A Secondary goal is to create a creative and innovative atmosphere in the class and student groups (Darsoe, 2000).

Throughout the project we use both qualitative and quantitative methods to collect data. The quantitative data is collected through questioners that are filled in by the students in the start, middle and at the end of the course. In some parts of the project a reference class being thought programming through traditional methods also fills in the same questioners. The qualitative data is in form of student blogs and reports in addition to the reports and referees from the research group.

The basic project research method is Action Research, where the cases are the basic interval between research reviews. The group of tutors and the teachers forms the research group, and reports are written and filed after each case. At the start of each course, the last years experiences and results are reviewed and used as a starting point for the new course. One course can then also be seen as a step in the action research cycle.

Research data is still not fully analyzed so at this time we cannot present any final empirical results. We have found though that key factors to good learning and motivation lie in the construction of interesting PBL-cases with the right learning intervals, and good PBL-group leadership. Cooperation with teachers of parallel or earlier courses (eg. art, mathematics and physics courses) is also very important since the sequence of topics in this course don't always follow the 'normal' teaching sequence of topics. We hope the final results from this project can contribute to the knowledge on how these factors can be implemented and optimized.

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# Vocational students' learning in classrooms and other rooms
## - with new technology and multimodal ways of working as bridge builder

*By METTE NORDBY*
*Norwegian University of Life Sciences, Section for Learning and Teacher Education, Ås, Norway*

*In Norway, vocational students' learning of science in school is not very well documented. My experience is that many students see science as of little relevance to their lives and future occupation, both in terms of content and work methods offered. This PhD project seeks to develop and test instructional designs that offer students diversifiedlearning arenas and working methods that includes the use of technology (mobile and PC). The research approach is action research in collaboration with two science teachers.*

**Keywords:** vocational students' learning,instructional design, learning contexts, multimodality

The school is a constructed arena where the knowledge conveyed is liberated from its natural context and adapted to the requirements of schooling, making it difficult to see the connection between theory and application of knowledge. Students who do not decode this context will struggle to see the meaning of what they are to learn.Many vocational students struggle with exactly this, and find little relation between what they learn in science and what they experience as important knowledge in the community. The aim of this Phd project is to explore if instructional designs built around diversified learning arenas(Frøyland, 2010; Huizenga, Admiraal, Akkerman, & ten Dam, 2009) can help the students to minimize this gap, and to make science more interesting to the students.

### RESEARCH QUESTIONS

What challenges do teachers encounter when they try to combine traditional classroom teaching with diversified learning arenas?How do students perceive teaching that combines different learning arenas?Will students' use of mobile phones to document and communicate experiences during learning activities enhance students' ability to recall and develop knowledge when they are moving between different arenas?What characterizes the students learning outcomes?

I have chosen action research as a research strategy in order to address the complexity of teaching and learning as rich practices embedded in sometimes conflicting purposes, possibilities and constraints. A teacher's actions (and students' perceptions of these) areembedded in a completely backdrop of motives, beliefs and actions. This complexity, I think can best be revealed if I jointly together with teachers discover, experience and reflect upon events and actions.

The study is conducted in collaboration with two science teachers and their two classes (one typical female class and one typical male class), and will continue for one and a half year. The teachers and I meet regularly (two hours per week) to discuss and reflect on instructional design. Our intention is to develop and test 2-3 teaching programs, targeted curriculum in science, upper secondary grade 1, vocational.

Further in the text, I will focus one of my research questions: *Will students' use of mobile phones to document and communicate experiences during learning activities enhance students' ability to recall and develop knowledge when they are moving between different arenas?*

All meaning making is motivated by an interest. One purpose of this project is to embed support structures in the teaching design that support students preserving of situated

experiences for later processing and transformation in the classroom (Selander & Kress, 2010). In one of the teaching programs, the students will be offered a one-day lesson by an alternative learning arena (a private hospital that treats obesity), where educational resources are developed in line with the principles outlined in DeWitt & Osborne (2007, p. 689). During this day the students will receive SMS tasks on their mobile phones. These tasks shall be solved by students submitting text, sound, image and video into a digital web-based notebook, OneNote.

The purposes of these tasks are to capture students' personal and subjective experience of the present moment. Different types of experiences and different types of representations are resources for learning. Learning occurs by transforming and switching between different resources (Wallace, 2004). By analyzing the student's online activities (e.g. sms, students logs) and products (e.g. presentations, tests) I will look for evidence of learning. It is also applicable to film students in action in order to connect a possible learning outcome with a specific learning activity.

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# Web based development of professional identity in physiotherapy and nurse education

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*When e-learning is introduced in educations that are very dependent not only on theoretical but also on bodily learning, new designs for learning are needed, if the e-learning students are supposed to be as competent as the students who shows up on campus every day. In physiotherapy education, e-learning has special implications for the student's development of professional identity because it traditionally pays more attention to the mind than to the body.*

**Keywords:** e-learning, Design-based Research, symbolic interactionism

## RESEARCH AREA AND OBJECTIVE

Development of professional identity requires the ability both to step into practice, to step outside it, and to relate to it reflexively (Wackerhausen: 2004). In order to do this, one might say (with Wenger: 1998) that *reification* is needed and that ICT can act as a meaningful tool. My PhD-project that is guided by a Design-based Research methodology, intends to describe and analyse how professional identity is developed in professional education on campus in order to develop, test and evaluate designs for learning that enhance the work with professional identity in web based teaching in physiotherapy and nurse education. My project is in the first year of the process and so far I have completed the observation and problem identification phase. In this paper, I would like to present the first findings and its consequences for the project.

## METHODOLOGICAL AND THEORETICAL FRAMEWORK

Design-based Research is not a method on its own but rather a methodology that calls for several methods for examining the field, analysing the data and developing designs for learning. In my PhD-project I have therefore used Grounded Theory in order to discover the challenges in physiotherapy education when the students are to be taught using e-learning.

During the last six months I have practiced participant observation of teaching on campus and on the net and I have interviewed the students. The data that was constructed here have been analysed with symbolic interactionism because this theoretical framework understands the human being as a relation between a *me* and an*I*, where other people as *the significant other* plays an important role concerning identity. Through interaction with other people and society, the identity is developed as a continuous process and the way other people see a person is of great importance and mirrors the identity.

## FINDINGS

In my field studies so far I found that the development of professional identity in e-learning physiotherapy is not at all as easy for the e-students as it is for the students who show up on campus every day. The picture of the physiotherapist as *the significant other*represents an ideal in the students minds: he or she eats healthy food, is very fit, would never consider smoking or drinking too much and, most important, he or she uses the body very consciously in the study of physiotherapy. The focus on the healthy body is extremely important to the students:*"A physiotherapist just look like that: healthy, fit and sporty dressed. And that affects you - a lot!"* ("Mike", 2011) Having a healthy fit body is a way of showing competence and knowledge concerning the physiotherapeutic practice: *"But I think it has something to do with*

*knowledge: if you are obese or wear skyhigh heels and you don't know the consequence, and then you start studying physiotherapy, then you learn things and you start thinking: Maybe I should take better care of myself!"* The students are very proud of their future profession and do everything they can to look like physiotherapists as soon as possible.

A very different story is told, when the students are asked about their understanding of e-learning and e-students: E-learning connotes unhealthy food, cigarettes andstill sitting computer studies without the slightest focus on the body. Thee-students see themselves with the eyes of the teachers and the other students as troublesome for the on campus teaching because they have special needs that should be taken care of (such as classroom change in order to stream the teaching in a better quality). But what causes the students the most trouble is the fact that they don't see themselves as *real* physiotherapists. *"I talked to a colleague the other day and he asked me how I was doing. When I told him that I was sitting in front of the computer then: "Okay, then you're not a real physio!" Because that's what you think!" ("Philip", 2011)*

## FUTURE WORK AND RESEARCH GOAL IN THE PHD-PROJECT

According to DBR the research goal is not only the description of a phenomenon but also the design of solutions that do real work in a specific domain of practice. In physiotherapy education where the body is that important for learning and for the development of professional identity, the design for e-learning must be designed and re-designed in collaboration between the students, the teachers and the researcher and only when the design has been tested and considered robust enough to work in other domains of practice working with bodily learning, the theory generation will take place.

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# Designing Internet Learning for Novice Users -Paper Based on a Action Research Project In India

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*The paper centre on an Action Research project undertaken in India for enabling the female students empowered through Internet use. The paper will discuss the design elements of Internet training for the first time users with limited Internet access based on Blooms Digital Taxonomy of Learning Domains.The paper also illustrates the identity formation of students, through learning to use Internet, using wengers social theory of learning with the empirical data.*

**Keywords:** Action Research, Blooms Digital Taxonomy, Learning to use Internet, Gender

In today's times technology plays a major role in transforming the process of learning. However, the success of any technology is determined by the social and cultural factors of the system into which it is introduced. It is a known fact that for any technology enabled learning environment availability of Internet is indispensable. There has been a rapid development in using Internet as learning and exploratory tool and it has become the first choice for information resource for most of the information seekers. The surging Internet usage by individuals in the web search process demands the research and development community to work in human-computer interaction and information retrieval (Marchionini, 2006). This research stems from such a thought process of what happens when learner of this generation (female students in this research context) who have limited access to technology, comes face to face with technology. Searching the Internet and getting adequate and relevant information is a complex process, which require great amount of specialized searching skills. Learning how to use Internet is not an easy task because of the diverse paths of navigation and usage options. (Iske et al. 2008). The research is originated mainly from the call demanding for more qualitative research which can throw light on how women's perceptions and attitudes differ in different cultures when they interact with and use technology (Huyer & Sikoska, 2003). The overall aim of the Action Research project was to empower the women students through Internet usage. The objective was to make the students digital information literates through the following:

- Successful in searching strategies
- Become experts in the critical and reflective evaluation and use of information in a variety of contexts
- Getting aptitude in creation of digital content

## EMPIRICAL STUDIES& THEORETICAL UNDERPINNING

Empirical studies for the research were done at Department of women's studies, University of Calicut in Kerala. The group was thirteen female master's students born between 1988 and 1990.The University followed a traditional classroom teaching methodology. The Department had two PC's with Internet connection but the curriculum did not have any learning activities that demanded student's engagement with ICT. Therefore, the students were not using Internet for any of their academic endeavours. The paper describe the identity shifts and identity transformation that emanates through learning with the help of Wengers social theory of learning. According to Wenger, learning is eventually about the kind of person we become.

"Learning helps to transform our identities by transforming our ability to participate in the world by changing all at once who we are, our practices and our communities" (Wenger, 1998). Thus, any form of learning involved a change of identity for the members. Knowledge, skills and competencies gained through learning as not views as abstracts but as formation of identity. Drawing on wengers social theory of learning the complex process of identity formation of the students with the usage of Internet would be investigated.

## RESEARCH METHODOLOGY

The Research was based on an Ethnographic Action Research approach. Ethnographic approach ensured that research is focused on how problems and opportunities are defined by people locally and allowed the research methods and the project itself to be creatively adapted to the local situation (Tacchi et al, 2003). Since the aim of the research was to enable the students in using the Internet with no prior knowledge, the project demanded great amount of flexibility. Since Action research is conducted to understand and change the situations, it provided the flexibility required by its action orientation to respond to the evolving phases of the research situation (Dick, 2007). Apart from Action Research multiple methods were used to collect the data so as to strengthen the validity of the findings like Future Workshops, Semi-structured Interviews, Participant observation, Student Reflections, Participant produced drawings and Field Notes. Students from the research were given Internet training based on Blooms Digital Taxonomy followed by Action Research workshops based on each training session. Blooms original taxonomy and the revised taxonomy by (Anderson & Krathwohl, 2001) as quoted in (Churches, 2009) focus on the cognitive domains and do not take into account the new behaviours, actions and learning opportunities emerging with the technology advancements and the widespread use of technology by this generation of students. Blooms Digital taxonomy developed by Churches (2009) focuses on the actions and learning behaviours in the new digital age where the information literate is considered as the one who can access, evaluate and use digital information efficiently. The Taxonomy is not about the tools and technologies instead its focuses on how to use these tools and technologies to achieve, recalling, understanding, application, analysis and evaluation of digital information.

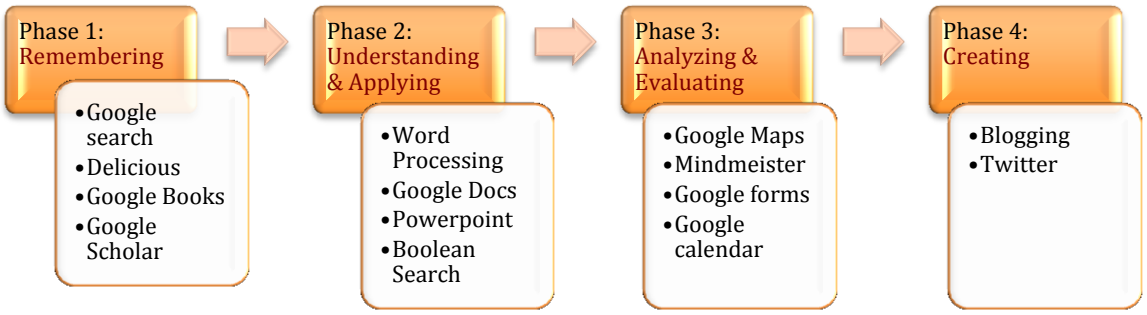


Figure 1 Design of Internet Training based on Blooms Digital Taxonomy

In the Action Research workshops, students were asked to perform activities using Internet. These activities were based on learning concept from Blooms digital taxonomy what they learnt in the preceding Internet training sessions. Students executed the Internet searching using the action research model for reflective Internet searching (Edwards & Bruce, 2002).

This model enabled the students to learn how to search Internet using the action research cycle of planning, acting, recording and reflecting. Students discussed the web search procedures and results and reflected on each other's activities that were participative and facilitated in mutual learning.

The paper will unfold the concepts of identity aspect of Wengers social learning theory using the data from the empirical studies.As most of the students were first time users of Internet, the personal, social and the cultural dimensions that affect the identity formation of the studentsthrough learning to use the internet will be elucidated with the empirical data.

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# Personalized learning Ecologies in Problem and Project Based Learning Environments

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*This paper reports the experiences of Aalborg University students engaging with a variety of tools for learning and everyday life.Some of these they have come in contact with through the problem and project based learning context practiced in Aalborg University. We analyse students' experiences through analysing more than 100 blog posts from first semester students where they report on their use of technologies for life and for learning. The analysis takes its departure in Grounded Theory.*

**Keywords:** Personalized Learning Ecologies, Problem Based Learning, Problem and Project Based Learning

Nowadays, we are surrounded by different kinds of technologies. Some are used in our daily life. In higher education, institutions leverage learning by providing courses, learning spaces and also different ICT systems as tools to support students' learning (Virtual learning environments). However, courses, physical learning environments, and Virtual Learning Environments are just temporary learning scaffoldings. Students may lose hold of them after finishing the course or the study. It takes time to build a new learning construct. Furthermore, it is becoming increasingly clear that university students inhabit complex online spaces. Apart from the institutionally provided tools, students also use different web 2.0 tools in their academic life. As such students' engagements with technology are composed of formal administrative systems, virtual learning environments, various other learning technologies and also a range of 'life'-technologies, such as Facebook, Youtube and many other services which form important parts of students everyday lives. It is important to investigate how students construct their knowledge with support from these tools.

Pedagogy is a key factor that influences learning experiences because it is the main framework that allows students to interact with teachers. The way they interact, the roles of the learners and the teachers are shaped by the pedagogy and its underlying learning theory.

Aalborg University has employed a social constructivist pedagogy, the so-called Aalborg PBL model, which is also called project-oriented problem based pedagogy-( POPP), or Problem and project based learning (Kolmos & Graaff, 2003)(Dirckinck-Holmfeld, 2002). In Aalborg University students have to work in groups each semester to understand and address a self-defined and complex problem and provide a solution to the problem which is evaluated in a report format (called the project). Students work with a real life problem in their project which is in contrast to an artificial learning setting often found in traditional education. As many other higher education institutions, Aalborg University aims at providing learning environments that support the underlying pedagogical approach employed, and which can lead to different online and offline learning activities. Aalborg University has chosen Moodle, as its primary Learning Management System (or VLE) for supporting online or blended provision of courses. However, Moodle is not a groupware system aimed specifically at supporting complex collaboration processes where there is a need for supporting e.g. coordination, communication, negotiation, document sharing, calendars, meetings and version control (Buus et al., 2012).Furthermore, the pedagogical fabric of LMSs/VLEs have recently been called into question and critiqued by proponents of Personal Learning Environments (PLEs)(Ryberg, Buus, & Georgsen, 2011) . In sum the critique is that VLEs have become

content silos enforcing a traditional, teacher-centred transmission pedagogy, and that there is a need to re-instate a more learner centred agenda and pedagogy. One of the proposed solutions is a move towards student-owned and controlled Personal Learning Environments (PLEs). Some argue that PLEs can be seen as loosely-coupled collections of personally owned and shared tools for students' self-directed or collaborative learning (Attwell, 2007)(Dalsgaard, 2009)(Drexler, 2010). Some suggest that these sit next to the more administrative systems (Dalsgaard, 2006), whereas others have embraced PLE-portals (e.g. Elgg) as the primary learning environment, and yet some see them as somewhat subversive places for students' 'real' learning and outreach to a wider network of peers not necessarily in the same institution (or within higher education). The latter seems, in many ways, to reflect the current landscape of students who do adopt and use a variety of tools. However, these may not necessarily be adopted for learning or academic purposes, as our own data, and those of others suggest. Thus, students may be stretched between administrative tools, learning management systems, everyday technologies, tools for learning etc. making it important to understand and conceptualise students' use of technology.

Ecology is the study of relationship between organisms in an environment which is the set of circumstances surrounding that organism. Learning ecologies are the study of the relationship of a learner or a group of learners who may interact with any communities or tools which have common interest to create learning experience (Siemens, 2003). We choose to use the concept of Personalized Learning Ecologies instead of Personal Learning Environments to represent the study. Firstly, because there is still confusion about the definition and the scope of Personal Learning Environments. In addition, the term-Personal Learning Environment trends to focus on the availability of tools which learners have chosen themselves. The term - Personal Learning Network (PLN) tends to take a bigger scope which covers all possibility networks that a learner can connect to. Therefore, we argue that Personalized Learning Ecology is a better way of conceptualising the study of how learners use different kind of tools to support their learning processes and how they stitch together or navigate in an ecology of partly self-chosen, partly provided tools and technologies.

This study demonstrates how students interact with tools, networks, and communities within learning ecologies in problem and project based learning environments by using an analysis of students' blog posts on 'how they use technologies to support their PBL project collaboration within their group'. Students mentioned about tools that they use and also their attitude on the tools. When conceptualizing the coded data, the authors also experiment with the concept of Personalized Learning Ecologies, transcending the term Personal Learning environments.

The data analysis is inspired by Grounded theory (Corbin & Strauss, 1998). The paper will also discuss tools that were used by rejected or domesticated by students. The physical environment will be taken into account of the analysis.

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# Pedagogical documentation as a transformative potential in aesthetic learning processes

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*Educational change is often both controversial and complex. Nevertheless it seems to be a consensus that new times require new designs for learning. As a PhD-student in arts education I want to contribute to the development of education through exploring the transformational potential in pedagogical documentation in school and teacher education.*

**Keywords:** Educational transformation, multimodal pedagogical documentation, aesthetic approaches to learning, participation, self-reflexivity.

## PEDAGOGICAL DOCUMENTATION AND TRANSFORMATION

*Pedagogical documentation* as a way of looking at, reflecting upon and developing practice has during the past decade been tried out and discussed in kindergartens and preschool teacher education in Norway, due to the Reggio Emilia- influence and implementations in preschools, and in accordance with the national framework plan for kindergartens in Norway. But neither the term nor the practical work of pedagogical documentation seems to be well known in schools or teacher education programs in Norway. My ongoing PhD-study´s focal point is to explore pedagogical documentation as a reflexive practice. Mymajor research question is:

*What is the transformational potential in working with pedagogical documentation in teacher education and in schools?*

In my PhD-project I want to investigate if working with multimodal pedagogical documentation can create self-reflective rooms where participation, transformative learning and change can be supported.

The study is set within the frame of a research and development project, SPACE ME, (http://www.ntnu.no/plu/space-me), combining art and science in education. The project involves teacher educators, teacher students, teachers, pupils and artists. Two secondary schools participate in the project, having the classroom as one point of departure and the outer space as a thematic destination, working with a variation of components including storyline, playback theatre and science theatre workshops. The SPACE ME project aims at contributing to the development of knowledge about a potentially broadened concept of what knowledge is - and can be - within education of teachers in arts and science. The R & D project brings transformative processes into focus. Key concepts are multidisciplinarity, multimodality (Kress, 2010), inquiry-based and aesthetic approaches to learning and the possible transformation of the participants' concepts of knowledge.

The empirical foundation of my research is an ongoing inquiry and collection of various multimodal documentations from this project, such as video and photographic documentation and journals from the participants. My next step is to create formal and informal rooms for self-reflexivity in small focus groups of participants by introducing edited multimodal documentations as a starting point for a reflexive dialogue.

## THE MIRROR, THE SELF-REFLEXIVE EYE AND THE SELF-REFLECTIVE ROOM

In writing the thesis, I will experiment with multimodal presentation forms, using *the mirror, the self-reflexive eye* and *the reflective room* as key metaphors in the thesis.

Pedagogical documentation is very much about reflecting upon practice by looking at multimodal documentation and asking questions about *what* happened and *why*. In my research I will add another meta-layer to this, by analyzing and reflecting upon the appearing meta-reflections. As for the room-metaphor, I am devoted to questions about how we can design different forms of self-reflective *rooms* in schools and teacher education through pedagogical documentation.

In my study I will use narrative and multimodal research approaches. I will apply theory connected to the Reggio Emilia pedagogy, with a focus on pedagogical documentation as a conceptual basis for the study (Lenz Taguchi 1999). The theoretical framework for the study also includes multimodal theory (Kress 2010), as well as literature about reflection and transformative learning (Fischer-Yoshida, et.al. 2009, Mezirow, 2000).The study is planned to result in an article-based thesis, to be concluded in summer 2015. My articles will be introduced and surrounded by a *coat*,entitled "The self-reflexive eye"

Article 1: *The transformative potential in using log as pedagogical documentation*will seek/ attempt to answer the corresponding research-question: What traces of self-reflexivity can be found in log-writings in the storyline-part of the SPACE ME-project? The data will consist of logs written by teacher educators and teacher students connected to the SPACE ME-project.

Article 2: *Resistance, ruptures and participation as a transformative potential in SPACE ME* is linked to the research-question: How can different forms of resistance, ruptures and participation in the SPACE ME-project be identified and understood? The data for this article is a) documentation of practical work with pedagogical documentation and exploration of a room for reflection in three small focus-groups, b) observations/ field notes, c) logs and questionnaires and d) multimodal documentation.

Article 3:*Remodalisation/transduction as a transformative potential in collaborative learning processes*, is connected to the research-question: What multimodal remodalisations /transductions can be identified in secondary school pupils' work with creating their own theatrical performance, inspired by SPACE ME? The data used here will be documentation and observations from the process of creating the theatre performance, inspired by the SPACE ME-project.

Article 4:*Pedagogical documentation - A room for reflection, a tool for transformation and a meeting point in teacher education*is corresponding with the following research question: How can the transformative potential in the pedagogical *backstage* as an open ended meeting point for joint self-reflexivity and didactics development and –designbe explored?

## RESEARCH GOALS AND CONTRIBUTION

The purpose of this study is to contribute to the knowledge base regarding possible rooms for collective and participatory self-reflexivity in school and teacher education. I try to understand, analyze and narrate what might emerge in this room. My aim is to be able to articulate new perspectives on pedagogical documentation for use in schools and teacher education. Through my research I wish to contribute to the investigation and development of new tools for educational and democratic change, through participation in accordance with human rights.

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# Children's collaborative encounters in preschool

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*Based on video recordings of pedagogical activities in two Danish preschool this study investigate the forms and pathways of children's collaboration and how the institutional demands influence children's collaborative encounters.I find that children's collaborative encounters are windows onto their interests and engagements, and therefore central to children's positive learning experiences. Institutional demands are found mostly to challenge children's collaboration.*

**Keywords:**Learning, preschool, collaborative encounters.

## INTRODUCTION AND AIM

Political and pedagogical focus on preschool children's learning calls for investigations of what entails a rich and positive learning environment in preschools. Within educational psychology the moment-by-moment development of a pedagogical activity in ongoing practice is considered an important insight into the sociocultural aspects of children's learning. Assuming that children can gain valuable learning experiences through their shared activities, children's collaboration in ongoing pedagogical activities in preschool is studied. This study theorise children's collaboration as an encounter and investigate the forms and pathways of children's collaboration and how the institutional demands influence children's collaborative encounters from a learning perspective.

## THEORETICAL PERSPECTIVE

The study is conducted from a sociocultural perspective on learning, where children's initiatives, interests, and engagements are considered central to children's learning experiences along with the institutional demands (Hedegaard, 2008). An understanding of children's collaboration and learning as embedded in a societal practise is underlying this study and an ontological split between person and historically-structured societal practice is therefore rejected. Through the ways in which pedagogical activities are structured and progressing adults and children shape each other as moral, social, and cognitive participants. Following a dialectical-interactive approach (Hedegaard, 2008) and a double perspective on children's collaboration, this study contributes to the literature by theorising children's collaboration as an encounter. Thereby not only referring to an encounter as a meeting between two or more children but also referring to the embeddedness of the encounter in a social situation where institutional demands and values influence the practitioner in her reaction to children's collaborative encounters. By theorising children's collaboration as an encounter it is also taken into consideration that several forms and pathways of this encounter could influence children's learning experiences.

## EMPIRICAL FOUNDATION

To capture the ongoing processes in pedagogical activities I apply interaction-based (Hedegaard, 2008) video observations of pedagogical activities (workshops and circle times) in two Danish preschools. Interaction-based observation is a dialectical-interactive method where both the diversity in conditions for children's collaboration and the ongoing processes can be studied. Pedagogical activities involving 3–14 children aged 3–5 years were observed on 24 separate occasions.

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After the recording, an index log was created including descriptions of data, time, number of participants, names of practitioners, and broad activity descriptions with brief general references to points of interest for further analysis. The recordings were viewed repeatedly, and for this specific analysis, 540 minutes of video recordings of pedagogical activities were extracted. To transcend a specific social situation the interpretations are at an institutional-practice level where I combine several pedagogical activities on a more thematic level. These broad patterns of themes provided a map for the more detailed analysis of micro-processes of interactions in which selected episodes were presented as vignettes (Fleer, 2012).

## RESEARCH CONTRIBUTION

Although institutional demands challenge children's collaborations, it is found that children's engagement becomes visible in collaborative encounters through which children build friendships, assist, inspire, and imitate one another. In order to support children's learning and engaged participation both a broader dialectical-interactive understanding of collaboration as an encounter and a stronger emphasis on children's collaborative encounters in early childhood education is suggested.

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# **Return of the Gamer,** Perceptions of the Digital Room

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*This paper presents anethnographic study of the Digital Room, a secondary education designed for "gamers". They are pupils who had left school and have a strong interest in digital culture, mainly commercial off-the-shelf (COTS) computer games. The study is based on interviews with, and observations of pupils. The problem of the traditional school is investigated through their perception of what makes the Digital Room work.*

**Keywords**: knowledge building, digital culture, games, learning, school

## BACKGROUND

The Digital Room is a secondary education in Sweden, designed for pupils (aged 16-20 years) who are gamers and previously dropped out of (or left) school. The goal of this research is to understand how the Digital Room creates meaningful affordances for the pupils, which the traditional school has failed to do. The main question investigated in this paper is: -What is the pupils' perceptions of the Digital Room to build knowledge, in contrast to traditional school?With the number of school dropouts today, it is highly relevant to understand the dropout phenomena from the perspective of the pupils. The pupils at the Digital Roomare both gamers*and* so-called school dropouts, not dropouts in general. As such they may be the best informants for what works or not in general, regarding the relationship between the traditional school and the digital culture; mostly represented by commercial off-the-shelf (COTS)computer games(Wiklund & Ekenberg, 2009). These games are hereafter referred to as just "computer games". While computer games are their main interest, many of the pupils are also interested in other expressions of digital culture, such as music, art and game design.

In the Digital Room, the foundation of the traditional school is replaced; the schedule is replaced by full workdays; digital resources replace schoolbooks (but not all books). Computer game worlds and digital tools are viewed as the foundation for - not a threat to - the learning process. Communication and discussion is appreciated and used as validation of competence. The pupils were selected based upon a common interest in computer games, to be able to create a strong group. The study is based on individual interviews with all 18 pupils at the end of the first year. It was done with permission from the school, as some pupils were minors (below 18 years old). The result has also been discussed and confirmed with the project manager who came to know the pupils very well and who have made many observations. He has almost gone native, e.g. by playing computer games with the pupils. This enables a deeper understanding of the interview quotes, which is elaborated in this paper. Further, observations have been made which is used to illustrate what is found in the interviews. To understand the results theoretically, concepts such as the index (Ong, 1982), education for children's rights (Qvarsell, 2005, 2011), ready-to-hand and being-in-the world (Winograd & Flores, 1986, 1987) and multimodality (Kress, 2009) are applied. The Digital Room has also been tried before in another location (Wiklund & Ekenberg, 2009), which may be compared in a full paper.

## RESULTS

The perceptions of why the design for learning at the Digital Rooms works, in contrast to traditional school may be summarized as follows. The non-scheduled, defragmented time and space, i.e. full workdays, makes it possible by design to respond to the pupils' interest

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immediately. The pupils are also able to build a better relationship with the teacher. Most of the pupils' spontanously expressed a sense of freedom but also a responsibility for learning. The pupils started to do assignments, which they would not have done in the traditional school, precisely because they did not feel controlled, but trusted. One of the pupils said: *Here they say you get a computer and you are responsible for doing your assignment. They don't nag as they did in the old school. Then you think that you must grab it with your own hands. That is why I started doing the tasks they gave me.*

The responsibility and freedom is in part expressed by the affordance of an individual path to subjects. The pupils are allowed to choose where, when and how to approach a subject, to make it meaningful. Some pupils said this leads to lifelong learning and to get different perspectives. As one pupil expressed it: *Here at the Digital room I may choose who I should write about and that enables me to have that knowledge for the rest of my life.*

Most pupils expressed that it is fun to learn at the Digital Room, which is a major difference to their previous experience of school. They relate to the relaxed atmosphere where collaboration and discussion is encouraged. An observation made by the project manager is that the atmosphere is created by the group process and socialization in the games they play. This is especially true in massively multiplayer online role-playing games (MMORPGs) such as World of Warcraft. The pupils didn't know each other when they started, but they have created a strong group by playing together. The strong group creates the conditions for learning. This is confirmed in the interviews where some pupils said that there are no brawls (as in their previous schools): *It creates a peace of mind among many if you compare with the old school where there is a lot of chaos, but here it is very calm, no brawl and everyone learns from each other and a big part of that is this freedom.*

A month after the interview presented above, six pupils were interviewed in group by the Swedish Schools Inspectorate. This was done to follow-up an anonymous notice. Both the interview questions asked by the Swedish Schools Inspectorate, and the situation (in group instead of individually) were different than the first interview. Still, the pupils expressed similar opinions in both interviews, which strengthens the result. In both interviews the pupils expressed that the Digital room is better or even the best thing that has happened to them. The freedom and own responsibility seems to be one key to why the Digital room works, and why their previous schools have not worked. By being treated (almost) as responsible adults they have realized that it is up to them to learn, and nagging is not needed. In contrast they express a will to learn, which is a clear difference to their previous school experience. In both interviews the pupils expressed that they learn more than in their previous schools. It seems that the way you learn is another key to why the Digital room is perceived as a better school, e.g. the removal of the schedule and the schoolbook (but not books in general). The pupils express that they get good feedback from teachers and are also able to learn from their peers.

## DISCUSSION

Written culture introduced the index in the transition from oral culture (Ong, 1982). In school the index is present in schedules (time, room, subject), grades and books (characters, rows, pages, chapters). In digital culture, which follows written culture, computer games provide worlds with affordances, ready-to-hand(Winograd & Flores, 1986, 1987). By percieving the world rather than reading about it, children learn by selection(Qvarsell, 2005, 2011). However, the ready-to-hand experience breaks down with the schedule, which prompts everyone to do the same thing, during a predefined time period. Instead of breaking the experience of being-in-the-world(Winograd & Flores, 1986, 1987) with an indexed time and space, teachers must become gamers to communicate with the pupils where they are. This underscores the need for a broader understanding of language (Kress, 2009) in the education for teachers.

The need for grades stems from the 17th century where the bourgeoisie fought the privileges granted the nobility at state employment (Grosin, 2001). These conditions are now gone, but the idea of grades persists. Being in the world (Winograd & Flores, 1986, 1987) implies activities such as play, learn and work (Qvarsell, 2001). How do you measure insights made in play, learning or work activities? This is where a breakdown (Winograd & Flores, 1986, 1987) occurs in the school system, built upon the idea of an index (Ong, 1982). Finally, Ravitch (Ravitch, 2011) explains where a school which focus on grades and control ends up: *...it is sure to cause teachers to spend more time preparing students for state tests, not on thoughtful writing, critical reading, scientific experiments, or historical study.*

## CONCLUSIONS

From this study, a number of conclusions can be drawn of what has worked well and not, for this group of pupils. This may be a model to understand how to design school for gamers who are dropping out of, or (perhaps more correct) choose not to attend the traditional school:

- Remove the schedule to integrate time, space and teacher resources into one simple structure: a full workday, which benefit dialectic feedback.
- Replace the schoolbook with meaningful affordances of the pupils' own learning path, based upon their common interest in computer games.
- Base learning upon collaboration and discussion (as opposed to control), which creates a relaxed atmosphere, where it is fun to learn.

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# Designs for Multimodal Literacy in School 2.0. A Discussion of Design Models

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*When new learning cultures involving multimodal text emerge in children's informal learning processes, multimodality becomes relevant for designs for literacy. How can designs for formal learning in primary school include and develop the pupil´s informal learning experiences with digital technologies in multimodal text production? This paper presents reflections of the model for Design for Formal Learning Sequence*(Selander & Kress, 2010)

**Keywords:** multimodality, design, literacy, learning, primary school

## MULTIMODAL LITERACY IN PRIMARY SCHOOL 2.0

Today's children are familiar with the multimodal world of communication on web 2.0 long before they start school. From a very young age, they have acquired experiences with multimodal text involving semiotic resources such as image, moving images, music, effect sound and written and spoken words, using strategies such as experimentation, edit-play and copy-paste. For some of the children their self-confidence as readers is destroyed when they meet literacy teaching in school (Kress, 2007) because literacy teaching is limited to alphabetic literacy. However, when offered the opportunity to create multimodal stories, they become deeply engaged in expressing meaning through the variety of modes featured by ICT (Nilsson, 2010). This is a reason, among others, why it is necessary that primary school includes multimodal text production in literacy teaching.

How can designs for formal learning in primary school include and develop the pupil´s informal learning experiences with digital technologies in multimodal text production?

My research is expected to contribute to school 2.0 as a concept and a practice (Sørensen, Audon, & Levinsen, 2010). The project aims to develop a model for Design for Formalized Informal Learning which includes and develops children's informal multimodal learning experiencesfrom web 2.0.Focus is on the positioning of both teacher and pupils as didactical designers.

The Ph.D.-project is based on collaboration with two teachers from two primary schools in Aalborg, both of whom I have collaborated with on this topic previously. The research approach is grounded in the tradition of design-based research.

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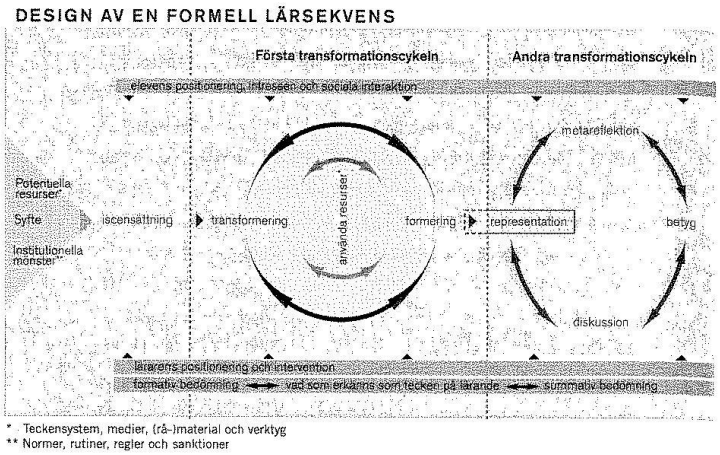
## MODELS FOR DESIGNS FOR FORMAL LEARNING

A starting point for the research is the model for Design for Formal Learning Sequence (Selander & Kress, 2010).




*Modell 2.* En formellt inramad lärsekvens.

This model does not represent how the pupils in my earlier research in three schools in Aalborg actual acted and navigated in transformation and transduction processes (Kress, 2007). My empirical data shows that the transformation and transduction processes did not proceed in two transformation cycles, but as one process in the shape of a coil. What is the reason for this difference? Firstly, Selander & Kress presents two models for design for learning: Model 1: Design for Learning Sequence in everyday life (informal learning outside school), Model 2: Design for Formal Learning Sequence. These two models are disconnected. They do not present a model for Design for Formal Learning Sequences which includes informal learning sequences. Secondly, their model includes the pupil's interest, but not the pupil´s knowledge and learning experiences from their practices outside school regarding i.e. multimodality. Thirdly, their model does not position the pupils as didactical designers(Sørensen, Audon, & Levinsen, 2010). In other words the model for Design for Formal Learning Sequences is not adequate for design *for* learning (didactical design 1) as a prerequisite for design *in* learning (didactical design 2) in my project.

I will compare the model developed by Selander & Kress with two other popular models for design for learning: The Teaching-Learning Cycle (Martin & Rose, 1998) and the model known in Denmark as Derewianka´s Snail Model (Derewianka, 1990) in order to discuss advantages and disadvantages regarding my research project.

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# Exploring pupils possibilities to transform and represent their knowledge in a test situation

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**Keywords:** Designs for Learning, social semiotics, one-to-one, learning, education

## ABSTRACT

Over the last couple of years there has been an increased interest from municipalities in Sweden to implement one-to-one (one laptop to each pupil and teacher) in schools. The argument for implementing one-to-one is often that the municipality wants their schools to enhance the pupils' learning outcome and prepare them for the 21st century. Researches in the educational field argues that laptops and other technologies do not only support learning they changes the way we learn and how we view learning (Selander & Kress, 2010; Säljö, 2010). Assessment practices is closely connected to learning and these practices in relation to contemporary technology is important to address and explore further. A recent longitudinal study in Sweden has followed schools implementation of one-to-one. The study has followed and video observed three classes in three different schools and ages. Over 20 themes, which has generated approximately 200 hours of video-recorded film has been documented. In this material there are little or no evidence of test that are conducted on the laptop and/or with word processor. In class, on a regular basis, pupils uses laptops for writing, taking notes, solving and answering questions and so on and so forth. In a test situation, mostly at the end of the themes, pupils are only allowed to use pen and paper. Haas (1996) claims that "..cultural tools and cognitive activity constitute one another in a symbiotic relationship…" (p. xiii). In her studies she has shown that the resources used effects the writer in different ways. Haas means that this is a complex phenomenon and calls upon focusing at technology rather than through it and look beyond the cultural myths of transparent and all-powerful technology (Ibid p. 23).

The purpose with the study is to explore the pupils' possibilities to represent their knowledge during different test settings/setup. Focus is on the writing activity and how the affordances of the resource effect (or not) the pupils writing activity. At this stage the research design has been tried out in a pilot study. The study is a micro comparative study that will investigate two conditions during a test situation; 1) pupils are allowed to use a word-processor and 2)the pupils are allowed to use pen and paper. The theoretical framework for this study is based on a *social semiotic* approach to contemporary communication (Kress, 2010) and the *designs for learning* perspective which sets focus on designs for learning but also designs of learning and assessment practices (Selander & Kress, 2010; Rostvall & Selander, 2008).

## BRIEF INTRODUCTION

My interest for the materiality of the technology and it's impact on the pupils writing process evoked when I was part of a longitudinal evaluation study about teaching and learning in a one-to-one classrooms. During, one of my many video-observations, a group of pupils in an upper secondary school worked in a smaller room on a task giving by the teacher and one of the pupils started to talk about tests and how they got tested. I got interested in their conversation and asked whether they were allowed to use computers during a test situation. The answer was no and one of the pupils told me that she often made complicated patterns of stars and punctuation in her test answers as she didn't write the test as a linear process starting with question 1 and so on and that she often went back and add information on questions that

she had written an answer too already. This leads me to think about two things. 1) In what way does technology (here the word-processor) impact the pupils writing activity?As they were are using word-processor on a daily basis when writing and in the test situation they were not. 2) howdoes the word-processor/technology impact the pupils planning and editing of the text. Focus in this paper is on describing the design of the study and the choices made to construct the data.

## DESIGN OF THE STUDY

The material includes pupils in the ninth grade. The pupils had been using computers in their schoolwork since seventh grade as both selected schools have a one-to-one approach. In test situation they seldom uses their computers. On the other hand they always worked with word-processor to write text when they handed in essays and other forms of home assignments and also on a daily bases in their schoolwork.

Drawing from the conclusions from the pilot-study the study has been redesign. The technology used to construct data is different and the study have been scaled up. I have also included two different subjects and two different layout of the test setup. The material is constructed within two different schools and in two different subjects, *Social Science – History* and *Chemistry*. The empirical material consists of video observations of 16 pupils using different resources. Eight pupils using *Smart pencils* and *paper* and eight uses the word processor *Word*. Construction of data and analysis was made in three steps: 1) Setting the scene, 2) Selection of sources to be use to record the pupils activities, 3) Coding.

## SETTING THE SCENE

The pupils were video-recorded at two different occasions with two different layout/setup of the tests, here called *TestA* and *TestB. Test A* had a layout were the question came first and directly after a space for answers. *Test B* had a layout were the questions were gathered at the top of the page and the pupils wrote their answers underneath the posed questions. The two layout were used as the layout of the test is seen as a resource and therefore was believed to also have an impact on the pupils writing.

## SELECTION OF TECHNOLOGY USED TO RECORD THE PUPILS ACTIVITIES

To record the activities while the pupils using pen and paper I have used *Pulse Smart Pencils*. The pencils records what the pupil writes, edits, in what order they answer the questions or adds text to previous questions already answered. This can be played-back in the software *LiveScribe Desktop*as an animated movie sequence. To record the activities when the pupils used *Word*a software called *Auto Screen Recorder* were used. The software is a freeware and records the computers screen activities while running. In addition I have video recorded the pupils while writing to have an understanding of the activity while they are not writing or editing the text. See figure below.

## CODING

The coded/transcribed material is a reduction of the activity performed by the pupils. The function of the transcribed material is to signifying what activity that goes on (Norris, 2002). The unit of analysis is the activity performed by the pupils with the semiotic resources. The purpose is to examine the activity during the test situation. I have chosen not to analyze the writing itself, what the pupils change, erase or keep, in a linguistic perspective as this has not been the main focus of the study.The construction of categories has been an iterative process where I have looked at the materialseveral times and tried out categories related to the aim of the study. The material has been coded in *ELAN*after mainly three categories; *Writing*, *Editing* and *Not writing/editing* the text. Two other categories has also been present in the scheme and they are named as *Utterance* and *Other*. These categories has mainly functioned as supported

to the other three and has not been in focus in the analysis of the activity. The three categories in focus will be described below:

- **Writing**- activities when the pupil writesin *Word* or with the *Smart Pen* constructing whole new words, part of sentence or paragraphs.
- **Editing** - activities when the pupil erases/deletes words and/or letters, copy and paste text or adding text into a question that they have already answered. Correction of spelling mistake or changing a word in a sentence. Using the formatting tools in *Word*.
- **Not writing or editing** – as the name of the category is suggest the category is used to see how long and how many "pauses" the pupils take while working with the text. Pauses longer than three seconds has been marked in *ELAN*.

In some occasions the pupils activity has been categorized as both *writing* and *editing*. This has been done when they move back to a question that they have alreadyworked with and adds new words or whole sentences. *Editing* because they change their text and *Writing* because they produce new text.The category *Other* has been used when the pupil has written his/her name or if I as a researcher has been approaching for checking the recording equipment.

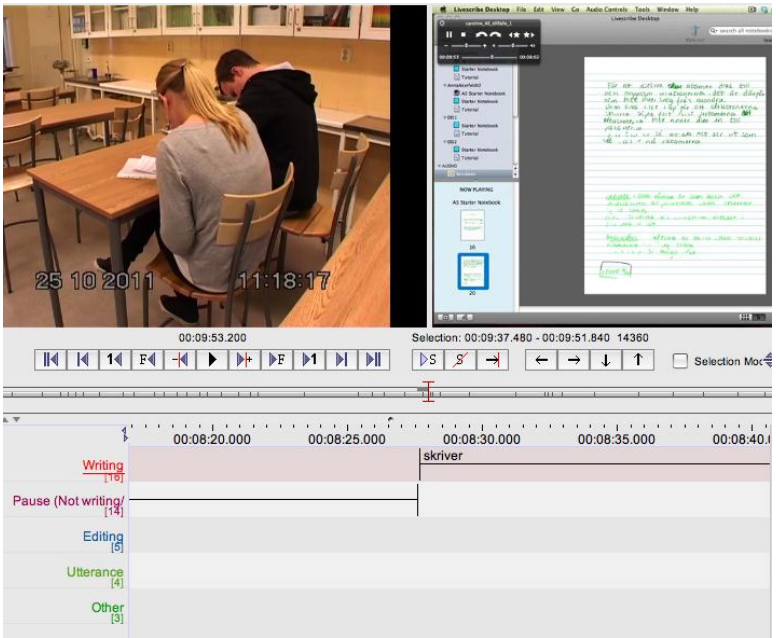


Figure. 1. Coding activities with ELAN.

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