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ABSTRACTS

Poster presentations

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EXPLORING EMOTIONAL EXPERIENCES IN THE CLASSROOM: A MULTI-METHOD QUALITATIVE STUDY

Wondimu Ahmed
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ABSTRACT

The purposes of this study was two-fold: (a) to explore students' emotional experiences in the classroom ; (b) to examine how appraisals of self-competence and task value relate to these emotions. To attain this purpose six junior secondary students were recruited as cases. We used multiple methods to collect data. We used video stimulated recall interview, nonverbal expressions coding scheme, heart rate changes and self-reports to assess emotions. To assess students' competence and value appraisals we used an appraisal questionnaire (adapted from Boekaerts, 2000). The findings revealed that students experience diverse emotions (e.g. enjoyment, pride, anxiety, concentration) and that negative emotions appear to be more prevalent than positive ones. The association between appraisals and emotions tend to be a bit complex. Both competence and value appraisals appear to evoke emotions independently or interactively.

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A THREE DIMENSIONAL PROGRAM TO ENHANCE POETIC INTERPRETATION AUTONOMY

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ABSTRACT

Answering to the demands of the Portuguese national curriculum for ninth grade poetic text reading, which includes a considerable diversity of poets and poetic styles, and approaching poetic reading as an integrative activity of the textual universe and the students' personal experiences, a teaching/learning program is proposed aiming at promoting comprehension and self-regulation activities leading to students' interpretative autonomy. Within reading comprehension-interpretation two text processing models, the reader response and the constructively responsive reading model, together with the interactive property model for metaphor comprehension, provide the main principles for the program design; within comprehension instruction the transactional strategies instructional method will be implemented. From a thinking-aloud study, previously developed, and involving 26 ninth graders skilled readers who interpret three poems with a metaphorical structure, were identified some very specific cognitive assumptions such as reading is thinking, reading is problem-solving and through selfquestioning previous knowledge is retrieved. Accordingly, the program includes prediction, conscious metaphorical inference-making and interpreting as main meaning-construction processes and selfquestioning, underlining, diagramming, hypothesizing, generalizing and synthesizing as monitoring strategies to be internalized as routines during interpretation. Within a total of 20 lessons, the thinking-aloud process is modelled by the teacher and then practiced by the students during the poem analysis. This instructional program will be evaluated in a study to be developed.

CHILDREN'S CONCEPTIONS ABOUT INFORMATION LITERACY

Andrea Dömsödy
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ABSTRACT

Knowing some possible ways how learners conceptualize information literacy will allow the creation of learner-centered, constructivist library instruction, methods, subjects and textbooks. The research cannot result in adaptive information about conceptions about library if the research does not investigate relationships from the point of view of information and information literacy generally and in terms of some preferred resources. So using qualitative methods, this research tries to describe some potential alternative conceptual frameworks about information literacy and its subtopics. This recent investigation also intends to prepare methods and equipments for a later research which is going to scan every age-group, and for teacher librarians to reveal concepts.

Research design includes a questionnaire, with one hundred tasks and questions which are repeated four direct topics (children's science, information, library and Internet), and structured interviews. The types of applied question: metaphors, association chains, concept mapping, attitudinal and other scales, grading, open-ended questions.

Responses will be recorded to computer words by words and analyzed with a data analyzer and a statistical software according to a complex system of codes. The quantitative and qualitative content analysis has two directions, a vertical and a horizontal (questions and children). This aspect will be applied with regard to the responses as a whole and separately to direct and indirect (learning, reading, books, computers) investigational topics. The conceptual framework about information literacy can be assembled from separate conceptions built up of concrete conceptions of the subtopics and the quality of their connections. One of the most essential questions is which information resources are also learning resources in children's conceptions.

"Information Literacy Profile" was work out to show a person's / a class's / a social strata's / a country's concepts (not only school achievement) about information literacy according to some essential indicators, which are mentioned above.

CHESS AND EDUCATION IN SCHOOL

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ABSTRACT

Chess is sport, game, art and science at the same time. At present this science is also being adopted. It may appear as independent science in the improvement of ability. My hypothesis in my research is that playing chess has positive, improving effect on the physic functions and partial-abilities. This is transfer effect and can be tested. I do my research among children at nursery school and pupils of first, second, third and fourth-year, on the basis of comparing with

control groups. The examined sections: attaining motivation, creativity, intelligence, writing-moving coordination. I measure motivation with the help of a test consisting of 45 questions, varied in age-groups and measured in 5-degree Likert-scale. The measurement of creativity was done with the picture-finishing and circle vice-tests of Torrance's tests, the intelligence was examined by nonverbal, child-version test of Raven's tests, whilst the observation of writing-moving coordination was fulfilled in accordance with the Diagnostic Development Observation System. The test is longitudinal. The pre-measurement is followed by post-measurement after a year. The evaluation of the foregoing results have been made by means of elementary, polyvariable and thorough tests.

As the pupils in my research live not only in Budapest but also in other regions of Hungary and they represent different social and cultural surroundings, I consider the results of my research interesting. Unanimously they suggest the conclusion that chess guarantees such benefits for students aged 5-8 which cannot be obtained at the same complexity and high-level by any other activities. The direct aim of my research is to prove the positive effect of chess on the improvement of children's skills, in a broader sense, to provide bigger room for the teaching of chess at school.

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UNIVERSITY STUDENTS' REPRESENTATIONS OF NOTE-TAKING

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ABSTRACT

Note-taking is one of the most common learning tasks that imply the use of written language, especially in the higher levels of formal education. Research has shown that note-taking is one of the tasks most commonly used and accepted by teachers and students alike for the purpose of learning (Barberà, Castelló y Monereo, 2003, Solé et al, 2005).

Note-taking can be influenced by several factors that affect amongst others how students note down information, the characteristics of the notes taken, and in particular how these notes are subsequently used for the purpose of learning. One of the variables that is thought to be the most relevant is the representations students have of note-taking. Note-taking can be seen as either a procedure of information gathering, or as a procedure of knowledge construction.

The work being presented forms part of a wider research project in which 65 psychology students of the University of Barcelona too, part and in which note-taking, its use and learning approach were studied. In this communication, we present the results obtained in an exploratory study about the students' representations of note-taking and its usage and we analyse the relationship between these representations and the learning approach of the students.

Based on the results obtained, several profiles have been identified about the representation students have of the type and usage of note-taking. Regarding the relationship between the

learning approach and the type and usage of the note-taking carried out by university students, we will discuss the lack of conclusive results and we will analyse its possible causes.

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INSTRUCTIONAL DESIGN OF MAPS IN GEOGRAPHICAL LEARNING ENVIRONMENTS AND THE ROLE OF EXPERTISE

Inge Jänen
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ABSTRACT

Geographical Information Systems (GIS) provide special functions to display maps on computers (e.g. zoom, overflight, layer, three-dimensional views). Until now it is not clear if These kinds of map presentation enhance or hamper effective learning when utilized in the academic subject Geography. According to the Cognitive Load Theory working memory capacity is limited and the processing of complex information easily can induce a cognitive overload. Therefore the planned study wants to examine the effect of a complex map versus a map composed of layers, where information is presented step by step. Moreover, as a classical aptitude-treatment-interaction study it will consider the expertise of the learners (domain specific prior knowledge and map reading ability). We presume that novices will experience a cognitive overload when learning with a complex map (due to high intrinsic cognitive load), but they may profit from a presentation in layer format. In contrast, experts are expected to show their best performance when learning with a complex map and might be impeded by layer format. The topic of the geographical GIS-based learning environment will be: Factors for industrial location. High school students shall learn with narration plus a complex map or narration combined with map layers. The complex map will show all information about factors for industrial location at once. However, the layer version first will give a ground plan and then successively slot in further information about discrete factors for industrial location. Layer by layer the map will become more complex until the whole map is built up. The dependent variables in two 2x2-designs are knowledge acquisition (difference between pre- and post-test) and experienced subjective cognitive load. Variables which will be controlled are working memory capacity and spatial ability.

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CHANGES IN STUDENTS' LEARNING IN HUNGARIAN HIGHER EDUCATION

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ABSTRACT

The starting point of this study is a new wave of research in higher education in the 1990s which resulted in a complex learning model including not only the learning processing strategies,

motivations and concepts of learning but also the regulative characteristics of learning. It has been established that upon entering higher education, in the new learning context the beliefs about learning change first, leading to a change in learning strategies only later (Vermunt and Vermetten, 2004).

Based on these findings we think one important task is to understand the belief system of students better. The three different elements of this system, namely the beliefs about learning, about the student, and about the knowledge, should be analysed a) separately and also b) in their interrelations, and c) in the way they change as well. Our analysis focuses not only on the cognitive but also on the affective and social aspects of beliefs within a constructivist framework.

Our research consists of three major parts: 1) a supplementary inventory about learning (based on Vermunt's Inventory of Learning Style, 1994) 2) a narrative analysis of a composition of students' life stories and 3) content analysis of students' metaphors about the meaning of being a student. The change in the belief system is analysed with a comparison of different cohorts and with a retrospective interpretation based on the students' compositions.

At the present stage of our research the analysis shows that the results gained by the inventory and by the qualitative methods have some contradictions (e.g., beliefs of social construction are stronger in the inventory than in students' life stories). The poster presentation focuses on the comparison of data gained by different research methods and on the evaluation of our methods and analysing strategies.

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KNOWLEDGE ACQUISITION AND OPINION FORMATION AT SCIENCE MUSEUMS: THE ROLE OF A MEDIA TERMINAL TO SUPPORT ELABORATION ON CONTROVERSIAL ISSUES

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ABSTRACT

In addressing current socio-scientific issues, science museums are challenged to present the ambiguity and ambivalence of these topics and to support visitors' reflective and critical thinking. In this project, a media terminal was designed to mediate and encourage elaboration on and opinion formation about nanotechnology (NT). It is assumed that salience of controversial arguments and opportunity to express one's own opinion are crucial factors for both learning and opinion formation. A first study tested the impact of *active opinion expression* and *salience of arguments* on knowledge acquisition and opinion formation in a 2x2-design. Ss interacted with the media terminal after they had explored the virtual exhibition 'nanodialogue': The control group works on a quiz which asks for facts about NT (1). In condition of salience of arguments but without expression of their own opinion, participants assign eight statements to corresponding experts by drag & drop (2). A second group rates NT in general as either "I am in favour of NT" or "I am against NT" on a rating scale and writes a short statement indicating their opinion about NT (3). The third group additionally evaluates eight expert statements by 'agreement' and 'relevance' by means of a rating scale (4). Preliminary results show that Ss of condition 4 have a

broader argument repertoire when asked to list all *pros* and *cons* of nanotechnology, and formed well-founded opinions which are not biased by prior or general attitudes. They also showed more awareness of controversy in a written statement about nanotechnology. For factual knowledge, no differences among the conditions could be found. In general, this study could show that active expression of opinion about a current and controversial scientific topic can enhance knowledge acquisition and opinion formation - provided that salience of relevant arguments is given.

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CONDITIONS FOR A SUCCESSFUL DISSEMINATION OF A TEACHER PROFESSIONAL DEVELOPMENT PROGRAM – WHEN DO TEACHERS START AND WHAT DO THEY NEED?

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ABSTRACT

The results of the TIMS-Study (Baumert et al., 1997) revealed deficiencies in the performance of German students in mathematics and science. To respond to these problems the pilot-program “Increasing the Efficiency of Mathematics and Science Instruction” (SINUS) has been established (Prenzel & Ostermeier, 2006). The aim was to introduce and establish processes of cooperative quality development at secondary schools throughout Germany and thereby to improve mathematics and science teaching. The program is distinguished by its problem-orientated approach. After a successful pilot phase, a phase of scaling-up, called SINUS Transfer, was initiated. This extensive program aims at disseminating the ideas of SINUS to a larger number of schools.

One central part of the program evaluation is to analyze the conditions that foster the dissemination process to a larger number of schools. It is investigated which characteristics of the participating teachers and which types of activities affect the success of the program. Participating teachers were asked about their experiences in questionnaire surveys With a major focus on questions concerning the support SINUS-transfer offered for teachers.

The two central questions of this study are: 1. How do teachers adapt to a program that is based on self-directed planning, problem solving and on cooperative work with fellow teachers and 2. What kind of support do they need? According to the teachers’ response we identified several types of teachers. This classification was based on their different needs for further support. These results will then be discussed with regard to support structures necessary for fostering the dissemination process of the program.

STUDY RELATED PERSONAL GOALS AND ACADEMIC ACHIEVEMENT AMONG THEOLOGY STUDENTS

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ABSTRACT

The goal of this study was to examine how different kinds of evaluations about study-related personal goals are related to academic achievement. Earlier studies indicate that evaluating goals as easy to attain and non-stressful predict best results in academic environment. In this study 133 Theology students filled up a revised version of Little's (1983) Personal Project Analysis questionnaire at the beginning of their studies. Information about study credits was gathered during the first three years of their studies.

According to evaluations about their study-related goals, the respondents were categorized in to three groups with a K-means cluster analysis. The groups were named

1) *self-fulfillers*, 2) *committed* and 3) *non-committed*. The *self-fulfillers* perceived the project as non-stressful, they saw themselves capable to complete it, but they didn't experience progress in achieving it. The *committed* students evaluated the project as stressful but they were progressing in achieving it. The *non-committed* also saw the project as stressful, but they were less capable to complete it and they didn't experience progress in achieving it. The *self-fulfillers* and *committed* students also evaluated intrinsic reasons as more important for striving towards the goal.

Goal contents varied between the groups. Goals reported by *self-fulfillers* related mostly to learning process, while goals reported by *committed* students related most often to graduation. The *non-committed* students had more goals focusing on areas outside Theology studies. It seems that goals reported at the beginning of studies reflect the orientation towards studies as a whole.

Students who were in the *committed*-group, completed more courses during the first three years of their studies. This indicates that autonomic reasons and perceived capability do not by themselves lead to best results. At least among these students, high levels of perceived achievement and stress led to most rapid achieving.

STIMULATING SITUATIONAL INTEREST AND STUDENT QUESTIONING IN HISTORY CLASSROOMS

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ABSTRACT

We conduct an experiment to investigate the effects of different types of introductions in history lessons on situational interest and the generating of student questions. We compare the effects of eye-witness accounts about an important historical event (containing characteristics that are

believed to contribute to situational interest) with an expository introductory text. Participants are 150 students in higher general secondary education. Students took a pre-test and a brief questionnaire to measure prior topic knowledge and topic interest. After reading the text, students are instructed to write down their questions and measured perceived interest and sources of interest.

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TEACHER PERCEPTIONS OF EVOLVING CLASS CLIMATE IN A NEW CLASS: OUTLINE OF A MULTIPLE CASE STUDY

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ABSTRACT

The focus of this study is an exploration of teachers' perception of class climate in new teacher class combinations. A qualitative approach was chosen to explore how teachers experience starting up new classes and how teachers' perceptions of class climate are grounded in classroom practice.

Four teachers participated with one to them unacquainted class in a case study. Introductory interviews were conducted and the first three lessons of each teacher where videotaped. After each lesson an interview was held where the teacher gave his/her general impression of the just finished lesson. In a video stimulated part of the interview teachers were asked to elaborate on thoughts, feelings and motivation regarding specific situations. Teachers' perceptions of class climate were measured with a shortened version of the Questionnaire on Teacher Interaction (QTI; Wubbels et al., 2006). Three and a half month after the last interview a story line interview was conducted with the focus on how teachers experienced the development of the class climate. As a reference measure for class climate every class completed a shortened version of the QTI each time a lesson was video taped, and approximately one week in advance of the story line interview.

The first step of the within case analysis will be to examine how teachers ground their perceptions of class climate in classroom practice of single lessons. The next step is to categorize and describe the grounding of the teacher perception of single lessons in relation to each other in order to examine the development of perceptions and grounding. On the cross case level grounding will be compared across teachers and several covariates will be used in order to explain differences and communalities across cases. Cases will be treated as separate experiments (replication logic; Yin, 2003).

LEARNING TO FLY – THE PROGRESSIVE DEVELOPMENT OF SITUATION AWARENESS

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ABSTRACT

The reported study investigates how situation awareness is constituted in the moment-to-moment interaction between a student learning to fly an airplane and her teacher, and how the student learns situation awareness, i.e. the ability to analyse a situation so as to provide ground for informed decisions about next actions. A view of situation awareness as an interactional on-going accomplishment is proposed. It is demonstrated how it is socially established and learned in briefing sessions, in flight lessons in the actual airplane, and in debriefing sessions. Learning is approached from within a conversation analytic (CA) perspective, building on prior CA research on the organisation of human interaction.

The empirical material consists of video recordings of flight lessons. Three students (one of them is in focus in this study) were followed and recorded during a series of briefing sessions, flight lessons and debriefing sessions. The studied task concerns situation awareness in recovering from unusual attitudes.

The results show that in the moment-to-moment constitution of situation awareness the participants rely both on information provided from the instruments, and on how it should “feel” when recovering. Further, the analysis shows that and how there are micro-longitudinal changes in the student’s performance of the recovery from the abnormal attitudes – both within the same flight lesson and over the course of the three lessons. These changes are socially established and upheld, in interaction between the student, the teacher, and the airplane controls and instruments. Problems in the pilots’ situation awareness are often reported as a significant contributing factor to airplane accidents. This study furthers the understanding of situation awareness as an interactional accomplishment and sheds light on how it is learned in the interaction between student and teacher, in the different educational contexts.

SURVEY OF CONTENT SELECTED FOR TEACHING EVOLUTION IN A BIOLOGY COURSE, IN UPPER SECONDARY SCHOOL, SWEDEN

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ABSTRACT

Evolution is an important component of modern biology. It is complex and can be controversial. Teaching evolution is an area where alternative understandings are well documented. The aim of this study is to investigate which content experienced teachers select to make it possible to teach in upper Secondary School. The content chosen can be related both to pedagogical/educational considerations on behalf of the students and to contextual matters. In this study a survey with a

list of concepts related to evolution, designed by influence from Skoog and Bilica (2002) and Zetterkvist (2003) has been presented to experienced teachers. The teachers were asked to A) state if these concepts were presented in their biology course and B) state which priority the themes had. In results from 18 teacher's concepts as Natural selection, adaptation, genetically variation, diversity, proofs of evolution, speciation, heritage are contents which are emphasized amongst all teachers, but conflicts in worldview, misconceptions, nature of science, human evolution, history of science and science in society are by some teachers excluded. From these results questions emerge: Are there two different strategies, implications of different strategies to avoid or to meet a controversial issue? One finding of this survey is that the vast educational research on misconceptions in teaching evolution, is not an major issue in teacher's choice for content. These questions that have emerged through this survey will be more elaborated in interviews with the teachers and in analysed with aims to study reasons experienced teachers give for their selection of content and subsidiary teaching methods.

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TEACHER COMPETENCIES IN THE PERCEPTION OF CLASSROOM SITUATIONS

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ABSTRACT

In line with current discussions about the professionalization of teachers, competencies in the perception of classroom situations are regarded as an important factor (Bromme, 1997). Identifying aspects in classroom interactions that are critical for teaching and learning processes is a key component for planning and modifying teaching behavior. In this study, the way teachers analyze videotaped classroom situations is seen as an indicator for their potential to perceive critical aspects in real classroom situations.

Our research questions are: (1) What are basic aspects for to perceive videobased classroom situations? (2) What are teacher competencies in the perception of classroom situations?

To develop criteria for a competent perception of classroom situations two approaches were combined. Rules of scientific observation-methods as well as empirical findings concerning teacher competencies in the perception of lessons are transferred in criteria for the perception of videobased classroom situations. Based on these approaches, five competence aspects for the perception of videobased classroom situations have been distinguished: a) elaboration of analysis, b) focus of analysis, c) nature of classification, d) quality of documentation, e) elaboration of valuation. For the description of teacher competencies concerning these criteria, teacher written protocols in analyzing a classroom video within the computerbased learning environment "LUV" were investigated. Coding schemes were developed and after a training with two independent raters and satisfying interrater reliabilities, texts of 83 individuals were analyzed. Through analyses, teacher competencies in the perception of classroom situations overall are characterized by the description and the valuation of situations, a focused analysis along given questions as well as an integration of situations in trivial concepts.

THE SENIOR TEACHER, A FORGOTTEN GROUP? RESEARCH ABOUT PROFESSIONAL LEARNING STRATEGIES OF SENIOR TEACHERS

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Universiteit Utrecht

ABSTRACT

We know little about teachers learning, although we expect teachers to be lifelong learners (Bolhuis, 2006). We assume that part of our teachers succeed developing learner strategies, while others may lack such strategies. Senior teachers are growing and we want to keep them in the profession as long as possible. We must make use of senior teachers because they are a very important source of experience and knowledge. With this research we aim to gain a better understanding of teachers professional learning strategies and we hope to develop an intervention to help senior teachers developing and or maintaining professional learning strategies.

By doing semi-structured interviews with two selected groups of successful and less successful senior teachers, in the first stage, we will get an idea of existing learning strategies and how they are developed. And, on the other hand, we will explore how senior teachers succeed in developing learning strategies, what helps them and what hinders them to do so.

In the second stage of this research an exploration of existing interventions, in context of developing professional learning strategies for senior teachers, will take place. Depending on whether we will find successful interventions we shall improve them by the knowledge gained from the interviews. If needed it is also possible to start a new intervention. In both cases we will work with methodologies of design research.

WHAT MOTIVATES AS POSTGRADUATE? GOALS IN PHD STUDIES

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University of Helsinki

ABSTRACT

The process of academic learning is centrally regulated by motivation. Goals are important regulators of individual action; they regulate what individuals strive for and reflect motivation (1, 2). Thereby motivation is in key position in understanding this process and furthermore in developing post-graduate education. Despite the importance of motivation in the process of learning scientific expertise, the emphasis on the debate on doctoral education has usually been excellence of performance (3, 4) rather than motivational processes.

The aim of this study was to understand the motivation of postgraduates through their goals. This study is part of a larger, national research project "From PhD students to academic experts" (2006-2008) in University of Helsinki, Finland. The participants were 602 postgraduates from University of Helsinki, Finland, who answered a survey (5), consisting of likert scaled items and open ended questions.

The goals of postgraduates were classified as *product goals*, *process goals* and *combined goals*. Postgraduates' with different kinds of goals differed in terms of experienced level of stress, anxiety, exhaustion and lack of interest. The results indicated that goals also varied on the basis of the study context and they were in relation with study persistence.

Results indicated that goals were related to the engagement in thesis process. Motivation appears to be critical in understanding this process and further, developing postgraduate education. It is important to acknowledge that thesis supervision not only targets cognition, but also motivation.

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PEOPLE, GENES AND POWER – A LONGITUDINAL ANALYSIS OF IDEOLOGY WITHIN TEACHER EDUCATION

Anna Tapola
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ABSTRACT

This contribution is a presentation of a ongoing research project that calls attention to the relationship between ideology and natural science education within teacher education, with special regard to genetics and gene technology (life-science) and different historical, scientific and societal contexts. This means, the project touches upon the dialectical relationships between ideology, power elites, hegemonic structures and certain biological subject matter, with special focus on the interplay between system and institutional level. Ultimately, the project aims to elucidate and discuss the educational consequences – pros and cons, risks and benefits – with regard to modern molecular biology and ideological impact. Methodologically, critical discourse analysis will be applied in the project, meaning, a modified version of Fairclough's three-dimensional model will be used as analytical tool. The project also focuses on human dignity, *Menschenwürde* and view(s) on human beings in life-science education within teacher education. The project's overall aim is to analyse and discuss why – with special regard to ideological impacts – human dignity, *Menschenwürde* and view(s) on human beings are constructed in certain ways. This also means the project aims to clarify what discourses that are involved over time and different contexts, and to discuss the educational consequences.

The project focuses on two overall research questions:

1. What constitutes and constructs human dignity, *Menschenwürde* and view on human beings in life science education within teacher education?
2. How is this construction related to outcomes from life science research?

**CONSTRUCTING RESEARCH INTENSIVE LEARNING ENVIRONMENT:
RELATIONSHIPS BETWEEN BELIEFS AND ACTIONS OF UNIVERSITY SCIENCE
TEACHERS REDESIGNING UNDEGRADUATE COURSES**

Roeland M. Van der Rijst
Leiden University

ABSTRACT

During the last decades there has been an increasing interest from both researchers in the field of education and curriculum developers to enhance links between academic research, teaching and learning. Some educational studies report evidence that support the hypothesis that enhancing the contribution of academic research in teaching has a positive influence on the development of various academic competences of students. Science departments at research universities provide students with authentic research intensive environments in which research exists in close harmony with teaching and learning.

However many academics responsible for designing science courses at research universities are not familiar with how to effectively construct learning environments in which harmonious linkages between research, teaching and learning are realised. Especially at undergraduate level many difficulties arise for university teachers when constructing innovative learning environments. A study into relationships between teachers' beliefs and their actions will increase our understanding, as well as facilitate educational developers with evidence-based tools to guide and support academics' professional pedagogical development. University science teachers redesigning undergraduate courses into innovative environments supportive for student learning provide us with interesting settings to study teachers' beliefs and their actions.

This poster reports the design of a study in which approximately 15 academics will participate. All participants will be responsible for undergraduate courses and will be selected from within the different departments of the Faculty of Mathematics and Natural Sciences at Leiden University in The Netherlands. Teachers' beliefs about dispositions supporting scientific research and beliefs about learning styles of students will be determined, and related to teachers' intentions and their actions in classroom. Furthermore the learning environments will be evaluated from a student experience perspective. A conceptual and chronological representation of the research design will be presented on a poster, in which methodology and data gathering techniques are explained in more detail.

SCHOLASTIC ACHIEVEMENT AND VOCATIONAL INTERESTS

Jasmin Warwas
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In recent years there has been a large body of research on examining students' achievement in school subjects. Nevertheless with regard to the upper secondary level we know few about the

development of students' abilities (in particular mathematics and English as two core subjects in German curriculum) after entering German vocational high school. Students from different prior schools proceed to a vocational high school that includes both, general education for high school graduation, and occupational subjects. Concerning the determinants of scholastic achievement, Schiefele, Krapp, and Schreyer (1993) confirmed in a meta-analysis a correlation between achievement and interests. Köller, Baumert, and Schnabel (2000) revealed an effect of interests on achievement in upper secondary level, but not reverse.

With upcoming career or study choices vocational interests are also considered to be meaningful. Holland (1997) stated six vocational interest orientations: realistic, investigative, artistic, social, enterprising, and conventional—which can be structured in a hexagonal order. In a meta-analysis Ackerman and Heggestad (1997) found substantial positive correlations between math achievement and realistic / investigative interests, and English and artistic / investigative interests. Nevertheless, we do not know if students' vocational interests effect achievement and / or achievement influences their vocational interests. Furthermore subject-specific differences should be examined. Therefore we address the following research questions: Does students' achievement in math and English (as two core subjects in German curriculum) increase until the end of the first year in a vocational high school? Is there an impact of math (English) achievement on realistic / investigative (artistic / investigative) interests and / or the other way round?

The sample consisted of 103 students (51 female; mean age of 18.3 years) in the 11th grade of a German vocational high school (focus on economics). Students were tested with a standardized achievement test of Mathematical Literacy and English, and completed a questionnaire on their vocational interests in the middle and at the end of the semester.

Achievement in math turned out to be quite stable regarding the mean, but increased in English significantly. Mutual influences in a cross-lagged panel between vocational interests and achievement in English could not be confirmed. However, there was an impact of realistic interests on math achievement and the other way round. We conclude that in order to enhance students' math achievement, educators could become engaged in encouraging students' realistic interests. For instance, it might be worthwhile to integrate more contextualized tasks into the daily lessons.

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RESEARCH ON THE EFFICIENCY OF THE APPLICATION OF DIDACTICAL TOOLS WHEN GENERATING MULTIMEDIA-BASED LEARNING ENVIRONMENTS

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ABSTRACT

Learning with multimedia-based learning environments is becoming increasingly important in school, since these types of environments offer teachers new possibilities of conveying learning contents in their classes (Lowe & Schnotz, 2003).

Consequently, teachers are confronted with more and further developed programmes for multimedia-based learning environments. These programmes can, however, only be compromise solutions, because of the multiple factors, such as the subject matter and the group of learners, which teachers have to bear in mind. Ideally, teachers should generate their own multimedia-based learning environments adjusted to the specific subject matter and the particular group of learners, but teachers usually do not possess the required knowledge to edit multimedia-based learning environments.

Based on the ‘Cognitive Theory of Multimedia Learning’ by R.E. Mayer (Mayer, 2003) and further research in this area (e.g. Clark & Mayer, 2003; Lowe, 1998; Lowe, 2003; Ploetzner & Lowe, 2004; Thissen, 2001), a didactical tool has been developed in this still ongoing study. Depending on the nature of information that is to be conveyed, the didactical tool makes recommendations which multimedia possibilities one could use in order to support the learning process in the best possible way.

The central question within the scope of reference of this investigation is, whether or not the use of such a didactical tool has an influence on the quality of multimedia-based learning environments created by teachers.

In order to answer this question, the generated multimedia-based learning environments developed by the test persons are examined with regard to their quality in the scope of a quasi-experimental research. Whereas the treatment-group receives assistance from the didactical tool when editing the learning environments, the control-group has to work without the didactical tool.

In the poster-presentation, the theoretical approach of this study, the didactical tool, expected results of the ongoing study as well as its practical and educational relevance will be presented and discussed.

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A MOBILE APPLICATION TO SATISFY SITUATIONAL INTEREST IN INFORMAL SETTINGS

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ABSTRACT

Museums play an important role in life-long learning with over 100 million visits per year in Germany alone. Despite its popularity, learning effects are not guaranteed by the visit alone. Situational interest and post-visit activity are of high importance in this informal setting but difficult to address due to the heterogeneity of the visitors and the amount of information available. This study analyses if situational interest and memory can be supported by mobile devices in allowing visitors to access additional information on the spot and bookmark interesting exhibits for post-visit reflection and discussion (‘Interest Trail’). In a 2x2 between-subjects design 62 student study subjects are randomized in one of four conditions: they either have the possibility to receive additional information in a laboratory exhibition or not and they either can

bookmark interesting information for post-visit reflection or not. Preliminary results indicate that the additional information was well used if available and that this information leads to longer visits and improved evaluation of the exhibition in terms of estimated size, detail, excitement, exceptionality and complexity. Evidence of deeper processing and improved learning was not found so far, probably due to the high motivation of the students and insensitive knowledge tests. The Interest Trail was rarely used, probably due to the extrinsic motivation of the students who were paid for their participation in the study. However, availability of additional information during the visit led to higher occupation with the topic after the visit. Since the student study subjects differ from “normal” museum visitors in their high level of education and extrinsic motivation, a second study will be conducted under field conditions with improved knowledge tests.

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THE EMERGENCE OF MATHEMATICAL CONSTRUCTIONS

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ABSTRACT

Knowledge construction was searched by many researchers in various domains. This study was conducted to observe the emergence of mathematical construction process with RBC model of abstraction. It was aimed to focus on observing the process of construction of mathematical knowledge rather than its outcomes.

A case study was conducted with a 7 grade student, M, who was asked to work on four tasks about triangular inequality that were unfamiliar to her. She was asked questions during the study to make her to reflect on what she was doing. She was videotaped during she worked on the tasks.

The case of M showed that it's important to recognize appropriate constructions to build a new structure because the trials for the need of a mathematical construction are stemmed from the structures that were recognized. It's also important to have mathematical structures which were constructed correctly.

In M's case it was observed that construction and building-with epistemic actions occurred simultaneously which pointed out the nested nature of epistemic actions as emphasized in RBC theory. M's case also showed that construction was not the final destination of other epistemic actions; rather it happened continuously during recognition and building-with epistemic actions. It was also observed that each of the principal components of the model, the epistemic actions, were important for constructing. Although constructing is the central epistemic action among them, recognizing a needed structure for a mathematical construction is also crucial. Recognizing a previously wrong constructed structure may cause to build a wrong structure. According to findings newly constructed structure needs consolidation to become more familiar to the learner.

COMBINING GOAL ORIENTATION AND INITIAL MOTIVATION AS EXPLANATIONS FOR PERFORMANCE

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ABSTRACT

Performance behaviour in achievement situations can be explained by goal orientation theory and by the cognitive-motivational process model. Elliot and McGregor (2001) assume competence and valence as conceptual cores of goal orientation and derive a 2 x 2 framework: 1) mastery-approach orientation, 2) mastery-avoidance orientation, 3) performance-approach orientation, and 4) performance-avoidance orientation. Goal orientations are considered to be stable traits. The cognitive-motivational process model proposes that initial motivation, made up of challenge, interest, probability of success, and anxiety is relevant for performance in learning settings. Initial motivation is explicitly defined as situational, because it emerges from the task at hand. Since both models explain performance in learning settings, we were interested in the relationships between goal orientation and initial motivation. As a second research question we assume that initial motivation is a better predictor for performance than goal orientation.

23 undergraduate students participated in the study. Twenty-three participants' goal orientation was measured with the Achievement Goal Questionnaire (Elliot & McGregor, 2001). The Questionnaire on Current Motivation (Rheinberg, Vollmeyer & Burns, 2001) was used to assess initial motivation after the tasks were explained. Participants had to solve Sudokus (total number of correct answers was used as performance indicator).

Our results show that mastery-approach orientation correlates with challenge. Performance-approach orientation related to challenge and negatively to probability of success. Mastery-avoidance orientation related to fear of failure but performance-avoidance orientation and fear of failure did not correlate.

THE DEVELOPMENT OF STUDENTS' ACADEMIC SELF-CONCEPT AFTER THE TRANSITION TO SECONDARY SCHOOL

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ABSTRACT

The transition from primary to secondary school is known as a critical moment in students' careers: Students have not only to deal with new environments (Eccles & Midgley, 1989), but in Germany after the 4th grade students also enter one of four different types of secondary school (tracking) mainly based on their performance in primary school. These changes do have consequences for the academic self-concept: The higher (lower) the intellectual composition of

secondary school, the more likely students' academic self-concept will decrease (increase), although students' actual performance stays equal. This effect is known as the institutional "Big-Little-Pond-Effect" (Marsh, 1987). Even though the BFLPE is well proved (e.g. Köller, 2004) the following questions are still unanswered and will be investigated in the present study: How does students' academic self-concept develop directly after the transition to secondary school? Does the type of secondary school moderate the development of academic self-concept? The sample contains 323 students of the 5th grade. During six months from the transition to the first school report, students' academic self-concept was assessed at eight measurement points using the standardized questionnaire SESSKO (Schöne et al., 2002). In addition, students' entry characteristics, e.g. achievement and goal-orientations were collected.

Confirmatory factor analysis was used in order to test the strong factorial invariance across four measurement points for the self-concept-scale, general "using the MPlus program. Factor scores for all persons were estimated. Difference scores for t3-t1, t5-t1 and t7-t1 were estimated in consideration of the school types "Gymnasium" and "Comprehensive School". Results show that the self-concept decreases in means at the Gymnasium and increases in the Comprehensive School. Thus, there seems to be better a motivational development in the Comprehensive school than in the Gymnasium, according to the institutional BFLPE.

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TRANSITION FROM SECONDARY TO HIGHER EDUCATION: ANTECEDENTS AND CONSEQUENCES OF GOAL COMMITMENT

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ABSTRACT

Transition from secondary to higher education asks students to select a college major. The "career decision-making process" model (Germeijs & Verschueren, 2006) articulates four decisional tasks (orientation to choice, exploration, decisional status, commitment) and tests the hypothesis that the way individuals cope with these decisional tasks has important consequences for implementing their career decision. Their results suggest that choice commitment is the most important predictor of the quality of early choice implementation in higher education, but further research is needed to investigate its antecedents and consequences. Our investigation will be based on two theoretical frameworks: the goals' hierarchical structure (Carver & Scheier, 1998) and the possible selves (Markus & Nurius, 1986). On the basis of their hierarchical organization, it is supposed (1) that goals at higher levels are intrinsically more important than those at lower levels and (2) that importance of goals at lower levels increases according to their relation to higher-order goals. Possible selves (i.e. beliefs about who one might become in the future) correspond to goals at the highest level of this hierarchy and are particularly salient in life transitions (Kerpelman, 2006). Our hypotheses are: (1) the importance of a particular career goal in the goals' hierarchy is an important indicator of choice commitment; (2) personal striving level, difficulties experienced and external influences are three potential antecedents of choice commitment (Vallacher & Wegner, 1989; Emmons, 1992); (3) when the career goal occupies an important place inside the goals' hierarchy, early choice implementation increases positively, whereas academic achievement is negatively influenced, and possible selves dimensions have an

increased impact on choice implementation (Carver & Scheier, 1998; Emmons, 1992). These hypotheses will be tested in longitudinal and experimental studies. A sample of 400 high school students (Grade 12) currently participate in an exploratory study. Preliminary results will be presented.

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ANALOGICAL REASONING AND WORKING MEMORY IN STUDENTS WITH MODERATE TO SEVERE MENTAL RETARDATION

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ABSTRACT

The CAM (Construction of Analogical reasoning Matrices) test was constructed in order to prevent memory overload. Children have to construct the right answer by choosing the different parts composing it. They use a touch screen on which they see the A, B and C terms of a matrix composed with concrete pictures. All components they need to construct the answer D are presented on the lower part of the screen, together with a number of incorrect components. This design allows them to create external memories and therefore to prevent memory overload.

Two versions of the CAM will be constructed: a classical one and a construction one. In the classical version the participant chooses the right answer among 6 or 8 alternatives. The construction version is designed in order to prevent the memory overload, because elements are available on the bottom of the screen and considered as external memories and can be consulted at any time.

The classical version will be given to students without mental retardation, whereas the construction version will be attributed to students with moderate to severe mental retardation. One hypothesis is that the construction version will allow students with mental retardation to reach the same level of performances as the level of participants without mental retardation who may encounter the memory overload with the ordinary version.

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SELF-REGULATION AFTER FAILURE AND EMOTIONS IN LANGUAGE INSTRUCTION

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ABSTRACT

Since students emotions as well as their ability to deal with failure is regarded to be associated with their performance outcome in other domains (Goetz, 2004; Goetz, Pekrun, Hall & Haag, 2002), this study aims to research both aspects in conjunction in the context of foreign language instruction. Therefore the study examines whether two learner groups differing in their degree of

self-regulation after failure (i.e. high or low action-orientation) report differences in their emotions – besides test anxiety – in language instruction. Besides, the temporal stability of possible differences was investigated.

Method: Therefore, N = 709 sixth graders from 18 high schools located in Hamburg, Germany, were asked two times over their first three months of learning French as second foreign language to indicate their experienced emotions in class in a survey study. In addition they were asked to fill out one subscale of an action-orientation-questionnaire. To control for other influencing variables on emotional development, students' sex, domain-specific selfconcepts' as well as their former school performance in grade 5 were investigated as well.

Results: ANCOVAs, in which high or low action-orientation was used as independent variable, reported emotions as dependent variable and students' sex, domain-specific selfconcepts' and their former school performance in grade 5 as covariates, displayed significant findings: Thus students scoring low in action-orientation displayed a higher degree of negative emotions on t1. This relationship becomes even stronger in the second measurement, where low action-oriented subjects showed not only more negative but also less positive emotions in class. Results are discussed in their relevance for learning outcome.

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THE ANTECEDENTS OF SITUATIONAL INTEREST: AN INTEGRATIVE PERSPECTIVE

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ABSTRACT

Personal interest is one of the most proximal motivators for long-term persistence and engagement (Harakiewicz, Barron, & Elliot, 1998). Besides, it can developed from a regularly experienced situational interest (Silvia, 2001; Hidi & Renninger, 2006). Situational interest is thus an important dimension of motivation. Meanwhile, the issue of interest and its optimal theoretical framework has no univocal answer (Krapp, 1999) and the literature on this topic is "eclectic and sprawling" (Silvia, 2005). The different perspectives definitely need to be integrated or at least clarified. The purpose of the Ph.D. is thus to investigate the antecedents of situational interest in an integrative way. In order to do it, some first theoretical options have been chosen. First, we consider interest as one of the basic emotions, arguing that it has the needed features of an emotion (Izard, 1977; Silvia, 2001). Therefore, appraisal theories of emotions (Roseman & Evdokas, 2004) are relevant to explore what could be the appraisal structure of interest, its antecedents. Recent empirical research has shown that two appraisals elicit interest: noveltycomplexity and coping potential (Silvia, 2005), focusing on the appraisal of the task rather than the actual task. Consequently, it questions some previous models promoting some types of activities supposed to improve interest (e.g. group work, computers, puzzles, Mitchell, 1993). Furthermore, we hypothesize that, on the basis of literature on self-regulation of motivation (Sansone & Thoman, 2005), goal congruence could be an additional appraisal to look at. Some research indeed suggests that it affects interest (Sansone, Sachau, & Weir, 1989). In planned empirical studies, we will analyze the three mentioned antecedents of situational interest

in classroom environment (correlational studies between task characteristics, personal characteristics and interest) and laboratory setting (manipulation of novelty/complexity, coping potential and goal congruence).

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THE MODERATING ROLE OF SELF-ORGANIZATION IN THE RELATION BETWEEN DIFFICULTIES AND WELL-BEING

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ABSTRACT

Two beginning teachers will not display the same reaction to a same level of difficulty encountered with their first class. Similarly two 1st year university students will not be affected in the same way by a failure at their exams. According to Linville (1987), a moderator of the relation between difficulties and psychological distress is the self-complexity. A complex self, i.e. which is composed of a *large number of distinct* aspects (e.g. lawyer, mother, tennis player, friend) will serve as a buffer against stress and lighten the psychological distress resulting from the difficulties encountered. Several studies have showed support for this effect (e.g. Niedenthal, Setterlund, & Wherry, 1992). However, they only consider the number of aspects one owns and the degree to which those are independent, and fail to consider the relative *importance* of the aspect threatened. In the line of Brewer (1993), we make the hypothesis that the more the self-aspect challenged by the difficulties is important for one's identity in comparison to the other aspects, the higher will be the distress if experiencing a failure in this area.

Method. Because my PhD is only at its beginning, here are the studies planned for the next academic year. Three different samples will be considered: first year university students facing their exams results, beginning teachers facing their first months of teaching, and participants succeeding or failing an experimental task. Self-aspects and self-complexity will be measured with Linville's card-sorting task, and the importance of each aspect will be assessed by an adaptation of Brewer's Athletic Identity Measurement Scale (AIMS). Regression analyses will be run in order to identify the moderating role of the relative importance of the particular aspect affected by the failure (i.e. the academic aspect, the teacher aspect, and the aspect affected by the task considered in the experimental study, respectively) over and above self-complexity.

**TURNING FROM EQUITY TO IDENTITY TO UNDERSTAND GENDERED
PARTICIPATION IN DOCTORAL PHYSICS**

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ABSTRACT

This poster outlines the process of co-piloting a study aimed at exploring doctoral physics students' experiences of identity re/construction through participation in a scientific community of practice. This research draws on identity theory and feminist post-structuralist theories of discourse and critical science studies to examine data collected from participant observation, auto-photography and in-depth ethnographic interviews. The methodology used here was co-piloted by both researcher and participant. We both explored the process of learning about identity, and we co-constructed narratives of experience through a series of interviews and analysis using frequent member-checks. The result of this pilot study was a refined methodology that will be used in a grander scale to study the experiences of theoretical, observational and experimental physicists as they engage in the process of gaining membership to the scientific community. While this study will not be limited to women, it is important to recognize that women's marginalization and alienation from physics before they even enter graduate programs in the discipline indicates that there is something about physics culture that needs to be better understood if we are to make changes to improve women's experiences. The purpose of conducting this study with members of all genders in the physics community is to identify the available discourses present in the community that students are able to situate themselves within. To that end, gender provides an informative lens in this study to understand how minority groups participate in the physics community, and to examine the identity transformation that students engage in when moving from new-comer to full-fledged member of the community of practice.

**SELF-REGULATED LEARNING AND KNOWLEDGE ACQUISITION IN PRIMARY
SCHOOL: THE ACQUISITION OF BIOLOGICAL CONCEPTS**

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ABSTRACT

The present research is an exploratory study of the relationship between self-regulated learning (SRL) and conceptual development (CD) of biological concepts in primary school. As such, it attempts to bring together research related to learning skills and studies regarding learning in a specific domain in natural contexts. A multiple case study methodology was used, with eight 8 to 9 year-old children belonging to third grade in primary school being followed during one academic semester of science education within the Chilean curriculum. Throughout this time repeated individual evaluations regarding the concepts being learned and SRL skills were conducted. In addition, data was collected during curricular group work sessions in the classrooms.

Among the techniques of data collection were interviews, direct observation, videotaping while children were engaged in individual or group tasks, and collection of material developed by the children. The activities designed to be observed were based in dynamic assessment evaluation techniques, which consist of a moment-by-moment evaluation of the learner during problem-solving whereby feedback can be provided in the context of the activity. The analysis of the development of SRL and biological conceptions was made through mainly two coding schemes: one that qualifies different dimensions of SRL and another which assesses the level of conceptual understanding being observed during the interviews and tasks developed during children's engagement in activities inside and outside the classroom.

This study presents evidence of the developmental traces of SRL and CD founded in the cases studied. It also includes some suggestions regarding the relationship between both theoretical constructs and the way they interact during learning processes in authentic classroom situations.

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USING VARIATION THEORY FROM PHENOMENOGRAPHY TO IMPROVE TEXT WRITING IN HONG KONG NEW SENIOR SECONDARY LIBERAL STUDIES

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ABSTRACT

Research about examples and nonexamples in concept learning has flourished in the past several decades. Mixed sequences of examples and nonexamples are favored over sequences of all examples in teaching concepts. The study examined the effectiveness of two texts of introducing a geometry concept to seventh-grade students. One text (VT) was designed by arranging examples and nonexamples based on the framework of variation theory from phenomenography, the other one (TT) was a traditional-textbook-like treatment containing examples only. Two classes of 60 seventh-grade students were recruited in this study. One was given VT and the other one was given TT randomly. Though students in VT class outperformed those in TT class in posttest, no significant difference was reported ($p > 0.05$). Results were discussed and suggestions were given to revise the VT. (132 words)

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HOW ELEMENTARY SCHOOL STUDENTS SELF-REGULATE THEIR LEARNING WHEN STUDYING SCIENCE WITH COMPUTER-BASED REGULATION TOOL?

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ABSTRACT

Empirical research reveal that students face difficulties engaging in learning and achieving their goals in a variety of learning contexts. To study effectively students need to regulate their learning process. In spite of strong understanding of self-regulation in learning there is still a

limited understanding about how self-regulation develops in learning context and especially how motivation regulation contributes to it. This study deals with motivation in self-regulated learning. The aim is to study how the elementary school students regulate their motivation as they study science with gStudy computer-based tool. A pedagogical framework for applying gStudy computer tools and Learning Kits in Science is described and the preliminary results of our first empirical experiment and intervention among grade three elementary school is reported.

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WHEN COLLABORATIVE LEARNING BECOMES MORE EFFICIENT THAN INDIVIDUAL LEARNING

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ABSTRACT

This study considered the limitations of the working memory capacity at the individual level as an important reason for assigning complex learning tasks to groups rather than to individuals. It was hypothesized that groups would be able to share the high cognitive load among the group members, which enables them to work with the interrelated information elements and construct better cognitive schemata than individuals. In contrast, it was expected that individuals who learn from carrying out the same complex tasks would need all processing capacity for remembering the interrelated information elements, and, consequently, would not be able to allocate resources to working with them. Using 72 pre-university students as participants performing tasks in a domain of biology (heredity), this study compared individual to group (i.e., triads) learning with regard to their effects on retention and transfer test performance, and experienced mental effort (Paas, 1992). The hypotheses that group members would be able to construct higher quality schemata than individuals was confirmed by the results on the retention and transfer test. The interaction effect that was found, indicated that, whereas individual learners invested less mental effort to obtain better retention test performance, group members invested less mental effort to obtain better transfer test performance. The results are discussed in the context of cognitive load theory.

SELF REGULATED LEARNING IN ALTERNATIVE EDUCATION

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ABSTRACT

A comprehensive school in the city of Hamburg reformed its pedagogical concept. From the fifth grade onwards pupils learn in an individualized setting. To support Self Regulated Learning (SRL) the school provides its students with tools for external regulation. Five interview partners were chosen from a group of fifth graders. A maximal contrast was sought in the handling of the autonomy, use of the logbook, as well as in the socio-economic statuses of the parental house and in the sex of the pupils. Aim of this study is to create types of pupils' use of the external regulation to achieve SRL. The school has set itself goals and was set goals by the department of education. To measure the goals and reconstruct a development two interviews were held with an interval of one year. The self-evaluation of the interviewed pupils is supported by external evaluation. For this the students' logbooks were analyzed with a grid that has been developed to measure the quantity and the quality of the entries. Pupils that were defined by their teacher as 'handling the autonomy well and using the logbook in a correct way' did not make better entries in their logbook, but made more use of the support the setting offered than the pupils who were defined as 'handling the autonomy and using the logbook poorly'.

**EFFECTS OF DIFFERENT INSTRUCTIONAL FRAMEWORKS ON
SELF-CONCEPTS AND LEARNING MOTIVATION**

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ABSTRACT

There are difficulties in adequately dealing with heterogeneous groups of learners in secondary schools. This is shown by large numbers of pupils who repeat classes or start school age-inappropriately. Implementing individualised learning and grouping learners in multi-age classes can be ways to deal with learners' heterogeneity. Using these instructional arrangements enables to individualise and differentiate within the group of learners. Multi-age learning often is operationalised in combination with individualisation. This leads to mixed effects of several instructional arrangements and unclarity about the effects of multi-age learning alone (Veenman, 1995). Therefore the aim of this study is to obtain clarity about the isolated effects of instructional arrangements which differently deal with learners' heterogeneity. Students learning with (a) traditional comprehensive school instruction, (b) individualised instruction without multi-age and (c) individualised instruction with multi-age are compared. In this study perceived satisfaction of basic needs (Deci & Ryan, 1985), learning motivation, and academic self-concepts are taken into focus. It has been shown that these variables have an impact on learning outcomes (Pintrich, 2003).

The aim is to detect if there are any differences in the dependent variables in the three instructional designs and to test whether those differences are stable over time. To measure the dependent variables fifth graders (N = 425) in five comprehensive schools in the city of Hamburg, Germany, filled out standardised questionnaires twice with an interval of six months.

Results show differences in the motivational variables depending on the instructional arrangement: students in the individualised frameworks with and without multi-age show higher scores in the motivational variables at both times of assessment. When the individualised arrangement without and with multi-age are compared no additional positive effects for multi-age can be found.

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INFLUENCE OF INDIVIDUAL DIFFERENCES ON EMOTIONAL REGULATION IN LEARNING SITUATION, AND CONSEQUENCES ON SCHOOL PERFORMANCE

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ABSTRACT

Interest for studying emotions in the context of learning seems demonstrated, but a lot of questions are still unresolved (Pekrun, Goetz, Titz, & Perry, 2002). Studies conducted in other contexts than the academic one, showed that the experience of positive and negative emotions is connected to dimensions of personality (Fredrickson & Joiner, 2002; Izard, Libero, Putnam, & Haynes, 1993; Watson & Clark, 1992). Our hypothesis is that there are interindividual differences in emotions experienced in learning situation and the commitment in learning activities. We postulate that these differences are determined by the subject's personality. The personality would influence: (1) the kind of emotions experienced, and (2) their intensity. Besides, we think that individuals differ by their ability to regulate their emotions. This regulation concerns control of emotional intensity and change in emotional valence.

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ILLUSION OF KNOWING YIELDS DIFFERENT EMOTIONAL RESPONSES AND READING BEHAVIOR IN THE ILLUSION AND IN REALITY?

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ABSTRACT

Illusion of knowing is a phenomenon that may hinder effective learning since participants do not know when they have missed critical information. One explanation given for the illusion is that participants do not get a signal of error- a signal corresponding to that something is not understood. It is predicted that there *are* emotional responses signaling and that emotional responses are different in participants with illusion of knowing and participants who correctly comprehend the text. Initial results shows that participants with the illusion of knowing report

their answer faster and have shorter fixation duration on manipulations in the text. The longer fixation duration for participants who correctly reads the text may be due to an increased level of processing required for making the manipulation meaningful and also reflect a more accurate regulation of processing capacities.

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GOAL-AWARENESS AND GOAL-ADAPTIVE INFORMATION PRESENTATION TO SUPPORT COLLABORATIVE LEARNING IN INFORMAL SETTINGS

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ABSTRACT

Learning in museums is often socially mediated, goals play a more important role than in formal settings, and reduced mental resources are available to process information. Technology (study 1: virtual exhibition, study 2: PDA in a laboratory exhibition, study 3: PDA in a real museum) is used to make visitor dyads aware of their shared goals and to adapt information to these shared goals. By way of these two applications more goal-oriented processes of learning (information selection, conversational elaboration) should cause higher learning outcomes (increased interest, factual, and transfer knowledge). Two experimental studies are conducted in this dissertation to confirm the expected learning benefit of awareness of shared goals and adaptive information presentation in museums. First results of study 1 show a beneficial effect of goal-awareness and adaptive information on acquisition of transfer knowledge. Additionally it could be shown, that dyads are more similar within than between, indicating processes of convergence during the visit.

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THE DEVELOPMENT OF SOCIABILITY WITHIN AN EARLY EDUCATION SETTING: SOCIAL EXCHANGES AND INTERACTIONS BETWEEN 20-40 MONTHS OLD TODDLERS

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ABSTRACT

Since, also for toddlers, development and learning are “situated” processes, early educational centres can be considered as important *natural contexts* for development and education, where social interactions play a primary role for socializing the “new members” of society. For these reasons, an early education setting – in Italy attended by 0-3 years old toddlers – is particularly suitable to observe social exchanges and interactions between toddlers and between adults and toddlers.

This study aims at observing and analyzing, in a qualitative perspective, the development of children’s sociability during the everyday life within an Italian early education setting. It involves 18 children of 20-40 months of age and their 4 caretakers. It wishes to observe:

- Toddlers' modalities of *mutual regulation of exchanges and interactions* (e.g. management and regulation of conflicts);
- *How individuals participate to small-group activities* (e.g. "participation structure").

The research is based on *semi-participant observation* and *video recording*. For the analysis, it adopts some of the main principles of CA and DA and it is made of two different steps: the *multimodal* transcription of videotaped interactions and the analysis of interactional sequences. This analysis procedure implies that it is not possible to establish in advance the relevance of some specific interactional phenomena, because it is a *circular process* of reading, making hypothesis and coming back to data.

The results, even though partial and in-progress, confirm the complexity of children's social interactions, concerning not only the strategies they use, but also their ability to co-construct with peers complex *participation structures*, which they seem to be able to deeply understand, switching between diverse communicative modalities and registers. By the end of the second year, toddlers are already able to find an implicit agreement about "how" they co-construct interactional exchanges, showing to accept and promote changes and re-adaptations of interactions.

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IMPROVING COMPETENCIES FOR E-PORTFOLIO

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ABSTRACT

The research topic is related to some experience gained in the higher education during a year. In the main focus there is the investigation of how to introduce the usage of e-Portfolios (eP — in what follows) in teacher's training. There are several points of evaluation and administration that can be linked to making eP in the process of teacher's training. Among others, managing and archiving data of documents about students' academic skills and teaching competencies are in focus. The main aims are: (a) reviewing the results attained so far, (b) preparing standards for evaluations for this domain, (c) elaborating topics for teacher's training, (d) assessing and improving competencies for eP. The experimental part of the research is planned in co-operation with students. Methodological tools involve e-questionnaires, continuous diarizing of activities and results, interviews and team sessions — sources of qualitative analysis. As a part of this research domain, our aim is to concentrate on IT skills especially, which are necessary for eP. This set of special competencies can be observed as a bridge from IT skills to the competencies, which can serve the students in their academic and personal career. The purpose of this paper is to show the significance of this new research domain. It gives an outline for direct and indirect effects of introducing eP methods.

**CITIZENSHIP COMPETENCES OF YOUNGSTERS: DIFFERENCES BETWEEN
YOUNGSTERS OF DIFFERENT ETHNIC ORIGIN, SOCIAL-ECONOMIC STATUS,
SEX AND AGE**

Maartje van der Niet, Wilfried Admiraal, Geert ten Dam & Femke Geijsel
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ABSTRACT

To answer the research question ‘to what extent do youngsters differ in citizenship competences?’, secondary analyses were conducted on data of the Citizenship Competences Questionnaire. The theoretical framework of this questionnaire consists of a matrix of four social tasks (participating in a democracy, carrying joint responsibility for the community, dealing with conflicts, dealing with differences) crossed with four components of competences (attitudes, skills, knowledge, reflection), leading to sixteen subunits. A full model multivariate analysis of variance (MANOVA) was conducted for each social task, with origin, social-economic status, sex and age as independent variables. Analysis of the main effects shows that there are differences in citizenship competences of youngsters. On all four social tasks we found significant differences between youngsters of different ethnic origin. On the knowledge component pupils with a Dutch mother had a higher score than pupils with a Turkish, Moroccan or Surinam mother. On the skills, reflection and attitudes components pupils with a Turkish, Moroccan or Surinam mother often had a higher score than pupils with a Dutch mother. We didn’t find differences between youngsters of different social-economic status. On three social tasks girls have a higher score than boys. We also found significant differences in citizenship competences of youngsters of different ages. These differences occurred on all social tasks and all components of competences. Younger pupils (10 and 11 year olds) often had a higher score than older pupils (12, 13 and 14 year olds). These analyses give some initial insights in citizenship competences of different youngsters. Further research will give us more insights in the development of citizenship competences of different youngsters and the meaning of citizenship and the role of the school in attaining citizenship competences according to youngsters.

**GENDER DIFFERENCES IN SECONDARY STUDENT’S
CONCEPTIONS ABOUT WRITING**

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ABSTRACT

One of the variables which can influence students’ representations of writing-to-learn tasks is conception about writing itself. Several studies have shown that student’s beliefs are related to the quality of the texts written and they seem to influence written composition (Campbell, Smith & Broker, 1998; White & Bruning, 2005). Different approaches have established two ways of conceiving writing. On one hand, writing is a mechanic and linear process and it is perceived as a tool for identifying and “transmitting” or “telling” knowledge. On the other hand, writing is

dynamic, creative and it is considered as a tool for “transforming” and constructing new knowledge through a “transaction” between writer, text and audience (Bereiter & Scardamalia, 1987; White & Bruning, 2005; Levin & Wagner, 2006). This last conception considers writing as a learning tool that could fulfil an epistemic function.

Several studies have shown a gender effect related to different writing variables. So, girls usually are more competent (Engelhard et al., 1994; Gambell & Hunter, 2000), have a higher self-efficacy beliefs (Pajares & Valiente, 2001), and more positive attitudes towards writing and have different writing tasks preferences (Merisuo-Storm, 2006) than boys.

In this work we examine secondary girls and boys’ conceptions about several writing facets. We used a questionnaire with two scales in which a reproductive and an epistemic writing conception can be identified. The results point out that girls and boys conceive the aspects examined in a different way and girls tend to show a more sophisticated conception than boys. However, both they are far from reaching the epistemic conception.

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ANALYZING THE KEY-FRAMES SELECTED BY SUBJECTS WITH DIFFERENT DOMAIN KNOWLEDGE WHILE LEARNING FROM ANIMATION

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ABSTRACT

Animations recently have become an important tool in education. Unfortunately, the conditions of successful learning with animations are not well known, because the efficacy of an animation is substantially influenced by several factors like content, layout, interactivity and the learner's prerequisites.

In any case the learner must be able to extract significant information from a continuously changing display. Therefore, the ability to identify the important states of a changing system could act as an indicator for the learner's benefit while learning from animation. The major objective of this study was to determine the influence of prior knowledge on the selection of important states.

Experts and novices in mechanical engineering resp. sports sciences were asked to observe animations of mechanical and biological movements and select a number of key-frames. 100 participants, differing in their level of expertise, observed two animations themes in each case:

The mechanical animation showed the operation of a four-stroke-engine, and the biological animation showed the crawl style swimming. After selecting the key-frames of each animation the participants were asked to explain the reasons for their selection.

The explanations were categorized by their perceptual and conceptual base. The results indicate that the key-frame selection was largely influenced by the conceptual prior knowledge of the

participants. Affirmative to our assumptions, experts were better able to identify and explain the causal relations within the displayed system, whereas the recognition of visual- perceptual cues which are not domain-specific was possible for both experts and novices. Based on these results, we conclude that successful learning from an animation requires a conceptual prior knowledge in the particular domain.

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**A PERSONAL EPISTEMOLOGY FRAMEWORK: USING A SYSTEMS
APPROACH TO INVESTIGATE CHILDHOOD EPISTEMOLOGY
IN A CLASSROOM ENVIRONMENT**

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ABSTRACT

A children's personal epistemology framework using a dynamic systems approach in a classroom context is proposed. Research in children's epistemology is limited. Recently there has been discussion among researchers in this area that suggests a phase of early epistemological onset. In this model personal epistemology is comprised of the nature of knowledge and the process of knowing. In dynamic systems theory an individual is not an isolated entity but rather part of a larger system. Consistent with this the framework incorporates the child, their parents and peers, and their preschool teacher. Each relationship is represented as a system and each system has sub-systems. Within the system are constructs that investigate internal and external processes. Interpersonal relationships are used as a way of observing language, cognitive, self, and emotive processes. Interactions identify ways in which these processes are able to connect. This type of approach is new to the field and will foster the ability to assess children's personal epistemology through their affect, language, relationships with parents, teachers, and peers. Such a framework will contribute to the field of personal epistemology generally and will also open doors for researching children specifically. This could have a significant impact on early educational curriculum and instruction.

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**YOUTH SUBCULTURES AND SCHOOL: 'INFORMAL' AND 'FORMAL'
LEARNING PROCESSES'**

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ABSTRACT

The poster presents research that compares the informal learning processes in youth subcultures and the formal ones characterizing school life. Departing from a postmodern and at the same time Marxian theoretical (extended) interpretation of learning as a socially and culturally shaped phenomenon that is part of initiation processes, I consider youth subcultures as educational

'spaces' where we can identify informal learning processes in continuous, multiple relations with the (mainly) formal learning processes in school.

The empirical part of the study is an educational ethnography among 17 years old students in a Hungarian secondary school. I was involved for six month in the ordinary school life of a class and partly also in the extra-school (subcultural) life of the students. The methods used in the study were participant observation (with field notes); non-structural interviews with students and teachers; comparative textual analysis of the most important school documents and of the web-pages of some subcultures.

My findings reassumed on the poster have come from the participant observation of students' life in school, from the conversations and interviews with them and from my learning processes (both formal and informal) experienced as a researcher-member of the community. In the school, I experienced with the students that there is a strong discrepancy between the creative, cooperative kind of informal learning processes and the boring, repetitive, competitive formal learning processes. The hierarchical structure of knowledge and instruction made highly passive the students' (our) formal learning processes. They expressed their resistance against this autocratic form of schooling. I was and I am with them in this resistance, expressing the idea that school education should take in consideration the characteristics of the informal learning processes experienced by the students.

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DOCUMENTING AUTHENTIC LEARNING WITH SMART PHONES: EXTENDING DIGITAL PORTFOLIO USE IN TEACHER EDUCATION

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University of Tampere

In portfolio assessment, the importance of reflective writings has been often emphasized (e.g. Smith and Tillema 2003; Fernsten and Fernsten 2005). These reflective pieces of writing require students to articulate, review and analyse the process and/or products of their portfolio components. Reflection pieces as a critical component of the portfolio are an essential tool in the learning process. Through reflection students learn to scrutinize their own performance, come to terms with what went wrong as well as to what went well, contemplate strategies to enhance their success in future work and take responsibility for their learning. Facilitating the documentation of authentic experiences and observations for reflection becomes vital.

At University of Tampere Subject Teacher Education Unit case implementation prospective subject teacher trainees are using a mobile blogging (direct publishing of entries in on-line weblog environment via smart phone) enabled digital portfolio system to support their personal development. The journaling style often inherent in blogging is in itself ideal for reflective learning. Mobile blogging enabled digital portfolio allows documenting learning experiences immediately in authentic contexts –whether it be a classroom training or a lecture, combining documentation from different contexts, and utilising multimedia presentation formats to enrich the situation specific documentation.

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ABSTRACTS

Roundtable presentations

EXPLORING THE RELATIONSHIPS BETWEEN THE SOCIAL CONTEXT, MOTIVATION AND ANXIETY IN MATHEMATICS: INNOVATIVE METHODOLOGIES AND ANALYTIC TECHNIQUES

Sarah Buckley

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ABSTRACT

In mathematics social influences seem to be important considering the negative culture surrounding the subject. Wilkins (2000) comments “society has come to accept, if not promote, negative attitudes towards mathematics” (p.411). However, contradicting this culture, mathematics is highly valued as a subject whose completion leads to increased opportunities. The focus of the present project is on peer influence, motivation and, in particular, anxiety in mathematics for adolescent students. Two hundred and twenty nine Year 8 students (120 girls and 109 boys) participated completing mathematics anxiety, test anxiety, motivation and social network measures. In order to capture the dynamic relationship between peer influence, motivation and anxiety (Järvelä, 2001), innovative methodologies and analytic techniques were employed. Using an interactive computer program Between The Lines (BTL; Ainley & Hidi, 2002) anxiety was measured in two ways. Firstly, the more trait-like aspect of anxiety was measured using traditional questionnaire techniques. Secondly, anxiety was assessed on-task as students completed a mathematics problem via the computer program BTL. To study peer influence a social network approach was adopted. This allowed application of sophisticated modelling techniques. TwoStep cluster analysis revealed three generalised anxiety groups – high, medium and low anxiety. Relationships were found between these groups and levels of motivation. Students in the low and high anxiety groups reported their friends as more and less anxious than themselves, respectively. Within the presentation emphasis will be placed on results of the Social Influence Modelling (Robins, Pattison & Elliot, 2001). These will present the structure of the peer relationships within the student group and examine what regions of this structure anxiety and motivation is distributed. Findings highlight the role of peers in shaping students learning, specifically levels of motivation and anxiety, in mathematics.

THE DEVELOPMENT OF ASSESSMENT CRITERIA TO FACILITATE THE CONSTRUCTION OF A SELF-ASSESSMENT AND TASK-SELECTION TRAINING

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ABSTRACT

Learner-controlled instruction has been advocated as a means to foster learners' self-regulated learning competence, to increase learners' involvement in their own learning processes, and to achieve higher learning outcomes. However, studies comparing learner-controlled with system-controlled instruction have shown inconclusive results on learning outcomes. We argue here that this is because those studies assume that learners are capable of accurate self-assessment and appropriate task selection. However, assessment literature has shown that this assumption may be incorrect.

Since there is evidence that learners typically misassess their own competence, fair conduction of studies on the effects of learner-controlled instruction, and effectiveness in practice of learner controlled instruction, might require training learners on self-assessment and task selection skills beforehand. This presentation focuses on the required input for the design of such a training. By means of an interactive session with the participants, we hope to show the problems learners have with defining assessment criteria, discuss the biases these problems may result from in self-assessments and task selections, and show the need for a training to improve learners' self-assessments and task-selections.

TEACHERS' DIAGNOSTIC COMPETENCE

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ABSTRACT

Diagnostic competencies of teachers have become a current topic of interest in Germany's educational policies since the comparatively low performance of German students in the PISA-survey and the claim for more professionalism and increased diagnostic competence of Germany teachers by the Standing Conference of Ministers of Education of the German States (Kultusministerkonferenz, 2001). This demand for higher levels of diagnostic competence stands in contrast to research which is still not satisfying as regards its development and impact.

Questions related to the development and impact of teacher's diagnostic competence will be addressed within my PhD study. The data base for my study is a longitudinal research project conducted by an interdisciplinary research team (BiKS) in Bamberg/Germany in which – among others – the achievement level of almost 2.400 students in various school related domains was

assessed first time in the second part of grade level three. Additionally, teachers' performance ratings for each student in these domains as well as for the whole school class were assessed. Thus far, preliminary results of our study about the accuracy of diagnostic appraisals of teachers in the domain of language and math show that teachers' appraisals correlate with the performance of individual students ranging from $r=.56$ and $r=.59$ depending on the subject domain.

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FACTORS INFLUENCING INTERDISCIPLINARY THINKING WITHIN THE CONTEXT OF HIGHER EDUCATION

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ABSTRACT

In response to the changing environment, higher education in the life sciences adjusted their programmes in order to develop interdisciplinary thinking among their students. In this respect, interdisciplinary thinking can be defined as the capacity to integrate knowledge of two or more disciplines, coming from both natural and social sciences, to produce a cognitive advancement – e.g. explaining a phenomenon, solving a problem – in ways that would have been unlikely through a single paradigm approach. Interdisciplinary thinking can thus be considered as a complex cognitive activity and therefore lecturers and students face difficult challenges to respectively teach and to learn this activity.

The question rises how can teaching-learning situations concerning interdisciplinary thinking be developed or optimized in order to reach this complex learning objective. A scientific understanding of factors influencing students' learning outcomes of interdisciplinary thinking within higher education in the life sciences is therefore essential, but is still lacking. Main reasons for this are: lack of empirical research in this field and proper assessment tools. We therefore designed a research project to answer the following question: 'Which factors, on student, teaching context and learning process level, influence interdisciplinary thinking of students within the context of higher education in the life sciences?'

In this paper a detailed problem definition and research design is presented. The research project includes four studies: a literature review study and a Delphi study for development of a conceptual model, followed by a study of measuring interdisciplinary thinking and lastly, an explorative study in order to establish relationships between influencing factors and interdisciplinary thinking.

A DOUBLE-HELIX MODEL FOR UNDERSTANDING THE DEVELOPMENT OF MEANING-MAKING

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ABSTRACT

In his seminal work on the intellectual and ethical development of university students, William Perry (1970) comments that organisms organise, and as human organisms, what we organise is meaning. Kegan (1982, p.11) elaborates that as human beings, the activity of *be-ing* is the activity of meaning-making. As Perry and Kegan have shown, and as research (e.g. Baxter Magolda, 1999) is currently showing, our ways of organising meaning influence how we interpret our experiences and approach tasks, such as learning

As human beings, we are evolving, and our ways of making meaning rarely remain static throughout our life span. As individuals concerned about our own learning and that of the students and/or professors with whom we work, understanding the ways in which this activity of meaning-making evolves therefore becomes crucial. Some of the following questions may help guide our thinking in this area: What is the beginning point of this development? Is there an end point? If so, what might it be? Do the stages in this process represent independent categories or hierarchical progressions? More importantly, perhaps, how can the trajectory from one stage to the next of development be explained? And, what role does affect play in the development of meaning making?

Drawing on the seminal work of Kegan (1982) in the area of Constructive-Developmentalism, as well as on concepts in philosophy, biology, and developmental psychology, I propose a double-helix model to serve as a visual guide for summarising the salient concepts involved in the developmental process of meaning-making.

THE IDEAL RESEARCH-TEACHING NEXUS ACCORDING TO ACADEMICS IN THE ARTS

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ABSTRACT

Research and teaching are two main tasks of universities; they are supposed to be closely related. Among academics the belief in a symbiotic relationship is very strong. However it is unclear how this relation should look like. Disciplinary culture and disciplinary epistemology shape the way academics perceive knowledge, research and teaching, and act in their discipline. This research project focuses on the research-teaching nexus in one specific domain; the Arts. The aim was to understand how academics' ideal research-teaching nexus looks like. What are the characteristics of an ideal nexus?

Thirty academics from the faculty of Arts of Leiden University were interviewed about their ideal research-teaching nexus. The respondents were selected using 6 different strata to capture all disciplines in the Arts. Their ideals were investigated using a visualisation assignment. Respondents were encouraged to describe how the linkage between research and teaching would look like in the ideal situation on the basis of questions like what is your most important goal, what kind of students do you have and which activities are carried out.

The first results indicate that there are some qualitatively different views on the ideal nexus, namely whether researcher's own research should be in the picture or not, on what moment students should get involved in research and what to focus on: research processes or research outcomes. Furthermore some academics emphasise the importance of being an example to students in their role as researcher. The different views will be described in detail and possible relations with disciplinary differences will be explored.

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TOWARDS A NEW PERSPECTIVE ON LEARNING IN SCIENCE CLASSROOMS

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ABSTRACT

Recent literature in the area of student science learning calls for a movement beyond constructivism, which has been increasingly recognized as an insufficient foundation to account for what and how students learn in their science classrooms (e.g. Erickson, 2001; Matthews, 1994; Solomon, 1994). In response to this call, this research project is intended to develop a theoretical perspective that extends and refines the current constructivist research programme into student science learning. To achieve this aim, a sequence of lessons on the topic of 'adaptation' in a Grade-seven Australian science classroom was examined through two theoretical lenses: Distributed Cognition and Theory of Variation. The interpretation of the recorded (and observed) interactions in this science classroom was supported by the reconstructive accounts from the video-stimulated post-lesson interviews with both the teacher and the students. While maintaining the agency of the learner as constructor of knowledge but conceiving learning as constituted in the relationship between the learners and the world (including other agents and artefacts), the synthesis of the accounts provided by the aforementioned theoretical lenses points to a more fruitful direction for understanding the nature of learning in science classrooms. It also generates some insights to inform the instructional design of science lessons and the design of learning environments that have the potential to enrich students' learning experiences in their science classrooms.