Emerging Methodologies in Educational Research

Biennial conference of the EARLI Special Interest Group 17

'Qualitative and Quantitative Approaches to Learning and Instruction'

August 17-19, 2016

Maastricht University, The Netherlands

Maastricht University

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Welcome word

Dear colleagues,

It is a great pleasure to welcome you to the 2016 Conference of the EARLI Special Interest Group 'Qualitative and Quantitative Approaches to Learning and Instruction' and to Maastricht University, Department of Educational Development, the host of the conference this year!

The theme of this year's conference is 'Emerging Methodologies in Educational Research'. This theme emphasizes the dynamic nature of both the research we conduct and its objects, learning and teaching processes. Recent societal, scientific and technological developments bring about changes also in the research methods we employ to unveil the mechanisms of learning and ways to enhance these. This year's conference provides context for a variety of studies that show how novel or emerging methods for research and analysis are being employed in different domains and contexts in which learning takes place. It offers an opportunity to learn about the new approaches employed by our peers and to reflect together of how we can engage in keeping up to date with methodological developments. The two keynotes talks by Roger Säljö and Bart Rienties are contributing to deepening our understanding of how the complexity of the phenomena we are investigating can be approached and examined through a just as sophisticated, but clarifying lenses. The invited symposium tackles the notion of emerging methodologies in relation to the use of mixed-methods and attempts to set the basis for discussion of reflection towards finding productive solutions.

Twenty-nine proposals were reviewed by the members of our international advisory board, to which we wish to extent our gratitude also with this occasion. The entries in the conference program reflect research work in which novel methods, analytical approaches and computer-assisted analysis tools are employed and generate new insights. In addition, the conference provides young researchers with the opportunity to discuss research designs and receive feedback from more experienced colleagues. You are invited to explore, reflect, and discuss insights emerging based on the conference content and activities. Not less important, we invite you to enjoy Maastricht, with its picturesque city center and cozy atmosphere, to engage in discussion and interaction with known and new colleagues!

We are looking forward to your interesting presentations and the emerging discussions, and we wish you a great conference experience!

The organizers

Conference organization

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Crina Damşa, University of Oslo, Norway (Co-chair)
Laurence Guérin, Saxion University College, The Netherlands

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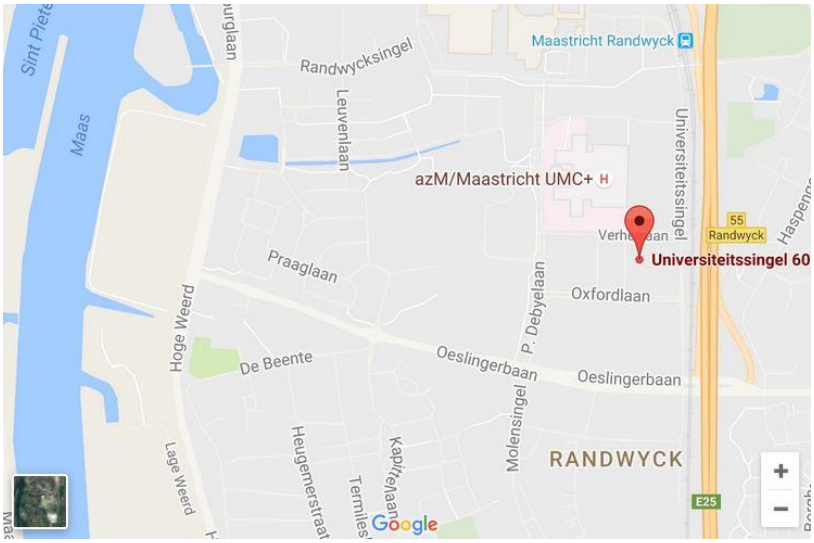
Roger Säljö, University of Gothenburg, Sweden
Judith Schoonenboom, University of Vienna, Austria
Patrick Sins, Saxion University of Applied Sciences, the Netherlands
Robbert Smit, University of Teacher Education (PHSG) St. Gallen, Switzerland
Jeroen van Merriënboer, Maastricht University, the Netherlands
Franziska Vogt, University of Teacher Education (PHSG) St. Gallen, Switzerland

Venue information

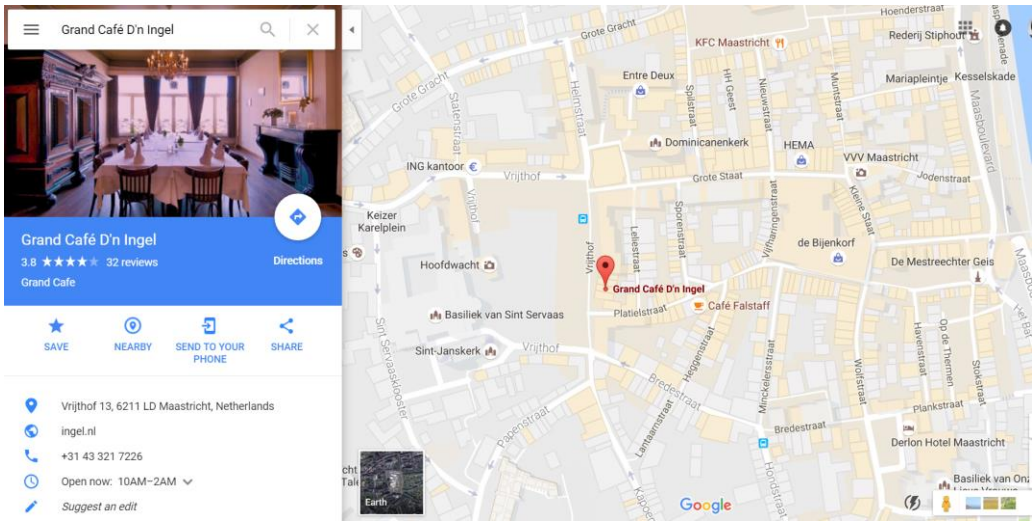
The conference and pre-conference activities will take place at the Faculty of Health, Medicine, and Life Sciences at Maastricht University, the Netherlands. The venue is located at Universiteitssingel 60, 6229 ER Maastricht, at the Department of Educational Development and Research, Campus Randwyck, in the building UNS60. Below is a map of where the conference venue (UNS60) is located.

The sessions will take place in the rooms **Co-Greepzaal M5.01, Docprofkamer N4.22, Vergaderkamer N4.32**. After entering the UNS60 building, use the elevator to the fourth floor and turn right to reach the rooms N4.22 and N4.32, or go to the fifth floor and turn left to reach the room M5.01.



Conference dinner

The conference dinner will take place on Thursday 18th of August, from 19.30 at **Grand Café D'n Ingel**, located in the old city center of Maastricht. The address is Vrijthof 13, 6211 LD Maastricht. The closest public transport stop (bus) is Vrijthof.



Conference schedule

Wednesday August 17 *Pre-conference*		**Thursday August 18**	**Friday August 19**
Parallel workshop sessions	9.00-10.30	Registration *(continues until noon)*	Paper session 3 Research Design Forum 4
	10.30-10.45	Conference opening	*Coffee break*
	10.45-12.00	Keynote 1	Keynote 2
	12.00-13.00	*Lunch break*	*Lunch break*
Parallel workshop sessions	13.00-14.30	Symposium 1 Research Design Forum 1	SIG17 Invited Symposium PechaKucha session
	14.30-14.45	*Coffee break*	*Coffee break*
	14.45-16.15	Paper session 1 Research Design Forum 2	Paper session 4 Research Design Forum 5
	16.15-16.30	*Coffee break*	
	16.30-18.00	Paper session 2 Research Design Forum 3	

Conference program

Thursday August 18, 2016

9.00-10.30	Registration (continues until noon)	
10.30-10.45	*Conference opening* Room: Co-Greepzaal M5.01	
10.45-12.00	***Keynote 1:*** **Roger Säljö, University of Gothenburg** **Learning and hybrid minds: Units of analysis in the study of human development** *Moderator: Andreas Gegenfurtner* Room: Co-Greepzaal M5.01	
12.00-13.00	*Lunch break*	
13.00-14.30	**Symposium 1** Room: Co-Greepzaal M5.01 Chair: Esther Slot	**Research Design Forum 1** Room: Docprofkamer N4.22 Chair: Dominik Froehlich
	Tracing interest development in daily life: the need for idiosyncratic and ecological methodology *Organizer: Sanne Akkerman* *Discussant: Andreas Gegenfurtner* S1.1 Measuring idiosyncratic interests and interest engagement in daily life: development and validation of an ecological momentary assessment smartphone application *Kroonenberg, Akkerman & Bakker* S1.2 Beyond the distinction between situational and individual interest *Draer, Slot, Akkerman, Bakker* S1.3 Patterns of interest engagement across multiple life domains of adolescents *Slot, Akkerman, Wubbels*	Developing visual expertise in Radiology: a longitudinal observational eye-tracking and think-aloud study *Van Geel , Kok, Gegenfurtner, Robben, Van Merriënboer* Commentators*: Koen Veermans, Judith Schoonenboom*
14.30-14.45	*Coffee break*	

	Paper session 1 Room: Co-Greepzaal M5.01 Chair: Judith Schoonenboom	**Research Design Forum 2** Room: Docprofkamer N4.22 Chair: Karen Könings
14.45-16.15	P1.1 Determinants of Social Interaction during Organizational Innovation Processes: A Social Network Analysis *Froehlich, Messmann* P1.2 Financial literacy of first-time homebuyers– what do potential customers learn from online information provided by banks *Fürstenau, Hommel, Leopold, Ponce, López* P1.3 Homophily and feedback-seeking in the workplace: A social network analysis *Frieling, Froehlich*	Adaptive scaffolding to enhance self-regulated learning in problem-based learning *Rovers, Clareabout, Winne, Van Merriënboer, Savelberg* Commentators: *Patrick Sins, Hanni Muukkonen*
16.15-16.30	*Coffee break*	
16.30-18.00	**Paper session 2** Room: Co-Greepzaal M5.01 Chair: Ellen Kok	**Research Design Forum 3** Room: Docprofkamer N4.22 Chair: Andreas Gegenfurtner
	P2.1 A multi-level longitudinal analysis of 80,000 online learners: : Affective-Behaviour-Cognition models of learning gains *Rogate, Rientjes, Whitelock, Cross, Littlejohn* P2.2 Effects of Metacognitive Checklists on Self-Regulated Learning Skills *Leppink, Gog, Kester, Paas, Chandler, Van Merriënboer* P2.3 Validating the Contextual Knowledge Practices Questionnaire: Considering the variation between course practices and learning outcomes *Muukkonen, Lakkala, Ilomaki, Lahti, Toom* P2.4 Work in Progress: Towards a Progression Model of Competence-Based Employability *Froehlich, Liu, Van der Heijden*	Meaning-Making and Participation in Digital Cultural Heritage: User Perspectives and Youth Engagement *Emily Oswald* Commentators: *Eric Sanchez, Crina Damşa*

Friday August 19, 2016

9.00-10.30	**Paper session 3** Room: Co-Greepzaal M5.01 Chair: Hanni Muukkonen	**Research Design Forum 4** Room: Docprofkamer N4.22 Chair: Crina Damşa
	P3.1 Some Reflections on the Use of Structured Equation Modeling in Education *Veermans, Topalli, Jaakkola* P3.2 The "good enough"-principle: How a study's action goal can be used to determine the required quality of the description and generalization in multi-method and mixed methods inquiry *Schoonenboom* P3.3 Challenges in Studying Visual Expertise in Medical Image Diagnosis *Gegenfurtner, Kok, Van Geel, Bruin, Jarodzka*	Scientific citizenship *Laurence Guérin* Commentators: *Klas Karlgren, Robbert Smit*
10.30-10.45	*Coffee break*	
10.45-12.00	***Keynote 2* Bart Rienties, UK Open University** **The power of learning analytics: a need to move towards new methodologies in education?** *Moderator: Patrick Sins*	
12.00-13.00	*Lunch break*	
13:00-14:30	**SIG17 Invited Symposium** Room: Co-Greepzaal M5.01 Chair: Patrick Sins	**Pecha Kucha session** Room: Docprofkamer N4.22 Chair: Andreas Gegenfurtner
	S2. Reflections on the use of mixed-methods in educational research *Organizer: Patrick Sins* *Discussant: Roger Säljö*	PK1 School Self-Concept: its Role in Learning and Teaching, Practical Implication and Measurement Considerations *Bakadorova* PK2 Teacher's proactive feedback-seeking and flourishing:

	S2.1 Ingredients for mixing methods in educational research *Sins* S2.2 Classifying existing mixed methods studies: it makes a difference! *Schoonenboom* S2.3 Using a novel language analysis tool for quantitative-qualitative analysis of transcripts *Karlgren*	Applicability of PLS-SEM in the context of a case-study *Froehlich, Harwood* PK3 Neural correlates of expertise in real-life tasks: Achieving ecological validity in fMRI research *Kok, De Bruin, Heyligers, Gegenfurtner, Robben, Van Geel, Sorger, Dolmans, Van Merriënboer*
14.30-14.45	*Coffee break*	
14.45-16.15	**Paper session 4** Room: Co-Greepzaal M5.01 Chair: Crina Damşa	**Research Design Forum 5** Room: Docprofkamer N4.22 Chair: Laurence Guérin
	P4.1 What are the effects of lesson preparation in peers? – Analysis of attitudes and knowledge with the help of an Actor-Partner Independence Model *Smit* P4.2 Learners' dynamics of lived experience. An application of the course-of-action method in a teacher education program *Dieumegard, Nicolas* P4.3 Characterizing Social Engagement in a Digital Role-Playing Game. A Case Study Based on Learning Analytics *Sanchez* P4.4 Learning across contexts. Analytical considerations *Damşa, Rasmussen*	Learning for the fourth industrial revolution *Froehlich, Covarrubias-Venegas* Commentators: *Andreas Gegenfurtner*, *Bart Rienties*

Pre-conference program
Wednesday August 17

Workshop 1: Integration in Mixed Methods Research
Time: 9.00-12.00

Room: N 4.22

Workshop focus: This workshop aims at fostering reflection, based on participants' own research experiences, on what makes integration of outcomes of qualitative and quantitative inquiry difficult, and understanding several types of integration. This will open up possibilities for participants to think of strategies they can pursue when confronted with qualitative and quantitative results. The workshop will also provide a number of tools and concepts that are useful in preparing integration of methods.

Workshop leader: Judith Schoonenboom
Judith is a Professor in Empirical Pedagogy at the University of Vienna, Austria. She conducts educational research with a focus on higher education and is specialized in mixed methods.

Workshop 2: Social Network Analysis: An Introduction
Time: 13.00-16.00

Room: N.432

Workshop focus:
This workshop will address the foundations of social network analysis. You will get an overview over the current methods that are used in this field and what kind of questions you could explore.
Please bring your own laptops (any Operating System), as we will also take a brief look into Gephi–an open source software for social network analysis and visualization. Please download it before the workshop (http://gephi.org/).

Workshop leader: Dominik E. Fröhlich
Dominik is a post-doctoral researcher at Maastricht University, School of Business and Economics, and researcher at the Institute for Industrial Economics in Vienna. In my research, I mostly focus on networks of informal learning from others (e.g., feedback-seeking networks) and how this translates into various learning outcomes such as employability.

Workshop 3: Analysis of Interaction Data and Strategies for Working with Video-data
Time: 13.00-16.00

Room: N.422

Workshop focus: The workshop mainly aims at offering insights into, discussing and working with strategies for analyzing data that capture learners' participation in verbal interaction and collaborative learning activities, such as team or project work. Main aspects addressed in the workshop will be: preparing interaction and video data for analysis; analysis of verbal interaction through interaction analysis; ways of using analytic software. Participants are encouraged to bring in their own data, to be used in the hands-on activities.

Workshop leader: Crina Damşa
Crina is a postdoctoral researcher at the University of Oslo. Her research focuses mainly on learning processes in higher education. She perform research that involves complex data and in-depth analyses, and employs primarily qualitative analysis of interaction, textual or visual data.

Workshop 4: Use and Misuse of Statistics

Time: 13.00-16.00

Room**:** M.4.08

Workshop focus: In this workshop, there will first be attention for the problems itself. What questionable research practices are out there, and how are they related to some basis statistical techniques? In the latter step, there will be attention for some more technical and philosophical aspects of these techniques, but no statistical knowledge beyond bachelor level in the social sciences is required. Also, some elementary but common statistical misconceptions are discussed. Subsequently, participants will search in published articles whether misinterpretation or questionable research practices can be distinguished. In the third part of the workshop, the implications and possibilities for change for researchers early in their careers are discussed. Are there alternatives in the first place? Could these alternatives hamper the careers of those using them? Are young researchers just bystanders in the scientific machinery, or can they contribute substantially to a way out of this so-called crisis?

Workshop leader: Rink Hoekstra is an assistant professor at the GION education/research institute at the university of Groningen. He is interested in researchers' use and interpretation of frequently used statistical techniques. His studies show that even basic techniques are often misunderstood. Arguably more worrying, it seems that the scientific community accepts and sometimes even endorses these misinterpretations, by often emphasizing the importance of the quantity of published papers, and by its pressure on novel outcomes.

Thursday, August 18

Keynote 1

Learning and hybrid minds: Units of analysis in the study of human development

Roger Säljö

University of Gothenburg, *Sweden*

roger.saljo@ped.gu.se

Room: Co-Greepzaal M5.01

Time: Thursday, August 18, 2016, 10.45-12.00

Moderator*: Andreas Gegenfurtner*

Abstract

All research presupposes some kind of reductionism. The world and the phenomena scholars study cannot be captured in their complexity. Important elements in scholarly reductionism concern the adoption of a theoretical perspective and the choice of method(s). Through such transformations phenomena such as learning, cognition, teaching etc. are converted from their everyday interpretations to more specified conceptual constructions that coincide with the presuppositions of analytical frameworks adopted. A consequence of such reductionism is that the findings have to be re-translated, as it were, to their more everyday interpretations for the results to be meaningful, for instance to users of research results and the contexts in which they operate.

In the behavioural sciences, and very much in the study of cognition, there is strong tradition of limiting the inquiries to what is construed as a fixed cognitive apparatus or a given set of capacities of the individual. This implies that the unit of analysis refers to phenomena that allegedly take place in the mind/brain of a person, and/or that form part her/his personality. In recent decades, there has been an increasing interest in studying learning and cognition as they form part of everyday practices in a diverse range of settings (the workplace, at home, in classrooms, during leisure activities etc.). In such situated interpretations of learning and cognition, the idea of a mind that may be separated from the practice, and its affordances such as other people and technologies, is difficult – even impossible – to uphold. An alternative is to construe human mindful practices in relational terms and

as accomplished through interaction with other people and with the environment. In such research approaches, thus, the unit of analysis, and the research methods used, has to reflect the hybrid nature of the human mind.

Biography

Roger is professor of education and educational psychology at the Department of Education, University of Gothenburg, Sweden. Between 1983 and 1997 he served as professor of the behavioural sciences at the Department (Graduate school) of Communication Studies, Linköping University, Sweden. Roger is Director of LinCS, The Linnaeus Centre for Research on Learning, Interaction and Mediated Communication in Contemporary Society. Roger was President of the European Association of Research on Learning and Instruction and now serves as Co-Editor of Learning, Culture and Social Interaction.

Keynote 2

The power of learning analytics: a need to move towards new methodologies in education?

Bart Rienties

Open University, UK

bart.rienties@ou.ac.uk

Room: Co-Greepzaal M5.01

Time: Friday, August 19, 2016, 10.45-12.00

Session Chair: Patrick Sins

Abstract

Across the globe many institutions and organisations have high hopes that learning analytics can play a major role in helping their organisations remain fit-for-purpose, flexible, and innovative. According to Tempelaar, Rienties, and Giesbers (2015, p. 158) "a broad goal of learning analytics is to apply the outcomes of analysing data gathered by monitoring and measuring the learning process". Learning analytics applications in education are expected to provide institutions with opportunities to support learner progression, but more importantly in the near future provide personalised, rich learning on a large scale (Rienties, Cross, & Zdrahal, 2016; Tempelaar et al., 2015; Tobarra, Robles-Gómez, Ros, Hernández, & Caminero, 2014). Increased availability of large datasets (Arbaugh, 2014), powerful analytics engines (Tobarra et al., 2014), and skilfully designed visualisations of analytics results (González-Torres, García-Peñalvo, & Therón, 2013) mean that institutions may now be able to use the experience of the past to create supportive, insightful models of primary (and even real-time) learning processes (Arnold & Pistilli, 2012; Ferguson & Buckingham Shum, 2012; Papamitsiou & Economides, 2014). Substantial progress in learning analytics research relating to identifying at-risk students has been made in the last few years using a range of advanced computational techniques (e.g., Bayesian modelling, cluster analysis, natural language processing, machine learning, predictive modelling, social network analysis). In this EARLI SIG17 keynote, I will argue that one of the largest challenges for learning analytics and wider educational research still lies ahead of us, and that one substantial and immediate

challenge is how to put the power of learning analytics into the hands of researchers, teachers and administrators. While an increasing body of literature has become available regarding how institutions have experimented with small-scale interventions (Papamitsiou & Economides, 2014), to the best of our knowledge no comprehensive conceptual model, nested within a strong evidence-base, is available that describes how researchers, teachers and administrators can use learning analytics to make successful interventions in their own practice. In this keynote, I will use the development of a foundation of an Analytics4Action Evaluation Framework (A4AEF) that is being currently tested and validated at the largest university in Europe (in terms of enrolled learners), namely the UK Open University (OU, Calvert, 2014), as an example of the complexity of different, interlinked methodological and conceptual approaches.

Biography

Bart Rienties is a Reader in Learning Analytics at the Institute of Educational Technology at the Open University UK. He is programme director Learning Analytics within IET and Chair of Analytics4Action project, which focuses on evidence-based research on interventions on OU modules to enhance student experience. As educational psychologist, he conducts multi-disciplinary research on work-based and collaborative learning environments and focuses on the role of social interaction in learning, which is published in leading academic journals and books. His primary research interests are focussed on Learning Analytics, Computer-Supported Collaborative Learning, and the role of motivation in learning. Furthermore, Bart is interested in broader internationalisation aspects of higher education. He successfully led a range of institutional/national/European projects and received several awards for his educational innovation projects.

Symposium 1

Room: Co-Greepzaal M5.01

Organizer*: Sanne Akkerman*

Chair: *Esther Slot*

Discussant*: Andreas Gegenfurtner*

S1: Tracing interest development in daily life: the need for idiosyncratic and ecological methodology

Symposium abstract

Given the significant role of interest for learning and development, scholars have long been concerned with understanding the way interests develop (Dewey, 1903; Renninger & Hidi, 2015). Despite its long tradition, interest research has been limited in its scope and methodology. So far, research focused mostly on the development of a specific interest in a specific context, often concerning an 'intended' interest (i.e., in mathematics) in an observed classroom setting (i.e., the mathematics classroom).

Due to this focus, there is little insight into the way interests develop naturally during daily life and over time. This is noteworthy, as an interest is highly personal, dependent on multiple goal pursuits (Hofer, 2010), potentially triggered and pursued in out-of-school activities (at home, with peers, online, during leisure) as much as in formal settings (e.g., Barron, 2006, Zimmerman, 2012). We pertain that there is a great need for research on interest development in its ecological and idiosyncratic form. Such research, however, also requires new methodologies able to capture daily life interest engagement of individuals.

This project symposium aims to present the first methodological steps and outcomes towards a new theoretical direction in interest research. The first paper addresses the validation of a newly developed smartphone application called *inTin*. We developed this as a so-called Ecological Momentary Assessment (EMA) instrument by means of which students keep track of their interest engagements during the day. Building on recent suggestions for validation techniques, we investigated to what extent the EMA instrument allows young students to make grounded, complete and relevant daily-life reports of their interest engagements. The second paper addresses the validation of various semantic scales to measure the developmental state of an interest. Development of interest is currently theorized as a linear process ranging from an initial momentary or "situated interest" to a longer term hold or "individual interest" (e.g., the four-phase model). Our new instrument and data allow us to investigate to what extent a linear categorical distinction of developmental states can be made. Relying on the EMA instrument validated in papers 1 and 2, the

third paper presentation reports an empirical study of interest engagements of 50 students, discussing the way in which we analyse continuity of interest engagement across in and out-of-school contexts, using social network measures. On the basis of the studies presented, we propose that interest theory would gain from taking a person perspective, that is, considering a persons' interests in whatever object and following interest development wherever and whenever it takes place.

Presentations in the symposium

S1.1 Measuring idiosyncratic interests and interest engagement in daily life: development and validation of an ecological momentary assessment smartphone application

Millitza Kroonenberg, Sanne Akkerman, & Arthur Bakker

Utrecht University, the Netherlands

Abstract

The aforementioned smartphone application, inTin, aiming at measuring interests in daily life was validated in a qualitative study. This newly developed tool combines more traditional questionnaire methods and ecological momentary assessment to collect more complete and rich data on interests and interest engagement in a social context. Participants self-report their interests and significant contacts, along with a valuation of their perceived importance at the start of the study. During participation, inTin is filled out every two hours to collect data on actual interest engagement in the social context. During data collection participants are encouraged to provide extra notes on interest engagement during the interval.

Validation of inTin focused on three aspects of participants´ reports of interests, interest engagement, and social context. First, groundedness of responses was assessed: is the reported response tied to everyday reality? For example, do reported interests refer to a topic or activity in which the participant engaged? Second, it was assessed if responses were complete: are all interest engagements within an interval reported, or are interests and contacts from diverse contexts reported? Third, the alignment with the relevant research goal was studied: Are reported contacts also significant as was asked for, are reported interests also interests in its scientific definition, and are valuations given by the participants also related to perceived importance?

Twenty students from three groups in secondary education (grade 8 prevocational, grades 8 and 9 general education) participated in this study. Participants filled out inTin for 2 consecutive days, yielding data on interests, interest engagement, and social context. This data was used as input for the interviews. All participants were interviewed about a specific interval of data collection, all reported data, and their evaluation of the instrument and items. Both inTin and interview data were

combined to assess completeness of responses, groundedness in reality, and alignment with the research goal.

The results show that all participants were able to use inTin in a satisfying way. All collected data were grounded in reality, and nearly all reported interests, contacts, and valuations were aligned with the research goal. Nonetheless, especially participants in grade 8 indicated that participation required a lot of effort and suffered from memory problems due to a high momentary engagement. Data from this group are therefore far from complete, but do present an accurate sample of interests and interests engagement in daily life. Participants in grade 9 generally met all aspects of validation.

Based on this study, inTin could be well used by participants in grade 8 and 9 of secondary education. When analyzing the inTin data, it should be considered that especially participants in the lower grade tend to be incomplete in data report. This study has indicated that memory loss and strong momentary attendance are threats to completeness of the data. The idiosyncratic data should always be analyzed partly qualitatively, combining information from the direct reports and the notes.

S1.2 Beyond the distinction between situational and individual interest

Jael Draer, Esther Slot, Sanne F. Akkerman, Arthur Bakker

Utrecht University, the Netherlands

Abstract

Both situational interest and individual interest are terms that have been used extensively in interest research. Situational interest is described as a temporary interest that arises because of certain conditions and/or objects in the direct environment (Krapp, Hidi & Renninger, 1992). Individual interest is described as a relatively stable form of interest which is specific to a certain individual and oriented towards a specific domain (Schiefele, 1999). Krapp (2002) developed a developmental model, proposing that situational interests developed into individual interests over time. He identified three phases by separating situational interests into newly occurring situational interests and stabilized situational interests. Hidi and Renninger (2006) subsequently modified the three-phase model into a four-phase model. They identified the following phases: triggered situational interest, maintained situational interest, emerging individual interest, and well-developed individual interest. The current study uses data from an Ecological Momentary Assessment (EMA) instrument called InTin to empirically determine the developmental structure of interests. This method is especially fit to investigate interests across all contexts and in all varieties and it provides a thorough overview of all interests that a participant experiences.We used InTin to gather information on all the interests that 95 Dutch high school students aged 13-15 experienced for two consecutive weeks in November 2015 and February 2016. Participants filled out the mobile application approximately six times a day and were asked to rate each new interest on six semantic scales: novelty (old – new),

value (low – high), trigger (internal – external), frequency (rarely – often), flow (not absorbed in – absorbed in), and expertise (novice-level – expert-level). The data that was gathered in November 2015 was used to determine the developmental phases using multilevel latent profile analysis (MLPA) and the data gathered in February 2016 was used to investigate transitions of interests between the phases using multilevel latent transition analysis (MLTA).

The results of the MLPA will indicate that either a two-, three-, four- or five-phase model fits the data, or that none of these models fit the data which would indicate a more continuous developmental model without clearly indicated phases. Furthermore the results will indicate which of the six semantic scales can be used to make the distinction between individual and situational interests. The outcomes of the MLTA will show in what quantity interests transition from one developmental phase to the other.

The results of this study make a new contribution to literature by providing empirical support of the developmental structure of interests across all contexts and domains. Educational programs can use the results of this study to encourage the development of interest.

S1.3 Patterns of interest engagement across multiple life domains of adolescents

Esther Slot, Sanne Akkerman, Theo Wubbels

Utrecht University, the Netherlands

Abstract

Interests develop out of ongoing processes between persons and objects in social and material contexts (Krapp, 2002). An object can refer to concrete artefacts, a topic, event, subject-matter or an abstract idea. Such interests can develop in many different life domains, for adolescents including school, home, peer/leisure practices (Azevedo, 2013). There are indications that interests, especially when more developed over time, can also extend the initial formal or informal context in which the interest once emerged (Barron et al., 2006; Crowley et al., 2015). Despite these indications, systematic research on this kind of continuity across contexts is lacking.

This study used social network principles to investigate the level of interaction between home, school and peer networks in terms of interest engagement. Our aim was to deduct patterns of continuity across adolescent life spaces, taking into account the type of interest (e.g. high or low personal value, intrinsic or extrinsically motivated). We gathered extensive idiosyncratic data on the ego-networks of 50 students and the interests that are shared in their networks. A 'betweenness' measure was calculated in order to describe the continuity of interest engagement in the adolescent ego networks. Results direct towards highly different patterns of interest engagement, illustrating the power of a person-centered approach to research interest engagement in adolescents. Detailed information will be provided on how social network principles were applied in this study.

Research Design Forum 1

Room: Docprofkamer N4.22

Chair: Dominik E. Froehlich

Commentators*: Koen Veermans, Judith Schoonenboom*

RDF1: Developing visual expertise in Radiology: a longitudinal observational eye-tracking and think-aloud study

Koos van Geel, MD[1] , Ellen M. Kok, PhD[2] , Andreas Gegenfürtner, PhD[2] , Simon G.F. Robben, MD, PhD[1] , Jeroen J.G. van Merriënboer, PhD[2]

[1] Department of Radiology, Maastricht University Medical Center
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Abstract

Research on visual expertise in radiology has found distinct differences between beginners and experts evaluating medical images: Experts have superior skills in detection and interpretation of abnormalities, are faster and view a smaller proportion of the image. However, all previous studies used a between-group methodology. How and when detection skills and eye movements evolve throughout training is yet to be elucidated. Furthermore, it is yet unknown if there is an interaction between eye movements and detection throughout radiology training. In this longitudinal, prospective eye-tracking study with first-year radiology residents the changes in evaluation skills and eye movements are investigated. 30 first-year radiology residents from the southern of Netherlands will be longitudinally followed for one year. All participants have a baseline observation in which they evaluate 30 chest radiographs and 2 chest CT-scans at the start of their training. Throughout this observation detection of abnormalities (sensitivity, specificity), eye-tracking data (time to first fixation, fixation duration, saccade length) and think-aloud data as measure of interpretation are acquired. During various intervals in their first year of training the residents participate in 10 follow-up observations. Consequently, data will be analyzed using multi-level statistical models.

Paper session 1

Room: Co-Greepzaal M5.01

Chair: Judith Schoonenboom

P1.1 Determinants of Social Interaction during Organizational Innovation Processes: A Social Network Analysis

Dominik E. Froehlich, Maastricht University, The Netherlands

Gerhard Messmann, University of Regensburg, Germany

Abstract

The need of employees at all levels to contribute to the generation, promotion, and realization of innovative ideas has lead to extensive research about employees' innovative work behavior. While it has been argued that innovative work behavior contains a substantial sociopolitical dimension, the social processes at work during the generation, promotion, and realization of innovative ideas have received little attention so far. In this study, we contribute to the field of innovative work behavior by exploring the determinants for choosing interaction partners during the innovation process. We argue that employees' decisions are largely influenced by their general patterns of social interactions and homophily.

In this exploratory study, we investigate 1,038 dyadic relationships between employees of five complete networks of organizations or organizational units using social network analysis methodology. After analyzing each network on its own, we combine the results in a meta-analysis. The results show first evidence for our arguments. We contribute to the literature by emphasizing the social side of innovative work behavior in groups of employees. Based on this insight, attention can then be drawn to factors which play a role in the decision to engage in social interactions during processes of innovation development.

P1.2 Financial literacy of first-time homebuyers– what do potential customers learn from online information provided by banks

Bärbel Fürstenau, Mandy Hommel, Claudia Leopold, Héctor Ponce, Mario López

University of Technology, Dresden, Germany

Abstract

Financial literacy has become increasingly important for citizens. However, financial products, such as mortgages are complex, difficult to comprehend, and have long-term consequences for individual's financial situation. In order to avoid wrong decisions, potential first-time homebuyers often consult the internet. Therefore, it is necessary to analyse whether information provided online can support learning and decision making.

In a first study we analysed the quality of information provided online by German banks by means of a content analysis. In a second study, we analysed the learning potential of two banks' webpages differing in quality of information. Eighty-one students took part in the study. They were randomly assigned to one of two experimental groups and a control group. All students answered behavioural questions, then surveyed the webpages and took a retention and transfer test afterwards.

Results of the first study show remarkable differences in quality of information between banks. Results of the second study do not show significant differences between the groups so that quality of information given does not seem to be crucial for learning. We can cautiously conclude that banks' online information is only partly suitable for fostering financial literacy about mortgages.

P1.3 Homophily and feedback-seeking in the workplace: A social network analysis

Madeline Frieling & Dominik Froehlich

Maastricht University, The Netherlands

Abstract

Feedback-seeking is an important way for employees to learn. However, previous research indicated that homophily, the tendency of individuals to connect to similar others, might lead to the development of a sub-optimal feedback-seeking network. In this exploratory study, we attempt to find out whether similar demographic attributes and similar feedback preferences influence the feedback-seeking frequency and the perceived feedback usefulness of employees. Furthermore, we test whether a team-building intervention offered by a professional trainer may help to decrease such effects. We investigated 110 feedback-seeking relationships in a small Dutch company by using the Multicollinerarity Robust Quadric Assignment Procedure (MRQAP) to test the developed hypotheses. The results indicate that homophily does influence the feedback-seeking relationships of that network of colleagues. We also tested whether an intervention in the form of a team-building workshop may decrease the influence that homophily has and found weak empirical evidence for this.

Research Design Forum 2

Room: Docprofkamer N4.22

Chair: Karen Könings

Commentators: *Patrick Sins, Hanni Muukkonen*

RDF 2: Adaptive scaffolding to enhance self-regulated learning in problem-based learning

Sanne Rovers[1]*, *Geraldine Clarebout*[1], *Philip Winne*[2], *Jeroen van Merriënboer*[1], *Hans Savelberg*[1]

[1] *Maastricht University, The Netherlands*
[2] *Simon Fraser University, Canada*

Abstract

After having successfully been applied for decades at several universities across the world, the effectiveness of problem-based learning seems to be diminishing. A possible explanation for this could be ineffective self-study among students, which may be caused by a lack of self-regulation skills in combination with the vast increase in learning resources available to students.

Similar to tool use patterns that have been found in research, we want to analyze students' activity in an online learning environment in order to detect self-regulation patterns. In particular, we are interested in how these patterns are related to self-regulated learning in the self-study phase in PBL and whether these patterns can be influenced by providing adaptive scaffolding, in which scaffolding is adjusted to a leaner's individual needs.

In a first study the self-regulation patterns will be identified in Biomedical sciences students from all three bachelor years. In a second study about 150 first-year Biomedical science students will be randomly allocated to one of three conditions: adaptive scaffolding, fixed scaffolding and no scaffolding. It is hypothesized that students receiving adaptive scaffolding will exhibit significantly more self-regulated learning strategies than students receiving fixed or no scaffolding, and hence this condition will result in a more effective self-study phase. We further hypothesize that there are no differences between those students receiving fixed scaffolding and those receiving no scaffolding. We are trying to find an innovative way of measuring and scaffolding self-regulated learning by using a new software program called Study to collect trace data (Winne et al., 2015).

Paper session 2

Room: Co-Greepzaal M5.01

Chair: Ellen Kok

P2.1 A multi-level longitudinal analysis of 80,000 online learners: Affective-Behaviour-Cognition models of learning gains

Jekaterina Rogaten, Bart Rienties, Denise Whitelock, Simon J. Cross and Allison Littlejohn

Open University, UK

Abstract

One of the challenges facing higher education is understanding what counts for an excellent educational outcome. Historically academic performance was a variable of choice for measuring 'excellence' in education, but more recently a concept of learning gain, which can be defined as change in knowledge, skills and personal development across time (e.g., Andrews et al., 2011; Boyas et al., 2012) gained momentum. Educational research also mainly looked at cognitive gain largely ignoring affective changes (attitude) and behaviour (Tempelaar et al., 2015a). Current research aims to address this gap by developing and testing an Affective-BehaviourCognition model of learning gains using longitudinal multilevel modelling. The learner-generated affective-behaviour-cognition data was retrieved from university database for 80,000+ undergraduate students who started their degree in autumn 2013/14. The preliminary multilevel modelling revealed that cognitive and behaviour learning gains are well explained by the hypothesised Affective-Behaviour-Cognition model, whereas the more complex affective learning gains model needs further refinement. The main strength of this research is that approach used is a practical and scalable solution that could be used by teachers, learners, higher education institutions and the sector as a whole in facilitating students' learning gains by further improving and personalising provision of higher education.

P2.2 Effects of Metacognitive Checklists on Self-Regulated Learning Skills

Jimmie Leppink [1], Tamara van Gog [2, 3], Liesbeth Kester [2, 4], Fred Paas [3, 5], Paul Chandler [5], & Jeroen J. G. Van Merriënboer [1, 4]

[1] *School of Health Professions Education, Maastricht University, the Netherlands*
[2] *Faculty of Social Sciences, Utrecht University, the Netherlands*
[3] *Faculty of Social Sciences, Erasmus University Rotterdam, the Netherlands*
[4] *Welten Institute, Open University, the Netherlands*
[5] *Faculty of Social Sciences, University of Wollongong, Australia*

Abstract

Self-assessment and learning-task selection are key self-regulated learning (SRL) skills. However, high school and higher education students appear to hardly use SRL-skills and when they do engage in self-assessment and/or task selection they are often inaccurate. We investigated in a randomized controlled experiment with N = 230 bachelor students whether self-assessment prompts and/or performance feedback can improve SRL accuracy to some extent. In short, self-assessment prompts tend to result in somewhat more accurate choices of task complexity, whereas performance feedback appears to make choices with regard to instructional support slightly more accurate.

P2.3 Validating the Contextual Knowledge Practices Questionnaire: Considering the variation between course practices and learning outcomes

Hanni Muukkonen, Pekka Lahti-Nuuttila, Minna Lakkala, Auli Toom, & Liisa Ilomäki

University of Helsinki, Finland

Abstract

The definitions of generic competences have focused on critical and analytical thinking, problem-solving, self-management of learning, interpersonal and communication skills, and information literacy (e.g., OECD, 2013; Strijbos et al., 2015; Hyytinen et al., 2015). Prior case studies have suggested that there are collective dimensions of generic competences to be explored further (e.g., Muukkonen & Lakkala, 2009), and a need to design instruments for their measurement (Shavelson, 2010). We developed a questionnaire on Contextual Knowledge Practices (CKP), theoretically based on the knowledge creation metaphor of learning (Paavola & Hakkarainen, 2005). It frames knowledge work competences as object-bound collaboration, integrating individual and collaborative working, feedback, persistent development of knowledge objects, understanding various disciplines and practices, interdisciplinary collaboration, and exploiting technology. Courses in two domains (media-engineering and life sciences) were compared to study 1) the invariance of the questionnaire structure and loadings via Exploratory Structural Equation Modeling (ESEM), and 2) to address the relationship between students' selfevaluated competence-development and the observed pedagogical practices of the courses. The results explicate the methodological challenges with coping with the nested structure of student responses (individual, course, domain). Further, the results evidenced how the pedagogical practices had an explicit impact on the competence-development students reported.

P2.4 Work in Progress: Towards a Progression Model of Competence-Based Employability

Dominik E. Froehlich, Maastricht University, The Netherlands
Mingyang Liu, Univeristy of Toledo, Spain
Beate van der Heijden, Radboud University Nijmegen, The Netherlands

Abstract

The increasing prevalence of inter-organizational careers makes employability a key-concept of human resource management. Past research has explored this concept and found that it is a composite of five competences: occupational expertise, anticipation and optimization, personal flexibility, corporate sense, and balance. However, previously used methods did not improve our understanding how these competences are related to each other. We performed a Rasch analysis of Van der Heijde and Van der Heijden's (2006) seminal employability scale to investigate the psychometric properties of the scale based on a dataset of 167 Austrian employees. The results suggest that there is a pattern of how the five competences of Van der Heijde and Van der Heijden's (2006) employability scale vary in difficulty: The competences do not stand next to each other in parallel, but rather build on each other.

This has important implications for the advice we give to employees and managers. While it might be a good advice for an inexperienced employee to build technical skills, employees farther in their career may be ill advised to so. For them, topics like adaptability, balance, and, eventually, influence, are more important.

Research Design Forum 3

Room: Docprofkamer N4.22

Chair: Andreas Gegenfurtner

Commentators: *Eric Sanchez, Crina Damşa*

RDF3: Meaning-Making and Participation in Digital Cultural Heritage: User Perspectives and Youth Engagement

Emily Oswald

University of Oslo, Norway

Abstract

Digital technologies are mediating the relationship between museums and archives and their audiences in new ways, with implications for both institutions and users. This project empirically explores user participation and engagement at cultural institutions. The aim of the research is to study participation and motivation from users' perspectives, and to examine the role of technology in shaping new models of participation in knowledge practices in cultural institutions. The research design is planned around case studies at a university natural history museum (Case 1) and a national folklore archive (Case 2). The cases include differing levels of existing participatory activities and allow for consideration of participation in digital cultural heritage across disciplines, institutions, and types of users. Methods will include interviews, virtual ethnography, and research-based design interventions, as well as surveys. The research will be conducted during a four-year PhD fellowship (2016-2020) in the Department of Education at the University of Oslo, and is part of the nationally financed research project, "Cultural Heritage Mediascapes: Innovation in Knowledge and Mediation Practices."

Friday, August 19

Paper session 3

Room: Co-Greepzaal M5.01

Chair: Hanni Muukkonen

P3.1 Some Reflections on the use of Structured Equation Modeling in Education

Koen Veermans[123], Pamela-Zoe Topalli[23] & Tomi Jaakkola[23]

[1] *Turku Institute for Advanced Studies*
[2] *Department of Teacher Education*
[3] *Center for Learning Research*
[4] *University of Turku, Finland*

Abstract

In recent years there has been a continuous increase of the use of Structural Equation Modeling (from here on SEM) in Educational Science. However, there are also some concerns that may be worth considering when constructing or interpreting SEM models. The paper touches on some of these concerns and proposes some directions. The concerns relate to model fit (what does model fit mean), the notion that SEM takes all data into account in modeling which relates to concerns about overfitting and concerns about the relation between indicators and models, and to concerns about the relation between the method and the type of data that is predominantly used. It is suggested that educational science and SEM proponents would benefit from more emphasis on conceptual understanding of SEM models (how do models and theory relate), adopting a fit and validation approach, and clarifying the relation between theory (theoretically SEM is theory driven) and practice (SEM use is quite often data driven). A special role in this process should be taken up by journals and reviewers. They should require authors to explain each decision point from a theoretical perspective before pointing out any fit related information.

P3.2 The "good enough"-principle: How a study's action goal can be used to determine the required quality of the description and generalization in multi-method and mixed methods inquiry

Judith Schoonenboom
University of Vienna, Austria

Theoretical framework

In the mixed methods literature, validity criteria are commonly formulated as criteria with which an inquiry should fully comply. The idea that validity might be a matter of degree, and consequently, that validity involves a comparative assessment, is not often encountered (but see Morse & Niehaus, 2009). Conversely, in the practice of mixed methods research, efficiency, and thus the degree to which one should obey validity criteria, plays an important role. Mixed methods can be used to strengthen a study, and strengthening is a process that in principle may continue forever. The *good enough* principle, described in this paper, is meant to put this process to an end in the practice of research.

The good enough principle applies to research that has an action goal at the level of the group. In common research jargon, the principle applies to intervention research or research that might form the basis of an intervention in the near or distant future. In addition to the action goal, which is a goal *of* research, I distinguish two goals *within* research, namely description and generalization, the joint result of which is labelled the "generalized description." In this type of inquiry "The generalized description should be good enough for the underlying action goal." In this paper presentation, I explain how this principle functions, and I demonstrate the principle using several examples from research in practice.

P3.3 Challenges in Studying Visual Expertise in Medical Image Diagnosis

Andreas Gegenfurtner, Ellen Kok, Koos van Geel, Anique de Bruin, and Halszka Jarodzka
Maastricht University, the Netherlands

Abstract

Visual expertise is the superior visual skill shown when executing domain-specific visual tasks. In the context of this presentation, we focus on the visual skill of medical image diagnosis and, more specifically, on the methodological setups routinely used in visual expertise research. We offer a critique of this method routine and propose three challenges for future research.

The first challenge addresses theory development. Novel prospects in modeling visual expertise can emerge when we reflect on cognitive and sociocultural epistemologies in visual expertise research; when we engage in statistical validations of existing theoretical assumptions; and include social and

sociocultural processes in expertise development.

The second challenge addresses the recording and analysis of longitudinal data. If we assume that the development of expertise is a long-term phenomenon, then it follows that future research can engage in advanced statistical modeling of longitudinal expertise data that extends the routine use of cross-sectional material through, for example, animations and dynamic visualizations of developmental data.

The third challenge addresses the combination of methods. Alternatives to current method practices can integrate qualitative and quantitative approaches in mixed method designs; embrace relevant yet underused data sources; and understand the need for multidisciplinary research teams.

Research Design Forum 4

Room: Docprofkamer N4.22

Chair: Crina Damşa

Commentators: *Klas Karlgren, Robbert Smit*

RDF4: Scientific citizenship

Laurence Guérin

Saxion University of Applied Sciences, The Netherlands

Abstract

In the four year project "Working together towards scientific citizenship" companies, schools (eight Primary schools and three secondary schools) and researchers from the Saxion and the University of Twente (UT) collaborate in developing a programme of learning activities dealing with socio-scientific issues. Through the learning activities to be designed, students develop their scientific literacy by solving socio-scientific issues in groups. The issues form the heart of authentic learning tasks taking place in the classroom and outside the school, in companies. The programmes alternate learning tasks performed at school with learning assignments carried out within the companies, whereby companies and schools form an integrated and varied learning environment. The methodology we use is design-based research, whereby we evaluate both the design and its effects by means of a mixed-method approach. Scientific literacy is going to be measured as follow: (1) the students' level of argumentation during their collaborative work on socio-scientific issues, (2) their knowledge of the scientific concepts to be dealt with, and (3) their attitude regarding science.

SIG17 Invited Symposium

Room: Co-Greepzaal M5.01
Organizer and Chair: *Patrick Sins*
Discussant: *Roger Säljö*

S2. Reflections on the use of mixed-methods in educational research

Symposium abstract

There can be little doubt that the employment of systematic combinations of methods has become increasingly unexceptional and unremarkable in educational research in recent years. Mixed methods are advocated as promising research tools for studying relevant educational phenomena. Justifications for combining and/or integrating methods are seeking to corroborate, triangulate, elaborate and illustrate results obtained from different methods or to extent the breadth and range of enquiry by using different methods for different inquiry components. In addition, technological advances have led to a better accessibility of more complex statistical analyses on the one hand, and a possibility to analyze large amounts of qualitative data on the other hand. However, the need for a proper integration of these methods still exists and at the same time how and when to combine methods is an open question in educational research.

This symposium is concerned with reflecting on the use of mixed methods for studying phenomena in the realm of education. More specifically, the contributors to this symposium will explore and share their ideas and/or experiences on using mixed methods for analyzing and interpreting data resulting from educational research. What is essential to the theme of this symposium is that you are invited to explore how to combine and compare, in a systematic way, insights from alternative methods or approaches to analyzing educational phenomena.

The contributions to the symposium deal with the following subthemes relating to use of mixed methods in educational research.

The first presentation by Patrick Sins discusses the use of mixed methods for studying phenomena in educational situations. The different ways in which methods can be mixed and how they are actually employed in educational research are considered.

The second presentation by Judith Schoonenboom discusses the effects of a change in classification of a mixed methods design, not only on how a study is viewed, but also on validity requirements. Using an example from an educational setting, she describes the effect of seeing one particular study as either a “sequential explanatory design” or as a case of “method triangulation”.

The third presentation by Klas Karlgren focuses on presenting the use of a specific tool for quantitative-qualitative analyses of transcripts and discusses mixing data collection methods in

relation to contextual activity sampling (CASS) and in an on-going study of "codes" (acute cases) at a emergency department.
Finally, a discussion by Roger Säljö provides a critical perspective on the three contributions and offers some reflective thoughts on the use of mixed methods in educational research.

Presentations in the symposium

S2.1 Ingredients for mixing methods in educational research

Patrick Sins

Saxion University of Applied Sciences & Thomas More, The Netherlands

Abstract

Several decades of educational research have given rise to a plethora of methods for analyzing educational phenomena, such as individual and/or collective motivation, (computer-supported) collaborative learning, critical thinking and self-regulated learning. There is no single correct, valid or 'true' method here: there are only methods which are more or less theoretically founded, systematically designed and validly applied and useful or fruitful for understanding the phenomena under study. However, these phenomena and the educational contexts in which they are situated are arguably of a degree of complexity such that no single method could provide adequate understanding along all levels and dimensions. Mixed method research has emerged as an approach to study these phenomena. Moreover, mixed methods have become increasingly common in educational research in recent years.

The term *mixed methods* can be understood in a number of different ways. The most obvious case is where qualitative methods are combined (or mixed) with quantitative methods. Other combinations of analyses relate to methods that take into account: different timescales, alternative theoretical and analytical visions of a given phenomenon, different levels of analysis pertaining to distinct research fields and first-person *versus* third-party (e.g. from researchers' corpus analysis) analytical visions. The emergence of computer-assisted tools to compare, combine or align multiple methods is an interesting area of study here. The predominant underlying assumption for mixing methods is that it provides a better understanding of research problems than employing a particular method alone.

When exploring the use of mixed methods in educational research, an interesting picture emerges. Not only the variety of methods used in mixed methods research is remarkably small, the rationales mentioned for employing mixed methods do not seem to diverge much. Firstly, a particular combination of methods appears to comprise the dominating technique of mixing methods. That is, one in which data is collected by either structured interview or questionnaire on the quantitative side

along with either a semi-structured or unstructured interview on the qualitative side. Secondly, most researchers maintain employing mixed methods to enquire elaboration, enhancement, illustration, clarification, expansion and triangulation of the findings obtained from one method with the results from another method. Finding contradictory or even unexpected results seems to be nonexistent in the justifications presented for employing mixed method research. Moreover, the erratic nature of educational research occasionally results in an incongruity between the rationale for mixing methods and how it used in practice.

In this contribution I will discuss the use of mixed methods for studying phenomena in educational situations. I will consider the different ways in which methods can be mixed and how they are actually employed in educational research. Eventually I will hope to animate you to reflect on the rationales you as educational researcher use for mixing methods and that you will critically consider the ways in which you (intend to) mix methods in your own research.

S2.2 Classifying existing mixed methods studies: it makes a difference!

Judith Schoonenboom

University of Vienna, Austria

Abstract

A well-known distinction in mixed methods research is the distinction between concurrent and sequential designs. In the mixed methods literature, this distinction is based on a difference in timing, and refers to the concurrent or sequential conduct of data collection and data analysis of one research line compared to data collection and data analysis of the other research line. Thus, in a sequential study, data collection and data analysis of one research line takes place before data collection and data analysis of the other research line. In a concurrent design, data collection and data analysis of both research lines take place at the same time.

I present a conceptual view, in which the distinction between concurrent and sequential answers the question whether the conclusions or results of the first research line are used in designing the second research line. If so, the relation between the two research lines is sequential. When conclusions are drawn separately and independently for each research line, and are subsequently integrated, the relation between the research lines is concurrent.

Although a design that is sequential (or concurrent) in the timing view may also be sequential (or concurrent) in the conceptual view, this is not necessarily the case. For example, the most important goal of a study may be concurrent in the conceptual sense of seeing whether the analysis of qualitative data yield the same results as the analysis of quantitative data, which are, for that purpose, assumed to be independent. Yet, from a timing point of view, such a study will be considered sequential. Using a real-life example, I will show that the timing view in such a case

prevents researchers from seeing the important concurrent goal of mixing.

S2.3 Using a novel language analysis tool for quantitative-qualitative analysis of transcripts

Klas Karlgren

Södersjukhuset Hospital in Stockholm & Karolinska Institutet, Sweden

Abstract

Qualitative content analysis (Elo & Kyngäs 2007; Graneheim & Lundman 2004; Hsieh & Shannon 2005) is common in educational research. The transcripts from interviews or from observations can however be overwhelming and the analyses extremely time-consuming. Common tools provide some possibilities for managing data but only limited possibilities for analysis. With or without tools such analyses are heavily dependent on the judgment and competence of the researcher and the quality of the analyses may be difficult to assess.

To study interactions during acute care courses, a novel language analysis tool called Gavagai Explorer was tested. The tool is intended for analysis of large amounts of text and automatically clusters utterances on the basis of linguistic analyses of frequencies of content terms. Terms are suggested supporting researchers in discovering recurrent themes. The analysis is however not complete at the push of a button: similarities and differences in the data need to be interpreted and the tool allows the researcher to merge, suggest or ignore terms after which the data is reclustered. Several such iterations enable carving out the essential themes. Advantages and challenges of using such a tool are discussed on the basis of analyses of interaction analysis transcripts and questionnaire data.

Pecha Kucha session

Room: Docprofkamer N4.22

Chair: Andreas Gegenfurtner

PK1 School Self-Concept: its Role in Learning and Teaching, Practical Implication and Measurement Considerations

Olga Bakadorova

University of Greifswald, Germany

Abstract

Self-concept as a set of attitudes that one holds about him- or herself is both a constituent and an outcome of learning situations (Burns, 1979), which is reflected in international educational policies. In regard of motivation drop during adolescence/ school transition, school self-concept presents a protective factor, affecting both current state and future aspirations (Craven & Marsh, 2005).

Based on both qualitative and quantitative methods (sample comprised by 1088 7-8thgrade students from Brandenburg, Germany), my research addresses school self-concept, achievement motivation and socio-motivational relations within one frame. The findings indicate that (a)relationships with teachers mediate the abovementioned association (Bakadorova & Raufelder, 2014); (b) socio-motivational relationships with teachers positively predict motivation of students with high or low school self-concept (Bakadorova & Raufelder, in press) and thereby (c) reveal differentiated needs of high/ low school self-concept students in the context of education (Bakadorova & Raufelder, 2015). This findings tap at the possible development of new school-based intervention strategies, buffering negative effects caused by school transition. However, especially in practical terms new questions arise: how can school self-concept be identified? What is the best way to measure it for future research? How to account for self-concept levels in learning and instruction?

PK2 Teacher's proactive feedback-seeking and flourishing: Applicability of PLS-SEM in the context of a case-study

Dominik Froehlich & Jade Harwood

Maastricht University, The Netherlands

Abstract

Case studies are an important means to develop and extend theory. To facilitate subsequent theory-testing using quantitative methods, it would be advisable to have some indication of quantified effect-sizes (e.g., to inform Bayesian analyses or to conduct Monte Carlo Simulation for power). However, in the field of education and professional learning, the cases that we study are often small (e.g., schools or SME), which often prevents the use of stochastic analysis methods. In this research, we explore the feasibility to use partial least squares regression and structural equation modeling (PLS-SEM) to generate first quantitative information about a research model. Content-wise, we focus on the effect of teacher's proactive feedback-seeking on their flourishing and the role their cultural background and personality plays for this relationship.

This research is original because we integrate PLS-SEM as a quantitative approach in an otherwise qualitative case study. This is especially true given the special context of the study, a small international school based in Indonesia with more than ten different nationalities. While the use of stochastic analysis is often problematic in case study research in education due to the potentially low sample sizes, the multi-national, high-variability context of the present research study amplifies those difficulties.

PK3 Neural correlates of expertise in real-life tasks: Achieving ecological validity in fMRI research

Ellen Kok, Anique de Bruin, Ide Heyligers, Andreas Gegenfurtner, Simon Robben, Koos van Geel, Bettina Sorger, Diana Dolmans, and Jeroen J. G. van Merrienboer

Maastricht University, The Netherlands

Abstract

Functional neuroimaging is a hot topic in educational research. It promises insight into the functioning of the learners' mind. Functional magnetic resonance imaging (fMRI) is a non-invasive functional-neuroimaging technique to measure brain activation. Since 'active' brain regions use (and thus need) more oxygen, differences in blood oxygenation indicate differences in activation of those brain regions.

Neuroimaging research, however, poses several challenges to educational research. Traditionally, fMRI experiments are highly artificial and tasks are restricted and repetitive. Furthermore, possibilities for collecting behavioral data other than button presses are limited. Educational research, on the other hand, often stresses the importance of ecologically valid tasks.

We investigated expertise differences using fMRI in two real-life tasks: diagnosing chest radiographs, and passive viewing of conducting surgical procedures. For both tasks, we included novice, intermediate and expert participants. A localizer task was used to locate brain regions of interest.

In this PechaKucha, we will discuss our considerations with regard to the constraints posed by fMRI, and how we balanced these with our aim of providing participants with an ecologically valid task.

Paper session 4

Room: Co-Greepzaal M5.01

Chair: Crina Damşa

P4.1 What are the effects of lesson preparation in peers? – Analysis of attitudes and knowledge with the help of an Actor-Partner Independence Model

Robbert Smit

University of St. Gallen, Switzerland

Abstract

As part of the study KUBeX in each of 60 dyads two pre-service teachers discussed a preparation for a science inquiry lesson. The teacher student with the lesson preparation had the role of the coachee while the other was a coach. We investigated the following research questions: 1. What are the effects of the coach on the attitudes (ATT) towards science inquiry teaching and the pedagogical content knowledge (PCK) of the coachee? 2. Is there a mediation effect of the lesson planning discussion on the development of ATT and PCK?

Based on an actor-partner independence model (APIM) (Laursen et al., 2008), we could clarify the relations of PCK and ATT between and within the dyads of coach and coachee. In addition, it was possible to analyse developments over time. Furthermore, the APIM allowed for including a mediator (lesson planning quality). Both, PCK and ATT have increased slightly but significantly during our project. PCK and ATT have converged between coach and coachee towards the end of the project. However, we could not find any cross-lagged effects, meaning there is no effect of coach on coachee or vice versa over time. Preceding PCK showed a significant effect on lesson planning.

P4.2 Learners' dynamics of lived experience. An application of the course-of-action method in a teacher education program

Dieumegard Gilles, LIRDEF - Faculté d'Education- ESPE – Université de Montpellier, France

Perrin Nicola, Equipe CRAFT, Université de Genève et HEP Vaud, Lausanne, Switzerland

Abstract

Our research explores the dynamics of learners' lived experience: to this end we use the "course-of-action method" which originates in ergonomics and is based on the enaction paradigm. This method

enables us to endeavor a fine grained analysis of the understanding processes of trainees in a teacher education course.

Data are provided by video records and written traces from the course, but also by subsequent "self-confrontation interviews" in which one views oneself on video and report his/her lived experience. We first analyze all these data comprehensively by identifying successions of units of activity and of "conceptual links". A second stage of comparative analysis investigates the understanding of the trainees.

Results show that trainees' experience combined in various ways listening, reading, copying and thinking about these various sources of statements. Hence backtracking was frequent, leading trainees to partial and delayed understanding. Breakdown experiences of the trainees could entail a conceptual development, but they could also make them temporarily drop out from the course.

By focusing on lived experience, our method complements other microgenetic approaches of learning insofar as it allows studying the dynamics of understanding even at moments when learners remain silent which are widespread in ecological situations.

P4.3 Characterizing Social Engagement in a Digital Role-Playing Game. A Case Study Based on Learning Analytics

Eric Sanchez

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Abstract

This paper draws on players' engagement with *Classcraft*, a digital role-playing game developed for classroom management at the high school level. Our work is based on the Self Determination Theory(Ryan & Deci, 2000) and on a model of engagement (Bouvier & al., 2013) which states that players' engagement encompasses four components: The *environmental component* (autonomy need), the *social component* (relatedness), the *self component* (autonomy need) and the *action component* (competence and autonomy needs).

Our study aims to depict players' engagement and its evolution among time. In particular this study addresses the *social component* of engagement. To what extend are the players involved into social interactions within the game? How do these interactions vary during the game?

We developed a specific methodology based on *learning analytics* (Siemens & Baker, 2012) and dedicated to monitor players' behaviours. The detection of engaged-behaviours is based on the collection and analysis of players' digital traces of players' interactions such as the use of "collaborative powers".

The results show that is possible to distinguish different categories of players in terms of *social engagement* and that *social engagement* varies among time, depending on specific features of the game and on the role taken by the teacher.

P4.4 Learning across contexts. Analytical considerations

Crina Damşa & Ingvill Rasmussen

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Abstract

This contribution addresses a growing interest in methodological challenges associated with examining learning in contexts no longer confined within physical walls but stretching across contexts. In this paper, we develop and explore a micro-analytical framework to examine sense-making in contexts where students use digital resources spanning physical and virtual contexts. We draw upon cases from two different domains: history and software engineering. Our exploration contributes to understanding how particular (conceptual) constructs, i.e., emergence, participation trajectories and assemblages of resources, can be employed as empirically sensitising notions to probe the empirical details of sense making with digital resources. We argue that this approach allows us to connect to and describe at the empirical level what 'becomes' the students' learning as a consequence of the boundary crossing between the physical and virtual contexts that characterises many contemporary learning environments.

Research Design Forum 5

Room: Docprofkamer N.22
Chair: Laurence Guérin
Commentators: *Andreas Gegenfurtner, Bart Rienties*

RDF5 Learning for the fourth industrial revolution

Dominik Froehlich, Maastricht University, The Netherlands
Barbara Covarrubias-Venegas
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Abstract

In this research project, we aim to investigate workplace learning in the context of the fourth industrial revolution. We develop and empirically test a research model that connects age, informal learning from others, employability, innovative work behavior on the individual level and that considers moderating effects from the organizational context: age climate and learning climate. The major contribution of this research project is that it takes current theories and concepts of workplace learning (employability, innovative work behavior, informal learning,...) and tests them in a new, highly volatile, and technologically advanced environment. We use structural equation modeling to test this multi-layered model empirically based on a cross-sectional database that contains survey data and archival performance data. Potential problems and the overall plan of research are discussed below.

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