

Workshop Sessions, Wed, July 1, 10:45 - 13:00

Workshop 1:

Sharing online workplace dilemmas in the international classroom.

Instructor:Roelien Wierda, NHL university of Applied Sciences, Netherlands; **Instructor:**Ron Barendsen, NHL Stenden University, Netherlands

In this workshop, participants will be introduced to and get to work with the first prototype of an online tool to facilitate and scaffold the sharing of workplace dilemmas in an international context. Face-to-face (f2f) peer consultation or “intervision” is traditionally a structural part of Dutch teacher training programmes under the assumption that “intervision” – or the structured discussion of workplace dilemmas during school placements – will bridge the gap between workplace learning and formal learning and that “intervision” will lead to short-term improved professional performance. However, extensive research has demonstrated that this is not the case. What can be demonstrated, however, is that participants develop a shared professional discourse (Joyce & Showers, 2002). Moreover, face-to-face intervision has a number of limitations (Wierda & Barendsen, 2011), which will be discussed during the workshop.

Workshop 2:

Multilingualism to learn or learning to act multilingually?

Instructor:Joana Duarte, NHL Stenden University of Applied Sciences, Netherlands

Although teachers might engage in micro-language policies, classroom interactions in most mainstream schools are often dominated by national languages, with the exception of foreign or, to a lesser extent, regional minority languages. While there is increasing evidence demonstrating the important role of home language(s) in contributing to students’ cognitive and socio-emotional development and in raising their academic attainment, the vast majority of schools adopt monolingual teaching approaches mostly focused on the promotion of national languages, and thus often overlooking pupils’ linguistic and cultural diversity. Recently, however, several multilingual teaching approaches have been put forward which aim to explore the use of multiple languages in teaching and learning. In this workshop, participants will analyse authentic data from Frisian primary and secondary schools who have developed and implemented an intervention for multilingual education focusing on the acknowledgment and use of pupils’ home languages in mainstream education. These include languages of pupils with an immigrant background or a regional minority language, as well as foreign and national languages or dialects. The aim of the workshop is to engage with different frameworks to analyse interaction taking into account the multilingual practices of speakers and to explore different types of multilingual classroom interaction, by understanding teachers’ and pupils’ functional language use during moments of multilingual interaction. The workshop will adopt a sociolinguistic and a didactical perspective on interactional data.

Workshop 3:

The politics of learning and education – transformative methodologies and epistemological challenges

Instructor:Peter David Renshaw, The University of Queensland, Australia; **Instructor:**Alfredo Jornet, University of Oslo, Department of Teacher Education and School Research, Spain; **Instructor:**Antti Rajala, University of Helsinki, Finland; **Instructor:**Giulia Messina Dahlberg, University of Gothenburg, Sweden; **Instructor:**Alessio Surian, Università degli Studi di Padova, Italy

This interactive workshop aims to address and engage with the ethical and political dimensions of learning and education. The ecological, economic and political crises of our times cannot go unaddressed by researchers of learning and education. This workshop joins with and expands recent initiatives of critical learning scientists and researchers within the tradition of cultural-historical activity theory to re-theorize learning from a critical perspective, and to examine the cultural and political contexts and consequences of this field of research. The workshop is envisaged as a forum for trans-disciplinary and cross-sectoral dialogue where illustrative cases with data from research projects that engage with the broader focus of the political dimension of learning—including projects that engage formal and informal learning to address issues like climate change—are presented and discussed. There will be space also for the workshop participants to share and discuss issues related to their own research. The cases illustrate methods and methodologies that are suitable for addressing these issues. Here, we are particularly interested in the creation and establishment of transformative methodologies that engage with the boundaries between research and practice as well as across research fields, ontologies and epistemologies. Furthermore, we present cases where the data generation enterprise is understood in terms of a reflective journey, in which the researcher’s gaze, in its being “non-predatory”, “de-centred” and “co-present”, is never fixed or static but rather enacts a scientific process that is generative, non-linear and ethically related to the communities in which our participants engage in.

Workshop 4:

Seeing, saying, self-reflecting: art for stimulating critical thinking and intercultural sensitivity

Instructor:Marjolein Deunk, University of Groningen, Netherlands; **Instructor:**Mariëtte Hingstman, Rijksuniversiteit Groningen, Dept of Education and GION, Netherlands

In this interactive workshop, participants will experiment with Visual Thinking Strategies (VTS, Yenawine, 2013): art-based discussions with the aim of stimulating self-reflection and intercultural sensitivity. After experiencing VTS themselves, participants are invited to analyze and discuss transcribed fragments of VTS-sessions with pre-service teachers. Visual Thinking Strategies is a structured protocol for discussing art. During a VTS session, a facilitator lets students reflect on a piece of art by asking three questions repetitively: *What is happening in this picture? What makes you say that?* and *What more can we see?* Empathy and self-reflection are important skills for professionals working in social fields like education. Due to the increasing ethnic-cultural diversity of many contemporary societies, educational professionals need sensitivity towards cultural differences and implicit norms and expectations, which might be hard to recognize (Cho & DeCastro-Ambrosetti, 2006; Haddix, 2008; Stoll, 2014). This intercultural sensitivity (Bennett, 1986; Chen, 1997) requires awareness of one’s own perspective (*propriospect*, Goodenough, 1981; Wolcott, 1991) and how this may influence interpretation and judgement of situations and people. As part of a teaching innovation project (Deunk et al., 2020), VTS was introduced to 2nd year students of the Primary School Teacher Training Program of the University of Groningen. The main aim was initiating a process of critical self-reflection and intercultural sensitivity in pre-service teachers, to add to the realization of educational equity in our multicultural society. Data and experiences from this project will be integrated in the workshop.

Interactive Poster Sessions, Wed, July 1, 15:00 - 16:00

Interactive Poster session 1:

The role of oral communicative competence in children's early peer relations

Presenting Author:Femke van der Wilt, VU Amsterdam, Netherlands; **Co-Author:**Dominik E. Froehlich, University of Vienna, Austria

Positive peer relations are of vital importance for children’s future functioning. Previous research has shown that children’s oral communicative competence plays a significant role in their relations with peers. However, it remains unknown whether oral communicative competence not only affects children’s peer relations, but also influences the network patterns in early childhood classrooms. The current study investigated two hypotheses: (1) children build relations with peers who have similar levels of oral communicative competence and (2) children with high levels of oral communicative competence have many positive peer relations. In addition, it was explored whether an intervention focused on the promotion of dialogic classroom talk affects change in network patterns. In total, $N = 18$ teachers and their $N = 334$ pupils participated in this study. Classrooms were randomly assigned to the intervention or control group. All participating teachers were asked to orchestrate weekly classroom discussions over an eight week period and to follow a teacher manual in doing so. In addition, teachers in the intervention group also participated in a professional development program and were asked to practice the use of productive talk and meta-communicative moves during the eight classroom discussions. Before and after the eight classroom discussions, children’s level of oral communicative competence was measured with the Nijmegen Test for Pragmatics and their peer relations were assessed by asking children to nominate peers they did and did not like to play with. To investigate the hypotheses, the data were analyzed using a relational, quantitative-dominant crossover mixed analysis.

Teachers' Belief, Confidence and Effectiveness in Implementing Culturally Responsive Practices

Presenting Author:Shiquan Shao, Utah State University, **Co-Author:**Alyson Lavigne, Utah State University

Over the past decade, the school-age population is becoming more diverse racially and ethnically. In order to better understand teachers’ perspectives regarding culturally responsive practices, this study examined culturally responsive practices of teachers serving racially and ethnically diverse elementary students and conducted a survey following regarding their beliefs and confidence in conducting culturally responsive practices. This exploratory study utilized qualitative and quantitative data to illuminate patterns and relationships within and between teachers’ beliefs about and enactment of culturally responsive instruction. Findings indicate a discrepancy

between teachers' beliefs of whether culturally responsive practices result in positive student outcomes and teachers' confidence to do so. Despite that teachers are mostly limited in practices, relationships appear to differ. For some, beliefs seem to align with practice while others with high scores in practice have a low confidence level.

Interplay of functional participatory roles and metacognitive regulation in collaborative learning

Presenting Author:Olli-Pekka Heinimäki, University of Turku, Finland; **Co-Author:**Tuiki Iiskala, University of Turku, Finland; **Co-Author:**Marja Vauras, University of Turku, Finland

The aim of the study was to examine the interplay of functional participatory roles and social forms of metacognitive regulation (MR) during collaborative science learning. Although there is some evidence suggesting that the interplay of roles and MR can explain the quality of collaborative learning outcomes, roles and MR have been mainly studied separately in prior literature. The purpose of this in-depth case study was therefore to explore what types of roles emerge during MR, and to compare the interplay of roles and MR between two senior high school groups that differed regarding the quality of their collective task outcome (high vs. low). The groups collaborated face-to-face in a virtual science-learning environment. The group task was to carry out a virtual study according to the principles of scientific research. Finally, the groups prepared presentations about their study, which quality was then evaluated with a scale from low to high. The data comprised video-recordings of task-related interactions that unfolded during two task phases (planning & concluding). From these phases, analysis of roles and verbalized MR unfolding during group processes were conducted at the turn level. The findings on the interplay of roles and MR revealed that in the high outcome group more roles were enacted during MR than in the low outcome group, especially roles contributing cognitively to science-based discourse during socially shared metacognitive regulation. In the presentation, the visualizations of the findings will be used to illustrate and elaborate on the findings further

Interactive Poster Session 2:

Processes that promote and hinder the improvement of induction

Presenting Author:Michelle Helms-Lorenz, University of Groningen, Netherlands; **Co-Author:**Patricia Brouwer, Hogeschool Utrecht, Netherlands; **Co-Author:**Carlos van Kan, HAN University Nijmegen, Netherlands; **Co-Author:**Rozemarijn Toly, CINOP, Netherlands

Supporting beginning teachers adequately is important because the dropout rate of teachers can be reduced and professional development can be accelerated during this vulnerable period. However, support (intentions) are difficult to implement in educational settings. Our study attempts to gain insight into the factors that promote and hinder the improvement of induction processes for beginning teachers in tertiary vocational education. At each of the three tertiary vocational institutions involved in this study, professional learning communities (PLCs) - consisting of beginning teachers, teacher leaders, HRM officers, teacher trainers, and experienced teachers - worked together to (re) design and implement support activities for beginning teachers, based on a design-oriented approach (van Aken & Andriessen, 2011). Stakeholder judgments of the support offered to the beginning teachers at the onset of the project, revealed divergent perspectives within as well as between the institutions. A number of facilitating and hampering factors were identified that influenced the (re)design and implementation process. Implications for practice will be discussed.

Examining teacher engagement in-context in professional development activities

Presenting Author:Irit Vivante, Ben Gurion University of the Negev, Israel; **Presenting Author:**Dana Vedder-Weiss, Ben-Gurion University of the Negev, Israel

While engagement in learning is critical for learning processes and outcomes, only scarce research explores teacher engagement in professional learning. The majority of the research on engagement in learning addresses student engagement and uses decontextualized self-report tools, i.e., questionnaires. Studies that do examine engagement in-context, through class observations, mostly relate to engagement dichotomously or do not present a rich multimodal description of the engagement dynamic relative to changing tasks and social interactions. The goal of this qualitative study is to develop an analytical tool that affords a rich account of teacher engagement in professional development (PD) activities. We develop this tool based on the analysis of 15 hours of video-recorded PD interaction of Israeli elementary and middle school science teachers. We used multimodal analysis to map teacher engagement, in relation to the task defined by the PD facilitator, onto a three-dimensional graph: (1) Engagement Level; (2) Engagement Modalities (both verbal and physical); and (3) Engagement Duration. The tool affords the typology of teachers and activities in relation to levels and modalities of engagement and, more significantly, the identification of engagement shifts. We will further interpret these typologies and shifts in light of a linguistic microanalysis of the interactions and of stimulating interviews with participating teachers. The tool we develop in this study will advance understanding of teacher engagement (and, hence, their learning) in PD and could serve to further evaluate different PD designs. It may also be adapted to classroom studies.

Intercultural competence in e-collaborative content-driven language education

Presenting Author:Viviana Gaballo, University of Macerata, Italy

It is broadly acknowledged that a methodology for understanding cultures based on social justice should become a fundamental tool for everyone (Sorrells, 2016). We also know that learning is a social process that mainly occurs via interpersonal interaction (Vygotsky, 1978) and that, in order for collaboration (Schrage, 1990) to be effective, we should ensure the simultaneous action of the five components of collaborative learning (*positive interdependence, promotive interaction, individual accountability, team skills, group processing*). Recent research studies have focused on the shift from e-learning to we-learning, investigating how to incorporate the new Web trends into the learning process and how to harness and apply Web 2.0/4.0 concepts to create new learning experiences (Chun, 1994). In order to provide the necessary integration of the above concepts so that they may fit the new technology-enhanced setting (Dircking-Homfeld et al., 2012), a specific course was designed for students attending the IPER (International Politics and Economic Relations) course offered by the Department of Political Sciences, University of Macerata, and was delivered in 12 classes (40 hours) in the 1st semester of 2016-17. International students were invited to analyze their own intercultural competence and helped to develop a personal action plan for further use beyond the classroom. Based on a framework that promoted critical thinking, reflection, and action, this course took a critical discourse approach that provided students with the skills and knowledge to understand how culture and communication intersect in the context of globalization, and to create a more equitable world through communication.

Data Sessions, Wed, July 1, 15:00 - 16:00 2

Data Session 1:

Querying and elaboration in dialogic teaching

Presenting Author:Maren Omland, University of Oslo, Norway

Previous research has shown the importance of particular dialogic patterns such as open questions, elaborations and reasoning in dialogic teaching (e.g. Mercer & Littleton, 2007). However, more research is needed on why and how these moves are associated with the construction of knowledge. In a large-scale study Howe, Hennessy, Mercer, Vrikki, & Wheatley (2019) found that the only two clear indicators (of nine coded for) of dialogic teaching positively associated with curriculum mastery, were elaboration and querying previous contributions. By using interaction analysis (Jordan & Henderson, 1995) this current study will investigate how querying and elaboration can contribute to students construction of knowledge. The empirical material is from one tenth-grade lesson where student groups interviewed each other about previously posted contributions displayed on a digital board, one group giving prepared critical questions to another. These conversations have a high density of student participation, elaboration and querying. Our preliminary analysis showed that both querying and invitations to elaborations leads to elaborations. However, where invitations to elaborations often make students elaborate on their previous lines of reasoning, querying can drive students into new lines of thoughts. Thus, querying may open dialogic space for a wider exploration of a topic. This study aims to give an empirically based elaboration of Howe et al.'s explanation of the positive association of querying and elaboration with curriculum mastery. We also propose some technology mediated teaching strategies which opens for classroom interactions where querying is used in a productive way.

Data Session 2:

Having multiple interests: Intraindividual dynamics of interest development

Presenting Author:Jael Draijer, University Utrecht, Netherlands; **Co-Author:**Larika Bronkhorst, Utrecht University, Netherlands; **Co-Author:**Sanne Akkerman, Utrecht University, Netherlands

Interest research is often focused on one interest in one context, for example interest in mathematics within the mathematics class. However, adolescents actively pursue multiple interests within their daily lives (Hofer, 2010). This multiplicity implies that one's interests are relative to one another and develop dialogically. One may experience competition between interests in terms of time and resources, and interests may over time become intertwined and be integrated, or may differentiate into multiple more specific interests (Akkerman & Bakker, 2019; Azevedo, 2011; Krapp, 2002). The current study aims to explore these dynamics in interest profiles (the

totality of one's interests) with the following research question: How do adolescents make sense of their interests in relation to each other, and (how) is this reflected in the development of their interest profiles? In order to explore the dynamics of having multiple interests, fifty-one adolescents of different educational tracks were interviewed twice about the time they spend on their interests and the way they (retrospectively) make sense of developments in their interest profiles. In between the interviews, adolescents report on their interests during three intermittent weeks three months apart, using an Experience Sampling Method (ESM) implemented in a smartphone application. During the data session we collaboratively explore (a tentative analysis of) both interview and ESM data. More knowledge about intrapersonal interest dynamics can enrich theory on interest development, and help to understand why certain interests are sustained over time, and others fade.

Data Session 3:

Pupil collaboration during individual work in one-to-one classrooms

Presenting Author: Øystein Gilje, University of Oslo, Norway; **Co-Author:** Åslaug Bjerke, Institute of Teacher Education and School Research, University of Oslo, Norway

Many Norwegian municipalities have implemented one-to-one programmes, and now more than 60 % of pupils in Norwegian primary and secondary schools have their own digital device. Previous research findings have indicated that pupils work more independently of the teacher in a one-to-one classroom, and that the teachers see themselves more as facilitators (Higgins & BuShell, 2018; Storz & Hoffman, 2013). The GEPP-project (2019-2020) revealed similar evidence after observing 54 lessons (3200 minutes) at 10 lower secondary schools.

In this session, we aim to examine how pupils communicate during individual work time in the GEPP-project. We will use transcripts of video data to analyse interactions between pupils during individual work answering the following interrelated research questions: What forms of collaboration can be identified during learning activities where pupils work individually in one-to-one classrooms? Can we, based on social interaction evidence, categorise different types of talk during pupils' individual work? We invite participants to discuss these questions based on the empirical examples from the GEPP-project.

Data session 4:

An ecological perspective on adolescents' interests

Co-Author: Sanne Akkerman, Utrecht University, Netherlands, **Co-Author:** Larike Bronkhorst, Utrecht University, Netherlands; **Presenting Author:** Joris Beek, Utrecht University, Netherlands

Adolescents are often engaging with their interests in their own way, at moments that suit their interest (and themselves). Inherent to the development of interests are the practices in which engagement takes place. The possibilities for developing and sustaining ones' interests may differ between interest or between adolescents. For example, despite the fact that an adolescent likes to read at home, there may be no money or attention for books. Or adolescents may need to change their sport clubs due to a move. Based on ecological dimensions identified by Akkerman and Lankveld², we developed an instrument that maps adolescents' interest practices. 414 adolescents shared their two most important interest practices. In this data session, we discuss our theoretical framework and initial findings, and ask participants to interpret them.

Symposium Sessions, Wed, July 1, 16:15 - 18:00

SIG 10 Invited Symposium: How art or artistic practices can promote spaces for learning and development?

Chairperson: Valérie Tartas, University of Toulouse 2, France

Organiser: Nathalie Muller Mirza, Université de Genève, Switzerland

Discussant: Michèle Grossen, University of Lausanne, Switzerland

This symposium examines the links between art and development from a sociocultural and narrative perspective in psychology and education. It will attempt to answer the following question: How do artistic practices (theatre, writing, literature) in education and training create spaces for learning and development, and under which conditions? This question will be explored through three dimensions, which we consider interdependent: 1) the relationship between artistic activities and the construction of knowledge (e.g. in what ways do literary or theatrical writing activities support the construction of new knowledge?), 2) that of pedagogical innovation (in what way do these activities lead teachers or trainers to rethink teaching-learning practices?), 3) that of the practices of researchers themselves (in what way do these objects of study invite researchers to develop new ways of thinking about their approach to data collection, participation, analysis and restitution?). Based on research conducted in the field of theatre, narratives, writing and literature in different educational contexts (school, university, adult education or more informal situations), the papers will attempt to shed light on the interactional processes at play and the conditions under which artistic activities make it possible to create a new relationship between learners (students, adult participants and researchers) to knowledge, to themselves and the world.

Artistic practices and "self" development in educational settings

Presenting Author: Valérie Tartas, University of Toulouse 2, France; **Co-Author:** Nathalie Muller Mirza, Université de Genève, Switzerland

In this paper, adopting a sociocultural and narrative approach in psychology and education, we would like to discuss the role of participating to "artistic" activities on psychological development. We rely more particularly on two sets of data extracted from two different studies relying on art practices: the first study analyzed writing an autobiography during a writing workshop by six immigrants and focused on how the "self" of the narrator is elaborated and reconstructed through the process of narrating (Grossen, 2015); the second study analyzed social interactions in two settings in which 7th grade's students were asked to discuss the Rimbaud's statement: "I is an Other" (Foumel, 2018) in two different philosophical workshops in a French class or in a Philo-Club (voluntary basis). A comparison between the two corpora will show the discursive moves and how new knowledge on self and on the other coevolve, as well as the role of the teachers in this process. As a conclusion, from these two examples of studies, we will discuss the relationship between artistic activities and development by the means of a conceptual tool that articulates three categories of mediation: social mediations (the role of the teachers and the animator in framing and guiding the psychological activity), cultural mediations (texts, literature as resources), and the language in its uses (narrative, argumentation, dialogical tensions, oral/written language).

The Everyday Aesthetic of Narrative Learning

Presenting Author: Colette Daiute, The Graduate Center, CUNY, United States

Common definitions of "aesthetic" mention "beauty" and "art". Of course, beauty and art are cultural concepts. Given that, how has human society created narrative as a cultural tool? Further, we ask how do people use narrative to enact human relations in everyday interactions, especially where interactions require delicacy if not beauty and art? This paper presents an analysis of narrating in everyday life, with a focus on how people in challenging circumstances use narrative to manage relations with other people, groups, and institutions. Drawing on sociocultural theory (Bakhtin, 1986; Vygotsky, 1930/1998) of narrative (Bruner, 1986), I explain how children, youth, and adults use aesthetic features of narrative in artful ways to manage their interactions in dangerous situations. After presenting principles of dynamic storytelling (Daiute, 2010; 2014), I focus on the materiality of narrative with a focus its aesthetic affordances as used in education and community organizations across systems of violence, displacement, and social exclusion. The paper presents aesthetic dynamics of narrating in use, including *metaphors of banned emotions*, *ventriloquy of trauma*, and *plotting injustice*. Zooming back from learning narrative skills and using narrative for learning subject matters, the paper concludes with a discussion of *relational complexity* as the kind of learning required in global systems defined by cultural heterogeneity. The intercultural relations wrought of contemporary violence and inequality require truly artful uses of cultural media for artful management of human relations.

Reviving Higher Education through Performing Arts

Presenting Author: Laure Kloetzer, Institute of Psychology & Education, Switzerland; **Co-Author:** Ramiro Tau, University of Geneva, Switzerland; **Co-Author:** Simon Henein, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

The research project ASCOPET (for Performing Arts in Higher Education) studies the learning dynamics in two academic courses which use Performing Arts in their pedagogical design: the Impiroengineering course, at the EPFL, and the Psychology and Migration course, at the University of Neuchâtel. The project contributes to a critical evaluation of these courses, and to the formalization of some principles for a pedagogical model supported by the performing arts. In our research design, we collected similar data for both courses: ethnographic data (observations during the classes), videorecordings, individual and collective interviews with the teachers, individual and collective interviews with the students, analysis of course documentation, and students' written productions. The "learning diaries" or "reflexive diaries" written during both courses and assessed have been also analyzed. The findings highlight the pleasure experienced both by teachers and students in these courses, the good appropriation by the students of their theoretical and practical content, some insights, "grasp of consciousness" of the students or transformative dimension in both courses, and offer traces of the capacity of the students to connect personal and academic experience. According to our results, these interesting pedagogical findings are linked to four

dimensions: a) the boundary crossing design of the courses, involving a partnership between universities and amateur or professional theatre places; b) the central role of the body in this learning process, overcoming the body alienation often experienced in education; c) the importance of horizontal collaboration and collective creation in the learning process; d) the students/teachers changing relations and interactions.

“Ways with Worlds”: Bringing Improvisational Theater into Play with Reading

Presenting Author: Kevin Leander, Vanderbilt University, United States

Discussions of reading in school classrooms are lacking affective vitality as much as they are lacking comprehension, questions, meaning or anything else. What if reading classrooms were a space for playful social dreaming, where completely singular events happened, never to be reproduced? What if classrooms were filled with potential for thinking differently about the world outside the classroom, all in relation to a shared text? To consider these questions, we look away from the reading classroom and turn to theatrical improvisation. This paper investigates improvisational theater and the possibilities it presents for re-considering reading pedagogy, with a focus on discussions of reading. The author conducted empirical, qualitative studies of improvisational practice and instruction, and analyzes improv through the construct of “worlding.” The concept of “worlding” generally describes how an ensemble makes present and creates unique events in time. The presentation offers a vision of reading discussions that emerges from re-thinking and re-feeling such discussions through forms of worlding found in improvisation. It will conclude by offering five improv-inspired teaching practices for discussions of reading: 1) teaching as invoking the text, 2) teaching as exchanging offers, 3) teaching as attuning, 4) teaching as following of lines of flight, and 5) teaching as activating embodied energy.

SIG 21 Invited Symposium: Diversity as a challenge - Challenges to diversity: Approaches in 2020

Chairperson: Alessio Surian, Università degli Studi di Padova, Italy

Organiser: Gudrun Ziegler, Luxembourg

Discussant: Charles Max, University of Luxembourg, Luxembourg

Diversity and heterogeneity is a key working field in the 21st century and is understood in different ways including mixing, questioning, challenging, and, too often, distancing and rejecting. *Fluxes* of people, their backgrounds and orientations; *streams* of data, not only in terms of languages or approaches to numbers but also regarding access to information and participation; and *waves* of (ever) new inventions and globalized phenomena and concerns have marked (and fundamentally determined) work in education and other areas of the humanities. Yet, the already often felt (and addressed) concern of the fuzziness of concepts (be it diversity, interculturality, culture (!), gender, ...) seems to be particularly apparent as we speak in 2020: As the pandemic globalizes, discussions from the beginnings of modern/European concepts of democracy and equity make it to the surface, while students and workers access a (heterogeneous) digital presumed “normal” and participation to any activity in the “here and now” is marked by “risks” (e.g., tracking, testing) rather than potential and opportunity (to learn for instance). As this symposium is held in the context of 2020’s tormented times, it aims to go back to the initial concern of working on “diversity” in the context of education, focusing particularly on higher and adult education. More specifically, the papers will provide data-driven examples of processes in education where diversity is *key* to the actual learning process, yet show, how the very idea of diversity is challenged by the current “new” and in that respect - globalized - remote learning frameworks.

Students are stories: individual experiences of intercultural group work in engineering education

Presenting Author: Becky Bergman, Gothenburg University, Sweden

Within international higher education, students have been divided into two groups, “home” and “international”, both administratively and within research. This presentation seeks to problematise these labels by highlighting the range of student backgrounds and experiences encompassed within these concepts. Internationalization and student mobility in university education has been strongly promoted (Carroll and Ryan 2007; Leask 2015). Globally, the trend in international student mobility has been for students from Asian countries travelling to English-speaking countries, though the trend is changing. At the same time, whilst we are in the middle of the pandemic, it is difficult to speculate about the future, yet this is also part of ongoing discussion. In terms of higher education and global mobility, it is clear that this situation will have a long-lasting impact. In Sweden, English as a Medium of Instruction (EMI) courses made up 28% of the total university courses given in the academic year 2018/2019 (Forsberg, 2018), placing it in the top five of European countries offering EMI courses per capita. International tertiary students favour fields in science, technology, engineering and mathematics (STEM): one-third of them enrolled in these fields in 2016 (OECD, 2018). In a qualitative longitudinal study of five Master engineering students involved in intercultural group work, their individual stories are illustrated, showing the complexity behind the terms “home” and “international”. The presentation suggests using the concepts “insider” and “outsider” to investigate the students’ experiences and exemplifies the factors that lead to insider or outsidersness.

“Et là, ça se passe!” - How learning the diverse “new” is (was?) engineered in interaction

Presenting Author: Gudrun Ziegler, Luxembourg multi-LEARN Institute, Luxembourg

When it comes to learning to be in new environments (e.g., work mobility or politically enforced moves) which are marked by diversity like the context of Luxembourg (as an example) with its some 50% foreign residents, tangible progress has been made in the past decade: Multilingualisms (including often forgotten sign-languages) for instance are no longer considered being an exception, rather a general phenomenon which might come in various forms et set-ups (e.g., family, society, educational success), early or later in life (e.g., early bilingual schooling, key healthcare not only for the elderly provided by foreign workforce), in formal or informal, in situ or mediated contexts (cf. video-games, FB groups). With interaction being a main site for learning, various programmes and educational designs emerged, engineering specifically created educational contexts (not only for language learning but also education in the context of citizenship or sexual health to name a few). While this paper sketches three educational designs which have been developed since 2010 in and for learning in (highly) diverse settings, the pressing aim within the symposium is to highlight not only the (general and documented) pitfalls of these approaches but to state the unprecedented threat in 2020 to this type of diversity driven education.

Topicalizing the pandemic and challenging boundaries of diversity in the digital wilds

Presenting Author: Sylvi Vigmo, University of Gothenburg, Sweden

The present study investigates recent developments in the wake of the pandemic as they play out in languaging in social network sites and belong to the wilderness of everyday life (Bagga-Gupta & Messina Dahlberg (forthcoming). Of particular interest for the present study are teachers’ ways of introducing the pandemic to the members of two Fb communities, which are characterized by practicing a new language; Swedish, living in the global-North, while the majority of the members represent the global-South. Though the Fb communities are framed by a non-instructional setting, it is led by administrators, all language teachers in their spare time. Both Fb groups are multilingual and cross-cultural Fb communities, in which members engage in languaging, as ways-of-being- with-words (Bagga-Gupta, 2014). The notion of “digital wilds” is here applied to situated language use in non-instructionally oriented contexts, and as dimensions of diversity in cultural and language backgrounds (Thorne, Sauro, & Smith, 2015). Data is generated during a limited time-frame, presenting teachers’ navigations across entangled local and global settings (Bagga-Gupta & Messina Dahlberg (forthcoming) in which the pandemic becomes topicalized, and what becomes center staged. The analytical work uncovered what is at stake in the global pandemic, and how debates about the pandemic draw attention to facts, beliefs, reliable sources, and attitudes towards Swedish authorities, politics and politicians, and how these are entangled with global perspectives, the teachers’ positioning of themselves relative to living in Sweden, and interactions and reactions of the Fb members living in pandemic times.

Keynote Lecture, Thu, July 2, 10:30 - 11:30

Exploring the role of educational technology use in supporting learning through dialogue

Keynote Speaker: Sara Hennesy, University of Cambridge

Dialogic approaches based on active student participation, open-ended discussion, and respectful critique of different perspectives are increasingly found to support student learning. Micro-level analyses of interactional sequences in particular yield important insights into the processes involved. Yet dialogic interaction is not very commonly observed in educational settings around the world. Recent advances in research indicate that – increasingly prevalent – digital technology has important pedagogical affordances for educational dialogue. Again, educators have typically not exploited its full interactive potential, with some exceptions. My work in this area draws on theories of sociocultural learning asserting that all human activity is mediated by artefacts and learning involves appropriating the shared norms, values and practices of a community. In particular, it has explored the mediating role of “digital knowledge artifacts” jointly created and manipulated during activities designed to foster collaborative knowledge building using objects of joint reference. These artefacts bring in new modes of interaction with others’ ideas. They are provisional records embodying the ongoing, collective – social and cognitive – activity. Interacting with digital artefacts can facilitate development of a sustained line of co-inquiry that extends the space and timescale of dialogue. This talk includes some of the methodological challenges arising in analysing sequences of multimodal dialogue taking place as it unfolds over time. It is illustrated with examples from classroom practice and draws out implications for researchers and educators.

Paper Sessions 1-3, Thu, July 2, 11:45 - 12:45

Paper Session 1:

Promoting university students' engagement in group work through cultural diversity and trust

Presenting Author:Irene Poort, University of Groningen, Netherlands; **Co-Author:**Ellen Jansen, University of Groningen, Netherlands; **Co-Author:**Adriaan Hofman, University of Groningen, Netherlands

Group work is a common active learning strategy in higher education aiming to enhance deep learning and develop team work skills. Culturally diverse learning groups are particularly considered valuable to prepare university students to effectively and meaningfully participate in a globalized world. However, to realize these benefits, students need to truly engage in the group work both behaviorally and cognitively. Therefore more insight is needed into factors that promote engagement. This study investigates the extent to which students' trust in the group and cultural diversity in the group contributes to behavioral and cognitive engagement in group work and the extent to which trust acts as a mediator between cultural diversity and engagement. A questionnaire was filled out by 1025 bachelor's students from six universities in the Netherlands and Canada. Structural Equation Modelling analyses identify students' trust in the group as the strongest positive predictor of both behavioral and cognitive engagement. The more students trust their group the higher their engagement. Greater cultural diversity promotes behavioral and cognitive engagement, but compared to trust the impacts are relatively small. Trust does not act as mediator between cultural diversity and engagement. Because trust promotes student engagement in group work we suggest that at the beginning of the group work assignment, or even before it starts, time is dedicated to trust building activities.

Widening participation? Institutional pathways in higher education for migrant students

Presenting Author:Giulia Messina Dahlberg, University of Gothenburg, Sweden; **Co-Author:**Sylvi Vigmo, University of Gothenburg, Sweden; **Co-Author:**Alessio Surian, Università degli Studi di Padova, Italy

One important consequence of the European migration situation post-2014-16 is that Sweden and Italy are two countries that have faced similar challenges in terms of the work for inclusion and integration of migrants in all sectors of society, not least in higher education (HE). Thus, a focus on migrant students, i.e. individuals enrolled in HE whose life is characterized by mobility between a country of origin and one of settlement, in terms of a comparison between Italy and Sweden, becomes central. Our aim is twofold: firstly, we focus upon social practices, as they play out in a range of settings for the students, to critically understand the "doing of" participation, normalization and marginalization in situ. Secondly, we throw light upon the ways in which transitions and support in relation to widening participation are framed in policy contexts. The study builds upon a case-study design in university settings in the nation-states of Sweden and Italy and data include national policy, laws and regulations related to issues of inclusion and widening participation in HE in Sweden and Italy and homepages and policy documents of a selection of national universities and university colleges in both countries. The study highlights issues of, for instance, communicative mismatching between the meaning-making activities of students and other academic actors as well as identifies generative ways to address critical events, that could, in turn, create possibilities for successful transition and participation in HE for this group.

Paper Session 2:

Factors related to face-work in teacher collaborative learning

Presenting Author:Adi Mendler, Ben-Gurion University of the Negev, Israel, **Co-Author:** Dana Vedder-Weiss, Ben-Gurion University of the Negev, Israel

Studies framed by the sociocultural theory of learning show that collaborative learning from problems of practice is beneficial to teachers' professional development. However, critical discussions of problems of practice can be challenging, since they expose teachers' work to face-threatening scrutiny and criticism. In this study, we examine under which circumstances face-work—efforts to protect one's face or the face of others—might impact teacher discussions of problems of practice. The study's findings are based on analysis of leading teacher interviews and observations of the in-school teacher learning meetings they led. Our initial findings point to four key aspects of teacher meetings related to face-work: (1) the type of representation discussed (e.g., classroom video recordings vs. narrated case studies); (2) group goal orientation (e.g., mastery goals vs. performance goals); (3) group composition and micropolitics in terms of teacher seniority and administrative roles; and (4) group maturation over time. The study advances our understanding of the socio-emotional processes involved in teacher collaborative learning, specifically the role of face-work in group discussion of problems of practice. On a practical level, understanding how and when face-work is involved in teacher discussions can help us better design and facilitate teacher collaborative learning.

Learning to track: How do teachers learn sorting practices?

Presenting Author:Avner Cohen Zamir, Ben Gurion University of the Negev, Israel

Whereas much of the research on teacher professional development presumes that professional learning takes place in formal training (Lefstein, Vedder-Weiss, & Segal, accepted), this study focuses on teachers learning on-the-job - in informal professional settings while engaging in practices. Thus, the goal of this study is to explore how and what teachers can learn about students' sorting through their daily practice. The data for this study was collected in two Israeli high schools, in Pedagogical and Placement Community Meetings (PPCMs), in which teachers make tracking decisions for each student. I used coding key topics to identify large-scale phenomena and then employed linguistic ethnographic analysis of select episodes (Rampton, 2007). These PPCMs had typical repeating characteristics that teachers were able to learn. For example, for their decisions, teachers tended to rely on their professional intuition rather than on students' scores. Not committing to scores allowed teachers to use student sorting for other personal and organizational needs, such as disciplining students. Additional sorting practices teachers could learn in the PPCMs included, for example: the difference between the declared and the enacted role of the different tracks; the use of sorting as a method of both punishment and reward; who is (unofficially) authorized to make final sorting decisions; and how to record their decisions in ways that prevent parents' possible critique. This study illustrates how daily interaction in teacher team meetings not designed for professional learning affords learning of sorting practices. More broadly, this study contributes to the understanding of teacher on-the-job learning.

Paper Session 3:

Changes in students' group interactions during design research

Presenting Author:Mieke Breukelman, Rijksuniversiteit Groningen, Netherlands; **Co-Author:**Frans Hiddink, NHL Stenden Hogeschool, Netherlands

Research has repeatedly demonstrated that dialogic classroom interaction, either among pupils or between a pupil and a teacher, is vital for knowledge construction (cf. Mercer & Littleton, 2007). In practice, however, such valuable dialogic interactions rarely occur, while teacher-led conversations are still dominantly prevalent (Howe & Abedin, 2013). It is therefore important that in teacher training, students already learn to elicit dialogic interactions with or between pupils. For this end, some changes have been made in the course 'communication' of the Teacher Training program at NHL Stenden University of Applied Sciences. The adjustment of the course consists of three components: 1) students are prompted to conduct Educational Design Research (EDR, cf. Collins, Joseph & Blęclaczc, 2004), for which they 2) analyse video-recordings of interactions from their own placement practice. In addition, 3) students are familiarized with results from recent research on interaction by means of CARM principles (Stokoe, 2014). Three groups of students have been videotaped during three to four EDR sessions in which they discussed and analysed their own recorded interactions. The videotaped EDR sessions have been transcribed and analysed by means of Applied Conversation Analysis (Antaki, 2011). The focus of our study is on how students' analyses of their interactions change over the course of the EDR. Such changes potentially indicate learning processes (cf. Melander & Sahlström, 2009). Consequently, it is expected that students become more competent in provoking dialogic interactions in their teaching practice.

Inclusive and dialogic education in multilingual contexts

Presenting Author:Albert Walsweer, NHL Stenden University of Applied Sciences, Netherlands

The presentation will present the recent developments around plurilingual dialogic education in Fryslân. It is set within the current context of regional minority languages, such as Frisian, growingly encountering migrant-induced language diversity. Against this backdrop we will present: (1) An example of a project called 3M, aiming to motivate teachers to develop *translanguaging practices* (Li Wei, 2014) and to assist teachers in their sustainable change towards plurilingual dialogic education. (2) Examples of how participants in multilingual interaction (whole class & group work) display (dis-)alignment and (dis-)affiliation in relation to dialogic education, by analysing the video-recordings of plurilingual activities using conversation analysis.

Symposium Sessions 1-4, Thu, July 2, 13:30 - 15:15

Symposium 1:

Facets of peer interaction and argumentation and their link to learning across different settings

Chairperson: Valentina Reitenbach, Germany

Chairperson: Christin Siegfried, Goethe-Universität Frankfurt, Germany

Discussant: Riikka Hofmann, University of Cambridge, United Kingdom

In cooperative educational settings, interaction is seen as crucial for learning. However, empirical evidence demonstrates that interaction does not automatically lead to learning success (e.g. Littleton & Mercer, 2010). This raises the questions: 1. Which *types or sequences of interaction* are relevant and 2. how can we *measure* them to display their relevance for learning processes? Because peer interactions are embedded in a specific context, these two questions cannot be approached without raising a third, and actually preceding, issue: 3. What *context or content of learning* are we addressing? Furthermore, successful interaction is not independent of their participants and their prerequisites, such as communicative and social competence and motivation, which they inevitably bring to the interaction (for an overview see Jurkowski, 2011). Hence, another question has to address 4. to what extent *participants' characteristics, group composition or type of cooperative setting* are relevant factors that need to be taken into account when looking at learning relevant interaction and its operationalisation? This symposium systematically brings together studies that 1. address different interaction types (elaboration of utterance, high- and low quality helping behaviour, pattern of argumentation structure) and 2. use different approaches to operationalize these interaction types (coding of audio/video data and test answers). They examine effectiveness in relation to 3. different disciplines (mathematics, economics) and educational settings (primary school, secondary school), whereby 4. the prerequisites of the interaction partners such as supportive climate, ethnicity or prior knowledge are also included as proxies.

The role of supportive climate and elaboration in peer learning with primary school students

Presenting Author: Valentina Reitenbach, BUW | University of Wuppertal, Germany

Peer learning promotes academic achievement across different subject areas and motivational as well as affective variables (e.g., Robinson et al., 2005). While there is empirical support that achievement in peer learning varies depending on individual and group factors such as motivation (for an overview see e.g. Slavin, 2014) as well as the type of peer interaction (Littleton & Mercer, 2010), research has rarely addressed the mechanisms of these relationships. Combining a (socio-)constructivist and a motivationalist perspective, this presentation investigates direct and mediating relationships between the three components supportive climate, elaboration in peer interaction and achievement with two different models (path-analytical and multilevel approach). Positive relationships and a partial mediation of supportive climate on achievement were expected. In order to investigate the relationships, data was obtained from a dyadic peer learning intervention (12 sessions). Students of grade three and four participated in a training that dealt with the flexible use of arithmetic strategies. Students with a higher amount of elaborated utterances as well as a peer with higher elaborated utterances had a higher flexibility in their strategy use than students with a lower elaboration. In the multilevel analysis, this relationship was only true on the group level. Both models identified a positive relationship between supportive climate and the level of elaboration in peer interaction on an individual level, but there is no significant mediation. Considering both models for analysis adds different aspects to the picture of learning mechanisms in cooperative settings. Limitations and practical value will be discussed.

Quality of group interaction, ethnic group composition, and individual mathematical learning gains

Presenting Author:Jolien Mouw, Rijksuniversiteit Groningen, Netherlands; **Co-Author:**Nadira Saab, Leiden University, Netherlands; **Co-Author:**Jeroen Janssen, Utrecht University, Netherlands; **Co-Author:**Paul Vedder, Leiden University, Netherlands

High-quality helping behavior is essential for effective peer interaction and learning. This study focused on ethnic group composition and the quality of group interaction as predictors of individual mathematics performance. Video-observations of 92 fifth-grade students working in groups balanced on mathematics performance level were analyzed. We expected a difference in the quality of interaction and test scores of native and non-native students. Multilevel analysis identified process regulation and giving answers as positive predictors of mathematics performance, whereas giving or applying explanations contributed negatively. Non-native students generally had lower achievement scores than native students. Non-native students working in ethnically heterogeneous groups performed better than did students working in homogenous groups. Homogeneous groups used more high-quality helping behaviors and engaged more often in task-oriented behavior. Heterogeneous groups engaged more often in low-quality helping behaviors. Working with native students may have been conducive to non-native students' understanding of word problems in realistic mathematics education.

An Exploratory Study of Students' Written Argumentation on Socio-Economic Issues

Presenting Author:Nicole Ackermann, Universität Zürich, Switzerland; **Co-Author:**Bengü Kavadarli, University of Zurich, Switzerland

As socio-scientific issues, socio-economic issues are complex and controversial (cf. Ackermann, 2019; Sadler, 2004; Simonneaux, 2008). Argumentation on socio-economic issues belongs to informal reasoning (Kolsto & Retcliffe, 2008). According to Toulmin's (1958) argumentation model, an argument consists of a claim (statement/position) supported by reasoning (data, backing, rebuttal). The goal of this exploratory study is to examine students' written argumentation structure when dealing with socio-economic issues (e.g., retirement provision, energy supply). (RQ1) What patterns in argumentation structure do students' answers reveal? (RQ2) How many clusters of argumentation structure can be identified and how are they characterized? (RQ3) What is the relation between argumentation structure and content knowledge?The data were collected from a sample of 159 high school students in Switzerland using the revised test on economic-civic competence (WBK-T2) (Ackermann, 2018, 2019). A new coding scheme was developed to analyse argumentation structure (cf. Ackermann & Kavadarli, 2019). The inter-rater reliability yielded good values (Cohen's $\kappa = .75$). Backing is found in 74 % of all students' answers, rebuttal in less than 10 %. Everyday explanations and scientific explanations are almost equal. 82 % of all answers use connectives between reasoning phrases; the most frequent is additive. The two identified clusters for reasoning differ substantially in content knowledge. The correlation between content knowledge and each of the three reasoning variables is moderately positive. Besides its methodical limitations, this study gives a first insight into students' written argumentation on socio-economic issues and opens up new perspectives on future research.

Group discussions and their influence on learning success in economics

Presenting Author:Christin Siegfried, Goethe-Universität Frankfurt, Germany

This article examines group discussions in the context of problem-oriented in economics education. This teaching setting is based on the assumption that the multiple perspectives and different competence requirements of economic competence are favoured in group discussions. This study focuses the identification of interactions in group discussions that are beneficial to learning in the field of economics. Thus, 90 high school students working in groups were videotaped and their group discussion analysed. In a first step, the cognitive processes of the individual group members associated with the individual contributions, the content diversity of the individuals contributions and the structure of the group discussions are examined. In a second step, potential relationships between the manifestation of these variables and the individual learning outcomes of the students are investigated. The results indicate that especially the proportion of elaborated contributions of the individuals in the group discussion has a positive effect on individual learning, while individual entry requirements seem to have little or no influence. At the group level, the content diversity seems to play an important role.

Symposium 2:

Investigating computational thinking in classrooms – conceptual issues and empirical processes

Chairperson: Nina Bonderup Dohn, University of Southern Denmark, Denmark

Organiser: Nina Bonderup Dohn, University of Southern Denmark, Denmark

Discussant: Paul Drijvers, Utrecht University, Netherlands

Computational thinking (CT) is increasingly highlighted in research literature, societal debates and educational policies alike as a set of problem-solving skills of prime significance in the 21st century (e.g. Wing, 2006). Researchers have sought to clarify which competences are involved in CT, often based on literature reviews of investigations of specific learning designs. Such reviews tend to be limited to learning designs which focus on problem-solving with coding as a vital step. However, as argued by Chongtay (2018), the core skills identified (decomposition, pattern recognition, design of a step-by-step solution procedure, and generalization) are useful beyond problem situations involving coding. CT and the learning of CT can thus be regarded a prime area for investigating classroom processes of learning to problem-solve. In this symposium, we investigate theoretical conceptualizations and empirical realizations of CT in classrooms spanning the educational system, in courses with and without coding. The first paper discusses how to delimit CT from other forms of thinking. The second paper presents a systematic literature review of pedagogical approaches in various analogue and digital learning designs. The third paper articulates pedagogical points for teaching (with) CT, based on research on specific learning designs. The fourth paper presents an empirical study of the use of CT across different learning settings in an interdisciplinary project course. Chongtay, R. (2018). Computational Literacy skill set – an incremental approach. In N.B. Dohn (Ed.), *Designing for learning in a networked world*. Abingdon: Routledge. Wing, J. (2006). Computational thinking. *Communications of the ACM*, 49(3), 33-35.

Defining Computational Thinking

Presenting Author: Stig Børsen Hansen, University of Southern Denmark, Denmark

This paper seeks to define computational thinking by identifying three theoretical landscapes that combine in contemporary, academic discussion. After a brief introduction of different kinds of definition and their desiderata, the paper proceeds by demonstrating how the following three theoretical backgrounds constitute and motivate the focus on computational thinking processes in classroom activities. The first strand of theory can be identified with notions drawn from logic and analyses of machinery, such as decomposition, generalization and automation. Under the heading of productivism, the second strand introduces themes from philosophy of technology that underscore the importance of work and its tools for the process of subjectification, for political influence and flourishing. Historically this has found different expressions, and the paper explores those found in Marxist and Heideggerian philosophy of technology, respectively. Finally, the third strand explores the notion of a thinking framework. For decades, a certain kind of thinking has been the starting point for a large number of educational policies and philosophies. These thinking frameworks have been the subject of systematic study and categorization, and placing CT in this theoretical landscape allows us to contrast CT with other approaches to education. The paper concludes with contrasting the tripartite definition offered here with other attempts found in the literature and discusses whether the three strands of theory that are argued to make up CT necessarily are found in e.g. designs for learning informed by CT.

Pedagogical approaches in Computational Thinking - A systematic literature review

Presenting Author: Christina Fyhn Nielsen, University of Southern Denmark, Denmark; **Co-Author:** Nina Bonderup Dohn, University of Southern Denmark, Denmark

This systematic literature review investigates the different pedagogical approaches involved in both physical and digital learning designs aimed at the learning of Computational Thinking (CT), as domain and as method. The database search provided 1049 publications, which was narrowed down to 98 publications after title and abstract screening. After full text screening 30 publications remained. The analysis of the review shows the following results: Learning CT is fostered as a domain or method in various subjects from the classical STEM courses, to music and language learning; utilising the following pedagogical approaches: instructionism, constructionism, constructivism, inquiry-based learning, project-based learning, (digital) Game-based learning, Design-based learning, Problem-based Learning. Specific pedagogical focus points were self-efficacy and scaffolding. Four different types of means are employed: 1) Screen-based Learning – different devices with e.g. visual programming tools like Scratch, 2) Unplugged learning – analogue learning, with physical materials without software, 3) Computational Things – e.g. learning robots or interactive products, 4) Embodied Learning – analogue learning with focus on students' use of their own their bodies. The majority of the publications applied one of the first three types, and we see a research gap as regards how students can learn CT through Embodiment. The publications demonstrate a learning potential for CT either as domain or as method in other subjects. None of the publications clearly state how to measure whether their approach works better than others. Therefore, another research gap concerns developing a method to compare diverging learning designs' support of CT competence development.

Focus points for the pedagogics of teaching (with) Computational Thinking

Presenting Author: Nina Bonderup Dohn, University of Southern Denmark, Denmark

Researchers agree that Computational Thinking (CT) involves a set of core skills, arguably relevant in problem-solving, irrespective of the subject to be learned (e.g. Chongtay, 2018). The skills are decomposition, pattern recognition, design of a step-by-step solution procedure, and generalization. In line with the view of CT as a general problem-solving method, Denmark is currently implementing CT at all educational levels, both as a domain in itself and as a method for learning other subjects. This paper reports from research on 20 teacher projects in upper secondary teaching of humanistic, social science and STEM disciplines. The projects focused on pedagogical design of CT-sessions. The research focus across the projects were the questions *How can CT be concretized in specific disciplines? How do CT-skills influence subject-matter and vice versa in specific disciplines?* Focus was on teachers' design activities, experiences, and reflections, as well as on ensuing classroom activities; not on students' experiences. Methodologically, the research employed design workshops with the teachers, classroom observations of CT-sessions, open questionnaires and interviews. Results, coupled with theoretical reflection on implicit premises of CT, point out key themes for the pedagogics of teaching (with) CT, e.g. *Discipline-specific potentials and challenges in teaching (with) CT; Presuppositions about problems, problem-setting and problem-solution; and Conceptual or disciplinary agency with CT.*

An empirical study of the use of Computational Thinking in an interdisciplinary project course

Presenting Author: Jesper Jensen, Department of Design and Communication, University of Southern Denmark, Denmark

This paper presents a small-scale empirical study, which focusses on an interdisciplinary project course where students learn coding and information technological implementation of algorithms as part of system design in relation to group based project work within the field of humanities and/or social science. The study primarily aims to examine how the students' Computational Thinking (CT) competences – such as problem solving competences, coding, and information technological implementation of algorithms – are transferred or transformed from other concurrent or previous courses to this broader project focus. The students involved in the interdisciplinary project course were a class of 3rd semester students on a BSc programme in engineering at a Danish university. All student project groups were to develop a theoretically supported and technologically realised design of an interactive web-based social campaign directed at children and young people. The study was conducted with an emphasis on five semi-structured group interviews carried out with all five project-groups shortly before the students' deadline for handing in their project work. Two classroom observations were also conducted in relation to two project presentation/feedback sessions – respectively, at time of project inception and just prior to project completion. The groups' final products, exam papers, as well as portfolio assignments made by students during the semester are used to qualify and nuance statements made by students in interviews, as well as provide additional context for and insight into their transfer or transformation of CT competences in regards to different process-oriented aspects and stages of their project work.

Symposium 3:

Makerspaces at school: at the boundary between social and material processes

Chairperson: Giuseppe Ritella, University of Helsinki, Finland

Organiser: Giuseppe Ritella, University of Helsinki, Finland

Discussant: Antonio Iannaccone, University of Neuchâtel, Switzerland

During the last decade, schools in many countries have been setting up makerspaces or digital fabrication labs, described as “disruptive” places in schools where students can design, make, and share personal projects (Blinkstein, 2013). The educational expectations associated with makerspaces are often alternative to traditional models of knowledge transmission, emphasizing student agency, knowledge creation, and creativity (Kumpulainen, Kajamaa, & Rajala, 2018). Accordingly, making constitutes a specific genre of constructivist and learner centered educational practices. In addition, maker-centered pedagogical approaches often highlight iterative processes of designing and making in collaborative settings, as well as the constitutive function of material embodiment. Nevertheless, the investigation of maker-centered pedagogical practices is a nascent field of research and it is not yet clear to what degree pre-existing theoretical conceptualizations and analytical constructs can be fruitfully adopted in the research context. The aim of the present symposium is to contribute to the development of this field of investigation by examining makerspaces through complementary analytical concepts enabling us to make visible and discuss emergent processes of socio-digital participation, and creative engagement with the material world. In sum, the presentations will discuss dimensions of and interconnections between social and material processes connected to making.

References

Blinkstein, P. (2013). Digital fabrication and “making” in education: The democratization of invention. In J. Walter-Herrmann & C. Büchling (Eds.), *FabLabs: Of machines, makers, and inventors*. Bielefeld, Germany: Transcript. Kumpulainen, K., Kajamaa, A., & Rajala, A., (2018). Understanding educational change: Agency-structure dynamics in a novel design and making environment. *Digital Education Review*, 33, 26–38.

Teachers' Narratives of Distributed Leadership in a Digital Makerspace

Presenting Author: Jasmina Leskinen, University of Helsinki, Finland; **Co-Author:** Kristiina Kumpulainen, University of Helsinki, Finland; **Co-Author:** Anu Kajamaa, University of Helsinki, Finland

Student-centered learning environments, such as makerspaces, create alternative teaching and learning arrangements. The possibility to navigate a variety of material and conceptual resources available in makerspaces, affords students to take more authority and leadership in their learning activities. Teachers are no longer seen as sole experts leading students' activities, but expertise and leadership can be widely distributed. Understanding that leadership is a pivotal element of makerspaces, the study examines teachers' perspectives to leadership in a school-based makerspace. We aim to depict how teachers define their and their students' roles in the makerspace and how this resonates with the ideals of student-driven learning as advocated by maker education. The study aims to generate valuable insights into the possibilities and tensions in (re-)constructing leadership in makerspaces, including the positioning of students, teachers and knowledge in this process. A narrative approach was applied in analyzing interview data of 8 Finnish primary school teachers. The results highlight three narratives to understanding leadership in makerspaces recounting teacher-centered, student-centered and shared leadership. Student-centered narratives reflected promoting students' own interests and engagement in personal and meaningful projects in and out of the makerspace environment. Teacher-centered narratives reflected needs to develop students' basic and digital literacy skills so that they can work

independently in the makerspace. Narratives of shared leadership reflected broadening and extending common knowledge as well as generating ideas together to promote the students' personal projects. Overall, the narratives highlighted the distribution of leadership between them and the students as a collective learning process.

The role of teachers in maker-centered pedagogy: examining ostensions during a co-invention project

Presenting Author:Giuseppe Ritella, University of Helsinki, Finland; **Co-Author:**Sini Riikonen, University of Helsinki, Finland; **Co-Author:**Varpu Mehto, University of Helsinki, Finland

The aim of this presentation is to discuss if and how embodied ostensive actions enacted by teachers support the process of knowledge creation in maker-centered pedagogies. Often the literature on ostension derives from Kuhn's theorizing (Kuhn, 1974), where ostension is considered a primary mechanism of conceptual learning. If a concept is learned by ostension, the meaning is conveyed by "pointing" to examples of things to which it applies (Bonevac 1999). In addition, some scholars distinguish between physical/embodied and verbal ostension (Sghaier et al., 2016). Since the process of co-creation in a makerspace is intrinsically affected by material relations and embodied actions, the analytic interest is on the potential role that embodied ostension might play in mediating the students' learning process and on the material resources involved in such embodied ostension. The research context is a co-invention project with 7th grade students at a Finnish basic school based on the knowledge creation approach. The project involved 70 students, aged 13 to 14. The second author of this paper conducted participant observation, wrote field notes, and videorecorded the students' groupwork. The authors have explored the videos from one group of students and agreed about the coding scheme for the systematic analysis of the whole dataset, which is ongoing. In the presentation, we will present our findings to illustrate how teachers enact embodied ostensions and how these support the knowledge creation process. Furthermore, we discuss limitations and opportunities that the concept of ostension might bring to investigations on maker-centered knowledge creation.

Material actors within a collaborative idea refinement process maker centered learning Presenting Author:Varpu Mehto, University of Helsinki, Finland

Maker-centered learning offers the opportunity to engage with the world by observing, designing, and creating. Learning through making involves human and non-human agents, including traditional and digital tools, material resources, and physical and digital spaces. To track the dynamic role of materiality in the maker-centered process, we build on the sociomaterial view of social and material being constitutively entangled. In this view, materials as more than mere mediators of human action. Instead, all phenomena are constituted in reciprocal relations between human and non-human components. The fixed properties of materials do not determine the meaning of materiality; meaning is performed in action. For example, the potential of materials is affected by students' craft skills. The material's agency appears not only in intentional design activities, but also in spontaneous moments of play, unforeseen challenges, or moments of boredom, leading to idle material manipulation. From a case study perspective, we shed light on how the material actors affect ideation processes through sociomaterial relations in a secondary school collaborative maker project. In the project, 14- to 15-year-old students created smart products in small teams. Our data involves ethnographic observations and student interviews together with video footage from four teams' processes. We present findings illustrating the interdependency of the idea refinement processes and the physical construction, emphasizing how creativity emerges from the network of sociomaterially entangled participants. Furthermore, we discuss new approaches that a sociomaterial perspective can bring to investigations on maker-centered learning.

Scaffolding the wicked, multi-faceted design thinking project in middle school: a case study Presenting Author:Noora Salonen, University of Helsinki, Finland

This presentation reports the first phase of a larger study exploring scaffolding of middle school students' design thinking process. Design thinking is suggested as an approach, where students dive into an empathic, action-oriented and creative collaborative process. Very little is known about what kind of scaffolds are needed for acknowledging the user perspective in the students' design thinking process. We adopt van de Pol et al.'s definition: "scaffolding encompasses processes where experts use means that are contingent on students' performance to assist students in the realization of intentions relevant to task success." In this study, we focus on different scaffolding strategies aiming at understanding the future user and supporting the collaborative designing. The research question for this study is: *What different scaffolding strategies were offered for acknowledging user perspective in students' design thinking process? In task descriptions (i.e. design assignments)b. In interactions between teachers and student group*

The data was collected from experimental project in a Finnish middle school, where the students co-designed e-textile artifacts according to preschoolers' wishes and needs. The data for this study includes video-data from three design sessions of one small group, design assignments and researcher diary. The Framework for Analysis of Scaffolding Strategies is utilized for directed qualitative content analysis. The first analysis step includes identifying scaffolding intentions (metacognitive, cognitive, affective), and the second, identifying means (feeding back, hints, instructing, explaining, modeling, and questioning). During the presentation I will discuss the identified scaffolding strategies and further possibilities of recognizing their implications on students' design thinking processes.

Symposium 4:

Fostering interest-driven engagement at school and beyond

Chairperson: Jaakko Hilppö, University of Helsinki, Finland

Organiser: Thea van Lankveld, Utrecht University, Netherlands

Discussant: Alfredo Jomet, Spain

This symposium brings together four studies that all explore the students' interests in educational contexts. Although prior research has shown that engaging students' interests has strong positive effects on their learning (Hidi & Renninger, 2006), maintaining and supporting their interests in formal learning activities is easier said than done (e.g. Potvin & Hasni, 2014). This is in part due to interest being both underconceptualized and narrowly investigated in prior educational studies (see also Anderhag, et al. 2016). To address these caveats, the aim of this symposium is to conceptualize and explore in more breadth and depth interest-driven engagement in four different but mutually supportive studies. The first paper aims to conceptualize of the role of interest in education. The second examines how, and the extent to which, school figures as part of adolescents self-reported interests during their daily life. The third paper focuses on teachers' ways of addressing students' interests in a novel interest-driven learning environment. Lastly, the fourth contribution focuses on students interest-driven learning when their interests leads them beyond the designed learning environment. Together these papers aim to generate a more encompassing understanding of how interest emerges and develops within formal education and especially how interests are connected to, and thus create continuity across the students' in-school and out-of-school lives and learning (Bronkhorst & Akkerman, 2016; Ito et al., 2013; Rasmussen & Damsa, 2016).

Interest in school and school in interest

Presenting Author:Esther Slot, University of Utrecht, Netherlands; **Co-Author:**Larike Bronkhorst, Utrecht University, Netherlands; **Co-Author:**Theo Wubbels, Utrecht University, Netherlands; **Co-Author:**Sanne Akkerman, Utrecht University, Netherlands

Questioning adolescents' reported lack of interest in school, this study aims to present a nuanced understanding of the role of school in interests in adolescents' daily life. Adopting a person-centered perspective, wherein adolescents self-define objects of interest and related interest practices, we asked 44 adolescents to report on interest experiences using an experience sampling smartphone application *inTim* at least six times daily, for a period of two weeks, with intervals of three months, over the course of a school year. We scrutinized the 7403 reported interest experiences for references to school (including but not limited to teacher, Math, assignment, student council, fieldtrip, grade(s)). 2014 events referred to school in some way, the percentages between all and school related interest experiences ranging between 0 and 68% across adolescents. Our analysis shows that school is reflected in interest experiences in three qualitatively different ways: adolescents showed selective interest in the (co)curricular content offered by school (i.e. interest in school), enriched their time in school by orienting towards social and leisure interests (i.e. interest at school), and after school deliberately engaged in leisure interests to recharge from school (i.e. school in interest). Two thirds of the adolescents refer more than one way; the others' interest experiences reflect a single way, with one adolescent not mentioning school at all. Results provide directions for interest research as well as educational practice, including for teachers to connect to adolescents' interests and for adolescents to become more aware of how they can shape school to their interests.

Teachers' contingent support for students' science interest in a digital STEAM learning environment

Presenting Author:Antti Rajala, University of Helsinki, Finland; **Co-Author:**Kristiina Kumpulainen, University of Helsinki, Finland; **Co-Author:**Anu Kajamaa, University of Helsinki, Finland; **Co-Author:**Jasmiina Leskinen, University of Helsinki, Finland

The aim of this paper is to advance understanding of how teachers address student interest in science learning. Science interest has a powerful influence on science learning and science-related career choices. Yet, relatively little is known about teacher strategies for harnessing student interest in science. In this study we build on and extend the existing research on contingent support of science interest. We draw on social practice theory of interest to examine teachers' strategies of contingently supporting student interest in science learning. We also examine what resources teachers employ in their support of student interest. The research setting is a digital learning environment (the FUSE studio) in a Finnish school that has been designed to foster student interest-driven learning in STEAM. The data comprise 65 hours of video-records of 9-12 year old students' science learning activities. The video data were transcribed and analyzed with interaction analysis methods. We used purposeful sampling of events in the video

data to address our research focus. The preliminary results show that in the FUSE studio, the teachers frequently oriented to the students' interest. The teachers' support was mostly contingent to students' science interest. They made use of the FUSE studio design principles, flexible participation structures, and material resources. However, our findings also show examples of misalignment between the students' interest and teacher guidance. In all, this study contributes novel conceptual and empirical understanding of how teachers can support students' science interest in formal education settings.

Learning outside the curriculum but inside school. A case of an extreme productive deviation

Presenting Author: Jaakko Hilppö, University of Helsinki, Finland; **Co-Author:** Reed Stevens, Northwestern University, United States

This study focuses on an understudied aspect of interest-driven learning within formal education, namely student learning that extends beyond the instructional design of the learning environment. These extensions mark pivotal moments in student's interest development as the students, through their agency, create new learning opportunities for themselves related to their interest and pursue them. In this study, we conceptualize these extensions as productive deviations (e.g., Rajala & Sannino, 2015) and drawing on video data form our year-long ethnographic study of seven different FUSE Studios—an open STEAM learning environment in schools (Stevens et al., 2016) focus on a particularly extended productive deviation where two students designed and created two computer games during their time in FUSE. Our interaction analysis (Jordan & Henderson, 1995) of the student's novel problem solving situations (n = 34) revealed that by following their interest beyond the design of the learning environment, the students were able to create rich learning opportunities for themselves both in relation to how videogames are made and how such work should be organized and capitalize on these opportunities. In all, the results of our study speaks for creating more open learning environments in schools to foster students' interest-driven learning.

Paper Sessions 4–6, Thu, July 2, 15:30 - 16:30

Paper Session 4:

Exploring teacher-student interaction in early childhood English language classrooms

Presenting Author: Selma Koyuncu, University of Helsinki, Finland

This study focuses on teacher-student interaction in Finnish pre-primary and first grade classrooms during English language lessons. The purpose of the study is to investigate the nature of classroom interaction in teacher- and student-initiated situations and how these create opportunities for students' active participation in English language learning. The empirical data of the study were gathered in seven preschools or primary schools; four pre-primary and three first grade classrooms. The research participants include 4 teachers and 205 children (aged 6-7). In total, 56 hours of video documentation were recorded during a 10 week period in English language lessons and analyzed qualitatively in addition to basic descriptive quantitative results. In addition, video-stimulated recalls were conducted with the four participating teachers to analyse the nature of classroom interaction. The results show that classroom interaction varied depending on the size of the group: teacher-initiated interactions were observed more in whole class sessions which includes more than 20 students. A more equal balance between teacher-initiated and student-initiated interaction was found to be more typical in smaller groups including 6 to 7 students. Teacher-student interactions were usually based on initiation-response-feedback (IRF) in whole class sessions while the communicative functions of the interactions were more varied in smaller group size sessions. Pedagogical implications of the study can help the stakeholders understand the gap between the knowledge and the practical nuances to contribute to ECEC policies, teacher trainings and applications.

The ebb and flow of early childhood mother-child interactions: A microgenetic approach.

Presenting Author: Erica Kamphorst, University of Groningen, Netherlands; **Co-Author:** Jolijn de Groot, University of Groningen, Netherlands; **Co-Author:** Marja Cantell, University of Groningen, Netherlands; **Co-Author:** Suzanne Houwen, University of Groningen, Netherlands; **Co-Author:** Alexander Minnaert, University of Groningen, Netherlands; **Co-Author:** Ralf Cox, University of Groningen, Netherlands

During early childhood, the mother-child relationship plays a crucial role in a child's cognitive, language, and social-emotional development. We aimed to understand how coordinated and adaptive mother-child relationships emerge from the ebb and flow of everyday momentary interactions between mothers and their typically developing 3- or 4-year old children. Accordingly, we adopted a bidirectional and microgenetic approach, by (1) including both the mother's and child's behavior and (2) zooming in on the dynamics of moment-to-moment interactions. In doing so, we shifted away from a focus on maternal behavior on a more global level (e.g., over the course of a whole interaction session) which has dominated mother-child interaction studies so far. During the data session we will explore video-observations from a larger ongoing longitudinal study on motor skills, executive functions, and language abilities of 3- to 6-year old children from Dutch-speaking families. Dyads carried out a semi-structured play task, the Etch-a-sketch. As interaction is a multimodal phenomenon, participants will engage in coding of interaction behavior in several modalities, that is, verbal communication, affective states, and body movement. Coding procedures were designed to provide bivariate behavioral streams from manual categorical coding, dynamic state tracking, and automatic extraction of body movements. Additionally, we will discuss the benefits and pitfalls of our novel microgenetic approach which aims at providing a better understanding of the multimodal behavioral coordination of mothers and children. Given malleability of maternal- and child behaviors, and sensitivity to interventions during early childhood, our findings may facilitate healthy and adaptive caregiver-child interaction.

Paper Session 5:

Dialogic interactions and the appropriation of text composition abilities in primary school children

Presenting Author: Sylvia Rojas-Drummond, National Autonomous University of Mexico, Mexico; **Co-Author:** Jose Hernandez-Quintero, National Autonomous University of Mexico, Mexico; **Co-Author:** Rocío Ivonne Hernández Cruz, National Autonomous University of Mexico, Mexico

The study to be reported analysed the teaching-learning strategies taking place in classrooms where an educational innovation was implemented. Participants were 120 sixth-graders from two experimental and control state schools. Both groups solved an individual and group pre- and post-intervention Test of Textual Production. Between tests, children from the experimental group participated in a programme called 'Learning Together', which promoted scaffolding, collaborative problem-solving and dialogic interactions. Five lessons from experimental and control groups were video-recorded throughout the year. Comparisons between pre- and post-tests revealed that the experimental group, in contrast with the control, learned to compose higher quality written articles when working in small-groups and independently. In order to understand how the achievements of Learning Together children might have come about, we carried out fine-grained analyses of selected lessons from each group. Results showed that the teaching-learning strategies of the control group tended to be directive and transmissional and literacy was addressed in a somewhat fragmented and decontextualized way. In contrast, the Learning Together classroom practices showed an orientation towards the joint construction of knowledge among teachers and students through connected, dialogic interactions and co-regulatory processes, as well as the promotion of literacy as an articulated, situated social practice. We hypothesise that these contrasting teaching-learning styles partly account for why Learning Together participants became more expert writers at the end of the academic year, in contrast with their control peers.

Self-regulated reasoning on social interactions in children with Autism Spectrum Disorder

Presenting Author: Carla Geveke, Hanze University of Applied Sciences, Netherlands; **Co-Author:** Herman Veenker, Hanze University of Applied Sciences, Netherlands; **Co-Author:** Henderien Steenbeek, Hanze University Groningen, University of Applied Sciences, Netherlands

It can be very challenging for practitioners to talk with children with Autism Spectrum Disorder (ASD), especially when the conversation calls for self-regulation. Autonomy as a basic psychological need that fosters competence is the key to self-regulated reasoning (SRR), since it helps children to know how to regulate interactions with others. Little is known about how autonomy influences competence in SRR of children with ASD. Central question in this study was: to what extent can autonomy provided scaffolding elicit high levels of SRR on social interactions over time? We used interaction data of three session between one special needs child and a practitioner, contextualized by a set of animated SRR, DSM-5 based items. Interaction variables were child's level of SRR and practitioner's level of provided autonomy. Results showed large proportions of high-level provided autonomy in all sessions and a decline of this level in last session. SRR improved significantly each session. When exploring the dynamics of the micro-data we found contingency over time and feedback-loops of high-level provided autonomy and high-level SRR. Since the child showed a significant improvement of SRR over time, our research question provides a promising perspective. Sessions positively affected SRR of the child with ASD and the role of the practitioner in autonomy provided scaffolding has been very important. Contrary to what one might expect in autism spectrum disorders, providing autonomy supported the performance of the child. These outcomes underline the relevance of giving a voice to children with a diagnose in the spectrum of autism.

Paper Session 6:

The Relationship between the learning environment and students' sense of social cohesion

Presenting Author:Irit Sasson, Tel-Hai College, Israel, Ben-Gurion University of the Negev, Israel

Around the world, various programs have been developed which aspire to implement innovative pedagogy that addresses, among other things, to develop social skills. This study examined an educational program that serves as an applied example of the constructivist approach with the goal of developing collaborative skills and team work. The new learning environment develops gradually in the school alongside traditional learning environments, so that in one age group there are two forms of teaching and learning, which allows investigation of the new learning mode compared to the traditional. First, the teaching and learning methods were characterized by 143 class observations and questionnaires filled by 149 9th and 10th grades students, and then the impact of the new learning environment on the development of a sense of social cohesion was examined among 82 students. Social cohesion expresses the extent to which students feel a sense of belonging, commitment and significance in their classroom. Students' sense of cohesion was measured by a questionnaire that included three categories: sense of belonging, solidarity and a perception of social support. The results of the observations and students' report indicate that the lessons in the innovative program have a significant higher application of collaborative group learning. The findings show that there is a statistically significant advantage in the sense of social cohesion for students of the innovative program compare to students of the traditional class. Students interpret the collaborative learning and social mediation that teachers create, as a key factor in the development of classroom cohesion.

Paper Sessions 7–8, Thu, July 2, 17:00 - 18:00

Paper Session 7:

The Real Me: Shared Technology's Effect on Collaboration, Power, and Status

Presenting Author:Christina Nishiyama, University of Nevada Las Vegas, United States; **Co-Author:**Michael Nussbaum, University of Nevada, Las Vegas, United States

Participation in computer-supported collaborative learning (CSCL) environments has been found to result in higher levels of student engagement and mutually shared cognition. Furthermore, higher levels of social perceptiveness are correlated with higher levels of group performance. However, student participation varies from group to group, and collaboration is not always successful, resulting in off-task behavior, inequity, and power imbalances. In this study, positioning theory and interaction analysis are used to investigate interactions in diverse groups working with technology and their negotiated positions of power and status. Results showed that racial minority group members experienced more imbalances of power and status, and rated participation as more inequitable. Results were exacerbated when minorities were also female. Higher levels of social perceptiveness were negatively correlated with perceptions of group collaborative success. Findings provide support for the use of positioning theory to examine collaborative interactions and have important implications for future CSCL research in both organizational and classroom settings.

Polemic Forums in blended learning as new strategies for a dialogic Higher Education

Presenting Author:Silviane Bonaccorsi Barbato, University of Brasilia, Institute of Psychology, Brazil

The extensive use of multimodal tools prompts changes in everyday educational practices. It turns possible new modes of communication as well as new forms of interaction contributing to change and transformation in human development. To create new possibilities of polyphony that changed traditional discursive activities in classrooms, we apply polemic forums in Moodle by presenting a series of news reports published in various newspapers and media. Students are invited to comment and position him/herself individually. The polemic forum in focus in this session discussed the use of technologies in classrooms and schools. Forty-seven students enrolled in a Developmental and Educational Psychology course for pre-teachers' education took part in the discussion, producing 126 posts. At the end of three weeks, discursive information is then submitted to (a) dialogic thematic analysis; (b) analysis of intersubjective dynamics. Results indicated that although Moodle tends to promote teacher-centered interactions in forums, interactions between peers were observed when personal posts focused on axiology; in alternative solutions to the problem; and on meta-analysis. Knowledge production dynamics were initiated with the focus on the introduction to the task, following the traditional Initiative-Respond-Evaluate strategy with the addition of elaborations, indicating the opening of a reflexive orientation to the use of a facilitate-reading-engage strategy. Relations between I-positions and peers' positions were built using experiential knowledge. Polyphony was formed favoring the actualization of positions and clusters of meanings.

Paper Session 8:

Culturally Responsive Teaching in Diverse Elementary Classrooms: Characteristics and beliefs

Presenting Author:Lotte Henrichs, Utrecht University, Netherlands; **Co-Author:**Alyson Lavigne, Utah State University, United States; **Co-Author:**Jorge Acosta Americo Feliz, Utah State University, United States; **Co-Author:**Vivian Shao, Utah State University, United States

In this study, we examine culturally responsive instructional practices of teachers in diverse elementary grade classrooms in the U.S (n= 10) and the Netherlands (n=8). We contrast these to 'generally effective instructional practices'. We seek an answer to the question what Culturally Responsive Teaching (CRT) looks like in these two different contexts, and to what extent culturally responsive practices are based on tacit or explicit knowledge of the (theoretical) concept of CRT. We observed teachers using the CRIOP instrument and we held post-observation interviews. Findings indicate that the extent to which both US and Dutch teachers show examples of CRT varies. US and Dutch teachers who are considered 'high on CRT' were similar in their culturally responsive strengths and in CRT practices that were observed less frequently. Interview data indicate that the Dutch teachers who showed most CRT, were also the ones to hold an explicit personal view on what CRT meant to them. However, the interview data of the US teachers who showed most CRT practices in their teaching, indicate more 'tacit knowledge' of the concept of CRT. They did not necessarily hold strong views with regard to viewing cultural background as an asset for learning for example. Results of the study have implications for teacher preparation, practice and research. Observation protocols such as the one used in this study and discussions about the practices these instruments describe may help researchers, teachers and school leaders center their efforts on instructional practices that are particularly valuable for their diverse learners.

Meanings of school children about socioeconomic inequalities in the film "Boy and the world"

Presenting Author:Matheus Sousa de Macena, University of Brasilia, Brazil; **Co-Author:**Leticia Dultra de Faro Menezes, Tiradentes University, Brazil; **Co-Author:**Livia de Melo Barros, Tiradentes University, Brazil; **Co-Author:**Franklyn Jeferson Costa de Oliveira, Tiradentes University, Brazil

Introduction: Cinema is a resource that favors problematizing reality and building new meanings, understood in the present study from the perspective of Cultural Psychology. The film chosen for the research was "Boy and the World", a Brazilian animation directed by Alê Abreu and released in 2013. Objective: analyze the meanings constructed by students in rural and urban areas about the social inequalities presented in the film "Boy and the World". Method: Qualitative, exploratory research with data analysis through Thematic Analysis (Bardin, 1977). The data were constructed by three school groups - one in the rural area (school A, public institution) and two in the urban area (school B, public institution; school C, private institution) in a focus group after showing the film mentioned above and using a script of triggering questions. Results: The students at school C demonstrated in the discussion a narrative understanding of the film shown, verbalizing the twists of the work and relating the scenes presented to the social, environmental, political and democratic conflicts that contemporary society has experienced. The students from schools A and B expressed identifications with the film plot, by exemplifying situations of playing with animals in nature and even of a father's absence. Conclusions: The contexts in which the subjects are inserted are potentially influential in their production of meanings and ways of understanding the world, and the use of art is a facilitator in the process of understanding and expressing these representations.

Symposium Sessions, Thu, July 2, 17:00 - 18:45

Symposium 5:

The legitimacy and normativity of 'new' models for learning in the digital age

Chairperson: Mariëtte De Haan, Utrecht University, Netherlands

Discussant: Kevin Leander, Vanderbilt University, United States

This symposium will bring together studies that focus on 'new' or 'current' forms of 21st century learning associated with digitalisation, new connectivities, global or interest based learning, and that either critically evaluate alternative paradigms that are formulated to capture these forms of learning or show how these new forms of learning push against the boundary of established educational norms. Located in the Netherlands and Sweden, through a number of different methodologies based in the ethnographic tradition such as digital (n)etnographies, video recordings and participant observation, these studies make not only visible the complexities of learning across sites (formal-informal, virtual-analogue), but also discuss the tensions that come into existence when institutionalized, traditional and relatively regulated forms of learning are confronted with those that put youth's learning and their narratives of educatedness center stage. Issues for discussion in relation to these presentations that we anticipate are: how youth centered, 'un-surveilled', understandings of learning push against the boundaries of upcoming 21st century models of education, but also the

legitimacy of normative, taken for granted models of learning in relation to digitalization, and how these relate to issues of learning *for all*. In our discussion we pay attention to the tension between the 'opening up' of forms of learning that are afforded in informal learning spaces and that are neglected by current formal education and the limitations and boundaries these spaces or new infrastructures impose on what kind of 'educatedness' is to be recognised or rewarded.

Young People's Learning in Digital Communities. The Challenge of Being Educated

Presenting Author:Zowi Vermeire, Utrecht University, Netherlands; **Co-Author:**Mariëtte De Haan, Utrecht University, Netherlands; **Co-Author:**Sanne Akkerman, Utrecht University, Netherlands; **Co-Author:**Julian Sefton-Green, Deakin University, Australia

A growing body of research acknowledges the learning potential of digital communities, while at a societal level, these digital learning experiences are often not acknowledged as 'learning' or as leading to becoming an 'educated person'. In this research we are interested in those communities in which young people seem to be shaped by (and shape) alternative notions of being educated that might question or challenge dominant discourses and practices related to what it means to be educated. We hope to answer the question: how do young people learn in digital, interest-based, learning communities, and how does their learning, through their interaction with the digital platform and respective community, represent alternative discourses on 'being educated'? Using an ethnographic approach, we have collected and analysed learning experiences of young people across three distinct digital, interest-based, learning communities within the popular platforms YouTube, TikTok and Twitch. In our analyses, bearing in mind Gert Biesta's conceptualization of the three functions of education (2010), we map alternative processes of qualification, socialisation and subjectification in the respective communities. Preliminary results indicate that young people consider 'alternative' learning paths and careers due to online learning. Also, they experience clashes between the digital norms and values, which hinder them from using them for the benefit of mainstream society. We will discuss these results in the light of the hypothesis that online distinct forms of qualification, subjectification and socialisation can arise that in different degrees will speak back to dominant notions of what it means to be educated.

Diverse mobilities in virtual sites for learning: conceptual explorations

Presenting Author:Giulia Messina Dahlberg, University of Gothenburg, Sweden

This study brings together data from three projects: i) CINLE Communication and identity processes in net-based learning environments, ii) PAL Participation for all? School and post-school pathways of young people with functional disabilities, iii) YRKSIM Digital simulation in vocational education and training. The data has been created through (n)ethnographic methods and consists of video recordings and observation of participants' activities in and across online-physical spaces where they use and inhabit a range of digital tools and practices (online tools, platforms, social media and digital simulators). Drawing on sociomaterial framings, this paper discusses the conceptual and methodological impasses when we "open up" social sites to "diverse mobilities" enabled by today's interconnectivity. These "new", "fluid" and "hybrid" mobilities, however, entail that boundaries and systems that are fixed and obey the laws of political/economical/institutional logics of control and governance, also emerge. The analysis of the empirical data shows that spaces are not hermetically sealed but rather they are surrounded by a membrane, which is highly permeable and allows information, tools, practices, people to get in and out. This seeping in and out across physical and digital spaces occurs randomly at times, but it is also a consequence of specific decisions, by algorithms or human beings that frame how participation is negotiated in light of the educational curriculum or other situated/informal expectations. By turning the spotlight on the movement (or not) of people, tools and ideas, this paper explicitly asks what constitutes the "situatedness" of such practices in humans' everyday wired existence.

Tracing connections of learning in Turkish, Moroccan and Dutch teens' personal networks

Presenting Author:Asli Unlusoy, Utrecht University, Netherlands; **Co-Author:**Mariëtte De Haan, Utrecht University, Netherlands

In the learning sciences, new learner ideals have been put forward that correspond to the possibilities and challenges of the digital era, such as the global learner or the connected learner. The learner prototype of the 21st century is often depicted as agentic, autonomous, interest-driven, making and maintaining connections in pursuit of personal learning goals. In this empirical study we provide an empirical record of what we think of as an 'atypical case' of a 21st century learner and discuss the inclusivity or universality of these prototypes and argue that our understanding of what a global/connected learner is should be expanded. We explore the (online and offline) personal networks of 25 Turkish-Dutch teens (Mage= 14.7, SD= 1.03), particularly paying attention to how these networks contribute to their learning and socialization, how new media (e.g., online networking platforms) is utilized for learning and what learning means for these teens. By combining ego-network methodology with in-depth interviews, the study documents a) Turkish-Dutch immigrants' use of technological affordances to expand their learning as well as b) their understanding of themselves as learners based on notions of the self and of becoming that are primarily relational and oriented towards the collective. The one sidedness of the global learner ideal is discussed, in particular the image of the autonomous, individualistic self implied in these ideals of global learning, as well as the idea that connectivity evolves around the individual learner.

Invited Symposium:

Learning from Learners: Power, Resistance and Learners' Voices in an Era of Uncertainty

Chairperson: Mara Mahmood, University of California Berkeley, United States

Chairperson: Charles Underwood, University of California, Berkeley, United States **Chairperson:** Kalonji Nzinga, University of Colorado at Boulder, United States

Organiser: Michael Cole, United States

Organiser: Charles Underwood, University of California, Berkeley, United States

Organiser: Mara Mahmood, University of California Berkeley, United States

Organiser: Sophina Choudry, University of Manchester, United Kingdom

Organiser: Arturo Cortez, United States

Organiser: Alfredo Jornet, Spain

Organiser: Antti Rajala, University of Helsinki, Finland

Organiser: Michael Bakal, UC Berkeley, United States

Organiser: M. Lisette Lopez, United States

Organiser: Kalonji Nzinga, University of Colorado at Boulder, United States

Organiser: José Ramón Lizárraga, University of Colorado, United States

Organiser: Angela Booker, United States

Organiser: Anna Stetsenko, The Graduate Center of the City University of New York, United States

Discussant: Angela Booker, United States

Discussant: Anna Stetsenko, The Graduate Center of the City University of New York, United States

This symposium engages panelists and participants in the exploration and re-conceptualization of "learners' voices" from a cultural-historical activity theory (CHAT) perspective that approaches education as a struggle to overcome dominant paradigms that thwart learners' development and agency in the face of an uncertain future. As part of a larger effort to re-generate CHAT, this symposium will articulate and elaborate the concept of "learners' voices" as a tool for guiding students, teachers, researchers, activists, and policy-makers in re-orienting pedagogy to cultivate their critical voices, empowering learners to become agentic sociopolitical actors in charge of their own futures-in-the-making. The concept of voice has been used in educational research, design and practice for calling out and naming the hidden power relations in systems of oppression and plays a role in learner-centered approaches (Corbett & Wilson, 1995) culturally-relevant pedagogies (Ladson-Billings 1994; Lee, 2006), hybrid language education (Gutiérrez, 1999), and critical race theories and pedagogies (Mensah, 2019). Panelists reconceptualize voice as "learners' voices" broadly to convey agentic engagement in meaning making in the face of unequal power relations. While the panelists work in different social contexts (see presentation abstracts) all employ the concept of "learners' voices" and explore ways of encouraging multivoicedness, speaking truth to power, and recognizing learners' voices as an educational necessity in an uncertain global context. The structure of the symposium encourages dialogue designed to promote the collective co-construction and development of the concept of "learners' voices" as a critical tool for expanding our understanding of teaching and learning.

Participatory Design Research for Climate Resilience and Activism

Presenting Author:Michael Bakal, UC Berkeley, United States

While youth voice has played a role in climate justice movements, indigenous youth voices have been largely missing from public discourse. Situated in a Mayan agricultural community threatened by climate change, this study describes a participatory design research (PDR) project in which Mayan youth develop a vision of the future rooted in local cultural practices and conceptualized within the framework of *buen vivir* (BV). Workshops — part of an initiative fostering youth climate activism and reviving ancestral agro-ecological practices — involved Mayan teens gathering testimonies from community elders and creating videos to educate their communities about the relevance of BV to their lives. BV emerged in South America based on Aymara and Quechua cosmologies and gained traction within social movements in Maya

communities in Guatemala and Southern Mexico (Macleod, 2015). BV challenges capitalist ideologies and ontologies of wealth extraction and the conflation of wellbeing with consumption at the root of the climate crisis. While BV has been analyzed in the field of Development Studies, few examine the educational implications of BV, or what a pedagogy of BV might look like. PDR challenges dominant ideologies, encourages an openness to diverse ways of knowing (Bang & Voussoughi, 2016), is future-oriented (Gutiérrez, 2008), and engages participants in critiquing dominant power structures. Drawing on PDR principles, this study identifies the underlying design principles that guided facilitators' pedagogy of BV within the workshops, examines the epistemic and relational affordances of this pedagogical approach, and considers its relevance in the current historical conjuncture of youth climate activism.

"Trump Would Just Get Sucked Into a Black Hole": Youthful Digital Imaginings of New Futures

Presenting Author: José Ramón Lizárraga, University of Colorado, United States; **Presenting Author:** Arturo Cortez, University of Colorado, Boulder, United States
This paper examines how young people use digital storytelling and the sci-fi genre to imagine and voice new social futures for themselves and their communities. Through a social design-based approach (Gutiérrez & Jurow, 2016) we attend to the ways that youth leverage cultural repertoires of practice (Gutiérrez & Rogoff, 2003) and socio-spatial repertoires (Cortez & Gutiérrez, 2019) to transform the sociopolitical landscapes navigated in their everyday lives. We build upon previous work that explores how youth use digital tools to document and take action in their everyday lives (Gutiérrez et al., 2019). We extend the work of the theatre of the oppressed (Boal, 2013) to explore how youth use editing software and embodiments in the face-to-face and virtual spaces to create a stage on which they enact new realities that counter oppression. In this regard, we advance a theory of digital teatro. Through analyses of weekly field notes and our observations in an urban afterschool program, we found the program fostered an environment where youth created and voiced an imagined world of their design—one that was fantastical but that dealt with everyday dilemmas relating to a real antagonist who was doing harm to their communities. Young people, in collaboration with undergraduates, made use of cutting-edge film editing and special effects software to create digital stages to enact agentic narratives of empowerment and liberation, specifically against the tyranny of Donald Trump. In this respect, the designed environment mediated the development of critical digital literacies as well as sociopolitical literacies.

Contradictory Activities Leading to Differential Learning in a Heterogeneous Mathematics Classroom

Presenting Author: Sophina Choudry, University of Manchester, United Kingdom
The aim of this paper is to address ethnic, gender and social class inequality in mathematics classrooms in the UK by showing how (i) respecting learners' and their peer groups' agency and their identifications with mathematics, and (ii) how teachers seeing and valuing such relations can lead to possibly transformative and new learning practices for students from disadvantaged backgrounds. Four exemplary students' mathematics learning experiences are reviewed in depth to demonstrate the differential mathematics learning experiences within one very heterogeneous classroom: (i) Abdul - who co-operates with the teacher and engages in mathematics lessons; (ii) Mohammed - who does not appear to have a voice and is more interested in being pack leaders of the 'street crowd'/peer groups and completely disinterest themselves from the lesson and, thus, contradict educational alignment; (iii) Alia - whose activities are contradictory (i.e. she is interested in both (i) and (ii)); and one example where the teacher's recognition of what is valued by the students, even if that may be contradictory to the current educational demands (such as compliance in classrooms), creates opportunities of resistance and opens up new learning opportunities for creating hybrid spaces (those who try being popular, as well as academic). Although Bourdieu's theory aids the investigation by unravelling the above hidden aspects, there is little room to understand how learner agency can challenge the doxa of the current educational system. A neo-Vygotskian approach that brings Bourdieu and Vygotsky together enables us to critique mathematics teaching and learning practices in complementary ways.

"It's Rigged!": The Disruption That Reverberates When Youth Vocalize That the System Is Fixed

Presenting Author: M. Lisette Lopez, University of California, Berkeley, United States; **Presenting Author:** Kalonji Nzinga, University of Colorado at Boulder, United States

Using data from informal and formal contexts, we illustrate how different learning ecologies facilitated or constrained nondominant youth subversive naming practices. We highlight a specific discursive move, calling out, and illustrate how acts of calling out are fundamental to the production of counter-scripts (Gutiérrez, 1995) that implicate power structures. We draw on theories of the sociopolitical dimensions of discourse (Bakhtin, 1934; Gee, 2007; Foucault, 1969; Vossoughi, 2014) to discuss how learners in each context recruited and created resources to contest power relations. We argue that critically attuning to these features of learners' voices (naming and calling out) will facilitate the sociopolitical becoming of youth.

In the episode from a data literacy project in an urban northern California middle school, we describe how students called out "rigged" when their epistemic authority was revoked. After developing arguments about a scientific controversy, students viewed a science expert video that presented the "correct answer" to a previously open debate. The immediate response of one student calling out "it's rigged" became a collective resource for others to join in to contest a project that felt deceitfully stacked against them. In the hip-hop arts education intervention in the Palestinian West Bank, we explore a youth-designed rap video in which a youth poet draws on hybrid language practices (Gutiérrez et al., 1999): Arabic and English languages, symbols and dialect from Black American hip-hop vernacular (Alim, 2007), and local discourses from Palestinian political movements to call out how his environment has been rigged by forces of Israeli occupation.

Learners' Voices and the Transformation of Schooling Towards a Sustainable Society

Presenting Author: Alfredo Jornet, University of Oslo, Department of Teacher Education and School Research, Spain; **Co-Author:** Antti Rajala, University of Helsinki, Finland

This paper examines the following question: How may pedagogical projects that center on learners' voices help us reconceptualize the place and function of schooling in a context of socio-ecological crisis? We take a critical, cultural-historical perspective that views learners' voices in the context of learners' political agency, that is, their freedom to act in a plural public realm (Slakmon & Schwarz, 2017). Studying the transformational potential of learners' voices involves studying the challenges and opportunities for socio-political change brought about in and through engaging learners as a leading force in their education. To address their transformational potential, we investigate learners' voices as they develop as part of pedagogical innovations involving research-partnerships between school and external partners to address issues of sustainability and climate justice in local communities. Through comparative analysis (Bateson, 1979) of ethnographic materials documenting those school partnership innovations, we identify general themes, opportunities, and challenges that emerge at the interpersonal and institutional levels as part of the struggle of making learners' voices and schooling more relevant to their societal context. We examine two case studies involving learners engaging in climate activism through school innovations in Finland and Norway. Results clarify how a critical revision of the place and function of learners' voices can inform transformative and agency-centered pedagogy situated at the intersection between school and the wider society. Moreover, the results highlight pedagogical principles that are useful in amplifying learners' voices and harnessing their transformative potential.

Paper Sessions 9–11, Fri, July 3, 09:15 - 10:15

Paper session 9:

Diversity-Oriented Mentoring of Student-Teachers

Presenting Author: Petr Svojanovský, Masaryk University, Czech Republic; **Presenting Author:** Katerina Vlckova, Masaryk University, Czech Republic; **Co-Author:** Jana Obrovská, Faculty of Education, Masaryk University, Brno, Czech Republic; **Co-Author:** Jana Kratochvilova, Faculty of Education, Masaryk University, Brno, Czech Republic

The diverse educational landscape represents a challenge for student-teachers, as dealing with learner diversity requires specific skills to be developed during pre-service teacher education, especially at their clinical placements, where the role of mentors in supporting reflective practice is also crucial. Our research, therefore, deals with the question of how mentors support student-teachers in developing their skills for working with diverse pupils. The paper is based on multi-sided ethnography at a university and lower-secondary schools in Czechia. Data corpus is composed of 80 video-recorded lessons of 8 student-teachers, 60 post-lesson reflections of student-teachers with their 6 mentors; 60 lesson preparations; 40 student-teachers reflective diaries; 8 interviews, and 55 lessons of university courses. Six researchers took fieldnotes from all activities; the notes were subsequently discussed in the team. The findings show how interactions between mentors and student-teachers during teaching and post-lesson reflections influence both student-teachers' beliefs of how to deal with diversity and their classroom practices. We identified several ways student-teachers/mentors deal with diversity while teaching. Student-teachers' "socialization" into different modes of dealing with diversity is influenced by the mentors' teaching approach and mentoring style. The analysis showed explicit pieces of advice given by mentors, as well as implicit practice modelling.

A minority perspective on in-group role models for underrepresented students in the medical faculty

Presenting Author: Isabella Spaans, UMC Utrecht / Utrecht University, Netherlands; **Co-Author:** Conny Seeleman, UMC Utrecht, Netherlands; **Co-Author:** Gönnül Dilaver, UMC Utrecht, Netherlands

BackgroundThe UMC Utrecht medical faculty aims to provide an inclusive learning environment with equal opportunities for all students. Role models are often regarded as a panacea for inequality [1] and thus form an important part of many diversity policies. This study examines what in-group role models mean to students from underrepresented backgrounds. MethodsIn this qualitative study we conducted in-depth interviews with ten ethnic minority alumni from the medical faculty about their experiences with role models. The guiding themes served as a priori codes. Summary of resultsThe results present a discrepancy: although participants acknowledge the hypothetical benefits of having a role model, they don't recognize the impact that (a lack of) role models had on their own development. Participants emphasize the dynamic and subjective nature of role models and the importance of displaying exemplary behavior. Incidents where a lack of diversity hindered participants' professional development formed an emerging theme. Discussion and ConclusionsParticipants did not miss having in-group role models, but they did experience hinder from a perceived lack of diversity in the medical faculty. This raises questions about the significance and understanding of role models in Dutch medical education. Take-home MessageWhen minority students don't report an experienced lack of in-group models, a more diverse setting can still be beneficial to them.

[1] Morgenroth, T., Ryan, M. K., & Peters, K. (2015). The motivational theory of role modeling: How role models influence role aspirants' goals. *Review of General Psychology, 19*(4), 465.

Paper session 10:

Roles of (educational) philosophy in educational research

Presenting Author: Nina Bonderup Dohn, University of Southern Denmark, Denmark

Educational theory comprises many different views as regards what theory and theorizing is, how theory is developed, what kinds of relationships theory and empirical research have, how various approaches to theory may inform each other, and, overall, what areas within educational research are in need of theory and theorizing. This paper focuses on one strand within educational theory, namely educational philosophy, and, more specifically, on the kind of educational philosophy which is concerned with doing philosophy within the field of educational research, i.e. the kind which aims at engaging in "philosophizing with" educational research on matters of common interest (Dohn, 2011; Hansson, 2008). Four different approaches to conducting "philosophizing with" - and thus to answering the questions raised above - are identified. The identified four positions are: Philosophy as 1) *provider of a priori conceptual analyses*, as 2) *clarifier of educational research concepts and their implications*, as 3) *Interpreter of educational research results*, and as 4) *Dialogue partner with a voice of its own*. The positions are discussed and their diverging ways of engaging educational research are exemplified with texts, focusing on the areas of *Knowledge and learning; Methodology; Aims of values in education; and Curriculum design*. Dohn, N. B. (2011). Roles of Epistemology in Investigating Knowledge: "Philosophizing With". *Metaphilosophy, 42*(4), 431-450. Hansson, S. O. (2008). Philosophy and other disciplines. *Metaphilosophy, 39*(4-5), 472-483.

The new narrative in learning with digital technologies: intra-action and storytelling with video

Presenting Author: Marianna Vivitsou, University of Helsinki, Finland

This paper draws from new materialist theories to reframe current discussions concerning interaction and learning with digital technologies. When learners use technologies in order to, for instance, tell stories in video format, a narrative emerges in the process that is both virtual and physical. As such, the digital narrative has both a material and a symbolic existence (Sintonen 2020). This supposition comes in contrast with the established approach to the media that views visual technology as a kind of machine that enables an already existing narrative. In her critique, Bassett (2007) claims that this view eventually sets the narrative apart on the grounds that the narrative itself remains unchanged, while technology is constantly changing. This perspective is very much visible in the way we approach interaction and learning with technology. A new narrative is therefore needed that, rather than inter-action, is built on intra-action, given that we aim to untangle the metaphors, protagonists, characters, narrators and events that emerge in the process. Intra-action is introduced by Barad (2007) to address the need to conceptualise our relation with technology as a more complex process; as a relationship that involves an interdependent collaboration amongst material and human actants that co-constitutes, e.g., experimentation with technologies. According to Sintonen (2020), the concept of intra-action reframes materiality into an interplay between physicality, fluidity and messiness of bodies, things and places. It is on the basis of intra-action that this paper proposes to frame learning with technology with a focus on telling stories in video format.

Paper Session 11:

Developing an ecological approach to mobile learning: Integrating mobile devices in the interaction

Presenting Author: Anttoni Kervinen, University of Helsinki, Finland; **Co-Author:** Wolff-Michael Roth, University of Victoria, BC, Canada; **Co-Author:** Kalle Juuti, University of Helsinki, Finland; **Co-Author:** Anna Uitto, University of Helsinki, Finland

The study of applications of mobile learning and their effects has become one of the most important dimensions of education research. Whereas the majority of existing studies focuses on how mobile devices affect the outcome of learning, the studies that approach the learning processes as situated in social practices tend to consider mobile devices as external tools that mediate the interaction between the participants and their environment. This is problematic, because from the social and situated perspective, the process of learning unfolds as transactions in and across space and time, in which the acting subjects and the environment—including the potential devices—all are part of the other and constitute the continuous nature of experience. This study presents an ecological (situated, sociocultural) approach that theorizes mobile devices as integral and constitutive to the persons and the activities in an event of communication. We exemplify this approach by analyzing episodes from 8th grade science education classes where student groups work autonomously outdoors and use mobile devices to communicate with the teacher. By taking the socio-cultural and affective (bodily) event of communication as the unit of analysis, this study makes a shift from investigating the mobile devices as separate tools that mediate the interaction to investigating the transactions in which these devices actually make sense for their users. Theoretical and methodological implications for future research and practical implications for teaching are discussed.

Mechanisms of interest sustainment

Presenting Author: Esther Slot, University of Utrecht, Netherlands; **Presenting Author:** Jonne Vulperhorst, Utrecht University, Netherlands; **Co-Author:** Larique Bronkhorst, Utrecht University, Netherlands; **Co-Author:** Roeland M. Van der Rijst, ICLON-Leiden University Graduate School of Teaching, Netherlands; **Co-Author:** Theo Wubbels, Utrecht University, Netherlands; **Co-Author:** Sanne Akkerman, Utrecht University, Netherlands

Interest sustainment comes with learning and development for adolescents. Whereas previous research has often attributed interest sustainment to deliberate reasons of an individual, it is likely not independent from daily routines and practices. The present study aims to provide a detailed and differentiated account of interest sustainment, to unravel how interests may be sustained, also beyond the deliberate goals and needs of the individual. In order to do so, 56 adolescents filled in an experience sampling smartphone application. Adolescents had to report all their moment-to-moment experiences of interests six times for a period of two weeks, with intervals of three months. By analysing the chronological qualifications made in the 8281 experiences of interest of 334 sustained interests, we found six mechanisms of interest sustainment. Two mechanisms were found in which individuals deliberately steered their sustainment, while four mechanisms were identified in which the object of interest and/or interest practice seemed to drive the sustainment. Our findings thereby demonstrate that future studies, in order to understand interest sustainment and development, should look beyond the active role and rationalities of the individual in sustaining interests.

Symposium Sessions, Fri, July 3, 10:30 - 12:15

Invited symposium:

Process-oriented analyses of interaction; showcasing qualitative and quantitative techniques

Chairperson: Marjolein Deunk, University of Groningen, Netherlands

Organiser: Myrte Gosen, University of Groningen, Netherlands

Organiser: Frans Hiddink, NHL University of Applied Sciences, Netherlands

Discussant: Jan Berenst, University of Applied Sciences Leeuwarden, Netherlands

Learning is a socially situated, dynamic process in which knowledge and skills are built over the course of time. The person who learns often does so in the context of help by another person; i.e., knowledge is co-constructed in a mutual process that takes place over time (Granott, 2002; Sorsana, 2008; Mercer & Littleton 2007). In classroom settings, this process often takes the shape of teacher-student interaction, or student-student interaction (Littleton & Howe 2010; Markee 2015). To analyze this process of mutual co-construction of knowledge, several approaches can be used. This symposium aims to showcase various qualitative and quantitative approaches for researching the processes at work in these interactions. Each approach highlights either the student or the teacher perspective in a micro level analysis of real time classroom interactions. The researchers in this symposium all analyzed the same two fragments from an existing data set (Van Vondel, 2017). Both fragments originate from a Dutch Science and Technology lesson series in grade 5/6 (students aged 10 to 12). Children were given a problem-solving task to work on in small groups. During the video

recorded fragments, the same teacher interacts with two groups of four children. The symposium illustrates how data can be analyzed in a variety of ways, using constructs that may have slightly different interpretations, depending on the chosen approach. The discussion will go into the relationship between the insights that different approaches provide and into the possibilities and desirability of methodological triangulation in this field of classroom interaction research.

Pupils' knowledge building as a co-constructed process; a quantitative approach

Presenting Author:Henderien Steenbeek, Hanze University of Applied Sciences, Netherlands; **Presenting Author:**Naomi de Ruiter, University of Groningen, Netherlands

When children learn in a group context they also co-construct knowledge (Thelen & Smith, 1994). This means that, rather than undergoing parallel learning processes, we conceive knowledge as emerging between two or more individuals. In this presentation, we aim to demonstrate the process of knowledge co-construction situated in peer interaction. The child utterances from the two video fragments were first coded based on their complexity level of reasoning, using a coding scheme based on Fischer's Skill Theory (Fischer, 1980). This is a cognitive developmental theory that categorizes scientific knowledge into three increasingly differentiated tiers of complexity (Fischer & Bidell, 2006). Next, the moment-to-moment codes were smoothed using a LOESS technique. This allows us to visualize the real-time dynamics of co-constructed knowledge. We examined the data for two peers separately as well as for the whole interaction as one process. With this distinction, we aim to highlight characteristics of the co-construction of knowledge (i.e., how do key individuals co-construct knowledge), and characteristics of the emergent knowledge (i.e., how does the general level of complexity emerge over time?). Results show that, as a group, the students reached a relatively high level of complexity over the course of the interaction and that, when zooming in on the interaction between two specific students (L1, L3), the utterances of one student (L3) often followed those of another (L1). In the presentation, we will discuss how these process characteristics contribute to our understanding of problem-solving processes, as well as advantages and disadvantages of using time series.

Quantitative analyses of teacher-student interactions: what patterns make up learning?

Presenting Author:Mayra Mascareño, University of Groningen, Netherlands; **Presenting Author:**Elisa Kupers, University of Groningen, Netherlands

It is widely recognized that teachers and students act in mutual interdependence as lessons unfold. Therefore, the importance of observing 'real-time' interactions has increasingly been recognized in educational research. In spite of this, quantitative observational studies tend to overlook the course of time, by providing aggregate scores or frequencies of behaviors over a whole lesson. These techniques fail to uncover *how* learning occurs in interaction between teacher and student(s). Teachers and students' behaviors, emotions and cognitions, trigger one another forming moment-to-moment patterns. Some patterns become 'typical' for teacher-student dyads or groups, that is, they tend to occur repeatedly across days or lessons. Learning and development in the long term emerges from these recurrent micro-level patterns. In this presentation, we illustrate two quantitative techniques that aim to capture the emergence of patterns in real-time interactions between a teacher and his students in two science lessons.

Teacher data was coded for type of utterance and content in relation to the empirical cycle; student data was coded for understanding/complexity. First, we use *sequential analysis* in order to uncover which (teacher or student) behaviors are more likely to follow other behaviors. Second, we conducted *T-pattern analysis* to unveil sequences of behaviors that tend to be repeated over time, in the same order, during interaction. The results of both analyses will be presented during the conference.

Teacher facilitating practices during inquiry-based learning: A conversation-analytic perspective

Presenting Author:Myrte Gosen, University of Groningen, Netherlands; **Presenting Author:**Annerose Willemsen, Faculty of Arts, University of Groningen, Netherlands; **Co-Author:**Tom Koole, University of Groningen, Netherlands

This presentation will showcase a conversation-analytic study of teacher-student interaction in an inquiry-based learning environment. The approach of Conversation Analysis allows us to uncover the methods teacher and students use to conduct their interactions (Gosen & Koole, 2017). This data-driven approach focuses on the conduct that the interactants make visible to each other and to us as analysts (Sidnell, 2011). Conversation analysts do not concentrate on knowing and learning as cognitive phenomena. Rather, we are interested in how participants in interaction *show* each other what they know and understand (Koole, 2015). These observable orientations give insight in students' learning processes as well as in teachers' conduct to facilitate learning (Koole, 2015; Willemsen, 2019). Our analysis focuses on the teacher's facilitating behavior in interaction with small groups. We will demonstrate that he uses a variety of methods to assist the students. The data fragments constitute moments in which the teacher approaches a group and either answers students' questions or asks questions himself. In these interactions, the teacher does not display his status as an expert. Instead, he shows to take a restrained role in the interaction. The experimental nature of the tasks offers room for students' agentic participation since experiments are set up to do a discovery. A teacher giving away the solution would not lead to such a discovery. With our presentation, we will demonstrate the specific interactional practices that facilitate a fruitful inquiry-based learning environment.

Students working together: a qualitative analysis of conversational problem-solving practices

Presenting Author:Jan Berenst, University of Applied Sciences Leeuwarden, Netherlands; **Presenting Author:**Marjolein Deunk, University of Groningen, Netherlands; **Presenting Author:**Frans Hiddink, NHL University of Applied Sciences, Netherlands

In this presentation we analyzed problem-solving interactions of students in small groups, in which the teacher is involved, from the student's perspective. Our qualitative analysis is informed by applied Conversation Analysis and by insights from sociocultural discourse analysis (SCDA) about *interthinking*. We made two collections of sequences drawn from the lessons: a) where pupils seem to be in charge and b) where the teacher seems to be in charge. We analyzed the interactional patterns in these collections (referring to *turn taking, action formation, sequence organization and turn design*; Heritage 2004) to characterize the specific participation framework during problem-solving discussions in a small group with involvement of the teacher these students prove to be oriented on. We found different interactional patterns, partly dependent on the contributions of the teacher that we will demonstrate in examples. In the discussion we will go into several issues related to the analytic approach we used: the difference between analyses from the students' and the teacher's angle, the relationship between verbal and nonverbal actions in these classroom interactions, and the role of transcript and video in the analysis process.

SIG 25 Invited symposium:

The Role of Theory in Process-oriented Research

Chairperson: Alexandra Nordström, University of Helsinki, Finland

Organiser: Nina Bonderup Dohn, University of Southern Denmark, Denmark

Discussant: Nina Bonderup Dohn, University of Southern Denmark, Denmark

Different approaches to research on education and learning take different stances on the role of theory in informing (or not) empirical investigations. At one end of a continuum are neo-positivist claims that any theoretical outset will necessarily be biasing so research should proceed from objective, theory-free data. At the other end are post-humanistic statements to the opposite effect, i.e. that lack of theoretical reflection on presuppositions will incur research that is seriously, often ethically condemnably, prejudiced. In SIG 25 on Educational Theory, the meta-discussion of the role of theory is a recurrent theme, along with, of course, discussions of the merits, flaws and compatibilities of specific educational theories. In our experience, it is also an issue for continuous discussion for researchers within other areas of educational research. For this Invited Symposium for SIG 25, we have called upon the three SIGs co-organizing this year's conference to "combine forces" on the issue: We have asked representatives of each SIG to reflect on and discuss with one another the role of theory within process-oriented research (i.e. the overarching conference theme), potentially with a perspective to the processes of change that education is experiencing in these disturbing corona-times.

Dialoging with theory in Process-oriented Learning Research: Challenges and Perspectives

Presenting Author:Nathalie Muller Mirza, Université de Genève, Switzerland; **Co-Author:**Valérie Tartas, University of Toulouse 2, France

Drawing from scholars like Vygotsky, Bakhtin or Mead, researchers assume that learning can be merely conceived around the metaphor of "dialogue", both in its epistemological signification (dialogue is an instrument in the process of the joint construction of knowledge, and like dialogue this construction is an ongoing and never ended process) and its ontological signification (self and reality are part of a dialogue, and dialogue is the very nature of our self) (Wegerif, 2019). As a consequence, learning is defined as inextricably "in relations", in tension, in dialogue. However, research on social interactions and learning developed various conceptions of the notion of interaction. Three main conceptions can be outlined, each of them having specific methodological and epistemological implications (Grossen & Muller Mirza, 2019): Interaction as a series of consecutive individual actions; interaction as a process of co-construction; interaction as a contradictory form between framework and network. This paper, based on these three definitions of interaction in process-oriented research, aims at discussing their possible repercussions on the relationship between theories and research. Three main aspects will be explored: The definition of the "object" and "subjects" of research; the methodological choices, and the relationships between researchers and the other actors of the research process.

Drawing on some examples of research in the field of learning, we propose to consider "dialogical approach" not (only) as a guide but also as a partner (who one calls into question) in an ongoing dialogue with the practices of the researcher, providing something like an "ethical compass".

Process-oriented research on changing sociomaterial ecologies in HE - In the wake of the pandemic

Presenting Author: Sylvi Vigmo, University of Gothenburg, Sweden

In the wake of the pandemic, the number of applicants to higher education (HE) is expected to rise, due to high unemployment. This in turn, can lead to new student groups transitioning to academic studies, and unfamiliar with what it means to be and become a student in HE. I use recent research to illustrate what constraints and enables access to higher education through examples of life trajectories of transnational HE students. This point of departure raises challenging questions concerning the investigation of potentially emergent and evolving communicative practices distinguished by physical distance while simultaneously connected online. In this talk I will situate the role of theory in process-oriented research on education in the current situation, in particular HE, and discuss merits but also challenges of a sociocultural perspective. What is at stake, from a process-oriented research approach, are the challenges of sociomaterial ecologies in HE, where the researcher may have less access or limited participation opportunities due to physical distancing, and teaching and learning increasingly mediated online. While keeping physical distance, we are simultaneously more connected online in communicative ecologies, brought about by the necessity to transform teaching and learning practices from campus to online, thereby transforming and disrupting prevalent conditions in the HE landscape. I argue that the sociocultural perspective has the potential to illuminate the fluid, complex and entangled meaning-making in these situated practices, which has imperative implications for the transdisciplinary study of complex, global and multilayered phenomena, that occur at diverse systemic and analytical levels.

What do theories do? Sociopolitics of educational theory in the rise of the COVID-19 pandemic

Presenting Author: Alfredo Jornet, University of Oslo, Department of Teacher Education and School Research, Spain

The role and status of (educational) theory with regards to (educational) praxis has been and continues to be an endless source of critical debate and productive discussion in scholarly as well as in educational practice. In the wake of the COVID-19 pandemic—as one of the many economical, ecological, and humanitarian crises that characterize our current times in the Anthropocene—considering what the role of *educational theory* may be for informing educational action seems most relevant than ever. How do our theories provide guidance and value in a time in which the need for change and reform no longer is a political choice but a necessity for the continuation of the field? While the classical discussion on how different theories conceive the relation between intellect and action is still relevant, that discussion won't do. To address the question, I consider the way educational scholarly practice, as the social practice that produces and reproduces educational theory as a value in/for society, relates to its shifting socio-historical context. As empirical materials, I draw from discussions in online fora such as social media groups, (public) mail list conversations, and other channels of scholarly communication, as well as publications made in connection to education and the ongoing pandemic. In my analysis, I attend to the discursive and practical ways in which (any) educational theory is made valuable as a relevant asset or commodity for actually doing something about the ongoing crisis.

Paper Sessions 12–14, Fri, July 3, 13:00 - 14:00

Paper Session 12:

Lessons Learned from Deploying an Adaptive Learning System in a University Course

Presenting Author: Maarten van der Velde, University of Groningen, Netherlands; **Co-Author:** Florian Sense, University of Groningen, Netherlands; **Co-Author:** Hedderik van Rijn, University of Groningen, Netherlands

Modern educational technology can help students use their study time more effectively. Computer-guided adaptive learning systems offer a learning experience tailored to the strengths and weaknesses of individual students. These systems can trace the acquisition and forgetting of knowledge over time using models of human memory, providing valuable insight into the learning process for students and teachers alike. Although adaptive learning systems have shown promise in controlled laboratory studies, putting them to use in educational practice is not straightforward. To be useful, such systems must be easy to develop and integrate into the classroom, while also being sensitive to individual differences. We evaluate the use of an adaptive fact learning system in an undergraduate Cognitive Psychology course. Students in two consecutive cohorts could access the system via their computer or smartphone. They could rehearse relevant terms and definitions through retrieval practice. Using the system was recommended but not enforced. This allowed us to observe students' self-directed engagement with the tool, and link their activity patterns and study performance to performance on the exam. We found that the memory model within the adaptive learning system predicted exam performance up to two weeks in advance. Time spent studying with the system yielded higher returns on the exam than other self-reported study activities, and students who spaced their usage achieved higher exam scores. In the future, insights gained through such a system may be used to provide students and teachers with tailored feedback based on current usage patterns and projected learning outcomes.

Evaluating an innovative model for university teaching: long lasting memories and transfer

Presenting Author: Giuseppe Ritella, University of Helsinki, Finland; **Co-Author:** Rosa Di Maso, University of Parma, Italy; **Co-Author:** Katherine McLay, University of Queensland, Australia; **Co-Author:** Susanna Annese, University of Bari, Italy; **Co-Author:** Maria Beatrice Ligorio, University of Bari, Italy

This paper presents the findings of a follow up study conducted on 10 iterations of a blended course on educational psychology and e-learning. All iterations of the course were designed using the Constructive and Collaborative Participation (CCP) model. The main research questions are: What are the students' long lasting memories of this course? How do the students reuse skills and competences acquired through the course across an extended period of time? The follow-up analysis was carried out by administering the survey to all 196 students who took part in the course in the 2005-2015 decade. Data collection took place in 2018. 196 students were invited to participate three to 13 years after the completion of the course. 96 students responded. The data were analyzed using a mixed methods approach, which revealed trends in the responses across the decade. In general, participants remembered the teaching methodology and often recalled specific activities such as Role Taking. Several students also recalled key concepts and content knowledge acquired during the course. In relation to transfer of skills, analysis indicates that participants tended to reuse mostly transversal skills, such as communicative and organizational skills in other contexts, especially in work contexts. Further, about half of the respondents reused the content knowledge of the course. This follow-up analysis allows us to understand the aspects of the model that are significant for the students in the long term, and to examine the transfer of skills useful for the students' personal and professional lives beyond the academy.

Paper Session 13:

Diverging interests reflecting (un)certain futures

Presenting Author: Alexandros Janse, Universiteit Utrecht, Netherlands; **Co-Author:** Larike Bronkhorst, Utrecht University, Netherlands; **Co-Author:** Sanne Akkerman, Utrecht University, Netherlands; **Co-Author:** Thea van Lankveld, Utrecht University, Netherlands

High drop-out and switching rates in diverse European countries indicate that educational transitions remain problematic. Acknowledging the diversity of students in processes of future orientation during educational transitions, the present study examines how students' personal and diverging interests are reflected in the more or less diverging future directions they consider to pursue. Data from 497 almost-graduates (both secondary and tertiary education) was collected via a digital questionnaire. Our qualitative coding of (intrapersonal) differences in reported interests suggest that students vary in three rough patterns, reporting either: similar interests, partly similar interests (with several special cases), or diverging interests. By contrasting these patterns of interest-similarity with differences in considered future directions and experienced certainty, insightful patterns of potential dilemmatic nature emerge. Subsequently, these inter- and intrapersonal patterns are explored in more depth by qualitatively analyzing multiple purposefully selected cases in the final analytical phase. Preliminary findings indicate that some persons reason from a single set of interests which they aspire to pursue in potentially different ways, whereas others aspire to pursue different sets of interests via different future directions. The final version of this paper can be used by researchers, policy-makers and counsellors to better understand educational transitions from students' perspectives, which is necessary to create and/or maintain educational spaces that prepare students for lives after (formal) education.

Future-making and radical agency in the discourses of young climate activists

Presenting Author: Antti Rajala, University of Helsinki, Finland; **Co-Author:** Anna Stetsenko, The Graduate Center of the City University of New York, United States

Agency is recently gaining in importance in education research, foregrounded centrally within a transformative view of learning and development. Research on students' transformative agency so far has mostly been confined to a limited range of local issues and communities. More rarely have empirical studies focused on youth as historical actors capable of influencing broad social practices. This study examines such radical forms of youth agency focusing on youth climate activists. Our argument is grounded in a transformative activist stance (TAS, Stetsenko, 2016). TAS views human development as coconstructed by people understood to be agentive actors of social practices, their own lives, identities, and common history. The study aims to add to concrete understandings of how youth relate to and commit to realizing futures as part of their political imagination. The empirical data include public accounts of the FFF communications. We examined how the youth explicitly address future focusing on: ways of relating to future; commitment to change; ethical stances and the level of detail and elaboration of the future visions; chronotopic (temporal/spatial) dimensions of agency. The findings show the discourse of the climate activists to embody a radical form of agency in which the unsustainable business-as-usual is contrasted with a needed for

social transformation in which “everything is changed.” Using a rich repertoire of modalities, futures are construed as multiple and contested. The findings contribute to a nuanced understanding of underresearched radical forms of agency and have pedagogical implications for addressing climate change and youth agency in education.

Paper Session 14:

Tracing learning in digital formative assessment practices

Presenting Author: Øystein Gilje, University of Oslo, Norway

The creation of multimodal compositions is an important part of composing practices outside of school, and it is gradually increasing as a literacy practice in school (Magnusson & Godhe, 2019). During the last five years Bærum municipality has implemented the one-to-one model, and they have given all of their 17000 pupils their own digital device (iPad). At the same time, there has been a change in pupils’ text production. They now produce digital multimodal texts, which incorporate several modalities. Previous research findings indicate that teachers appear to lack both the experience with multimodal texts and the research-based knowledge required to assess these texts (Aagaard & Lund, 2013, author 1 & author 2, 2019). Previous research also suggests that these multimodal texts play an important part in teachers’ facilitation of pupils’ learning and as a tool for formative assessment. One study found that pupils engaged longer with multimodal feedback compared to traditional written feedback. In addition, the feedback tended to be richer since it contained both verbal and non- verbal information (Campell & Feldmann, 2017).

This article combines interactional data from two different research projects, and the preliminary findings suggest that the digital ecology (OneNote, Teams and Showbie) scaffolds the formative assessment process. The scaffolding takes place during face-to-face assessments, but the feedback also has a longer supporting effect since it is available for students through different audio and video recordings made by the teacher.

Toward a metatheory of feedback in human communication

Presenting Author: Jan-Willem Strijbos, University of Groningen, Netherlands; **Presenting Author:** Filitsa Dingyloudi, University of Groningen, Netherlands

Over the past 15 years research interest into the topic of feedback revived, marked by a large number of literature reviews in close succession. These reviews (a) emphasize situational demands and active processing while seeking, giving and receiving feedback, and (b) mostly conceive feedback as an unidirectional process flowing from a sender (e.g., teacher, manager) to a receiver (e.g., student, employee). Although recent conceptualizations emphasize a transition from monologue to dialogue, they are typically only labelled as ‘dialogic’ and hardly conceptually unpacked. We conducted an interdisciplinary integrated conceptual analysis with purposive selection of feedback literature in pursuit of a metatheoretical understanding of and new ways of thinking about the feedback process involving human agents. Our analysis resulted in a transactional feedback communication model. Key to this model are the following central tenants:· the feedback process is better captured as transactional communication;· the human agent(s) exert(s) psychological agency in all stages of the feedback process;· the feedback process involves both intrapersonal and interpersonal factors in all stages;· feedback seeking, feedback giving and feedback receiving are all part- processes of the entire feedback process. At the conference we will illustrate our argumentation for a metatheoretical understanding of feedback and the feasibility of the transactional feedback communication model.