Keywords: Collaborative Learning, Computer-supported collaborative learning, E-learning / Online learning, Lifelong learning
Presenting Author: Elsebeth Korsgaard Sorensen, Aalborg University, Denmark

Abstract Many flexible designs of online learning offer no possibilities for interaction and collaboration among students. Others do so, but have problems - even when interaction occurs – in qualifying a truly collaborative knowledge building dialogue. This paper deals with the question of how to qualify a knowledge building dialogue as a result of providing meta-awareness around the functions of comments in the dialogue. The paper suggests that meta-awareness around this actually contributes to qualifying a knowledge building process in online collaborative learning. The data and methodology used are hermeneutic-phenomenologic content analysis of student-generated knowledge building comments in evolving tapestries of dialogue. Wittgenstein's notion of language games is used as framework to capture and identify the analytical units of the dialogic threads. Keywords: collaborative learning, knowledge building, dialogue, meta-communication, reflection, inclusion, digital

Session C 8

30 August 2017 08:30 - 10:00
Main Building E - E222
Poster Presentation
Assessment and Evaluation, Higher Education, Learning and Instructional Technology

PO: Online Measures of Learning Processes

Keywords: Collaborative Learning, E-learning / Online learning, Educational Psychology, Experimental studies, Higher education, Informal learning, Learning analytics, Learning approaches, Learning Technologies, Metacognition, Mixed-method research, Motivation, Problem solving, Reading comprehension, Self-regulation, Student learning, Survey Research, Technology, Video analysis
Interest group: SIG 27 - Online Measures of Learning Processes
Chairperson: Daphne van Weijen, University of Amsterdam, Netherlands

Predicting learners' motivation from their typing behaviour in web based learning environments
Keywords: Learning analytics, Learning Technologies, Metacognition, Self-regulation
Presenting Author: Markus Hörmann, Technical University of Munich (TUM), Germany; **Co-Author:**Maria Bannert, Technical University of Munich (TUM), Germany

Adaptive learning systems support learning by fitting the presented environment to learners' diverse prerequisites. To make reasonable adaptions, valid sources should give us relevant and accurate information about learners. Capturing the typing behaviour while learners work on exercises offers an unobtrusive, non-reactive real-time source that could contribute such information. In a field study, we analysed the typing behaviour of 38 undergraduates who learned about programming with a web-based environment for 60 minutes. Typing behaviour was recorded while writing program-code (six coding-tasks) and regular text (recall-task). We linked different indices of typing behaviour (e.g. frequency of corrections or pauses) with measures of motivational states. Initial motivation was assessed before learning using the Questionnaire of Current Motivation (QCM, Rheinberg, Vollmeyer, & Burns, 2001) and current motivational state before each of the typing tasks using a short measure of three items. Results reveal significant correlations between different typing-indices and the motivational measures. Correlations were positive for typing in recall-tasks and initial motivation ($r = .374$). In addition, negative correlations were found for writing program-code and current motivation ($r = -.540$ to $-.354$). This indicates that typing behaviour has to be interpreted task-specifically. Following the indications of this study, mining the keyboard-data could be used to assess different learner states and hence to offer a range of possibilities to support learners in future adaptive learning environments.

The Relationships between Exploration and Learning Strategies in a Problem-Solving Environment
Keywords: Higher education, Learning approaches, Motivation, Problem solving
Presenting Author: Gyongyver Molnar, University of Szeged, Hungary; **Co-Author:**Eniko Bus, University of Szeged, Hungary; **Co-Author:**Erzsébet Korom, University of Szeged, MTA-SZTE Science Education Research Group, Hungary; **Co-Author:**Benö Csapó, University of Szeged, Hungary

In this paper, we examined the relationships between exploration strategies and different learning styles in a problem-solving environment. The aims of the study were to determine (1) qualitatively different exploration strategies by analysing log files and investigating the number of latent profiles into which first-year university students could be meaningfully divided and (2) the relationships between the quality and effectiveness of the exploration strategy used and different learning styles, including different learning strategies (memorization, elaboration and control), and levels of mastery motivation (task persistence, preference for challenge, task-related pleasure, self-efficacy, task absorption and motivation level during testing). The samples for the study were drawn from first-year university students ($N=1729$, $M_{age}=19.5$, $sd_{age}=1.87$). The instruments were a complex problem-solving test (20 items) and a learning style questionnaire (45 items, including questions on learning strategies and mastery motivation). Latent class analyses, ANOVA, factor analyses and bivariate correlations were used for the analyses. The reliability of the instruments is high ($\alpha_{CPS}=.90$;

α_learning_style=.92). Four qualitatively different class profiles were identified: proficient explorers (65.6%), low-performing explorers (13.7%), rapid learners (9.9%) and non-persistent explorers (10.8%). Students who often use memorization strategies in their learning proved to be less developed explorers and problem-solvers (r=-20, p

Electrodermal Activity Arousal throughout a Full Physics Course: A Clue for Learning Regulation?
Keywords: Collaborative Learning, Learning analytics, Self-regulation, Technology
Presenting Author:Héctor Javier Pijeira Díaz, University of Oulu, Finland; **Co-Author:**Paul A. Kirschner, Open University of the Netherlands, Netherlands; **Co-Author:**Sanna Järvelä, University of Oulu, Finland; **Co-Author:**Hendrik Drachsler, Open University of the Netherlands, Netherlands

Self-regulated learning (SRL) research has been searching for data which is complementary to self-reports and simple digital traces, techniques recognized for their limitations in reliability and representative sufficiency. One approach gaining attention is physiological data. Electrodermal activity (EDA) is a physiological response indicating cognitive, affective and/or physical arousal (i.e., states of activation such as stress or anxiety). Peaks in EDA might indicate perceived challenges which are known to invite self-regulation activities. Although extensively used in psychophysiology, studies have rarely focused on EDA in authentic learning situations. This paper reports on one student (of 12) who was tracked in the 19 collaborative learning sessions of a regular high school advanced physics course, known to be cognitively demanding. EDA peaks showing arousal were detected. The number of peaks ranged from 12 to 337 per session and the amplitudes from 1.78 to 11.13 μSiemens across sessions. Lower session values might indicate boredom or lack of interest while higher ones might show stress, engagement and/or high cognitive/emotional load in the respective sessions. These results point to a potential for teacher intervention and a more balanced instruction design across lessons.

Reading on Paper or on Tablet: An Eye-tracking Study
Keywords: Educational Psychology, Experimental studies, Learning Technologies, Reading comprehension
Presenting Author: Pablo Delgado Herrera, University of Valencia, Spain; **Co-Author:**Ladislao Salmeron, University of Valencia, Spain

While a wide-spread assumption considers that reading on digital mediums induces shallower processing than on paper (e.g. Ackerman & Lauterman, 2012), previous literature reveals inconsistent results regarding the effects of medium on text comprehension (e.g., Kretzschmar et al., 2013). As a way to understand such effects, we analysed the on-line reading processes on the different mediums. We tested two complementary hypotheses: (1) Strategic hypothesis: Participants will show less strategic reading on tablet than on paper, specially when reading the structurally relevant parts of the texts, e.g. titles (Hyönä, Lorch, & Kaakinen, 2002); and (2) Easiness processing hypothesis: Participants will show a higher global reading rate on tablet than on paper (e.g. shorter fixation times, less number of fixations). In a within-subject study, 35 undergraduates read three expository texts on paper and three on tablet, while their eye-movements were tracked. For each text, they rated their expected comprehension scores and answered a set of multiple-choice comprehension questions. Even though eye-tracking data revealed no differences when looking at participants' reading of the text paragraphs, results indicated that participants' first-pass fixation time, first-pass number of fixations and lookback fixations on texts' titles were longer and higher when reading on paper than on tablet. We also found longer first-pass fixation duration when participants read the last sentence of each paragraph on paper. This pattern of results supports the strategic hypothesis. Notwithstanding, no differences between mediums were found in the scores in comprehension questions or in the metacognitive judgements.

Cue detection of emergency care clinicians during a simulation based critical incident
Keywords: Informal learning, Mixed-method research, Problem solving, Video analysis
Presenting Author: Anneke van der Niet, Maastricht University, Netherlands; **Co-Author:**Ellen Kok, Utrecht University, Netherlands; **Co-Author:**Jeroen Van Merrienboer, Maastricht University, Netherlands; **Co-Author:**Anique de Bruin, Maastricht University, Netherlands

The aim of this study is to examine the detection of relevant information by expert and competent non-expert emergency care clinicians during two simulated diagnostic scenarios. One scenario involves a situation that all clinicians encounter frequently and can be executed more or less routinely, while the other scenario will involve a critical incident that requires a more effortful mode of acting. In both scenarios, the information acquisition pattern of experts and competent non-experts will be examined using eye tracking, video observation and cued retrospective reporting. It is expected that during the routine scenario both groups of clinicians will display quite similar gaze patterns, due to the experience of both groups with this particular situation. Also, execution of the tasks will show similarities. However, during the scenario involving a critical incident, it is hypothesized that experts will show a different gaze pattern compared to the competent non-experts. Experts most likely will direct their attention to more relevant cues that will guide their actions.

Online learning students in Russia: who are they?
Keywords: E-learning / Online learning, Higher education, Student learning, Survey Research
Presenting Author: Polina Pekker, Lomonosov Moscow State University, Russian Federation; **Co-Author:**Lyudmila Popova, Lomonosov Moscow State University, Russian Federation

Massive open online courses (MOOC) have become popular around the world because they provide access to education to students from different social groups. Russian National platform «Open education» started to work in September 2015 and eight leading Russian universities downloaded 47 courses (107 courses in October 2016). We analyzed the reasons, why