

Presenting Author:Darcy Fawcett, Gisborne Boys' High School, New Zealand

This presentation will discuss and evaluate the use of e-learning by students and teachers at a New Zealand secondary school during their Physics investigations. The presentation will include: (1) an introduction to the e-learning environment – teacher and student use of Google Classroom for resource sharing and management; teacher use of screen-casts for concept teaching and Google Forms for concept testing with automated feedback; student use of Google Sheets, Plot.ly and Google Docs for data manipulation, graphical analysis and report writing; teacher use of the Goggle Docs and Sheets comment features for feedback; (2) an evaluation of assessment results reporting significant gains in student outcomes; (3) changes introduced for the following year; (4) discussion from the floor.

A system for automatic speech recognition and observation of classroom interactions

Keywords: Assessment methods and tools, Content analysis, Science education, Teacher Professional Development

Presenting Author:Daniela Caballero, Universidad de Chile, Chile; **Co-Author:**Hanna Kronholm, University of Jyväskylä, Finland; **Co-Author:**André Mansikkaniemi, Aalto University, Finland; **Co-Author:**Jouni Viiri, University of Jyväskylä, Finland; **Co-Author:**Roberto Araya, Universidad de Chile, Chile; **Co-Author:**Pasi Pertilä, Tampere University of Technology, Finland; **Co-Author:**Tuomas Virtanen, Tampere University of Technology, Finland; **Co-Author:**Mikko Kurimo, Aalto University, Finland

In this project we develop and study computational methods that can convert speech into text, but also to analyze the contents and the quality of classroom talk, and at the same time, allow observing classroom interactions. Classroom talk analysis is essential when studying teaching and learning. Particularly, the quality of classroom talk, for example, questions posed by teacher, and the richness of the concepts used in the classroom directly affect learning. Classroom observations provide valuable information which helps teachers to improve their daily practices, such as how time is distributed in different activities. However, analysing classroom talk manually is time consuming, and data analysis and immediate feedback of the observed classroom is almost impossible due to the way data is collected (pen-and-paper) and the amount of information. The aim is to develop a system which collects information of the classroom, and which every teacher can use to study his or her own teaching, and to get feedback in forms of charts and graphs quickly after the lesson. The system consists of an Android smartphone, the application and an external microphone. The talk is transformed to text by automatic speech recognition (ASR) analysis methods. In the presentation we will show the developed application, some data collected in schools and preliminary results of speech recognition.

Session M 4

1 September 2017 12:00 - 13:30

Main Building E - E222

Poster Presentation

Cognitive Science, Developmental Aspects of Instruction, Instructional Design, Learning and Social Interaction

PO: Learning and Development in Early Childhood

Keywords: Assessment methods and tools, At-risk students, Cognitive development, Early childhood education, Educational attainment, Educational policy, Language (L1/Standard Language), Literacy, Motivation, Out-of-school learning, Parental involvement in learning, Primary education, Quantitative methods, Reasoning, Science education, Social interaction, Student learning, Teaching / instruction, Writing / Literacy

Interest group: SIG 05 - Learning and Development in Early Childhood , SIG 10 - Social Interaction in Learning and Instruction

Chairperson: Charalambos Charalambous, University of Cyprus, Cyprus

Preschool from Age Two: The perspectives of parents and teachers

Keywords: Early childhood education, Educational policy, Quantitative methods, Teaching / instruction

Presenting Author:Adriana Wiegerová, Tomas Bata University, Czech Republic; **Co-Author:**Peter Gavora, Tomas Bata University, Czech Republic

Preschools in the Czech Republic have traditionally provided education for children between the ages of three and six. This research responds on the new initiative of the Ministry of Education in the Czech Republic which issued a positive standpoint concerning acceptance of two years old children to preschools if conditions are favourable. This study concentrates on a sample of preschools which provide education for children from age two and parents of these children. The purposes of the study are threefold: (1) To identify the key motives of parents to enrol their children into preschool and their view of the preschool's education programme; (2) To find out how teachers adopt their processes to meet the developmental requirements of two years old children; (3) To determine the degree by which facilities and infrastructure of preschools are appropriate for the provision of safe, healthy and learning-oriented setting for young children. The sample consists of 15 preschools in the Zlin Region of the Czech Republic which provide education for children from age two to six. Preschools were selected to represent downtown areas, suburbs, and villages in the region. Three research methods were used: a questionnaire for parents, a questionnaire for teachers and a preschool setting description form. Final data will be presented at the conference.

Developing combinatorial reasoning among third grade pupils

Keywords: Cognitive development, Primary education, Reasoning, Science education

Presenting Author:Zsófia Gabriella Szabó, University of Szeged, Hungary; **Co-Author:**Erzsébet Korom, University of Szeged, MTA-SZTE Science Education Research Group, Hungary

The study looks at combinatorial reasoning, which is a skill playing an important role in problem solving, and experimental and scientific reasoning. Even though the fostering of thinking skills is an important task, few training programs focus on the development of combinatorial reasoning in a science context. The aim of our research was to develop a training program for the improvement of combinatorial reasoning in science and to analyse its effectiveness among third grade Hungarian students. Our training program is based on Csapó's (1988) theoretical model and focuses on the development of six combinatorial operations. It contains 54 combinatorial tasks, with a story line embedded in a science context. The training experiment was led by the students' regular teachers, who used our methodology. To assess the effectiveness of the 6-8-week program, we assigned students to experimental (N=92) and control (N=73) groups, and measured their combinatorial reasoning competence with an online test (Csapó, Pásztor & Molnár, 2015) before and after the training program. The results show that combinatorial reasoning improved significantly in both groups. The mean improvement in the experimental group (17.9%) was more than twice the size of improvement in the control group (8.2%). The effect size of the training program was moderate (Cohen's $d=0.57$), and the program had a greater impact on students having lower initial skills. Our findings indicate that the combinatorial reasoning training program had the desired effect, and the science context could be successfully combined with combinatorial operations.

Individual and environmental factors interacting in vocabulary of elementary school children

Keywords: At-risk students, Language (L1/Standard Language), Parental involvement in learning, Social interaction

Presenting Author:Christian Müller, Goethe-University Frankfurt, Germany; **Co-Author:**Sebastian Poloczek, Bristol University, United Kingdom; **Co-Author:**Bettina Retzbach, Goethe-Universität Frankfurt, Germany; **Co-Author:**Gerhard Buettner, University of Frankfurt, Germany

The present study examined interactions effects of individual and environmental factors on predicting expressive vocabulary of mono- and bilingual elementary children and with special focus on effects of family language input and interactions with IQ. As individual factors non-verbal intelligence scores and short-term memory of words and non-words were assessed. As environmental factors, measures for social-economic-status and family language input regarding usage of society's language at home were chosen. The sample consisted of 148 German elementary school children aged six to nine years. By structural equation models and stepwise regression, we found linear associations on predicting expressive vocabulary by all assessed individual and environmental factors (except for sex). Family language input at home in particular was highly related to vocabulary development. Additionally, interactions for non-verbal intelligence and family language whilst controlling other factors in this population were found suggesting that the impact of the ratio of German being spoken in the family on vocabulary development was less pronounced in children with higher non-verbal intelligence and particularly strong in those with a lower non-verbal IQ.

Oral text abilities of children attending kindergarten: development of a measurement instrument

Keywords: Early childhood education, Language (L1/Standard Language), Student learning, Writing / Literacy

Presenting Author:Iris Dinkelmann, Thurgau University of Teacher Education, Switzerland; **Co-Author:**Katharina Kirchhofer, Thurgau University of Teacher Education, Switzerland; **Co-Author:**Claudia Hefti Christ, Thurgau University of Teacher Education, Switzerland; **Co-Author:**Dieter Isler, Thurgau University of Teacher Education, Switzerland

Based on theoretical assumptions and recent research, no one questions the importance of higher level literacy abilities as needed for reporting experiences or inventing stories for successful academic learning. These abilities - we conceptualize them as "oral text abilities" - develop long before formal reading and writing instruction takes place in school. However, they considerably vary across children depending on their familial background. Although there is clear empirical support for the assumption that these abilities can be fostered systematically in formal education, recent research shows a lack of awareness and instructional practice among kindergarten teachers. As we plan to conduct an intervention study (testing effects of intervention on oral text abilities), in this pre-study, we develop an instrument to measure oral text abilities of kindergarten-aged children. Approximately 110 four- to six-year olds are videotaped while retelling a silent animated movie in a standardized setting. The videos will be transcribed and the anonymous transcriptions will be rated on a five-point Likert-scale (manual-based). Our poster (a) will document collection, rating as well as analysis procedures, and (b) will report the results concerning the factorial structure of the instrument.

Playful assessment of cognitive development in young children

Keywords: Assessment methods and tools, Cognitive development, Early childhood education, Educational attainment

Presenting Author:Corrie Urlings, Maastricht University, Netherlands; **Co-Author:**Karien Coppens, Maastricht University School of Business and Economics, Netherlands; **Co-Author:**Lex Borghans, Maastricht University School of Business and Economics, Netherlands

School achievement tests and observations can be time consuming and it is debated which aspects of development are precisely measured with tests and how objective observations are. The current study moves away from these traditional assessments of cognitive ability by exploring the potential use of play to assess cognitive development. We will focus specifically on executive function in young children aged 5-6 years old. For this purpose a wooden maze is transformed into an 'assessment tool'. A combination of the new measurement instrument, a standardized test battery and children's