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Summary

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Digital citizenship in primary education. From theoretical models to  
curricula

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# EARLI 2021 ONLINE BOOK OF ABSTRACTS

the 19th Biennial  
EARLI  
Conference for  
Research  
on Learning  
and Instruction



**EDUCATION AND  
CITIZENSHIP:**  
Learning and Instruction  
and the Shaping of Futures

education, the core elements of the Response-to-Intervention approach (RTI) were implemented in two primary schools based on an experimental control group design with pre-post and progress testing. In order to obtain representative factors, qualitative and quantitative data from two sub-studies of the implementation study were combined in a mixed-method approach. The focus of the analysis is the structuring qualitative content analysis according to (Kuckartz, 2018). The factors analysed from the cooperation protocols of the team meetings represent the central decisions of the teachers when deviating from the scientific results. The results show that more than one third of the children were not encouraged or challenged in their initial lessons on mathematics.

#### Session I 7

24 August 2021 15:45 - 16:45

Session Room 10

Single Paper

Assessment and Evaluation, Motivational, Social and Affective Processes

##### Assessment Methods, Attitudes and Beliefs

**Keywords:** Assessment Methods and Tools, At-risk Students, Attitudes and Beliefs, Game-based Learning, Learning Technologies, Parental Involvement in Learning, Reading Comprehension, Survey Research

**Interest group:** SIG 01 - Assessment and Evaluation, SIG 07 - Technology-Enhanced Learning And Instruction

**Chairperson:** Juuso Henrik Nieminen, University of Eastern Finland, Finland

##### Mindset Moderates Healthcare Providers' Performance in a Neonatal Resuscitation Simulator

**Keywords:** Assessment Methods and Tools, Attitudes and Beliefs, Game-based Learning, Learning Technologies

**Presenting Author:** Chang Lu, University of Alberta, Canada; **Co-Author:** Simran Ghoman, University of Alberta, Canada; **Co-Author:** Maria Cutumisu, University of Alberta, Canada; **Co-Author:** Georg Schmoelzer, University of Alberta, Canada

Simulation education can benefit healthcare providers (HCPs) by providing opportunities to practice the high-acuity, low-occurrence neonatal resuscitation tasks in low-stakes environments. However, few studies investigated the role of growth mindset on HCPs' longitudinal neonatal resuscitation performance before and after simulation-based training. This study examines whether the RETAIN digital and table-top simulators effectively facilitate HCPs with neonatal resuscitation knowledge gain, retention, and transfer; and whether growth mindset moderates HCPs' longitudinal performance in neonatal resuscitation. Participants were  $n=50$  HCPs affiliated with a tertiary perinatal centre in Canada. This longitudinal study included a pre-test and a mindset survey, immediately followed by a post-test using the RETAIN digital simulator, and two post-tests after two and five months using the RETAIN digital and table-top simulator, respectively. General Linear Mixed Model repeated-measures were employed to observe HCPs' performance over time, and to scrutinize the moderating effect of growth mindset on the association between test-time points and performance. Results revealed that, compared with their pre-test performance, HCPs effectively improved their neonatal resuscitation knowledge after the simulation-based training on the immediate post-test ( $Est=1.88, p$

##### A German Digital Reading Test for Grades 3 to 4: Development and Piloting

**Keywords:** Assessment Methods and Tools, At-risk Students, Learning Technologies, Reading Comprehension

**Presenting Author:** Susanne Seifert, University of Graz, Austria; **Co-Author:** Lisa Paleczek, University of Graz, Austria

To adequately support each student in reading lessons, it is necessary to assess their reading skills. Using digital assessments can support teachers in the process of (repeated) assessment, especially when preparing, conducting, evaluating and documenting assessments. A digital assessment tool focusing on assessing reading comprehension skills in Grades 3 and 4 is currently being developed in Austria. This reading assessment covers three domains referring to reading comprehension (word-, sentence- and text-level). Text-level is assessed via two subtests (Subtest I: presentation of nonsense-stories and corresponding questions, and Subtest II: maze selection). The other levels consist of one subtest each. This paper focusses on two studies. Study 1 (data collection: 10/2019-12/2019) aimed at the development of the digital reading test and the item analysis ( $N=273$  students; Grade 3:  $N=117$ ; Grade 4:  $N=156$ ). The final version of the test after item selection shows satisfactory values for internal consistency (word:  $\alpha=.91$ , sentence:  $\alpha=.81$ , text I:  $\alpha=.87$ , text II: as four items needed to be revised, the internal consistency will be provided after Study 2). Study 2 (data collection: 09/2020-11/2020) analyses the reliability and validity measures of the digital reading assessment ( $N=550$  students, Grade 3:  $N=333$ ; Grade 4:  $N=217$ ). The results are discussed in the light of teachers' needs for and assets and challenges of standardized digital assessments to ease identification of students needing tailored support in reading.

##### Parent' perceptions and beliefs of assessment in Finnish basic education: A large-scale study

**Keywords:** Assessment Methods and Tools, Attitudes and Beliefs, Parental Involvement in Learning, Survey Research

**Presenting Author:** Juuso Henrik Nieminen, University of Eastern Finland, Finland; **Co-Author:** Paivi Atjonen, University of Eastern Finland, Finland

While the perspective of teachers in particular and pupils to lesser extent has been acknowledged in literature concerning educational assessment, research on parents is still scarce and undertheorised in relation to assessment. In this study, we address this research gap in the context of Finnish basic education. Through a mixed methods design we observe both parents' ( $N=1014$ ) perceptions (with a quantitative approach) and epistemic beliefs (with a qualitative approach based on open-ended questions) concerning classroom assessment. Thus, this study contributes to earlier literature by introducing new empirical evidence from the context of Finland, but also through further theorising parents' role in assessment. According to the quantitative results, Finnish parents had mostly positive perceptions of assessment, with only a few drawbacks identified. They strongly hoped for numerical assessment, rather than verbal comments, for the clarity of assessment information. We deepened these findings through a reflexive thematic analysis of teachers' epistemic beliefs concerning assessment. These qualitative results showed that parents lacked epistemic resources with which to interpret assessment data. With the theorisation of parents' epistemic beliefs, we shift the focus from parents to the structures of assessment that restrict their epistemic resources than aim for fostering them. Based on the results, implications for assessment design are discussed.

#### Session I 8

24 August 2021 15:45 - 16:45

Session Room 13

Single Paper

Instructional Design, Learning and Instructional Technology

##### Instructional Design and Learning Technologies

**Keywords:** Citizenship Education, E-Learning/Online Learning, Educational Psychology, Instructional Design, Learning Technologies, Meta-analysis, Multimedia Learning, Primary Education, Secondary Education

**Interest group:** SIG 06 - Instructional Design, SIG 07 - Technology-Enhanced Learning And Instruction

**Chairperson:** Sylvi Vigmo, University of Gothenburg, Sweden

##### Digital citizenship in primary education. From theoretical models to curriculums

**Keywords:** Citizenship Education, Instructional Design, Learning Technologies, Primary Education

**Presenting Author:** Lionel Alvarez, HEP-Fribourg | Université de Fribourg, Switzerland; **Co-Author:** Kostanca Cuko, University for Teacher Education Fribourg, Switzerland; **Co-Author:** Ania Tadlaoui-Brahmi, Universiti for Teacher Education Fribourg, Switzerland

Digital citizenship, defined as the capacity to engage positively, critically, and skillfully in digital environments, is chosen as the priority goal for the new K-12 study plan for digital education in the French-speaking side of Switzerland. As material for teachers has to be developed, it first has to be clearly defined, and ambitions benefit from being well delineated. This paper explains the process explored by a group of developers of pedagogical material, from digital citizenship

models found in the scientific literature to the teaching material created. From this process, the choices of the digital environments used with students and the message vehiculated appeared to be key components to actually engage in an inclusive digital citizenship curriculum.

### **Effects of digital media on knowledge acquisition in school: A systematic review of meta-analyses**

**Keywords:** Learning Technologies, Meta-analysis, Primary Education, Secondary Education

**Presenting Author:**Tamara Kastorff, Ludwig-Maximilians-Universität (LMU), Germany; **Co-Author:**Karsten Stegmann, Ludwig-Maximilians-Universität (LMU), Germany; **Co-Author:**Sonja Berger, Ludwig-Maximilians-Universität (LMU), Germany; **Co-Author:**Michael Sailer, LMU Munich, Germany; **Co-Author:**Frank Fischer, Ludwig-Maximilians-Universität (LMU), Germany

This systematic review of meta-analyses examines the question to what extent knowledge acquisition in school can be facilitated by digital media. Meta-analyses on learning with digital media are usually emphasizing moderator analyses regarding specific technological features. This systematic review of meta-analyses aggregates the effects of digital media by the level of learning activities induced through digital media. Therefore, control and experimental conditions of 79 effect sizes from ten meta-analyses were coded using the ICAP taxonomy. The ICAP taxonomy differentiates four levels of cognitive activation based on observable behavior: (1) passive, (2) active, (3) constructive, and (4) interactive. The effect sizes were clustered according to effects of digital media at the same level of activity and effects of digital media at different levels of activity in control and experimental conditions. The positive effects of digital media within the ICAP levels on knowledge acquisition in school (RQ1) support the interpretation that digital media effectively increase the likelihood of certain learning activities. The positive effects of digital media across the ICAP levels on knowledge acquisition in school (RQ2) showed that digital media can effectively be used to increase the level of activity. However, caution is required in interpreting this as a causal effect of digital media due to the confounding of the level of activity and use of digital media. Overall, the findings support the ICAP taxonomy and the assumptions about the relationship between the different levels of activity and knowledge acquisition.

### **Does the effect of instructor's presence in videos vary with slide type and presentation type?**

**Keywords:** E-Learning/Online Learning, Educational Psychology, Instructional Design, Multimedia Learning

**Presenting Author:**Christina Sondermann, German Institute for Adult Education, Germany; **Co-Author:**Martin Merkt, Deutsches Institut für Erwachsenenbildung, Germany

Because video-based learning plays an increasingly important role - and not just since the Corona pandemic - the optimal design of video-based learning materials garners the attention of scientists and practitioners alike. In this context, designers of online courses or lectures face the question whether it makes sense to integrate the instructor into educational videos. In two online experiments, we investigated the effect of the instructor's presence on learning outcomes and participants' subjective ratings of the videos. We varied as between-factor whether the instructor was present or absent in learning videos including narrated slides and as within-factor whether the visual content was relevant for learning or mostly redundant with the narration (operationalized by graphic vs. text slides). While in Experiment 1 the contents on the slides appeared sequentially to all participants, in Experiment 2 we additionally varied the type of presentation as a between-factor (sequential vs. static presentation). Results of Experiment 1 indicated no detrimental effects of instructor's presence on learning outcomes (i.e., knowledge acquisition) and perceived difficulty, independent of slide type. We were able to replicate these findings for the comparable conditions (i.e., conditions with sequential presentation) in Experiment 2. Contrary to our expectations, there was no learning-impairing effect of the present instructor on graphic slides with static presentation. However, a significant interaction in Experiment 2 showed that perceived difficulty was highest in this condition. Potential explanations for the findings and possibilities for future research are discussed.

### **Session I 9**

24 August 2021 15:45 - 16:45

Session Room 9

Single Paper

Cognitive Science

### **Cognitive Development and Conceptual Change**

**Keywords:** Cognitive Development, Conceptual Change, Experimental Studies, Higher Education, Knowledge Creation, Misconceptions, Numeracy, Philosophy

**Interest group:** SIG 03 - Conceptual Change, SIG 05 - Learning and Development in Early Childhood

**Chairperson:** Klara Bolander Laksov, Stockholm University, Sweden

### **Modes of dealing with opposing theoretical perspectives in cognitive science**

**Keywords:** Cognitive Development, Conceptual Change, Knowledge Creation, Philosophy

**Presenting Author:**Thorsten Scheiner, Australian Catholic University, Australia

Many issues in cognitive science are expansive and multi-faceted, and therefore open to diverse interpretations that often lead to contrasting, even conflicting, theoretical perspectives. Relatively little attention has been paid to the opportunities offered by conflicts, tensions, and paradoxes among theoretical perspectives for theory building. In this presentation, four modes of dealing with opposing theoretical perspectives are outlined: (1) taking contrasting theoretical perspectives as incommensurable; (2) holding opposites not as conflicting but as complementary; (3) dissolving or surpassing oppositions by blending perspectives; and (4) preserving paradoxes by recognizing the interdependence of constitutive oppositions. These four modes are exemplified by application to the long-standing debate of knowledge as theory-like versus knowledge as piece-like in research on conceptual change.

### **Conceptual change in random transfer probability reasoning**

**Keywords:** Cognitive Development, Conceptual Change, Higher Education, Misconceptions

**Presenting Author:**Ida Kukliansky, Ruppin Academic Center, Israel; **Co-Author:**Yael Tal, Tel Aviv University, Israel

Faced with two urns: Urn A contains 3 black balls and 2 white balls while Urn B contains 2 black balls and 1 white ball, you are asked to compare the probability of randomly drawing a black ball from the two urns. Next, you are asked how the probability of drawing a black ball from Urn B will change after transferring a random ball from Urn A to Urn B. These two tasks differ in their content and question but can be solved analytically in the same way by comparing probabilities. While the first task has been widely discussed in previous studies, the reasoning associated with the second task having an additional condition of uncertainty has not. The 66 college students, participants in this study, used an analytic process for the first task and a heuristic for the second task. The findings show that they focused on the most likely event and derived a prediction based on this event that, in some cases, led them to answer incorrectly. The educational implications include a gradual method for developing better intuition for the students.

### **When do children understand that number words refer to exact cardinalities?**

**Keywords:** Cognitive Development, Conceptual Change, Experimental Studies, Numeracy

**Presenting Author:**Pierina Cheung, National Institute of Education/Nanyang Technological University, Singapore, Singapore

When do children understand that number words such as "five" refer to exactly 5 things? Understanding that number words are exact is a pre-requisite for acquiring numerical knowledge. On one view, only children who understand the meaning of the last word of a count (cardinal principle) know that number words are exact. On another view, children know that number words refer to exact cardinalities prior to acquiring the cardinal principle. The current study addresses this using an experimental task adapted from previous studies. If children know that number words are exact, they should understand that a set labelled as having N objects no longer have N when an object is added to or removed from the set. We tested this in a group of 80 children between the ages of 2 ½ and 5 ½. We showed children a box of objects labelled as having N objects. N sometimes refers to known number words such as "five" and sometimes an unknown number such as "a hundred and fifty-six". An experimenter then performed a transformation and asked whether there are still N objects in the box. We found evidence that children likely have early knowledge of the exactness prior to acquiring the cardinal principle but such knowledge is limited, because these children cannot