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Hands-on artificial intelligence in K-12. How can GOFAI and machine learning be taught ?

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Teachers' digital competencies and training workshops as predictors of the ICT use in teaching
Keywords: Continuing professional development in Teachers, Educational Technology, In-service Teacher Training, Innovations in education
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The purpose of the present correlational study was to examine whether teachers' digital competencies self-reported prior to the implementation of a project aiming at applying ICT in teaching, as well as the frequency of attending teacher training workshops during the project, predicted teachers' reported ICT use in educational activities.Elementary and high school teachers (N=1234) filled up an online questionnaire about their general and specific digital competencies, at the beginning of the project, and, at the end of it, an online questionnaire about their use of ICT and digital educational content in various school-related activities. Teachers also assessed the frequency of their participation in workshops during the project.Three hierarchical regression analyses were performed with digital competencies and frequency of participation in workshops as predictors and three indicators of reported ICT use as criteria.The results revealed that specific digital competencies (especially one related to using digital technology for teaching and learning) and participation in workshops were significant and strongest predictors of all selected indicators of ICT use. Future education training and/or projects for teachers should focus on developing specific digital competencies and on offering various educational workshops to increase teachers' probability of successful ICT use.

Hands-on artificial intelligence in K-12. How can GOFAI and machine learning be taught?
Keywords: Artificial intelligence, Beliefs and conceptions of teaching, Educational Technology, Innovations in education
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For the new K-12 study plan about digital education in the French-speaking side of Switzerland (CIIP, 2020), a teaching material based on digital citizenship has been developed.The instructional design of the artificial intelligence (AI) sessions raised many questions. In addition to the digital environment that had to be chosen, the retained definitions of AI, the message conveyed at the end of the sessions, and the learning experience proposed to each kid were particularly challenging because of the scope of the concept of AI. By working with various tools, students should become aware of the potential uses of these tools in the professional world and question their own professional ambitions in an inclusive perspective. This paper session will be the opportunity to present the instructional design process and the impact of the first implementations in K-12 classrooms.

Sessions D 6

25 November 2021 09:00 - 10:30
Session Room 6
Present & Discuss
Secondary education, Vocational education

Improving learning and well-being in Secondary Education & Leadership in Education

Keywords: 21st century learning, Creativity, Culture and Education, Innovations in education, Multiculturalism in Education, Practice-based research (methodology), Professional Development, Secondary school education, Self-regulation and self-regulated learning, Vocational education, Well-being and engagement
Interest group: CLOUD 04 - Improving learning and well-being, CLOUD 12 - Leadership in Education
Chairperson: Julian Ng, United Kingdom

Photovoice as a Collaborative Research Methodology of Teaching Practices in Junior High Schools
Keywords: Innovations in education, Practice-based research (methodology), Secondary school education, Self-regulation and self-regulated learning
Presenting Author: Leen Alaerts, UC Leuven-Limburg, Belgium; **Co-Author:**Anne Decelle, UC Leuven-Limburg, Netherlands; **Co-Author:**Ruth Wouters, UCLL, Belgium

This collaborative research contributes to the discussion whether education in junior high schools should be comprehensive, rather than categorical. The educational reform in Flanders (September 2019) insists on a more comprehensive approach. However, because of the rather loose character of the reform, schools have given rise to a rich variety of innovative educational practices. In order to investigate the quality of these initiatives, the research question of this project (2018-2021) is: what contributes to a successful junior high school? The qualification 'successful' is specified as: (a) meeting up to the required learning goals; (b) having a positive impact on wellbeing; (c) having a positive impact on learners' academic self-concept and (d) offering a positive orientation in school curriculum. Photovoice is chosen as main data-collection methodology. Photovoices are focus-groups in which the members identify, represent and enhance certain processes by taking, sharing and discussing photos (Wang, 1997) These data (photos and transcriptions) were iteratively analyzed in combination with desk research and a participatory trajectory in schools. The analysis confirms prudently that there is a positive correlation between a more comprehensive approach and the wellbeing of learners. Offering opportunities to enhance autonomous learning and self-regulation seems to be a crucial factor.

Impact of Education 4.0 environments on students' learning approach&teacher's awareness (CANCELLED)
Keywords: 21st century learning, Creativity, Innovations in education, Well-being and engagement
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To face our VUCA-world (Volatile, Uncertain, Complex, Ambiguous), we need Education 4.0 according to the social innovation framework Theory U (Scharmer & Kaufer, 2013). This kind of co-creative education requires a shift in awareness of teachers and puts students at the center of the learning process. The aim of this awareness-based action research was to realize an education 4.0 environment and to examine its impact on students' learning approach and on the teacher's awareness. We coached a teacher and her 53 students towards and in a 4.0 learning environment. The students filled in a questionnaire on learning approaches twice (pretest-posttest design). Descriptive statistics and paired t-tests show a statistically significant positive impact of the co-created learning environment on students' learning approach. Lack of regulation, controlled motivation and amotivation reduced while autonomous motivation, self-efficacy, student cohesiveness, teacher support, student involvement, cooperation, enjoyment of learning and academic efficacy increased. Mapping the teacher's experience through in-depth interview revealed shifts in awareness. She went from an open mind over an open heart to an open will, and let come what wanted to emerge in her classroom. The prototype resulting from this practice-based research might be a source of inspiration for launching innovation in schools.

Finnish-Dominican Education Programme for Managers Developing Competences for Industry 4.0
Keywords: Culture and Education, Multiculturalism in Education, Professional Development, Vocational education
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This research gives an example of how the framework of Design-Based Implementation Research (Fishman, Penuel, Allen, Haugan, & Cheng 2013) was applied in the co-design of a Finnish-Dominican professional development programme "Programa de Desarrollo de Educación Vocacional" for vocational education managers and pedagogical developers of INFOTEP from the Dominican Republic. Fifty-eight participants co-designed, implemented and evaluated 12 regional development projects of vocational education within the two-year programme, 2018-2020. The data gathering concerns 1) the participants' most important learning experiences of the first contact period of programme, 2) their expectations for the online guidance period and 3) the Dominican programme managers' expectations for the concrete outcomes of the process. The most meaningful learning experiences were the introduction of *the student-centered*