european society for research in mathematics education

YESS 10 - Young ERME Summer School

Web-plenaries program

Tuesday 21 April 2020, 13:30-15:00

Emergent tasks: A story about how a theory-driven idea became a practical tool
Angelika Bikner-Ahsbahs, University of Bremen (Germany)

Abstract: Research in mathematics education may take various forms. Fundamental research for example deals with the theoretical foundation of a problem in the field from where application might still be far removed. In other cases of research relevant phenomena, practical or theoretical, may be identified, investigated and conceptualized. Practice is more explicitly addressed by design research guided by two issues, a practical and a theoretical one: e. g. the practical issue can be to develop an instructional model for teaching mathematics in inclusive classrooms and the theoretical issue to elucidate how this inclusive way of teaching and learning may take place. Design research may also solve a pure practical problem, for instance how an innovative instructional model can be implemented in pre-service teacher education.

The talk will provide examples of these forms of research by telling the research story of finding and developing emergent tasks as a heuristic tool for adaptive teaching. The story begins with the context of discovery. It continues describing how the phenomenon of emergent tasks is conceptualized and further investigated. Then it delves into teacher education by narrating the embedding of emergent tasks into an instructional model for teaching and learning in inclusive mathematical classrooms and finally it outlines how this model is implemented into pre-service teacher education at the university.

Link to the web-plenary: **https://connect.uninett.no/plenarybikner/**

Wednesday, April 22nd 2020, 13:30-15:00

Digital technology and its various uses from the instrumental perspective
Jana Trgalova, University of Lyon (France)

Abstract: In 1985, Pea contrasted the use of computers in an amplification and reorganization metaphors: in the former, technology allows performing tasks faster, more efficiently and accurately, whereas in the latter, technology qualitatively changes the content and the cognitive processes engaged in problem solving. In this talk, I take dynamic geometry as an example of digital technology to illustrate various ways in which it can be used, referring to the SAMR model (Puentedura, 2006). Drawing on the instrumental approach (Rabardel, 2002), for each kind of use, I analyse the role of the drag mode to highlight a variety of instruments that can be developed and the corresponding conceptualizations. I conclude with some implications bringing to light challenges that mathematics teachers face with the use of technologies.

Link to the web-plenary: **https://connect.uninett.no/janatrgalova/**

Thursday, April 23rd 2020, 13:30-15:00

YERME Discussion group
Dorota Lembrer, Western Norway University of Applied Sciences, Bergen (Norway)
Andrea Maffia, University of Pavia (Italy)

Abstract: Communication, collaboration and cooperation are keywords for ERME in general, and one important aim of ERME is to promote early-career researchers in Mathematical Education in particular. Early-career researchers are organised in a specific ERME community called YERME. YESS is one of the activities involving YERME, but it is not the only one. During the Informal Discussion Group, the online activities of YERME (including social networks and webinars) are presented. Also, YERME-day is introduced with the aim of collecting young researchers' opinions about a meeting for YESS10 participants in Bolzano in 2021, when the next YERME-day is taking place. Finally, during the Informal Discussion Group, the representatives of YERME in the ERME board interact with the participants to collect any proposal by the community of early-career researchers that could be discussed in the ERME board.

Link to the YERME discussion: **https://connect.uninett.no/informaldiscussion/**

Friday, April 24th 2020, 13:30-15:00

Transitions to and within university mathematics: the anthropological approach
Carl Winslow, University of Copenhagen (Denmark)

Abstract: After an example based introduction to the anthropological approach to university mathematics, and more generally as a research programme in Didactics of Mathematics, I will address two specific research topics which this approach has been applied to (in my personal research):

- Transitions between mathematical teaching and research at university
- Transitions from high school to university, and back

The first could be said to be a "teachers' viewpoint", while the latter concerns students' experiences of gaps – the "back" refer to those students who will become high school teachers based on a university degree in more or less "pure" mathematics.

Given that we are all relatively new to online lectures I will ask you to use the "chat" function to ask questions, and bear with me if I can only attend to some of the questions at the end. To avoid too much "noise" on the line, please turn off your microphones during the lecture.

Link to the web-plenary: **https://connect.uninett.no/carlwinslow/**

Saturday, April 25th 2020, 13:30-15:00

The role of theory in a research framework
Angelika Bikner-Ahsbahs, University of Bremen (Germany)

Abstract: The talk will expound notions of theory in mathematics education and illustrate one meta-theoretical concept of theory by a research example. In order to show how theories may inform research two kinds of research frameworks, theoretical and conceptual, are illustrated using examples taken from recent research projects. The first example shows how the classroom phenomenon of the epistemological gap, a dissonance of coming to know in teacher–student–interaction, was identified in a theoretical framework and resulted in a conceptual extension of the two theories involved. The second example illustrates a conceptual framework used to investigate teaching and learning with a new digital tool on learning algebra, the MAL-system. This study resulted in a layered model of learning how to solve equations with this tool. By contrasting the two research examples, conditions, advantages, and disadvantages of the two kinds of research frameworks are specified and the roles of theory with respect to the findings are reflected.

Link to the web-plenary: **https://connect.uninett.no/angelikabiknerno2/**