ICME DG: APPLYING CONTEMPORARY PHILOSOPHY IN MATHEMATICS AND STATISTICS EDUCATION: THE PERSPECTIVE OF INFERENTIALISM

Organizers: Co-Chairs:

Kate Mackrell, London (UK) katemackrell@mac.com

Maike Schindler, Örebro (SE) maike.schindler@oru.se

Team members:

Arthur Bakker, Utrecht (NL) A.Bakker4@uu.nl

Dave Pratt, London (UK) D.Pratt@ioe.ac.uk

Discussant: Luis Radford

DESCRIPTION, AIMS AND RATIONALE

The perspective of Inferentialism in Mathematics and Statistics Education (IMSE) is increasingly gaining interest in mathematics education. This is indicated for example, by the growing number of papers published in this area (e.g., Mackrell & Pratt, 2016; Schindler & Joklitschke, 2016; Hußmann & Schacht, 2015; Noorloos et al., 2014; Schindler & Hußmann, 2013; Bakker & Derry, 2011). Inferentialism is a semantic theory (Brandom, 1994; 2000), based on philosophical ideas offered by for example, Kant, Hegel, Frege, Wittgenstein, and Heidegger.

Similar to theories such as constructivism, inferentialism can be considered as an orienting framework (diSessa & Cobb, 2004). It provides ontological and epistemological foundations for conceptualizing and analyzing knowledge, learning, communication, and reasoning in the fields of mathematics and statistics. Inferentialism avoids a representationalist perspective on learning that implicitly supports a dualism between students' internal representation and the worlds' external reality (Cobb, Yackel & Wood, 1992; Noorloos. et al., 2014,). "Rather than seeing representation to be the basis for reasoning, Brandom explains the meaning of representations through their origin in reasoning practices" (Noorloos et al., 2014). Thus, reasoning and inferences are crucial aspects of research linked to IMSE. In recent years, inferentialism served as a basis for the development of theoretical and analytical frameworks within mathematics and statistics education.

The DG aims to bring together researchers who are interested in the role and use of inferentialism or other contemporary philosophies in mathematics and statistics education (e.g., Bakhurst, 2011; McDowell, 1996; Habermas, 1984). It gives the attendants the opportunity to discuss the significance and the restrictions of the perspective of inferentialism and other contemporary philosophies on the learning and teaching of mathematics and statistics. It offers a platform and venue, which is not only open for researchers who already have used inferentialism in their scientific work. It also offers the opportunity to inform those who are interested in this perspective; to compare different perspectives on inferentialism and its applications in mathematics/statistics education; to compare different analytical and methodical implications; to share these ideas and to discuss them. This DG welcomes all researchers who are interested in philosophical influences on mathematics/statistics education research. The DG will contribute to an exchange of ideas and networking as inspired by the networking strategies described in the book edited by Bikner-Ahsbahs and Prediger (2014)

but then in the area of inferentialism and other contemporary philosophies within mathematics and statistics education.

KEY QUESTIONS

The discussion will be guided by the key questions that are presented in the following. For discussing the key questions, the attendants may be asked to form subgroups – depending on the number of attendants and the types of contributions.

- Inferentialism and other contemporary philosophies as *background or foreground theories* in mathematics/statistics education:
  - To what extent is it fruitful to use contemporary philosophies in mathematics and statistics education (cf. Cobb, 2007)? Which aims do we have? Why is this necessary considering the variety of existing educational theories within mathematics/statistics education?
  - What aspects of the philosophies can be used for applying them in mathematics/statistics education? Which ontological and epistemological ideas are significant in this respect? How and to what extent can we relate educational and philosophical theories?
  - To what extent do various philosophical positions/ideas differ? How are they consistent or complement each other? Can we draw on more than one when we consider educational issues?
- Using inferentialism and other contemporary philosophies for *empirical purposes*:
  - How can aspects of inferentialism or other contemporary philosophies be used for planning empirical investigations or projects, or for analyzing data?
  - Which findings already exist resulting from the use of inferentialism or other contemporary philosophies? To what extent is the use of philosophical theories beneficial (offering added value in comparison to existing theories within mathematics/statistics education)?
  - On what aspects in the teaching and learning processes within mathematics/statistics education does empirical research based on inferentialism or other contemporary philosophies focus?

ANTICIPATED STRUCTURE

The organizers will present a brief introduction to the ideas behind inferentialism and to related empirical work. In addition, we invite prospective participants to submit individual contributions addressing the key issues of this DG. These may, among others, focus on:

- theoretical considerations on inferentialism and their implications for mathematics and/or statistics education,
- other contemporary philosophical theories and their implications for mathematics and/or statistics education (e.g., Bakhurst, 2011; McDowell, 1996; Habermas, 1984),
- educational theories that are linked to inferentialism or other contemporary philosophies,
- reports on empirical investigations or projects using inferentialism (or other contemporary philosophies) as a background/foreground theory,
- Reports on designs of future investigations/projects using inferentialism (or other contemporary philosophies) as a background/foreground theory.

The final structure will depend on the contributions received.

HOW TO JOIN THE DG? – CALL FOR CONTRIBUTIONS

We welcome **paper contributions** that are closely related to the above-mentioned key issues of this DG and address the outlined aspects. Please send us your individual contributions as soon as possible, but **not later than March 15, 2016** (maike.schindler@oru.se). Please be aware that your contribution should not exceed a **space limit of two pages** and should be written in the ICME poster template available via

http://icme13.org/submission_process/paper_and_poster_template.

The organizing team will collaboratively decide on **paper acceptance by March 30**. Accepted papers will be made available to all participants of the DG on the ICME website before the conference. Participants of DG should read all papers as a preparation for the DG.

Accepted papers will be included in the **DG Proceedings**, which will be made **available online** after the conference if the authors agree.

Decisions on the DG program and its timetable will be made and published after acceptance of individual contributions.

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