

ICDME-TSUKUBA INTERNATIONAL CONFERENCE 2022 INTERNATIONAL COOPERATION DEVELOPMENT IN MATHEMATICS EDUCATION

ISSUES AND CHALLENGES IN THE DEVELOPMENT OF AN INTERNATIONAL NETWORK FOR DIDACTIC RESEARCH IN UNIVERSITY MATHEMATICS

Viviane DURAND-GUERRIER, IMAG, CNRS, univ. Montpellier, France

The emergence of the network on previous backgrounds

The creation of the network did not come out of nowhere. Here are some milestones:

- ICMI Study on the Teaching and Learning of Mathematics at University Level Singapore, December 1997 (Holton 2001).
- Biannual conference DELTA (southern hemisphere seminars on undergraduate mathematics and statistics education) since 1997.
- Annual conference on SIGMAA on RUME (Special Interest Group of the Mathematical Association of American on Research in Undergraduate Mathematics Education) since 2001.

The emergence of the network on previous backgrounds

- A recurrent topic in conferences of *Espace Mathématique Francophone*, recognized as a *linguiistic régional conference by ICMI* since 2003.
- A recurrent Topic Study Group on *Mathematics Education at tertiary level* in quadriennal ICME conferences.
- Creation of a Thematic Working Group University Mathematics Education in the biannual CERME conferences since 2011; this new TWG attracked quickly many participants form Europe and the worldwide.
- National networks developing in many European countries (France, Germany, Norway, Spain, United Kindgom, etc.)

The creation of the INDRUM Network

The mentioned dynamics let emerge the relevance of developing a permanent network favoring the development of collaborations.

A first informal presentation occurred in Oberwolfach (Germany) during an international meeting organized by the German Centre for Higher Mathematics Education (KHDM).

The network was formally founded at CERME9 in Prague (Czech Republic), by a group of scholars in February 2015.

The initial group of scholars gathered 19 scholars from 12 countries (Belgium, Canada, Denmark, France, Germany, Italia, Mexico, Norway, Spain, Tunisia, United Kingdom, United States).

The current INDRUM scientific committee comprises 41 members from 16 countries, including a Coordination Group that will be renewed every 2 years during the conferences.

Issues and challenges

The aim was to build an International Network aiming to contribute to the development of Didactic Research at University, in Mathematics, whathever the level and the track, with a particular focus on *building research capacity* in the field, with a concern for the *development of early-carrier researchers*, and for *dialogue with the mathematics community*.

The main concrete objectives

1/ elaboration of a scientific programme that will federate existing research in this field in Europe and beyond;

2/ development and emergence of international collaborations by applying to project calls at all levels (local, regional, european, international);

3/ reinforcement of the visibility of these research studies to researchers in mathematics education and to the mathematics community;

4/ contribution to the development of doctoral programmes in this field

Strategies to solve the issues and challenges (1)

Organizing biennial international conferences hosted by universities that address all aspects of research in didactics of mathematics at tertiary level, on two broad themes: *students' and teachers' practices* and *the teaching and learning of specific mathematical topics (Analysis, Geometry, Arithmetic, Probability, Discrete Mathematics, Logic, Topology* etc.)

INDRUM 2016 University of Montpellier (France)INDRUM 2018 University of Agder (Norway)INDRUM 2020 Online from Faculty of Sciences of Bizerte (Carthage University, Tunisia)

INDRUM2022 will held in Hanover (Germany) at the Leibniz University, 19-22 Oct.2022. https://indrum2022.sciencesconf.org/ March 11, 2022: Registration open

April 1, 2022: Deadline for submission of papers and poster proposals

The four conferences are labelled as ERME Topic Conferences: http://erme.site/topic-conferences/

Strategies to solve the issues and challenges (2)

Proceedings available in a same place with open access:

The free platform <u>sciencesconf.org</u> of the French CNRS (National Center for Scientific Research), is used for each conference website, whatever the hosted university ; jointly, a webpage on the French open archive HAL as been created for gathering the proceedings: <u>https://hal.archives-ouvertes.fr/INDRUM/page/indrum-proceedings</u>

Strategies of publications

A special issue in IJRUME (International Journal for Research in University Mathematics Education): Nardi & Winslow (2018), *with selected papers of INDRUM 2016.*

A book in the ERME Series at Routledge : Durand-Guerrier, V., Hochmuth, R., Nardi, E., Winslow, C. (2021), that provides a deep synthesis of the research field as it appears through two INDRUM conferences organised in 2016 and 2018.

A special issue in IJMEST (International Journal of Mathematical Education in Science and Technology), *with selected papers of INDRUM 2020*, is currently prepared by T. Hausberger and M. Bosch (to appear in 2022).

FUMME - An international online seminar

FUMME (From University Mathematics to Mathematics Education) The seminar is intended to present recent researches on the transition faced by university students when they move to teaching at school (Klein's Second Transition), in particular those conducted by young researchers, including PhD students: https://hal.archives-ouvertes.fr/FUMME/

The presentations focus on well-identified mathematical fields (Analysis, Geometry, Arithmetic, Probability, Discrete Mathematics, Logic, Topology etc ..). Avenues for university teachers' training can be considered.

A special issue of RDM (Recherches en Didactique des Mathématiques) will be published in 2023.

More than 100 scholars are inscribed on the seminar mailing list in order to receive the videoconference link at each session, and the number is still increasing.

References

Durand-Guerrier, V., Hochmuth, R., Nardi, E., Winslow, C. (Eds.) (2021). *Research and Development in University Mathematics Education. Overview produced by the International Network for Didactic Research in in University Mathematics.* ERME Series. London and New-York: Routledge.

Holton, D. (Ed.) (2001). *The Teaching and Learning of Mathematics at University Level*. Dordrecht: Kluwer.

Nardi, E. & Winsløw, C. (Eds) (2018). Special Issue: INDRUM (International Network for Didactic Research in University Mathematics) 2016 Select Papers, *International Journal for Research in Undergraduate Mathematics Education* 4(1).

Thank you for your attention

viviane.durand-guerrier@umontpellier.fr
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