

# **Stimulating and facilitating Norwegian RUME**

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*MatRIC – Centre for Research, Innovation and Coordination of Mathematics Teaching is a Norwegian centre of excellence in higher education. The centre focuses on innovation in university level mathematics teaching. We foster research in teaching and learning mathematics, especially but not exclusively in the context of innovative practice. MatRIC also seeks to facilitate the networking of university level mathematics teachers within Norway and with the international community. This poster focuses on MatRIC's activity aimed at the development of research in university mathematics education. The poster sets out strands of activity within MatRIC's research programme, types of inquiry pursued, and categories of purpose.*

*Keywords: Norway, Research programme, Centre of Excellence.*

## **STRANDS OF ACTIVITY WITHIN MATRIC'S RESEARCH PROGRAMME**

There are four strands of activity: i. Researcher education and development (masters, PhD and post-doctoral research); ii. Small research grants; iii. Research embedded within MatRIC's networks for innovation; iv. Externally funded research projects.

i. Researcher education and development spans project and dissertation work in a masters programme in mathematics education and with PhD fellowships and a post-doctoral researcher. To date one master's dissertation has been completed; this explores engineering students' response to interactive software designed to visualize and simulate mathematical concepts. Five PhD fellowships (3 started and 2 to begin August 2016) are focused on teaching and learning undergraduate mathematics in the context of innovative practice, such as use of video and flipped classroom approaches. The post-doctoral researcher contributes to research embedded with the networks (strand iii) and pursues research that builds on his PhD that explored university mathematics teaching from a discourse perspective.

ii. MatRIC makes available small research grants (up to about €6000). These are open to researchers in higher education institutions throughout Norway who propose research into teaching and learning mathematics at university level. Proposals are peer-reviewed before funding is made available. In the last two years 10 such awards have been made, about half of these to researchers outside the University of Agder. Reports from these small scale studies are published on the MatRIC web pages ([www.matric.no](http://www.matric.no)).

iii. MatRIC organizes and supports networks of university level mathematics teachers who are using and developing innovative approaches in their practice: video, computer aided assessment, digital visualization, and mathematical modelling. There is also a teacher education network. Research is embedded within these

networks, including that conducted by PhD fellows affiliated with different networks. Teachers within networks also pursue forms of developmental research to explore the consequences of the innovative approaches they introduce to teaching and learning mathematics.

iv. External research funds are sought from agencies and programmes that sponsor educational research in Norway. MatRIC's networks and activities provide a base for launching larger scale research project proposals. At the time of writing one project related to mathematical modelling and based on collaboration with Brno University of Technology is supported by EEA Grants (European Economic Area/Norway Grants). Other proposals are under review.

## **TYPES OF INQUIRY PURSUED AND SUPPORTED BY MATRIC**

Research sponsored and pursued by MatRIC is aligned with the so called 'Pasteur's quadrant' in Donald Stokes's depiction of scientific research (Stokes, 1997), that is MatRIC's research is focused on understanding the field better to inform practice within the field. The studies pursued fall into two types. Exploratory studies, which seek better understanding of teaching and learning in different learning environments to inform teaching. Second, as noted above, developmental research which pursues theoretical and principle-driven innovation in practice and researches the process to inform theory and principles in addition to developing practice.

## **CATEGORIES OF PURPOSE IN MATRIC'S RESEARCH**

Developmental research is pursued to inform innovation in teaching and learning, this seeks to explore and develop as outlined above. Developmental research is also pursued in what might be characterized as traditional higher education teaching-learning situations such as lectures and seminars. There is no assumption that 'innovation means better' or 'traditional' approaches cannot be better understood or improved.

Hermeneutic research that seeks to explore and understand better teaching and learning in both innovative and traditional settings is also pursued. The outcomes from this research will be of value in future developmental activity.

## **THE POSTER**

MatRIC's research is presented in the form of an annotated matrix, rows and columns represent types of inquiry and strands within the research programme respectively. Individual projects, represented by elements within the matrix, are colour coded to indicate the category of purpose.

## **REFERENCES**

Stokes, D. E. (1997). *Pasteur's quadrant: Basic Science and Technological Innovation*. Washington, DC: Brookings Institution Press.