

**NOKUT - Centre for Excellence, MatRIC evaluation 2017: Evaluation panel meetings at the University of Agder, Kristiansand, May 22.**

**Additional information requested by the evaluation panel.**

1. **List of Publications** (note only international publications are included below)

'MSRG' indicates the research was supported by a MatRIC Small Research Grant.

**Peer reviewed journal papers**

Fuglestad, A. B. (2017 forthcoming). Support for students' learning and competence development in mathematics. *NOMAD*

Hauge, K.H. & Barwell, R. (2017). Post-normal science and mathematics education in uncertain times: educating future citizens for extended peer communities. Sluijs, J.v.d., & Dankel, D.J. (Eds.) *Special Issue: Post-Normal Science in Practice. Futures.* (MSRG)

Viirman, O. (2015). Explanation, motivation and question posing routines in university mathematics teachers' pedagogical discourse: a commognitive analysis. *International Journal of Mathematical Education in Science and Technology*, 46(8), 1165-1181.

Treffert-Thomas, S., Viirman, O., Hernandez-Martinez, P. & Rogovchenko, Y. (2017 forthcoming). *Mathematics lecturer's views on the teaching of mathematical modelling. Nordic Studies in Mathematics Education, NOMAD.* (MSRG)

**Peer-reviewed chapters in edited book**

Hauge, K.H. (2016). Usikkerhet i temperaturprognoser. In T.E. Rangnes & H. Alrø (Eds.), *Matematikk læring for framtida – Festskrift til Marit Johnsen-Høines* (217 – 240). Bergen, Norway: Caspar Forlag AS. (MSRG)

**Peer reviewed conference presentation with publication of full paper in proceedings**

Brekke, M. (2016). New way of teaching and integrating Mathematics for engineering students in Electronics, *18th SEFI Mathematics Working Group Seminar, 27.06.16 - 29.06.16, Chalmers University of Technology, Gothenburg, Sweden.* Pp. 63 – 68, Publisher: European Society for Engineering Education (SEFI), Brussels ISBN: 978-2-87352-013-7 <http://sefi.htw-aalen.de/>

Fredriksen, H., Hadjerrouit, S., Monaghan, J., & Rensaa, R. J. (2017 forthcoming). Exploring Tensions in a Mathematical Course for Engineers utilizing a Flipped Classroom Approach. CERME10, Dublin, 1 – 5 February 2017.

Goodchild, S. & Rønning, F. (2015), Teaching mathematics at higher education. In *Nordic Research in Mathematics Education: Proceedings of NORMA14.* University of Turku: The Finnish Research Association for Subject Didactics 2015 ISBN 978-952-5993-17-2. s. 396-400

Hadjerrouit, S. (2016). Mapping and Evaluating Pedagogical Opportunities Provided by SimReal+: A Case Study in Mathematics Education. *Proceedings of the Conference of the International Journal of Arts and Sciences* 9(3), pp. 157-162. (MSRG)

Hauge, K.H., & Barwell, R. (2015). Uncertainty in texts about climate change: A critical mathematics education perspective. In S. Mukhopadhyay & B. Greer (Eds.) *Proceedings of the Eighth International Mathematics Education and Society Conference*, pp. 582-595. Portland, OR: Portland State University. (MSRG)

Hauge, K. H., Sørngård, M.A., Vethe, T.I., Bringeland, T.A., Hagen, A.A., & Sumstad, M.S. (2015) Critical reflections on temperature change. In K. Krainer & N. Vondrová (Eds.) *Proceedings of the Ninth Conference of the European Society for Research in Mathematics Education (CERME9, 4-8 February 2015)* (pp. 1577-1583). Prague, Czech Republic: Charles University in Prague, Faculty of Education and ERME. (MSRG)

Hogstad, N. M., Isabwe, G. M. N., & Vos, P. (2016). Engineering students' use of visualizations to communicate about representations and applications in a technological environment. In E. Nardi, C. Winsløw, & T. Hausberger (Eds.), *Proceedings of the First Conference of the International Network for Didactic Research in University Mathematics* (pp. 211-220). Montpellier, France: University of Montpellier and INDRUM. Can be accessed at: <https://hal.archives-ouvertes.fr/INDRUM2016/>

Hogstad, N. M., Isabwe, G. M. N., & Vos, P. (2017 forthcoming). A digital tool for applying integrals in a kinematic simulation: A perspective on instrumental genesis, epistemic value and semiotic potential. Paper accepted for *CERME10 Conference Dublin1-5 February 2017* (<http://cerme10.org/>).

Viirman, O. (2015). The constitution of the nature of mathematics in the lecturing practices of three university mathematics teachers. In K. Krainer & N. Vondrova (Eds.), *Proceedings of the ninth congress of the European mathematical society for research in mathematics education*. (2263-2269). Prague: ERME.

Viirman, O. & Nardi, E. (2017 forthcoming) From ritual to exploration: The evolution of Biology students' mathematical discourse through Mathematical Modelling activities. *CERME10*.

Viirman, O., Goodchild, S., & Rogovchenko, Y. (forthcoming). Using mathematical modelling activities to motivate biology students to learn mathematics. *Short presentation at MADIF 10: The 10th Swedish Mathematics Education Research Seminar 2016, Karlstad, Sweden*.

Viirman, O. (2015). The role of mathematics in the design of engineering programs – a case study of two Scandinavian universities. In R. Göller, R. Biehler, R. Hochmuth, & H.-G. Rück (Eds.), *Didactics of Mathematics in Higher Education as a Scientific Discipline. Proceedings of the KHDM 2015 conference*. (508-512). Kassel: KHDM.

#### **Peer reviewed conference presentation**

Brekke, M. (2016). Modern Mathematics teaching: "It's all digital", *OEB Berlin 2016 Shaping the future of learning, 30.11.16 - 02.12.16*, Berlin. <https://online-educa.com/programme>

Brekke, M. (2016). Using CAA to set grades in mathematics courses for engineering students in electronics, EAMS Conference "*E-Assessment in Mathematical Sciences*", 13.09.16 - 14.09.16, University of Newcastle, Newcastle. <http://eams.ncl.ac.uk/session/using-caa-to-set-grades-in-engineering/>

Goodchild, S. & Rønning, F. (2015). *Innovation in mathematics teaching and learning on engineering courses in Norway*. 8th IMA Conference on Mathematical Education of Engineers. Loughborough UK.

Hadjerrouit, S. (2017). Assessing the Affordances of SimReal+ and their Applicability to Support the Learning of Mathematics in Teacher Education. Accepted for publication in *InSITE 2017 (Informing Science + IT Education Conference)*. Informing Science Institute. (MSRG)

Hogstad, N. M., Viirman, O. (2017). An exploration of students' discourse using Sim2Bil within group work: A commognitive perspective. Preliminary Research Report for the *RUME Conference San Diego, 23-25th February, 2017*.

Liakos, I. E. (2017). Mathematical Modelling and Mathematical Competencies: The case of Biology students. Preliminary Report accepted for *RUME Conference to be held in San Diego, 23-25th February, 2017*.

Maugesten, M.; Nordbakke, M. (2016). Flipped classroom in the education of teacher students in mathematics. *European Conference on Education Research (ECER), 2016; Dublin, 23-26 August 2016*. <http://www.eera-ecer.de/ecer-2016-dublin/> (MSRG)

Viirman, O. (2016). The development of the mathematical discourse of biology students working with mathematical modelling. *Poster presented at INDRUM 2016: First conference of the International Network for Didactic Research in University Mathematics, Montpellier, France*.

Viirman, O., Goodchild, S., & Rogovchenko, Y. (2016a). Using mathematical modelling activities to motivate biology students to learn mathematics. In C. Csíkós, A. Rausch & J. Sztányi (Eds.). *Proceedings of the 40th Conference of the International Group for the Psychology of Mathematics Education, Vol. 1* (p. 262). Szeged, Hungary: PME.

### **Peer reviewed poster presentations**

Fredriksen, H., & Hadjerrouit, S. (2016). Using the Flipped Classroom Model of Instruction to explore teaching and learning activities in mathematical education for engineers: An activity theory perspective. INDRUM 2016 conference, March 31– April 2, 2016, Montepellier.

Fredriksen, H., & Voigt, M. (2017). Designing a Richer Flipped Classroom Calculus Experience. *RUME conference, February 23 - 25, 2017, San Diego, CA*.

Hogstad, N. M. (2016). On the potential of visualization and simulation tools in open and distance e-learning of mathematics at university level. Presentation at *Annual Research Workshop on Distance Education Leapfrogging Project (DELP2016) at Makerere University, Kampala, Uganda, 2nd of May 2016*.

Hogstad, N. M., Isabwe, G. M. N., & Vos, P. (2015). Using digital tools for collaborative visualization of integrals by engineering students. In N. Amado, & S. Carreira (Eds.), *Proceedings of the 12th International Conference on Technology in Mathematics Teaching*, (p. 552). <http://sapientia.ualg.pt/handle/10400.1/6081>

Liakos, I. E. (2017). Introducing Mathematical Modeling to Biology Students: Studying the Competence Profile of the student. Poster accepted for *CERME10 Conference Dublin1-5 February 2017* (<http://cerme10.org/>)

Rogovchenko, S., Rogovchenko, Y., Treffert-Thomas, S. (2017). Individual and Group Work with Nonstandard Problems in an Ordinary Differential Equations Course for Engineering Students. Poster presentation at RUME, February 24-26, 2017. San Diego, CA

## 2. Student involvement and student engagement.

Project	Number of Students	Discipline	Institution	Contribution to Centre
<b>Students as partners in teaching and development</b>				
Student advisory groups	8	Engineering, teacher education	UiA Kristiansand and Grimstad campuses	Setting strategic direction of MatRIC, suggest new activities and projects recommend where students can be directly involved in the developmental activity.
Partners in Learning (Change Institute)	3	Leaders from the Students' Organisation at Agder	UiA	Development of MatRIC's innovation. Help in planning student engagement in programme, course and teaching/learning support developments.
Drop-in Support Centre (1)	KRS 7 GRM 3	Teaching assistants	UiA, Grimstad and Kristiansand campuses	MatRIC's support agenda. Advise on how Drop-in centres can meet students' needs better.
Revision support (1)	10	Teaching assistants	UiA Grimstad campus	MatRIC's support agenda. Represent partnership in teaching and learning that MatRIC advocates.
Teaching assistants in teaching mathematics for electronic engineers	3	Second year electronics engineer students	UiA Grimstad campus	Support in the development of resources for teaching and learning in ICT/digital environments
Developing CAA mathematics questions on 3 levels to be tested on master-students in mathematics question. Test made for level 1-7, 5-10 and 8 - 13	1	Masters in mathematics education	UiA Kristiansand campus	Support in the development of resources for teaching and learning in ICT/digital environments and assists the transfer of knowledge across programmes and campuses.
Development of MatRIC TV	2	Third year Multimedia Technology	UiA Grimstad campus	Provides technical support in transferring and translating support videos purchased on

		and Design students		licence from MEC, Loughborough University.
<b>Student led project</b>				
Student led design of web-based teaching resource (SCI-CODE) + project manager	5 + 1	Engineering programme	UiA Grimstad campus	Developing a net-based on-line teaching – learning tool. Contributing to MatRIC’s vision of integrated digital learning resource.
<b>Research</b>				
Master Dissertations	3	Mathematics Education	UiA Kristiansand and Grimstad campuses	Informs about development of simulation and visualization tool. Piloting a research instrument to explore teachers’ mathematical meanings. Contributing to MatRIC’s research agenda.
Evaluation of students’ perceptions using a simulation/visualization program for mathematics teaching & learning	60	Students following a master in Mathematics Education programme	UiA Kristiansand campus	Students engaged in research and development partnerships with developer and research to explore and advise on the usefulness of a digital simulation/visualization tool in teaching and learning school mathematics.
Students’ critical reflections on a graph of temperature anomalies	5	Students following a master in Mathematics Education programme	Western Norway University of Applied Sciences	Students are active partners in the teacher’s research and development project. Provide feedback and advice about the engagement of students in R&D based education.

<p align="center"><b>Teaching developmental research</b></p> <p><b>MatRIC seeks students' better engagement in their studies, higher levels of motivation, and sense of relevance of mathematics within their programmes, greater levels of enjoyment with the anticipated outcome – better performance. Students engaged in the developmental research of MatRIC provide an essential source of information about the effectiveness of actions believed to be beneficial, and how actions transfer from one teacher/situation to another.</b></p>				
Teaching innovation (flipped classroom approach)	25	Mathematics in a computer engineering programme	UiT The Arctic University of Norway, Bodø campus	Provide feedback on the implementation and effectiveness of innovative teaching approach.
Mathematica modelling in Biology - bioCEED collaboration	30	First year biology students	UiB, Department of Biology.	MatRIC – bioCEED collaboration. Provide feedback on the implementation and effectiveness of innovative teaching approach. Support the collaboration between SFUs.
Innovation in teaching approach for mathematics	c.70	Students following electronics engineering programme	UiA Grimstad campus	Provide feedback on the implementation and effectiveness of innovative teaching approach.
Mathematical modelling in Physics Lab.	c.350	First year students following engineering programmes	UiA Grimstad campus	Provide feedback on the implementation and effectiveness of innovative teaching approach.
Using flipped classroom approach	28	Students on a teacher education programme (for grades 1 to 10)	Østfold University College	Provide feedback on the implementation and effectiveness of innovative teaching approach.
Use of a free on-line learning tool	24	Students on a teacher education programme (for grades 1 to 10)	Oslo and Akershus University of Applied Sciences	Provide feedback on the implementation and effectiveness of innovative teaching approach.
Inquiry based teaching	c.120	Teacher education programme: mathematics for grades 5 to 10	UiA campus Kristiansand	Students engaged with their teacher in research and development based education. Provide feedback on the implementation and effectiveness of

				innovative teaching approach.
<b>Student learning support</b>				
<b>Many students who follow mathematics courses as a 'service' subject experience difficulties. MatRIC's provision of learning support follows international developments (UK, Republic of Ireland, Germany, Australia) that have been exposed through engagement in MatRIC's international network. Through the provision of support when needed MatRIC increased motivation, enjoyment and engagement and helps to lift students' performance.</b>				
Drop-in Support Centre (2) * The numbers are based on attendance records, not individual students	KRS c.2500* GRM c.2000*	Users, visiting for support	UiA, Grimstad and Kristiansand campuses	Feedback from students helps to shape the provision of learning support to fit students' needs.
Revision support (2)	c.150	First year engineering students revising for mathematics examination	UiA Grimstad campus	Feedback from students helps to shape the provision of learning support to fit students' needs.
<b>Student focused events</b>				
Teacher education workshop 2016	70	Teacher education programme	UiA Kristiansand campus	Feedback from students informs the development of MatRIC's teacher education network.
Open Lecture	c. 1000	UiA students and pupils from upper secondary schools	UiA, Grimstad and Kristiansand campuses	Feedback from students and schools informs MatRIC's approach to engage with society outside HE.

### 3. Cooperation across SFUs.

MatRIC has fully participated in the meetings for all SFUs that have been organised by NOKUT. These meetings have been valuable for their formal content (eg focus on students as partners, measuring impact, etc.) but also for the informal networking opportunities with the other SFUs that they have provided. Although much of the work that each SFU is carrying out is quite different (in terms of discipline focus, institutional context, teaching culture) there are many issues at a meta-level, such as enhancing the status of teaching viz-a-viz research, distinguishing between successful action, achievement and impact; reporting and dissemination approaches, student engagement in programme and course design and delivery, where sharing of approaches have been very beneficial. We anticipate that with the growing number of SFUs, following the third-round awards, these meetings will become even more useful and MatRIC certainly intends to continue playing a full and active role in these meetings.

**bioCEED:** MatRIC's closest collaboration, to date, has been with bioCEED. MatRIC focuses on mathematics as a service subject in user programmes and biology is one such user programme. Traditionally, biology has been the least mathematical based of the STEM subjects, however in recent years this has changed with the subject becoming ever more reliant on sophisticated

mathematical and statistical models. This has created a gap in student awareness and preparedness that bioCEED and MatRIC are working together to fill. A key element to this approach is the use of mathematical modelling activities which give context and motivate learners to move out of their 'mathematical comfort zones'.

MatRIC is developing and implementing resources for mathematical modelling for biology. Biology students at UiB are taught mathematics in their first semester in a large group with students from other life science programmes. The mathematics taught is not focused especially on the needs of biology students. Some students enter the course with a weak background in mathematics, and for many students the weak connection between the mathematics studied and biology programme does not motivate engagement with their mathematical studies. These are the challenges that MatRIC seeks to confront. The collaboration with bioCEED is providing an excellent space for trialling approaches MatRIC seeks to promote. A MatRIC team conducted some pilot studies during 2015, and during the autumn semester 2016 a MatRIC PhD fellow conducted a semester long sequence of teaching studies – these generated the data that are being analysed and reported within the fellow's PhD.

We are now planning a meeting/workshop to take place in June 2017 to include MatRIC, bioCEED and the Mathematics Department at the University of Bergen to report from the pilot studies and explore ways to apply the knowledge gained in the development of mathematics courses. Students, teachers and researchers (in biology, mathematics and mathematic education) will be represented in the workshop.

MatRIC has collaborated with bioCEED in the production of videos for supporting the teaching and learning elementary statistics. Following discussions with statisticians and bioCEED colleagues at Bergen, MatRIC enabled the bioCEED production group to use the excellent recording studios and technical support available at UiA. The bioCEED videos take a different approach to those produced within MatRIC TV, the videos contextualise the mathematics and present the material with a more dialogical approach than used in MatRIC TV. The differences between the production conceptions provide the basis for a sound comparative analysis, an important future task will be to carry out a comparative approach of the effectiveness of the two different types of resources.

There is a very close working relation between bioCEED and MatRIC, MatRIC has certainly benefitted from this, in the ways outlined above and more. bioCEED's use of a student developed digital resource (App) for classifying plants on field trips added to confidence within MatRIC to support student led ICT projects. bioCEED's use of the MNT (STEM) conference arranged by UHR provides MatRIC with a strategy for sustainability of MatRIC's contributions.

**ProTed:** There is a clear intersection of interests between MatRIC and ProTed. MatRIC's prime concern is with the mathematical education of students on teacher education programmes, whereas ProTed focuses on the professional development of student teachers. MatRIC and ProTed have had meetings to explore synergies and joint actions. It is a priority in the remainder of the present funding period, and beyond to transform the discussions and proposals into actions – a combined action was proposed for spring 2017, but could not take place because of lack of synchronisation between school experience in the programmes of the two institutions.

**CCSE:** MatRIC was delighted when CCSE was announced as one of the third round SFUs. We had already collaborated with some of the key players in CSSE. One of the leaders of CSSE contributed to the induction teaching course for new lecturers and also gave a presentation at MatRIC's 2016 conference. There are significant areas of complementarity in CCSE and MatRIC's



foci. CCSE's disciplinary focus is primarily physics, traditionally a highly mathematical course of study. CCSE intends to explore how traditional approaches to teaching physics may have been constrained by traditional approaches to teaching mathematics and this is an area where MatRIC can make a significant contribution. We are actively developing projects where we can work together with colleagues from CCSE on projects to address these areas of mutual interest especially related to MatRIC's visualization and simulation network. MatRIC has plans for further involvement of CCSE in MatRIC's actions.

**CEMPE:** Contacts with this Centre for Excellence have been mainly through the NOKUT arranged gatherings. We recognise differences in the situations and approaches of the two centres. However, we gain strength through understanding each other's challenges.

2016 round of SFU proposals: MatRIC offered to collaborate and/or provide advice to any potential bidders during the SFU third round application process. ENGAGE were one of the groups who contacted MatRIC and some preliminary discussion took place. The areas of synergy here are less obvious than with CCSE, ProTEd and bioCEED, however MatRIC is well aware that quantitative literacy is a key component of entrepreneurship. We plan to follow this up in the near future.

As MatRIC prepares to enter the second funding period the Management Board will discuss ways in which MatRIC may benefit from closer involvement with other SFUs, such as representation on the Management Board or developing a new group including all the STEM SFUs that will coordinate activities, identify synergies, facilitate transfer of knowledge etc.

#### 4. **International advisory board.**

*How has the centre benefited from/been influenced by having critical friends/external evaluations? All the centres have international advisory boards. How has these boards contributed to developments (or not) and how do you see their role in the second centre period and how will you work to get external input and evaluation? Please add reports from advisory board if possible.*

The IAB has made a vital contribution to the development of MatRIC strategy during its first three years as an SFU. The IAB members have all engaged proactively with MatRIC's work. They are very effective in their role as critical friends. The IAB is composed of five members from UK, Germany, Denmark and Norway, it provides strategic advice from an international and disciplinary perspective, contributing:

- Experience of establishing and leading successful centres of excellence in mathematics education.
- Deep first-hand knowledge of university leadership from positions of senior management.
- Experience of leadership of key international bodies, such as Mathematics Working Group of the European Society for Engineering Education.
- Experience of leadership of a key Norwegian network - Norwegian Mathematics Council.
- International recognition for research in university mathematics education.

The advisory tasks of members of this group have evolved to take on diverse roles to capitalize on their knowledge and expertise. One has broadened the scope of advice to include the development and management of UiA's institutional strategy. Another is taking on the role of MatRIC Ambassador, and a third the role of MatRIC research coordinator. Altogether, the members of IAB have facilitated the development of MatRIC's international network and provided extremely valuable advice to ET

(MatRIC's Executive Team) and MB (MatRIC's Management Board) regarding the actions and development of MatRIC. (From Self-evaluation document, p. 8)

IAB engages with MatRIC Director informally through discussion and e-mail, and formally at an annual meeting with the Management Board. Notes from these discussions are made by MatRIC Director (these notes and other related documents are sent with this requested additional information). These discussions are both critical, with a penetrating analysis of MatRIC's actions and effectiveness, and very supportive and encouraging – offering clear suggestions for further action. As examples of the IAB's influence:

- At the outset MatRIC's mission was about teaching mathematics as a service subject. The IAB challenged the focus and encouraged the Centre to be more inclusive of mathematics teaching and learning in pure and applied mathematics programmes.
- The original conception of MatRIC as a Centre for Excellence in *Education* (rather than *research*) encouraged MatRIC leaders to underplay the significance of research in MatRIC's actions. IAB has strongly challenged this perception so that attempts to demonstrate a coherence in MatRIC's research agenda, and now the appointment of a research coordinator.
- The IAB strongly recommended a through discussion of MatRIC's strategy within the Management Board. This took place during the first half of 2016, with the production of a strategy document.
- The IAB has recommended themes for successive annual conferences – 2016 that focused on challenges faced by higher education mathematics teachers, and 2017 that will focus on excellence in mathematics teaching in HE.
- IAB recommended with concrete suggestions approaches for greater involvement of students as partners in MatRIC's actions.
- MatRIC Director articulated concerns about attracting new participants into MatRIC events, and the IAB suggested the introduction of MatRIC Ambassadors.
- The IAB have also undertaken post-hoc appraisals of MatRIC's annual reports. The resulting critique has provided excellent learning opportunities for MatRIC's leaders.
- The IAB has provided extremely valuable contacts and experience that have enabled the development of MatRIC's Drop-in mathematics support centres and the induction teaching course. The IAB has introduced MatRIC to the **sigma** network and groups in the Republic in Ireland that have developed mathematics support.
- Through the IAB MatRIC has been introduced to the European Society for Engineering Education, Mathematics Working Group (SEFI-MWG), and the German centre for excellence KHDM.
- A member of IAB provided the scientific leadership in a project proposal within the EU Horizon 2020 Erasmus+ programme; the outcome from this proposal has not been announced.
- The leader of the Mathematical Modelling network was able to spend time in Denmark with an IAB member to have discussions about different conceptions of mathematical modelling and the relationship between mathematicians' and mathematics educators' views of mathematical modelling in education.
- Members of the IAB have contributed by presentations at many MatRIC events – conferences, workshops and colloquiums

The annual joint meeting of the IAB and MB is timed to follow immediately after MatRIC's annual conference. As a result, members of the IAB have been full participants in the annual conference – in 2015 the five keynote addresses at the conference were given by members of the IAB. The MatRIC

Executive Team finds these annual meetings of the IAB to be the most challenging and stimulating events in the annual calendar. The IAB members are certainly not ‘yes men and women’ – they provide challenge and constructive criticism. Their discipline-based perspective and their cumulative experience have been invaluable to MatRIC. As demonstrated by the list above, they have made a significant contribution to the development of MatRIC’s strategic direction.

In addition to the formal annual meeting, there is regular correspondence by email with IAB members who provide comments on the annual report and advice on emerging strategic issues. The two UK-based members of the IAB have participated in the regular visits made by MatRIC staff to the Mathematics Education Centre at Loughborough University. The IAB provides links with key centres in the UK and Germany, also into the major European networks. Further through the IAB MatRIC is developing productive partnerships with key centres in the USA.

The IAB have contributed to the process of producing the self-evaluation document and this additional information. As an indication of their support, commitment and desire to see MatRIC’s work continued into a second phase: a presumed final version of this ‘additional information’ paper was circulated to the IAB on Saturday May 13 at about 17:00 without any expectation of response in such a time-frame. However, by Monday 08:30, I had received substantial responses ... that led me to request an extension to the deadline for submitting this. The commitment shown by the IAB is evidence of the fact that they value what MatRIC is achieving.

The participation of the IAB in MatRIC’s on-going work is planned to continue. Crucially IAB will join MatRIC’s Management Board and Executive Team in planning an effective response to the evaluation panel’s recommendations for MatRIC’s second period. We are already considering possible expansion to the IAB, bringing in someone with firsthand experience of mathematics in user programmes in economics and business.

MatRIC is accumulating an enormous amount of knowledge and experience about mathematics teaching development at higher education level. The product of sustained engagement over a ten-year period will be considerable, and must be available both to the community of HE mathematics teachers and providers, policy makers and those charged with quality assurance. The report of MatRIC’s activity and impact must represent both internal and independent external perspectives. Early in the second funding period we will appoint an external evaluator (with NOKUT’s advice). The person appointed will be expected to produce a report in MatRIC’s tenth year. The early appointment of the person will open the opportunity for her/him to propose data that might be generated to support the evaluation. Internal perspectives will be facilitated through the on-going critical engagement of IAB and MatRIC’s Management Board.