# SFU MAGAZINE

# BRINGING MATHEMATICS TO LIFE

New simulation tool from **MatRIC** 

# ProTed + Stanford

DEVELOPING A DIGITAL LEARNING PLATFORM

ON A RESEARCH CRUISE

bioCEED students in practical training

CLOSE TO THE AUDIENCE CEMPE STUDENTS PLAYING HOME CONCERT





Centres of Excellence in Education

## THE SFU MAGAZINE SPRING/SUMMER 2015

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Terje Mørland **Director General**, NOKUT

# A few words from the Director General

Dear reader

At NOKUT, we are passionate about promoting the importance of educational activities at Norwegian universities and university colleges. The SFU arrangement is an essential addition to our commitment, because it helps to highlight some outstanding examples of education and teaching. The arrangement contributes to motivating and stimulating different academic communities to engage in innovative thinking in relation to methods for teaching, education and R&D-based education.

In this context, the centres that have been awarded status as SFU play a very important role, as they are the ones that provide the content of the SFU arrangement. By disseminating knowledge about activities and methods that promote learning, these centres should be beacons lighting the way for others who want to achieve excellence. They stand to inspire, but perhaps even more imporant, they involve others in their work. And it its through such collaboration that ideas knowledge and experience are transferred, contributing to raising the quality of education in other academic communities.

The SFU magazine is a collaboration between NOKUT and all four SFU centres – CEMPE, MatRIC, ProTed and bioCEED – whose objective is just that, to spread the good ideas. The articles in this issue show some of the different projects and activities that the centres are planning or that are already under way.

- > ProTed is participating in an international collaboration project on a digital learning platform under the auspices of Stanford University. ViCoTed is going to make it easier for teacher educators and student teachers all over the world to develop and exchange examples of good practices in teacher education and schools.
- > MatRIC continues to establish itself as a national centre of expertise in mathematics. They are now intensifying their efforts to gather and disseminate knowledge about the use of digital assessment. In June, they will host a colloquium on this topic with participants from both Norway and abroad.
- ▶ In the course of 2015, bioCEED plans to map all the biology study programmes available in Norway. The objective is to look more closely at the variations between the educational institutions and how they provide different perspectives on biology education and learning.
- > CEMPE is being noticed abroad, and this winter it was invited to attend the Third Reflective Conservatoire conference in London. The prestigious Guildhall School of Music and Drama hosted the conference.

You can read about all this, and more, on the following pages. I hope you will enjoy the SFU magazine and that you will help us spread the word about the new issue!

TajiMolar









# Ingrid Maria Hanken Centre director, CEMPE

#### HOW WOULD YOU DEFINE **EXCELLENCE IN HIGHER EDUCATION?**

'It means that there is quality throughout. Excellence in higher education is conditional on having structures in place that ensure that standards are upheld and that can stimulate development. Secondly, it requires that the institution has a culture for prioritising quality in education and seeing it as a work in progress.'

#### WHAT WILL BE THE HIGHLIGHT FOR **CEMPE THIS SPRING?**

'CEMPE was invited as a partner to the Reflective Conservatoire conference in

London in February, and gave several presentations. This is the most important showcase in the field of music education, and it was very inspiring to see that the participants showed such great interest in CEMPE! THE CENTRE HAS NOW BEEN IN

# **OPERATION FOR JUST OVER A YEAR.** WHAT ARE YOU MOST PROUD OF?

'I'm most proud of the centre having managed to kindle an interest in CEMPE's activities both within our own institution and internationally.

I'm most proud of the centre having managed to kindle an interest in CEMPE's activities both within our own institution and internationally.

# Centre of Excellence in Music Performance Education

# **Centre of Excellence in Music** Performance Education (CEMPE)

- SFU status 2014-2018
- · Affiliated to the Norwegian Academy of Music (NAM)
- Ingrid Maria Hanken is the director of the centre

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CEMPE's goal is to develop knowledge and experience that can support performance students in their search for artistic excellence. CEMPE also aims to qualify the students for a career in a rapidly changing globalised music community.



> www.cempe.no

CEMPE Centre of Excellence in **Music Performance Education** 





Students from the Norwegian Academy of Music playing together with musicians from Hammerfest.

# The 'Kulturtrøkk' festival in Hammerfest challenges the master's students at NAM

**T** n 2013, the Norwegian Academy of Music (NAM), Hammerfest municipality and Statoil started a L collaboration project resulting in the music festival 'Kulturtrøkk' ('Kulturtrøkk') in Hammerfest. In the course of eight days, more than 300 children, 100 adults and 20 music performance master's students engaged in playing music in different contexts and at different venues. 'Kulturtrøkk' is related to two of CEMPE's development projects – 'Professional Music Practicum' and 'Independent Music Careers'.

For the master's students from the NAM, 'Kulturtrøkk' is an opportunity to experiment with new ways of presenting their music in different venues for different kinds of audiences. As a practice arena, 'Kulturtrøkk' encourages innovative ideas and actions, which is important when educating musicians for a rapidly changing society where the 'portfolio musician' can become a norm.

#### COLLABORATION. RELATIONSHIPS AND DIALOGUE

Some of the key elements of the project are collaboration and creating relationships through dialogue and experimenting with performing in different contexts. During 'Kulturtrøkk', the students perform music in classrooms, in people's homes, in big concert halls, in shopping centres and in offices - all in collaboration with other students, children, local musicians or music teachers. The project also has a continuous focus on conversation and reflection between students, and between students and teachers.

A research study led by senior lecturer Brit Ågot Brøske

Danielsen investigates the students' experience of participating in 'Kulturtrøkk'. Among other things, the results of the research study show that the students think that collaborating with others is important. It seems that collaboration with fellow students is something that the students generally miss. This collaboration contributes to strengthening the students' sense of empowerment and their artistic perspective.

'Kulturtrøkk' gave me an opportunity to get to know and be creative with my fellow students across instrumental groups and genres. A conversation with the other students after the school concert was very valuable to me. Talking with the others and realising that you don't have to be outgoing and full of initiative in all situations in order to be a good person, was a great relief,' says one of the students participating in 'Kulturtrøkk'.

Collaboration with different groups of people such as amateur and professional musicians, children and people with special needs, as well as working across disciplines, is also in itself considered to be an important and valuable experience for the participating students. This experience challenges students' preconceptions and strengthens their understanding of the value of music.

#### CLOSENESS TO THE AUDIENCE

The research study also shows that dialogue with audiences is very important to the students.

'The concert in someone's home was a significant moment. It contributed to reducing the distance between the audience and the performer, which I think is very important. It was very interesting to listen to their thoughts on artistic work after the concert. It made a great impression on me to see how much they appreciated our visit,' one student says.



Playing together requires concentration and attention

# KUITURTRØKK

'Kulturtrøkk' was initiated and is conducted by Kjell Tore at the Norwegian Academu of Music, in close collaboration with Frode Sollie. headmaster of Hammerfest cultural school.

The project was established as a three-year project from 2013 to 2015, and is now planned to continue for another three years.

More than 300 children were involved in music performances during 'Kulturtrøkk'.

Getting to know the audience contributes to reducing the distance between performers and the audience, which further fosters a twoway mutual interest in each other. Surprise is a key element in the students' reflections on audiences; surprises about audiences' reflections and views, and even that people actually like classical music. Through such experiences, students increase their awareness about audiences and gain experience of presenting and performing music for different target groups.

#### A RICH CULTURAL SCENE IN HAMMERFEST

Hammerfest municipality is experiencing strong growth and development, mainly because of the establishment of the Snøhvit

field and the development of Melkøya. With help from Statoil, Hammerfest has worked to make the town an attractive place to live, and strengthening the cultural scene is an important means towards this end. People in Hammerfest talk about the valuable meetings and experiences they have had during the project, both as hosts for musicians, in artistic collaboration, and through aesthetic experiences.

Written by Brit Ågot Brøske Danielsen, associate professor at the Norwegian Academy of Music, and Kjell Tore Innervik, associate professor at the Norwegian Academy of Music. 4

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The concert

in someone's

home was a

significant

moment.

# #peer learning

# **EDUCATING INDEPENDENT MUSICIANS**

Peer learning and reflective feedback are two key aspects of a new CEMPE project.

wnership of one's own artistic development and identity is important if music students are to become independent and creative musicians. In one of the subprojects in CEMPE's development project 'Teaching Principal Instrument in Groups,' ten song students from the Bachelor of Music in Music Education programme, together with their teacher Kristin Kjølberg, explore how peer learning and reflective feedback can contribute to such ownership.

The sub-project is also linked to the Norwegian Academy of Music's (NHM) strategy 'I samspill. Strategi 2025' ('Playing together. Strategy 2025'): 'The study programmes shall contribute to developing students' independence and artistic identity. The students shall be in focus and set themselves goals for their development. We will stimulate the development of artistic identity and critical reflection.'

## 'CRITICAL RESPONSE PROCESS'

'The group meets every three weeks. The group's work method is peer learning, with Liz Lerman's "Critical Response Process" (see fact box) as the specific method,' says sub-project manager Kristin Kjølberg.

Music students develop artistic expertise and identity together with their instrumental teachers. Students are in a constant learning process where receiving feedback is an essential component. Feedback can be provided by fellow students, but is mostly given by the teachers in the form of advice, suggestions or possible solutions. Clear instructions, procedures and criticism are also forms of feedback.

How feedback is provided has a big effect on the students' motivation to go back to their own practice room and develop their artistic expertise. The

feedback is meant to be constructive and uplifting and can often create motivation and a zeal for work. But it can also have the opposite effect. Most musicians have experienced that feedback can also make you feel overwhelmed, confused, discouraged or deflated, says Kjølberg.





Through peer learning, students are trained to be independent musicians

#### DISCOVERING THEIR OWN KNOWLEDGE AND CREATIVITY

It is important that music students develop a clear artistic identity if society is to have creative and innovative musicians who do not merely copy others or look to the past. By working as peers, the students develop greater confidence and the courage to reflect on and create their own roles as musicians. One student in the project says:

'I don't think there have been any other situations during my studies where I have had such great opportunities to discover my own tacit musical knowledge. Here, I can find out and show how much competence I actually have.'

# 'The love of the art is so great that we can put up with any kind of critique, right or wrong, in order to develop as artists.

-LIZ LERMAN, AMERICAN DANCER AND CHOREOGRAPHER AND CREATOR OF THE CRITICAL PESPONSE PROCESS

Many of the students believe that this structured way of providing feedback helps them to experience mastery and makes them feel more creative when practising. In addition, they take more responsibility for developing their artistic material and skills. They say that they have begun to be braver, ask more questions and take greater control of their own process on the path to becoming a professional music performer.

#### **INCREASED FEELING OF MASTERY**

At the start of the project, many of the students said that they wanted more teacher-based instrumental teaching and, in many contexts, clear instructions from their teachers. They have now developed more courage when it comes to contributing to their own development and feel more able to engage with the teachers in dialogue about possible directions and challenges and the solutions to them. One student from the project describes it in the following manner:

'It is very difficult to take control of my own development, because the teachers have always given me feedback about what is suitable for me. I've only really followed the teachers' instructions. I haven't reflected much on what I want to do. This year, I've developed the ability to listen to my own ideas . What I now feel deep down that I want to sing is not quite in line with what my teacher thinks I should do.'

#### THE FURTHER DEVELOPMENT OF THE PROJECT

'With the support of Lerman, the group is working on further developing the Critical Response Process so that it can be used in various teaching contexts at NAM. The project will continue next year. The students will be divided into two groups that will work alone, without a teacher present. I will follow up the groups, but then in the role as researcher, says Kjølberg.

In addition, she will gather a group of teachers from NAM who will use peer learning to train their Critical Response Process skills based on the model used in the student project.

Kristin Kjølberg is an associate professor and head of the Music Education and Music Therapy Department at the Norwegian Academy of Music.

# THE 'CRITICAL

**RESPONSE PROCESS'** erman and Borstel 2003 processes. The method is ► The artist Responders ▶ The facilitate contribute to the artist who

IN STEP 1. the responders provide feedback on what was meaningful in the work they have just witnessed. 'Meaninaful' can mean anything from inspirational, evocative surprising interesting, different, thought-provoking etc.

IN STEP 2. the artist asks auestions about the work The responders should give honest, but relevant, answers. In other words, the artist controls which issues should be addressed in this step.

IN STEP 3, the responders ask the artist open, neutral questions. These questions should stimulate reflection and encourage the artist to find solutions.

IN STEP 4, the responders can provide input and state their opinions. However, they have to clearly articulate the topic of the suggestion and ask the artist's permission to make it. For example: 'I have a suggestion on how you can enunciate the text more clearly. Do you want to hear it?' The artist can say yes or no to this

# MatRIC





# Simon Goodchild

Centre director, MatRIC

#### WHAT WILL BE THE HIGHLIGHT FOR **MATRIC THIS SPRING?**

'This spring, we will be planning a number of interesting events for the rest of the year. For me, one of the highlights is seeing how the team works together to realize MatRIC's ambitious programme. The team, Project Manager and group coordinators have established many national and international contacts. We are now closer to our vision of being a learning community across

#### THE CENTRE HAS NOW BEEN IN **OPERATION FOR JUST OVER A YEAR.** WHAT ARE YOU MOST PROUD OF?

institutions in Norway and abroad.'

'First of all, I'm proud of the MatRIC team, but I'm also very proud of the university management, which has enabled us to take on a national role, even if it does sometimes mean

#### teaching and learning founded on solid research evidence of effective practice. Also a commitment to developing and implementing resources that are in tune with students' learning styles. Excellence in mathematics teaching and learning is dependent upon may

**EDUCATION?** 

support.'

# We are now closer to our vision of being a learning community across institutions in Norway and abroad.

performance.

# CEMPE AT AN INTERNATIONAL MUSIC CONFERENCE

In February, eight staff members from the Norwegian Academy of Music gave presentations on CEMPE at the Third Reflective Conservatoire conference at the Guildhall School of Music and Drama in London.

'This conference is one of the most important meeting places in higher music education. It was therefore very pleasing that CEMPE was invited to the conference as a partner,

thereby attracting a lot of attention. The response to our presentations was overwhelming and there was great interest in our work,' says centre director Ingrid Maria Hanken

CEMPE presented its experience of a project in Hammerfest (see other article) and had chief responsibility for two colloquiums: one about teaching practicing and one about peer learning in music academies

# Centre for Research. Innovation and Coordination of Mathematics Teaching

that the University of Agder itself plays a less visible role. Among other things, we have been able to award small amounts of research funding to colleagues at other institutions. It is great that the leaders give us so much

#### HOW WOULD YOU DEFINE **EXCELLENCE IN HIGHER**

'It means taking a versatile approach to factors: students' interest and motivation, their active involvement in learning as well as their

Centre for Research, Innovation and **Coordination of Mathematics Teaching** (MatRIC)

- SFU status 2014-2018
- Affiliated to the University of Agder
- Simon Goodchild is the director of the centre

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MatRIC's vision is to be a national resource centre that encourages and supports excellence in teaching and learning mathematics in natural sciences, engineering, economics teacher education and other higher education programmes with significant mathematical content.



> www.matric.no



MatRIC Centre for Research, Innovation and Coordination of Mathematics Teaching



Chris Sangwin

# International leaders to take part in a colloquium on digital assessment

MatRIC is working to give Norwegian mathematics teachers at universities and university colleges an opportunity to learn from excellent teaching practices at home and abroad. One of the people who has accepted MatRIC's invitation to take part in a national colloquium on digital assessment is Chris Sangwin, the author of one of the most important books on this topic.

hris Sangwin of Loughborough University in England focuses on the didactic aspect of digital forms of assessment.

'I've always been fascinated by technology and mathematics. Since assessment is considered such a vital part of students' learning processes, I decided to research technology that supports mathematics learning and assessment online,' he says. MatRIC director Simon Goodchild looks forward to Chris Sangwin's lecture.

"Chris Sangwin is the author of the most important text about digital assessment in mathematics that has been published "Computer Aided Assessment in Mathematics", and we are very pleased that he will be coming to the MatRIC colloquium in June,' says the centre director. In addition to Chris Sangwin, other international experts will be coming to the colloquium, such as Bill Foster of Newcastle University and André Heck of the University of Amsterdam. There will be ample opportunity for discussion, so that the colloquium will function as a workshop, which will be very useful to teachers working in this area. The desired result is to improve the quality of digital assessment.

#### WANTS INCREASED COLLABORATION ON DIGITAL ASSESSMENT

Many mathematics teachers in Norway now use various forms of digital assessment. Unfortunately, this is a 'fragmented practice', both within each institution and at the national level. MatRIC wants to contribute to increased collaboration, which would benefit the individual teacher, institutions and, not least, the students. Collaboration fosters reflection on how digital assessment can best be utilised and the opportunities available for testing it. 'One of MatRIC's goals is to establish a competence pool in this area, so that Norwegian academics with expertise and experience can support others in developing and staring to use this type of technology to support teaching and learning,' says project manager Line Eielsen Malde.

To achieve this, MatRIC is currently planning various events, including the colloquium on digital assessment, where national and international experts will contribute to knowledge dissemination and sharing. Norwegian students will notice this in the form of increasingly better and more efficient teaching.

'We are creating meeting places where teachers from different fields and institutions can learn together and share their experience of all aspects of teaching mathematics. Several heads are better than one, and the goal is that this will result in world-class mathematics teaching for Norwegian students,' says Malde. MATRIC AS A NATIONAL RESOURCE

As a national resource centre, MatRIC is creating meeting places across Norway to gather competence and contribute to knowledge dissemination. They are also more frequently invited to contribute to conferences and relevant committees. See the article on digital assessment below.

'We are very pleased that the Norwegian Association of Higher Education Institutions (UHR) and others recognise and use us as a national resource. This helps us to reach the goal we have set ourselves – namely to be a national resource in mathematics teaching at university and university college level,' says MatRIC project manager Line Eielsen Malde.

MatRIC has only been in operation for a short time, but has already made a name for itself in Norway.

## ←

# DIGITAL ASSESSMENT

Digital assessment in mathematics means using ICT tools to ask students questions, evaluate their answers and provide useful feedback, especially when the students' answers are incorrect. There are many challenges in ensuring efficient use of digital tools:

- Writing complicated mathematical
   expressions and specialised symbols
   qu
   pre-
- Distinguishing between correct answers when there are several ways of writing the same things (e.g. 'a half', ½, 0.5 and 50%)
- The computer must be able to identify the source of the error in multi-step solutions

 The teacher formulating the questions needs expertise in preparing good assignments in the ICT format

• The students need skills to analyse their own mathematical texts



The photo is from a video workshop in Bergen in autumn 2014. MatRIC was the main organiser together with Bergen University College.

# DIGITAL ONLINE RESOURCE MEANT TO RESULT IN FEWER FAILS

The percentage of students failing mathematics programmes in higher education is high. MatRIC has been asked to lead a project to develop a digital online resource that will help to ease the transition from mathematics teaching in upper secondary school to mathematics teaching at university and university college level.

The Norwegian Association of Higher Education Institutions (UHR) and MatRIC will each be investing NOK 0.5 million, and Professor Tom Lindstrøm of the University of Oslo has been asked to take professional responsibility for the group appointed to develop the digital online resource. The goal is for one part to be ready for the start of term this autumn.

'The online resource will contain videos. These videos will take a look at the mathematics taught in upper secondary school from a university and university college perspective. They will particularly emphasise important topics in the introductory mathematics courses in higher education,' says project manager Tom Lindstrøm.

MatRIC was asked to assume this responsibility by the MNT-SAK group, a collaboration between UHR's strategic academic bodies, the National Faculty Meeting for the Sciences and the National Council for Technological Education. The background for the project is a national mathematics survey which elucidated various aspects of teaching from the perspective of both the educational institutions and the students, and a desire to strengthen science didactics in the MNT subjects (mathematics, natural sciences and technology).

'The mathematics survey has provided extensive material containing many interesting findings. We are now working to achieve greater coherence between the teaching and learning methods employed in mathematics during the period of transition from upper secondary school to university and university college. The goal is that this resource will build a bridge between the teaching the students are familiar with from upper secondary school and what they encounter in higher education,' Mette Mo Jakobsen of UHR explains.



# MATHEMATICS COURSE FOR NEW MATHEMATICS TEACHERS

This autumn, MatRIC will start up a course for new mathematic teachers at university and university college level. The courses will be organised in collaboration with the Norwegian University of Science and Technology (NTNU) and will, among other things, have didactic approaches and innovative teaching methods on the agenda.

One important goal is for the teachers to meet a few times so that they can establish contact with other teachers of mathematics.

'Such networks and forums for discussing teaching are very important to the quality of teaching,'says the centre director, Simon Goodchild.





UHR wishes to develop a new digital online resource, and MatRIC is the project manager. The photo shows centre director Simon Goodchild at a video workshop in Bergen in autumn 2014.



# **VISUALISATION BRINGS MATHEMATICS TO LIFE** FOR STUDENTS

'Mathematics is a lively and accessible subject. The students just have to learn to see that,' says MatRIC coordinator Per Henrik Hogstad. He has developed SimReal+, an interactive tool that makes learning easier for many students who struggle with the fundamentally abstract nature of mathematics.

> atRIC is working to bring mathematics to life for the tudents to increase their understanding of the discipline. Per Henrik Hogstad coordinates the MatRIC group working on simulations. Through SimReal+, students can see simulations and programme simulations themselves. That makes mathematics more accessible.

SimReal+ is one of the tools that can be used to achieve this, but Per Henrik Hogstad is also in touch with colleagues from Gjøvik University College, the University of Oslo and the Norwegian University of Science and Technology (NTNU), among others, who use other tools to reach the same goal.

#### WORKSHOP IN MAY

'MatRIC wants to look more closely at how simulations and programming contribute to students' learning and understanding in mathematics,' says MatRIC director Simon Goodchild

The centre will therefore organise a simulation and modelling workshop in May.

'The workshop will not only focus on SimReal+, but also on presentations from among others UiO and NTNU, which use other digital tools,' says centre director Simon Goodchild. As a national centre of expertise in mathematics,

MatRIC wishes to stimulate cooperation across institutional boundaries, including in simulation.

'Preparing and developing simulations is time-consuming work. The goal of this event is therefore to discuss and arrive at joint solutions for how to include programming and simulations in teaching, and to see what the resulting learning outcome is for the students,' explains Hogstad.

# FOUR STUDENTS ON SimReal



'It is a great help to have things visualised. It helps me to understand the challenges. Being able to play with the simulations helps to illustrate things that books and lecturers may not be able to. SimReal brings out a new aspect of mathematics and can make boring maths assignments more interesting, and you often remember more of the material you've been working on.'



'I feel that SimReal makes me understand mathematics better. There's no point solving problems on paper if you don't understand the underlying principles, and that makes it difficult to tackle new problems. It's also easier to learn mathematics if you can have a visual understanding of it.'



'I think using simulations in subjects such as mathematics and physics is an excellent tool. We gain a better understanding of all the new definitions, formulas and expressions we learn. I learn and remember more by doing things myself and really seeing how things work. SimReal increases motivation - mathematics often has a tendency to become vague and very aeneral.



'SimReal is a useful tool for finding out what's happening. It's a peg to hang your knowledge on, and it's easier to use mathematics as the tool that it is. SimReal is a great tool that will help many students and I'm very happy that this aid is available to us."

# ProTed





Andreas Lund Centre director. ProTed

#### WHAT WAS THE HIGHLIGHT FOR **PROTED IN AUTUMN 2014?**

'Definitely the university school conference. It demonstrated both innovative thinking and implementation capacity in the relationship between schools and universities.'

#### WHAT OPPORTUNITIES HAS PROTED GAINED THROUGH ITS **CENTRE OF EXCELLENCE IN HIGHER EDUCATION STATUS?**

'ProTed is a vital development unit that has accelerated developments in teacher

education, and we have also established an extensive network with many partners both in Norway and abroad.

#### WHAT IS THE BEST THING ABOUT THE CENTRE TEAM?

sense of humour and self-irony!'

ProTed is a vital development unit that has accelerated developments in teacher education.

# Centre for Professional Learning in Teacher Education

'UiO and UiT have different histories, cultures and programme portfolios in teacher education. We have been able to utilise the complementarity between the two institutions, not least thanks to a heightened

# Centre for Professional Learning in **Teacher Education (ProTed)**

- SFU status 2012-2016
- · Affiliated to the University of Oslo (UiO) and the University of Tromsø (UiT)
- Andreas Lund (UiO) and Rachel Jakhelln (UiT) are the directors of the centre



ProTed's vision is to educate professional. knowledgeable, secure and internationally oriented teachers for a multicultural society.



> www.uv.uio.no/proted/



# #digital learning tools



Dr Renate Fruchter of the Stanford School of Engineering is giving a lecture on how virtual worlds are used in several professions



The students' workstations at the School of Engineering are often equipped for video communication.

# **New platform for international** collaboration on teacher education

he teacher education programmes at Stanford University and the Department of Teacher Education and School Research at the University of Oslo (UiO) have enjoyed good cooperation for many years, which has, among other things, led to UiO making some major changes to its own teacher education programmes. This autumn, Stanford issued an invitation to take part in a collaboration project on the development and testing of a virtual world for teacher education: ViCoTed - Virtual Collaboration for Teacher Education. This then became a ProTed project, thus including both UiO and the University of Tromsø (UiT).

In February this year, a large delegation from ProTed travelled to Stanford University to start up an international collaboration project on the development of the ViCoTed platform, where teacher educators and student teachers all over the world can develop and exchange examples of good practices in teacher education and schools. So far, the project includes participants from the USA, Chile, Brazil, South Africa, Sweden and Norway, and will initially be a two-year pilot project.

ViCoTed allows participants to talk, act and show video sequences or presentations via avatars

'Thematically speaking, we will focus on the same development areas as ProTed. But the possibilities for staging learning and teaching situations via avatars that would be both challenging and even unethical in "real" situations is perhaps even more exciting,' says centre director Andreas Lund. This way, ViCoTed can become a learning arena where students can both act and discuss courses of events.

Adding the fact that this takes place in an international environment, students can also gain experience of multicultural contexts and perhaps also different conventions and sets of values.

In the long term, ViCoTed can contribute to an international and joint knowledge base for teacher educators. It can also help to bring the classroom into campus teaching in new ways. The pilot testing will be accompanied by formative research by Stanford in which interactions will be carefully analysed.

'The collaboration with Stanford and the pilot testing of ViCoTed will in earnest take teacher education into the international online community of the 21st century,' says Andreas Lund



roTed has, in cooperation with the Knowledge Centre for Education, issued invitations to the Knowledge Parliament ('Kunnskapsparlamentet'), a new arena for synthesising knowledge about teacher education where all players in the teacher education field are invited to participate.

Today, all the teacher education institutions are working on developing research-based, integrated study programme designs for profession-oriented teacher education, and there are many examples of good practices. The objective of the Knowledge Parliament is to highlight the knowledge that already exists about integrated study programme designs and then disseminate this knowledge to inspire further development of the teacher education programmes - including models for five-year integrated master's degrees. Through good questions, discussion and a transparent process, the Knowledge Parliament will be used to establish agreement on important principles for good study programmes and clear the way for a more systematic exchange of experience and documentation of good study programmes and recognised good practices.

# **ProTed to establish a** knowledge parliament

The eight universities that offer teacher education programmes have been invited to describe what the institutions do to promote integrated teacher education. The Knowledge Centre and ProTed will synthesise this information before issuing invitations in September to a dialogue between all institutions that offer teacher education programmes, schools and players in the policy field.

'We hope that the Knowledge Parliament will result in sounder knowledge about integrated study programme design for the mutual benefit of everyone working with and for teacher education,' says Sølvi Lillejord, director of the Knowledge Centre for Education.

ProTed and the Knowledge Centre for Education are both responsible for promoting knowledge development and exchange at the national level. In the past, strategic collaboration between the Knowledge Centre and ProTed has resulted in the research survey 'Partnerskap i lærerutdanningen' ('Partnerships in teacher education') by the Knowledge Centre for Education and the conference 'Partnerskap for fremtiden' ('Partnerships for the future'). The ambition of the collaboration is to combine synthesised knowledge from research with the practice field.

The establishment of the Knowledge Parliament is made more relevant by the fact that it has now been decided that the Norwegian primary and lower secondary teacher education programmes shall be five-year programmes. Pro'Ted's Rachel Jakhelln (University of Tromsø) has been appointed to the new national curriculum committee tasked with providing input to a new structure for the primary and lower secondary teacher education programmes. The committee's remit emphasises that it should examine the University of Tromsø's experience of the teacher education programme 'Pilot in the North' and ProTed's work on five-year integrated models.

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# Learning café for integrating campus teaching and teaching practice experience

The purpose of the learning café concept is to create a café setting where students can systematically process and analyse their experience from their teaching practice in schools. The inspiration for the learning café came from the 'world café' concept, an internationally recognised method for promoting dialogue and increasing participation in social discourse (Thunberg, 2013).

The students were divided into groups that moved from table to table in a predefined pattern. Each table represented a new analytical concept. Before lunch, the students carried out a SWOT analysis (strength, weaknesses, opportunities and threats). After lunch, they carried out a GLL analysis ('gjort-lært-lurt' – 'done-learntsmart') (Tiller, 2016). The students printed their analyses on posters and presented them in a plenary session.

When they met in January, the students focused on experience and learning from the last period of teaching practice at UiT, a two-week period where they were responsible for running the school. The students recognise the strengths of such teaching practice: 'We experienced the responsibility inherent in the teacher role, but also the weaknesses: 'The teaching practice period was too short - just when we had got to know the pupils, it was over The institution receives specific feedback part seems to be more constructive for the students. It allows them to look at learning and what lessons they should take with them in future. In the analysis, many students mentioned that they got to practise cooperation and learnt the significance of a culture of sharing.

# Prize boost for the mathematics community in the teacher education programme at UiT

The mathematics didactics community at the Faculty of Humanities, Social Sciences and Education at the University of Tromsø (UiT), was awarded the Teaching Award for 2014 for having carried out what Dean Sonni Olsen has described as a revolution in mathematics teaching for student teachers. The community is engaged in research-based development of practical mathematics teaching.

The ProTed project 'Bruk av dramapedagogiske metoder i matematikkundervisningen' ('Use of drama pedagogy methods in mathematics teaching') is part of this important work. A film about the master's project of Stian Gamst Johnsen (UiT), who participates in the project: <u>https://www.youtube.com/</u> <u>watch?v=nkYotEKIfuI.</u>



'Research shows that mathematics teaching often takes the form of fixed conversation patterns where pupils answer questions while the teachers initiate and assess all individual answers. The project is concerned with finding out how to use data methods to change this conversation pattern, for example by giving both teachers and pupils specific roles and carrying out a discussion within those parameters. By practising this way, we can shake up this locked conversation pattern and establish a more active pupil role,' says Ove Drageset, associate professor and head of studies at the Department of Education (UiT).



# Seeds take root to promote R&D collaboration and innovation

For several years, ProTed has supported projects of relevance to teacher education through seed capital, among other things in cooperation with the interdepartmental initiative KiS (Knowledge in Schools) at the University of Oslo (UiO).

One of the projects that received seed capital is the ReleKvant project, which was recently awarded funding from the Olav Thon Foundation to continue its work. Read more about this prize and the project at <u>http://www.mn.uio.no/fysikk/om/aktuelt/aktuelle-</u> <u>saker/2015/thon-relekvant.html.</u>

This spring, a call for applications was announced for seed capital funds to promote R&D collaboration between the university schools and the teacher education programme at UiO. Read more here: <u>http:/// www.uv.uio.no/ils/om/aktuelt/aktuelle-saker/2015/</u> sakornmidler.html

# EUROPEAN SCHOOLNET MAKING FILM ABOUT PROTED PROJECT

ProTed's project 'Videobasert vurdering av studenters praksisperioder i lærerutdanningen' ('Video-based assessment of students' teaching practice periods in teacher education') intends to test the use of video and screencast technology to give students undergoing teaching practice feedback both during the period of teaching practice (formative assessments) and in final assessments (summative assessments).

European Schoolnet and the Norwegian Centre for ICT in Education is now making a film about ProTed's project to inspire other educational communities that wish to test innovative methods for student and pupil assessment. European Schoolnet is a network aiming to promote innovation in teaching and learning comprising 31 European Ministries of Education.

# bioCEED





## Vigdis Vandvik Centre director, bioCEED

## WHAT WAS THE HIGHLIGHT FOR BIOCEED IN AUTUMN 2014?

"The two-day teachers' retreat at Lygra outside Bergen. Building a joint teacher culture for the development of our teaching is one of bioCEED's most important goals. We often go on academic conferences and meetings for the research part of our job, but this was the first time the whole teaching staff was gathered for several days to discuss teaching and teaching development.'

# WHAT WILL BE THE HIGHLIGHT FOR BIOCEED THIS SPRING?

'We are looking forward to getting the results of our big national surveys on learning,

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We are looking forward to getting the results of our big national surveys on learning, competence and attitudes to biology and biologists.

# Centre of Excellence in Biology Education

competence and attitudes to biology and biologists. The results will give bioCEED a useful baseline, and the findings will be used actively in our development work.'

#### HOW WOULD YOU DEFINE EXCELLENCE IN HIGHER

**EDUCATION?** 

'Excellence in higher education can mean and involve so many things. The simplest definition is perhaps that you can recognise it by its results. Excellence in higher education leads to change, growth and development that last. In the individual subject and in society.'

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# Centre of Excellence in Biology Education (bioCEED)

- SFU status 2014-2018
- Affiliated to the University of Bergen (UiB), the University Centre in Svalbard (UNIS) and the Institute of Marine Research (HI)
- Vigdis Vandvik (UiB) and Pernille Bronken Eidesen (UNIS) are the centre directors

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bioCEED aims to strengthen biology education to ensure that the biologists of tomorrow are highly qualified and well prepared for a professional career.



> <u>www.bioceed.no</u>



# bioCEED students on research cruise

Students from the University Centre in Svalbard are helping scientists from the Institute of Marine Research to study the biological diversity of the Barents Sea.

s part of a marine ecology course, bioCEED students at the University Centre in Svalbard (UNIS) can participate in a research cruise in the Barents Sea, where they learn both theory and practical skills. As a Centre of Excellence in Higher Education, bioCEED's goal is to create clearer connections between teaching and the students' professional careers.

'We want to ensure that the biologists of the future are highly qualified and well prepared for a professional career. To achieve this, we want to connect theoretical grounding with practical skills as a response to society's need for biological understanding,' says Øystein Varpe, associate professor at UNIS, one of bioCEED's work package managers.

#### LEARNING TO UNDERSTAND RESOURCE MANAGEMENT

'Ecosystem-based Management of Arctic Marine Systems' is a new course at UNIS that has particularly close ties with the Institute of Marine Research, which is a bioCEED partner.

The Institute of Marine Research has chief responsibility for providing advice to the Norwegian authorities on aquaculture, the major oceanic ecosystems and the coastal zone. The Institute of Marine Research endeavours to understand the functioning and variation of the ecosystem of the Barents Sea, with its great fish resources. The students taking the course get to participate in the practical part of this work by joining the Institute of Marine Research on a research cruise in the Barents Sea for a week and a half.

#### SIX HOURS ON, SIX HOURS OFF

On the cruise, the students are included in the ordinary shift rota: six hours on and six hours off. The cruise follows a grid of stations that are visited annually, and the students participate in the collection of samples together with technicians and scientists.

At each station, they measure the physical variables, study the plankton and trawl for fish. Along the route, acoustics are continuously used to study the amounts of fish and, from the bridge, seabirds are counted. Prawns are measured, fish stomachs are gathered and ear stones are kept to establish the fish's age. The work is very varied. The goal is to



Practical training in a nutshell. Lisette van Noord is learning how to adjust the cod end. Asbjørn Aasen in the middle and Alexander Pavlenko to the right.

gain a holistic understanding of the ecosystem and provide advice to the public administration about, e.g. the cod, herring and capelin fisheries.

#### STUDENTS AND SCIENTISTS SIDE BY SIDE

Student Tom Langbehn participated in the 2014 cruise. He says the students felt like team members on board the boat, primarily because they worked shifts together with the scientists.

'We fell into the cruise routine and obtained valuable practical experience and learnt a lot about everything that can happen during a cruise,' says Langbehn. He emphasises the chance to learn and test practical skills as being particularly useful.

'Working this close to skilled scientists and technicians taught us a lot that we would never learn in an auditorium,'says Langbehn.

Maybe the technicians and scientists were also inspired by the students' new thinking on ecosystem-based management?

# UNIS

- The University Centre in Svalbard (UNIS) has a rich course portfolio in Arctic biology
- The centre has courses from bachelor's to PhD level and has Svalbard and the Arctic ecosystems as its field laboratory.
- The teaching takes place in small groups with a maximum of 18 students per course. This allows for close follow-up of the students and for efficient field work.
- The courses AB-335 and AB-835 'Ecosystembased Management of Arctic Marine Systems' are worth 10 credits and run every autumn semester. Knut Sunnanå (the Institute of Marine Research and UNIS) is responsible for the course. Øystein Varpe is the UNIS contact person.

# MAPPING BIOLOGY STUDY PROGRAMMES IN NORWAY

What is good and what could be improved in the education of biologists of the future? bioCeed has initiated a survey of the biology study programmes in Norway.

currently on offer.

o learn more about teaching, learning and competence in the biology study programmes, bioCEED sent out a survey this spring to the majority of biology students in Norway. The objective is to map the variations between the different educational institutions and how they provide different perspectives on biology education and learning.

# We have worked on tunicates and are going to save the world!

The results of the survey will form a baseline for measuring the effect of bioCEED's and other players' future work in relation to biology study programmes throughout Norway.

Surveys were also sent to teachers and administrative staff connected to the biology study programmes, in addition to enterprises that hire the biologists when they complete their education. Together with the feedback from the students, this will provide good pointers on what is working well and what can Through PRIME and the courses for practical training in biology (Yrkespraksis i biologi I and II), bioCEED and the Department of Biology at UiB are at the very forefront of this change. 'Already this semester, ten of our students are out doing practical training in enterprises. Their experience and the feedback from the enterprises involved will be important to bioCEED and PRIME's further work,' says Gaute Velle, project manager of PRIME.



be improved in the biology study programmes

To analyse the results, bioCEED works with the different faculties at the University of Bergen (UiB), and has appointed a group of biologists and educationalists. Torstein Hole is a doctoral research fellow at bioCEED and will use the survey data in his doctoral work.

'We spent a long time developing questions that are as relevant as possible, so we expect to benefit greatly from the results. We have already received a lot of completed surveys, and we expect many more in the next few weeks', says Hole.

# GAINING EARLY PRACTICAL EXPERIENCE THROUGH PRIME

The bioCEED project PRIME is part of the background to the survey. PRIME aims to find relevant practical training places for biology students during their studies. Academic study programmes have not usually offered students practical training, but that is now changing.

Roymond Olsen is a biology student in his

fourth semester at UiB. He has done two days' practical training at Uni Research when he tells us:

'In upper secondary school, work placement meant doing boring tasks that made no difference to the enterprise. In this course, I've been given an opportunity to work as a biologist and use specialist terminology and theory I have learnt over the past four semesters. I really feel that our efforts make a difference.'



Roymond Olsen and Mari V Bjordal are carrying out practical training at Uni Research through the newly established practical training course at the University of Bergen.

The students in practical training are blogging about their experience, and you can read more about Roymond's, Mari's and the other students' experience and reflections here:

> http://www.uib.no/bio/87223/
studentblogger-om-praksis

# The SFU arrangement

# The first year with four centres in full operation

'The year 2015 will be an exciting year in the SFU context,' says Ole-Jacob Skodvin, Director of Analysis and Development at NOKUT. This is the first year where all four centres have been in full operation, and also the first time a mid-term evaluation will be carried out of a Centre of Excellence in Higher Education.

As admintrators of the SFU arangement, NOKUT aim for close follow-ups of the different centres. This autumn, NOKUT will be making site visits to bioCEED, CEMPE and MatRIC, which were awarded centre status in 2013. The idea came from similar arrangements for research, the Centres of Excellence (SFF) and the Centres for Researchbased Innovation (SFI).

'The visits to the institutions will focus on development, not supervision. All three centres will then have been in operation for about a year and a half, and we believe that good dialogue can contribute to the further development of the centres. Another focus area will be how the centres make their work known in order to contribute to the dissemination and development of knowledge in cooperation with other academic communities. We want to motivate the centres to become beacons of excellent quality in higher education,'says Skodvin.

## MID-TERM EVALUATION IS A MILESTONE

The status as a Centre of Excellence in Higher Education is awarded for five years, with the possibility of an extension for another five years. Whether a centre should be granted an extension of a further five years is decided through a midterm evaluation carried out by an expert committee, which is also the case with the SFFs and SFIs. In 2015, the very first mid-term evaluation of a Centre of Excellence in Higher Education will be carried out when the pilot centre ProTed is assessed for extension.

'The first mid-term evaluation marks an important milestone for the SFU arrangement. The evaluation provides important information about the workings of the centre, and gives us general knowledge that can help us to adjust and improve the SFU arrangement,'says Skodvin.

# **NOKUT** ANNOUNCES SCHOLARSHIPS FOR MASTER'S STUDENTS

Naturally, the students are at the heart of the SFU arrangement. In order to ensure that students play an active role in the various SFUs, NOKUT announces eight scholarships for master's students in 2015, two for each centre. The scholarships will be awarded to master's students in study programmes affiliated to SFUs who wish to write their master's theses on topics such as developments and innovation in teaching and learning, R&D-based education, student-centred learning or other topics of relevance to the various centres. The study projects should lend new perspectives to the work of the centres. Each scholarship is for NOK 25,000.

NAME: Torstein Hole AGE:

27

EDUCATION: Master's degree in Education from the University of Bergen I believe that learning through practical experience, whether in the field, a laboratory or a workplace, will give the students invaluable expertise.

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Torstein Hole, doctoral research fellow at bioCEED, is working on implementing and testing practical training in the biology education programmes.

WHAT IS YOUR ROLE IN BIOCEED? 'I am a PhD student at bioCEED and the practical training research project PRIME.'

#### WHY IS IT IMPORTANT TO ALSO INCLUDE A RESEARCH PERSPECTIVE IN THE WORK ON EXCELLENCE IN HIGHER EDUCATION?

'Research is the best tool and language for systematising the education-related knowledge and experience of students and teachers. I believe we should make systematic use of concrete experience and evidence when we develop education programmes.'

#### HOW DID YOU FIND BEING AN 'UNDERCOVER EDUCATIONALIST' IN THE BIOLOGY COMMUNITY?

'It was very exciting! I've managed to absorb some biology as well, which was an added bonus. At the same time, now that "my cover is blown", I notice that many people think that educational science is about being nice and shying away from conflict – I believe it is mostly about daring to take a critical view of your own teaching practice.

# WHAT IS A TYPICAL WORKDAY LIKE FOR YOU?

'I think it's most important to be where the teaching is taking place, which means listening and talking to students and teachers. Statistically, however, on a typical workday you'll find me in front of the computer planning and writing with a coffee cup filled to the brim.'

#### WHAT IS YOUR CONTRIBUTION TO EXCELLENCE IN BIOLOGY TEACHING?

'Together with the rest of the bioCEED team, I work on knowledge-building and testing teaching strategies. My personal area of interest is learning through practical experience. We have started up a practical training course where biology students work for enterprises. I believe that learning through practical experience, whether in the field, a laboratory or a workplace, will give the students invaluable expertise.'

#### HOW WILL YOU MAKE YOUR MARK ON BIOCEED'S WORK?

'Through my work on practical training experience. In general, I'm also very concerned with bioCEED creating engagement among the students. They must be a part of the team and be taken seriously if bioCEED is to become a success.'

## WHAT IS YOUR BEST TEACHING TIP?

'Don't be afraid of trying out something new. New students and new findings in the individual field mean that teaching and teaching methods change all the time. By trying out new methods, you can find the ones that work best for the teachers and students alike.' Ole-Jacob Skodvin Director of Analysis and Development, NOKUT



NOKUT's board decides whether to extend the centre status on the basis of the expert committee's recommendation. The expert committee consists of capable experts appointed by NOKUT with broad competence in learning and teaching, teacher education and evaluation work at both the national and international level. There is also a student on the committee. The committee is chaired by Professor Vicky Gunn of the Glasgow School of Art, where she is the head of learning and teaching.

# SEMINAR ABOUT EXCELLENT QUALITY IN HIGHER EDUCATION

What characterises excellent higher education is the topic of a seminar on 3 and 4 November, organised by NOKUT. NOKUT will invite participants from the university and university college sector to discuss what characterises excellent quality in higher education on the basis of NOKUT's six areas of study-related quality work. They include admission, the students' learning trajectories, learning outcome, education expertise and management, as well as a knowledge base. The SFU arrangement will be a recurring topic over these two days.

'We hope the sector will join us in a discussion of what characterises excellent quality in education and how we can recognise and document excellence. We wish to explore and challenge the concept of "excellent quality in education" and look at how NOKUT and the institutions can work to achieve it. The SFU arrangement plays an important role in this endeavour,' says Skodvin.

# MID-TERM EVALUATION

The committee that will carry out the mid-term evaluation of ProTed will comprise:

- Professor Vicky Gunn, Head of learning and teaching at the Glasgow School of Art.
- Professor Duncan Lawson of the Newman University, who took part in assessing applications for centre status in 2013.
- Professor Elaine Munthe of the University of Stavanger, a national authority on teacher education.
- Professor Jeppe Bundsgaard of Aarhus University, who has specialist expertise in ICT in teacher education and schools.
- Senior Research Associate Don Westerheijden of Twente University, who has broad evaluation expertise.
- Student in Teacher Education Espen Tangnes of the University of Bergen.



# **FIVE VIEWS ON THE SFU** ARRANGEMENT

3 4

- How would you define excellence in higher education?
- 2 What expectations do you have of the centres?
  - What aspect of the SFU arrangement is most valuable to the quality of higher education?
  - In your opinion, what will it take to make higher education more prestigious?
- 5 What will the SFU arrangement look like in ten years?



#### Olgunn Ransedokken PRO-RECTOR FOR EDUCATION AT THE OSLO AND AKERSHUS UNIVERSITY COLLEGE OF APPLIED SCIENCES (HIOA)

It means that I, as pro-rector for education, as well as all other managers at all levels of a university or university college, must keep a clear focus on what excellence in higher education is, and, not least, what priorities and initiatives are required to be able to invest in excellent quality in education.

One of the SFUs' most important roles is to Give education the same status as research. The centres contribute to the exchange of experience and dissemination of good examples, giving the other institutions something to strive towards. This can contribute to an increased culture of sharing and collaboration in the best interest of the students and their learning outcomes and preparation for a professional career.

In ten years, as many institutions will be granted ➡ SFU status as are granted SFF status each year, and being awarded SFU status will be just as prestigious as being awarded SFF status.



#### Anders Kvernmo Langset PRESIDENT OF THE NATIONAL UNION OF STUDENTS

That the students will participate in the SFUs' 💪 management and project groups on a par with the staff. That the SFUs research their own activities and work actively to disseminate experience and results to other academic communities in Norway.

That must be that an SFU status gives the institution more freedom of action to test new methods for learning and teaching.

// NSO believes that the SFUs' funding should be significantly increased, so that it is possible for the institutions awarded such status to have ambitious goals. Furthermore, education and teaching should be worth more in connection with promotions and career development in the academic community.



#### Berit Johanne Kjeldstad PRO-RECTOR AT THE NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY (NTNU)

**TNU's goal is excellence at the international** level. That means that all study programmes should be characterised by quality at a high international level in both the academic and teaching field. Excellent educational institutions attract the best students and staff and offer high quality in all aspects that are important to teaching and the students' learning.

I expect that the centres will contribute to innovative thinking in relation to teaching and assessments methods that becomes noticed and has an impact beyond the educational institution with SEU status

That the arrangement highlights the fact that quality of education is developed though a research-based approach to education. Furthermore, the SFU arrangement means that we now finally have a prestigious national competitive arena for higher education.



## Mari Sundli Tveit RECTOR AT THE NORWEGIAN UNIVERSITY OF LIFE SCIENCES (NMBU)

This spring, NMBU will launch our ambitious initiative for excellence in education and research, precisely because it is fundamentally important to us that this is one joint initiative. Excellence in education is primarily about facilitating good learning, which we have worked hard for many years to achieve.

🅤 The SFU arrangement puts education on the agenda and sends a clear signal that excellence in education must confer prestige on a par with excellence in research.

/ We must have clear ambitions at all levels in the organisation and clear expectations of how we teach in order to promote the students' learning outcomes. Furthermore, education and teaching must confer merit in connection with employment and promotion to a much higher degree than at present.



## Torbjørn Røe Isaksen MINISTER OF EDUCATION AND RESEARCH

🦳 I expect the centres to be world class in their fields, but also that they will inspire dother educational institutions to invest in education and teaching, which they already do. The SFU centres should highlight the fact that education and research are tasks of equal value for universities and university colleges

5 Its most valuable aspect is that it promotes high-quality education and that it also inspires the other academic communities to compete for SFU status. Research has always been competition-based. With the SFUs, we now have a competitive arena for education as well.

C In ten years, the SFU arrangement will be the most important tool for developing excellent education communities in Norway, and it will play a key role in cultivating world-leading communities.

# SFU

The Ministry of Education and Research launched the Centres of Excellence in Education in 2010 as a national prestige arrangement for educational activity in higher education.

The status as a Centre of Excellence in Education will be awarded to academic communities that can already demonstrate excellent quality and innovative practices in their educational provision. A crucial demand is the ability to disseminate knowledge and results that have been achieved. The centres must have specified plans for further development and innovation.

The SFU arrangement, which is managed by NOKUT, is a parallel to Centres of Excellence in Research (SFF) and other top centre arrangements in research.

## THE AIMS OF THE SFU ARRANGEMENT

The SFU arrangement entails a concentrated, focused and long-term effort to stimulate the development of teaching and learning methods in higher education at the BA and MA levels.

The overarching aim of the arrangement is to contribute to the development of excellent quality in higher education and to demonstrate that teaching and research are tasks of equal importance for universities and university colleges. An important aim is to stimulate the development of excellent R&D-based education.

# Centres of excellence in Education

In particular, the SFU arrangement must promote and reward work that is carried out in interaction between students, teachers, support services and the knowledge base of the education.

## THE ORGANISATION AND **DURATION OF THE CENTRES** An SFU is attached to an educational institution or a host institution that remains responsible for its activities. Host institutions may be universities, special field universities or university colleges.

Calls for applications are on principle open to all educational areas, but the Ministry of Education and Research may issue specific priorities for specific application rounds. It is the intention to announce new centres every three years.

The award of status as SFU is given for five years, with the possibility of another five years. Centres will be evaluated after they have been operative for three and a half years. After this evaluation it is decided whether centre status will prolonged beyond five years.

> Read more about the arrangement here nokut.no



