



EEA AND NORWAY GRANTS
2009-2014 (2016):

What has been achieved?



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By travelling less often and reducing the need for physical transport of drawings and components, companies can save both time and money. In addition, the environmental impact is reduced.

PREFACE

This magazine is dedicated to the educational cooperation within the EEA and Norway Grants.

The objective is to provide information about the EEA and Norway Grants special features and to offer some glimpses of good cooperation projects in education.

In the current funding period, 2009–2014 (2016), Iceland, Liechtenstein and Norway have allocated a total of €1.8 billion to the EEA and Norway Grants. Through the Grants, Iceland, Liechtenstein and Norway contribute to promoting social and economic cohesion and strengthening bilateral relations in the European Economic Area (EEA).

The Scholarship Fund consists of 11 national programmes. The aim of the Scholarship Programmes is to facilitate networking and exchange knowledge between educational institutions in Iceland, Liechtenstein and Norway and beneficiary states in Europe.

The cooperation may include activities like mobility (student, staff, etc.) and institutional cooperation projects. Another aim is to enhance human capital and knowledge base in the beneficiary states.

EXPECTED OUTCOMES

- Increased higher education student and staff mobility between beneficiary and EEA EFTA States
- Increased and strengthened institutional cooperation at all levels of the education sector (school education, higher education, vocational training/education and adult education) between Beneficiary and EEA EFTA States
- Increased mobility of education sector staff at all levels of education between Beneficiary and EEA EFTA States

The programme is financed by Norwegian Ministry of Foreign Affairs. Norwegian Centre for International Cooperation in Education (SIU) has a role of a DPP (Donor Programme Partner) and cooperates closely with other DPPs (in Iceland and Liechtenstein), national programme managers and operators in the beneficiary states, as well as FMO (Financial Mechanism Office) in Brussels.

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EDITOR-IN-CHIEF
Kristin Solheim,
Head of Communications

EDITOR Andreas Kjeldsberg Pihl

EDITORIAL STAFF
Marianne Lid Iversen
Runo Isaksen

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SIU
P.O. Box 1093
5809 Bergen, Norway

siu.no/eng

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Adamina Korwin-Szymanowska;
University of Szeged / FMO;
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up to June 2016.

FOREWORD

As a Donor Programme Partner for the Scholarship programme in 11 countries, SIU has played an important role in the development and facilitation of the programme in general, and as an advisor to the individual country in particular. In Norway, SIU has been responsible for information, promotion and guidance regarding opportunities for cooperation and mobility of staff, students and pupils between Norwegian educational institutions and institutions in countries that receive support.

As the national agency for internationalisation in education we have the knowledge base of the education sector in Norway and experience from the management of international cooperation programmes. We have thus been able to provide time-tested and experience-based advice in the development and implementation of the scholarship programmes. We have also been able to facilitate cooperation by promoting the programmes through our wide network and meeting arenas with the Norwegian education sector. This has encouraged the involvement of academic milieus of excellence from Norway and there has been knowledge exchange of high quality between our countries.

Many of the project collaborations are in state-of-the-art fields of study and there are common gains on both sides. Study and research visits enhancing academic and professional competence, joint dissemination of results through seminars, conferences and publications, school cooperation and work placements in SMEs are evidence of this mutually beneficial cooperation.

It has been an enriching experience for SIU to work together with highly professional and competent programme operators in the beneficiary states, and our cooperation has fostered close relations and understanding between our organisations as well.

There is no doubt in my mind that the EEA Grants have paved the way for future cooperation between our countries. Stable and long-term funding through the grants has resulted in a solid knowledge base. With the background of positive experiences between the educational institutions involved, we are certain that there will be future joint ventures through the EEA grants and other complementary EU and international programmes as well.

HARALD NYBØLET
DIRECTOR GENERAL,
NORWEGIAN CENTRE FOR INTERNATIONAL COOPERATION IN EDUCATION (SIU)

SCHOLARSHIPS AND EDUCATIONAL COOPERATION

Creating networks, strengthening academic milieus and facilitating knowledge exchange



SCIENCE AND SUSTAINABILITY:
200 students from 11 Spanish universities have something in common: they have all spent part of their 2014–2015 academic year in principal education centres in Iceland, Liechtenstein or Norway thanks to the EEA Grants Scholarships.

PHOTO: YAYOPINO/FMO



ADAPTED PHYSICAL ACTIVITY:
Students from Józef Piłsudski University of Physical Education, Warsaw and the University of Iceland taking part in a workshop on how to better adapt activities to wheelchair users. The project helps to improve the social inclusion of wheelchair users.

PHOTO: MARIOLA GODLEWSKA / FMO

PARTNERSHIPS IN EDUCATION

TEXT: VEENA GILL

Building knowledge and human capital

The Scholarship Programme – The EEA and Norway Grants Financial Mechanism

Under the EEA and Norway Grants Scholarship Programme, educational and research institutions in 11 European countries – Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia, Slovak Republic and Spain – can apply for funding for cooperation with partners in the donor states Iceland, Liechtenstein and Norway

The main activities supported are:

- Institutional projects at all levels of education
 - Primary and secondary school, adult education and training, VET, and
 - Higher education and research
- Exchange opportunities and work placements for students, pupils, research and academic staff, teachers and trainees through project cooperation.

The activities of this programme commenced in 2011 and it is now in the last phase for this period.

This article provides an overview of the results and achievements of the EEA and Norway Grants Scholarship Programme up to 2016. It concludes by briefly touching upon the focus and priorities for the next period of educational cooperation under the EEA and Norway Grants Financial Mechanism (2014–2021).

Status of cooperation in the current program period 2009–2014 (2016)

In all there are about 40.9 million euros available for distribution within the different scholarship programmes, and over 90% of the total funds have already been spent. The main activities in this programme period were to be completed by September 2016, but there are also funds for dissemination of results, consolidation and development of bilateral relations. These funds can be spent up to April 2017.

The project portfolio in this period consists of collaborations with beneficiary countries in higher education, schools, adult education and VET. The Scholarship Programme offers Norwegian partner institutions fully funded collaborative project opportunities that are not necessarily prioritised in Erasmus+ or other comparable EU programmes. The programmes are bilateral, unlike Erasmus+ where normally there must be at least three institutions and countries involved in the cooperation.

There are nearly 800 projects – mostly in higher education, but also good spread in primary and secondary school, adult education and VET. All Norwegian universities and a large number of university colleges are participating in the programme, with many leading academic milieus involved in joint education projects.

There is a good regional distribution also within the beneficiary states and between large, medium and small institutions. Substantial stipends, have also contributed to

increased access for students from all regions irrespective of social background, for study at donor partner institutions.

With 150 participating institutions mainly from Norway, over 350 participating institutions from institutions/organisations in beneficiary countries, and over 2500 staff and student mobilities, the Scholarship Programme has exceeded its planned targets and outcomes in almost all countries.

Participation by Liechtenstein, although limited, is of high quality with several forefront institutions taking part. Cooperation between Icelandic institutions and beneficiary countries has been noteworthy in secondary school cooperation.

Main features

The scholarship programmes in the beneficiary countries are in line with mainstream European strategies and policies, such as ET 2020 and Horizon 2020 research and innovation programmes. However, the programmes vary in terms of size and thematic focus as they are all anchored in national educational policies.

The largest programmes are in Poland, Romania, Spain and the Czech Republic and the smallest in Latvia and Lithuania.

They are however, all developed and based on a common set of guidelines. This makes it easier to measure the total impact at the end of the programme period in realising the specific objective of the Scholarship programme:

- Knowledge exchange and building human capital
- Strengthening bilateral cooperation

- 33.9% projects link higher education and research – primarily curriculum development of new research based courses and intensive (summer) courses in special topics/research.
- 36.4% projects address the modernization of education systems in beneficiary countries with knowledge transfer of best practice from donor countries – such as technical and vocational training, secondary school cooperation and adult education.
- 12.3% projects in higher education and secondary schools focus on educational cooperation in environment/energy and sustainable development.
- 10.2% projects specifically address skills for job potential in higher education and vocational training.

*) Measures and main topics funded-portfolio of 739 projects analysed

(SOURCE: FINANCIAL MECHANISM OFFICE (FMO), 10TH JUNE 2016, BRUSSELS)

POLAND

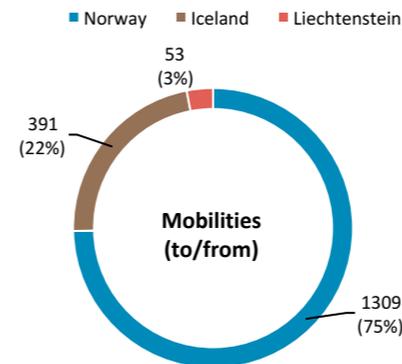
- 748 Polish students have studied at Norwegian institutions, and 183 Norwegian students had stipends for study at Polish institutions, during a program implementation period of roughly three years.
- 506 researchers and teachers have visited Norwegian institutions, and 247 have moved the other way during the implementation of these bilateral joint projects.

SOURCE: FRSE-FSS, POLAND, 10TH JUNE 2016, BRUSSELS

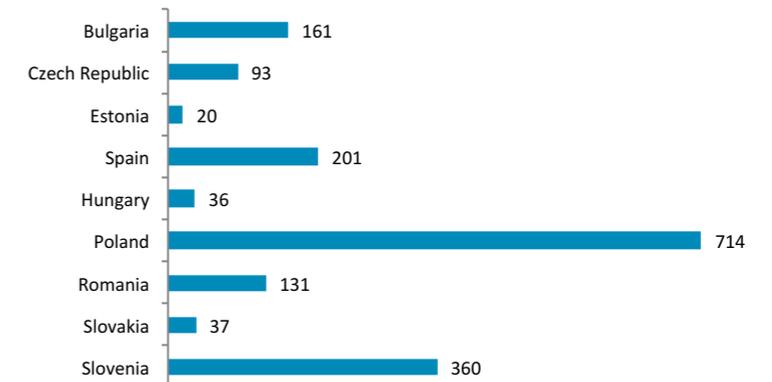
TOTAL FIGURES 2016

- 1,566** Mobile staff
- 617** Staff with increased skills and competences
- 495** Joint products and services, e.g. teaching materials, etc.
- 1,046** Students that gained ECTS credits for their study placements
- 85%** Projects that have bilateral cooperation

MOBILITIES



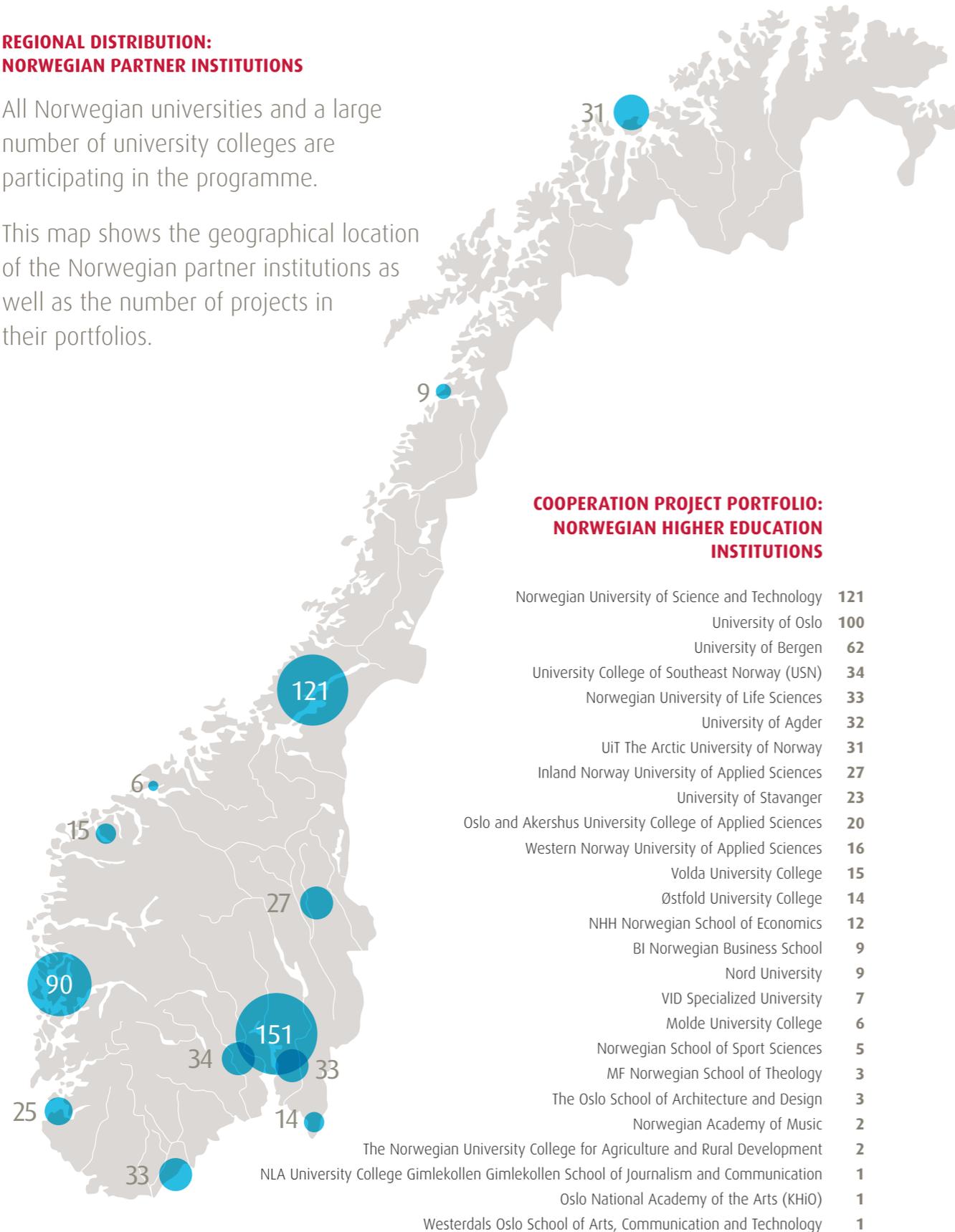
SOURCE: FMO, APRIL 2016



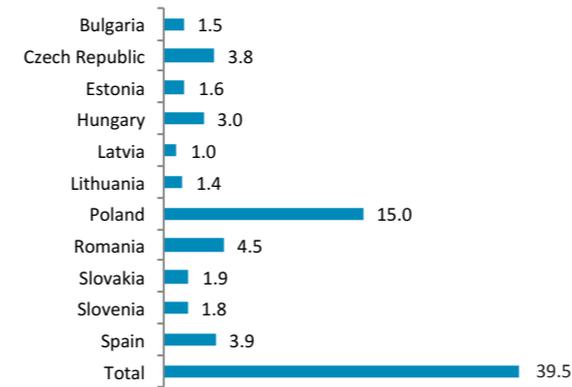
REGIONAL DISTRIBUTION: NORWEGIAN PARTNER INSTITUTIONS

All Norwegian universities and a large number of university colleges are participating in the programme.

This map shows the geographical location of the Norwegian partner institutions as well as the number of projects in their portfolios.



GRANT AMOUNTS (€ MILLION)



Additionally, contributing to the overall objectives of the EEA Grants and Norway Grants:

- To reduce socio-economic disparities in Europe
- Strengthening bilateral relations between donor and beneficiary states

Educational cooperation in this period supports projects covering a wide range of areas such as innovative teaching methodologies, improved skills and competences of students, young researchers, academics, teachers and other staff, school development and new and modernized curricula.

Furthermore, the projects provide opportunities for knowledge exchange and building networks through work placements and staff and student exchanges.

Cooperation through this programme complements already existing European programmes such as ERASMUS+, but is also a springboard for newer areas and forms of cooperation in the education sector in Europe.

Closer linkage between research and education

During the present programme period, there is focus on partnerships and institutional cooperation, student and staff exchanges, and closer linkage between higher education and research.

Higher education and research play a particularly important role in Latvia and Spain and the Czech Republic, Bulgaria, Hungary, Romania, Estonia and Poland all have a strong focus on higher education and research in their programmes as well.

Examples of cooperation are intensive courses for PhD and Master students, development of new and modernised curricula and joint programmes from spin-offs in research, thesis supervision, participation by young researchers in scientific seminars and state-of-the-art research activity.

In Estonia, Hungary, Lithuania, Slovakia and Slovenia projects have also covered school development, new teaching methodologies, teacher training, adult education and VET involving top academic milieus with a high rate of publications and pedagogical training manuals.

Experience from the present programme period shows that important research based higher educational programmes and milieus in the respective countries have developed through bilateral cooperation between the beneficiary countries and Norway. Such milieus can in turn create a sustainable environment for long term cooperation which is ideal for all partners.

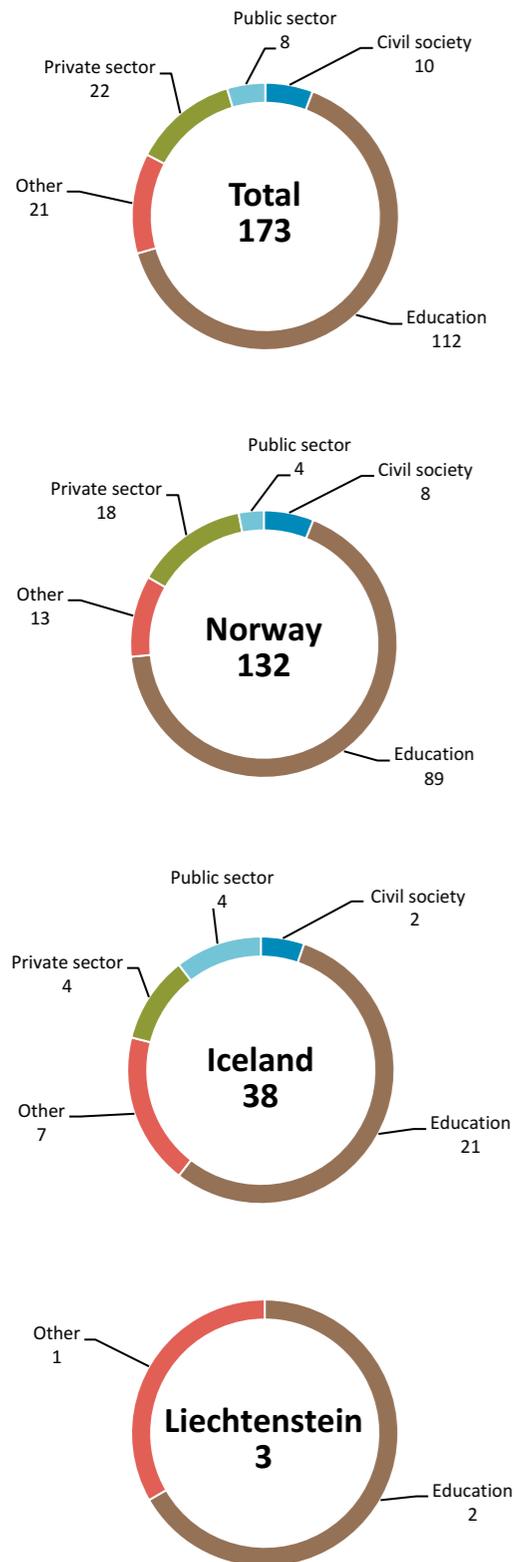
In the previous EEA grants period (2004–2009) research and scholarships were the most successful sectors in establishing bilateral cooperation (Financial Mechanism Office, Annual Report 2009). A recent bilateral mid-term evaluation commissioned by the Financial Mechanism Office in 2016, points in the same direction.

The way ahead

The concrete measures and activities being carried out have contributed to wide ranging relevant and quality educational cooperation between the donor and beneficiary countries. Ongoing educational activities are very much in line with Norwegian policy on internationalisation of education and current European policy in the education sector, thereby contributing to national goals as well. Examples of bilateral cooperation are mutual exchange of research staff in connection with educational activities, Master and PhD student learning and work mobility. In addition, many projects focus on curriculum development, joint courses and supervision of graduate and PhD theses contributing to sustainable institutional cooperation between partners. In line with national needs in the beneficiary countries, a large number of School and VET cooperation projects aim at modernisation of educational systems, new teaching methodologies, work placements in cooperation with SMEs and public and private partnerships.

An added value is that this broad cooperation also has the potential for education cooperation under the EEA grants

SECTOR DISTRIBUTION DONOR PROJECT PARTNERS



GRAPHICS PREPARED IN COOPERATION WITH TERJE KOLBU JACOBSEN.

Financial Mechanisms for the period 2014–2021, which is aimed at enhanced competence for work life and quality and relevance of international education cooperation.

Educational cooperation in the next EEA grants period 2014–2021 will focus on:

- Curriculum development to meet future needs
- Innovative models and new technologies in education
- Developing/enhancing skills for job potential
- Innovative solutions for recruiting to study, work or entrepreneurship
- Youth entrepreneurship through education and training

Concluding remarks

Partnerships in education – with a focus on user needs, being financed by the EEA and Norway Grants Financial Mechanism, are creating networks, strengthening academic milieus and facilitating knowledge exchange, all contributing to knowledge production and building human capital.

At a more general level, the Scholarship Programme is enhancing understanding of each other’s educational and cultural systems.

At the institutional level, administrators are building up a valuable network, which will be useful in future cooperative ventures, both bilateral and multilateral.

We have been successful in jointly involving enterprises, research institutions, and educational institutions in all education sectors, from universities and colleges to primary and secondary schools.

In a long term perspective, stable and continuous funding through the EEA and Norway Grants Financial Mechanism will contribute to the following desired outcomes:

- Mainstreaming into current European policy and education/research programmes
- Enhancing internationalisation at institutions and higher quality education
- Contributing to consolidate and enhancing sustainable education milieus at institutions in beneficiary states
- Facilitating long lasting institutional bilateral cooperation between beneficiary states and donor states
- Reducing discrepancies in access for all to education

SOURCE: FMO. DATA COLLECTED FOR THE MID-TERM EVALUATION OF THE SUPPORT TO STRENGTHENED BILATERAL RELATIONS UNDER THE EEA AND NORWAY GRANTS (2016)

‘The communist legacy is alive and well here in the Czech Republic, and particularly in the countryside. Most people put their trust in the state or big enterprises. They are happy to receive their salary every month and avoid the uncertainty that comes with starting up a business of their own. That is our biggest problem.’

TEXT: RUNO ISAKSEN

Entrepreneurs must save the countryside

Jiří Dlouhý is a lecturer at the Environment Center at Charles University in Prague, one of the oldest educational institutions in Europe. He is also the Czech coordinator for a recently concluded EEA collaboration with the Norwegian University College for Agriculture and Rural Development (HLB).

Forces opportunities

‘The fact that we have no tradition of a free market and entrepreneurship means that we have to work to change people’s mentality. Courses in entrepreneurship are sorely needed here,’ Dlouhý emphasises.

This objective of this collaboration was to develop and provide courses in social entrepreneurship and rural development.

Two rounds of courses were held in the countryside in the southern part of the Czech Republic, with Norwegian support. Each course had 25 students. Some already had a business of their own, while others dreamed of making it happen. Some were ‘ordinary’ students, others came via public agencies.

OPPORTUNITIES: ‘This course is about recognising opportunities. Seeing the real value of the place and taking advantage of it,’ says Jiří Dlouhý (in front) and Rhys Evans (middle), together with course participants. (Photo: Private)



‘The trend in agriculture is towards fewer and bigger enterprises that need fewer and fewer employees. So people try to find work elsewhere. Many regions are underdeveloped. This project could help, because its aim is to “force” people to see new opportunities.’

Being unique

The course took place over six days, and the students who wanted to could take an exam worth ten credits.

‘The students left the course full of new ideas. And with a network; some of them stayed in touch and have exchanged ideas after the course,’ says Dlouhý. He mentions a female participant from a family-run vineyard.

‘They have to compete with big wine producers and need to find their own niche. She was very inspired. It’s about being unique, she concluded. You have to see your own advantages and cultivate them. Could you also offer something to attract tourists? Bike rental? Horseback riding? In the Czech Republic, we have no tradition of exploiting such opportunities,’ says Dlouhý.

Don’t see their own value

Rhys Evans agrees. He is an Associate Professor at the Norwegian University College for Agriculture and Rural

INNOVATION: ‘There’s a lot of innovation and enthusiasm in Norway that we could learn from,’ says Jiří Dlouhý (middle), together with Rhys Evans (right) and a participant from Dalhousie University in Nova Scotia, Canada. (Photo: Private)



FACTS

‘Community Innovative Entrepreneurship Study Course Czech Promoter’ was a two-year EEA collaboration project (2014–2016) between Charles University in Prague (the Czech Republic) and the Norwegian University College for Agriculture and Rural Development, Klepp.

As part of the project, entrepreneurship courses were held in the Czech Republic. A special database of good examples of Czech entrepreneurship has been developed. So far, it contains 30 examples, and more will follow.

Development (HLB) in addition to being the Norwegian coordinator for the EEA collaboration.

‘The course is about helping to create a vibrant countryside. It covered a wide range of topics: local food, traditional craft, textiles. Then comes the big question: How can we make this relevant and interesting in the 21st century?’

Sustainable development is precisely about developing something of real value, in Evans’ opinion. Or also: to actually see the value.

‘Often people don’t see the value of what they have to offer. During the course, we raised topics such as urban demand for rural products. And what is known as “repurposing”, meaning to change known products’ usage. Such as the traditional family vineyard, which has now been developed to open to visitors and host various events. Or the wool producer that is now linked to the fashion industry. All development starts with knowledge,’ says Evans.

Dead communities

Czech statistics show that there is no large-scale migration from the countryside to the cities. The situation is rather that people live in the countryside, but work in the city.

‘Firstly, this causes major transport problems. Secondly, it results in dead communities, often without shops, schools or public transport. My vision is to develop the countryside in a sustainable manner. To make country life interesting, even for young people. Small businesses are among several important factors in this effort,’ says Dlouhý.

‘Another important factor is education, so we need local kindergartens and schools. That is how we get educated people to create something together, such as local festivals. There is no future in just sitting in the pub,’ says Dlouhý.

International campus at Klepp

The course itself is over, but Dlouhý and his colleagues plan to develop it further and offer it to other interested parties.

The long-term plan is to create an international joint master’s degree in rural development. Rhys Evans envisages

The course is about helping to create a vibrant countryside.

Rhys Evans, Norwegian University College for Agriculture and Rural Development

a collaboration between the Charles University and HLB together with one or two other educational institutions. A programme where the students first take core courses at home, before they go abroad and continue their education in English.

‘We can play on each other’s strengths and give the students a broad range of choices. We can offer an excellent education, and that also allows for more and better research. International collaboration is needed to achieve excellence in research and education,’ says Evans.

‘Today, we have very few international students on our campus here at Klepp. With an international joint degree, that situation could soon change.’

Should live without support

Dlouhý says that cooperating with Norway has also contributed to his own personal professional development. The changes and challenges that the countryside faces are not that different in the two countries.

‘But the way of thinking differs enormously. There’s a lot of innovation and enthusiasm in Norway that we could learn from. It’s also great to cooperate with a small institution such as HLB, with an efficient administration. Things prob-



VALUE: ‘Often people don’t see the value of what they have to offer,’ says Rhys Evans (right). Mr. Slavko (left) is the Castellan of Czesky Krumlov Castle and a partner in one of the projects. (Photo: Private)

ably do work more slowly at a big, traditional university such as ours.’

‘In future, such collaboration should ideally take place without financial support from external parties such as EEA Grants. But for now, it’s not easy for us to manage without external support,’ Dlouhý admits.

Develops new knowledge

According to Evans, the collaboration was not about Norway flying in expertise to the Czech Republic.

‘It was a mutual and complementary collaboration where we developed new knowledge together. Charles University also has great expertise, but the point is this: We can both achieve more together than on our own.’

He learnt a lot about political, financial and social factors in the Eastern European countryside. And about culture and entrepreneurship, too.

‘This all provides inspiration for my own teaching in Norway as well. There are definitely cultural differences, but that is not a problem. They are really a part of the project itself,’ says Evans.

He emphasises that the EEA project also leads to closer and better professional cooperation. The partners are now working together on some articles.

‘We benefit from this cooperation, professionally, socially and personally, and we are committed. So yes: We will continue to develop cooperation with Czech partners.’

If we want children to have a relationship to nature and be interested and take care of it as adults, we have to start early. A Polish-Norwegian collaboration is leading to changes in teacher education programmes.

TEXT: MARIANNE LID IVERSEN

Polish children set to explore nature

The project aims to get Polish children out of the classroom and kindergartens. The goal is more time spent outside and less 'Dead Mouse' teaching methods.

It's not as simple as pushing a button

'This is about encouraging Polish children to take an interest in nature,' says Stan Nitak over the phone from Warsaw.

Nitak participated as an interpreter and environmental expert in the project. He is a geographer and has previously lived in Norway and speaks fluent Norwegian. Nitak normally works at Gap Polska, an environmental organisation working for a greener Poland. Nitak is passionate about teaching children about nature at an early stage:

'We organise courses for kindergartens, schools and individuals in order to update people's attitudes to and knowledge about natural resources. But that's not enough. If we want real change, we have to try to change the education programmes for Poland's future teachers. That is precisely why my biggest wish was to be hired by a university that educates teachers.'

The EEA funds enabled a sustainable educational collaboration to be established between Poland and Norway.

'We can't just push a button when the children turn 18 and expect them to start taking responsibility for the environment and nature around them,' says Kirsti Vindal Halvorsen with conviction.

She is an associate professor at the University of Agder and is the Norwegian team leader in the project.

A pioneer in the project

Vindal Halvorsen is one of few pioneers in the children-nature field in Norway. She has worked and researched this field for several decades.

Already in 1991, she published the book *Barn oppdager naturen* ('Children discover nature') in cooperation with Magnhild Mogstad Tveit. More than 20 years later, this publication was to become an important part of the inspiration for an international collaboration project.

'One day, I got a phone call from Poland. Stan contacted me and wondered whether the book was available in English, as he wanted to work on environmental issues. An idea started to take form. Imagine if we could create a project where I shared my experience from Norway with Poland.'

Nitak wanted to learn from Norwegian kindergartens and school models for outdoor play and activity. He hoped to ignite children's interest in nature at an early stage.

'Involving kindergartens and schools in close cooperation with universities that educate teachers is a crucial factor,' says Nitak from Warsaw.

The idea developed into the collaboration project with Polish teacher educators and researchers from the Maria Grzegorzewska University and the University of Agder. The partnership was named 'Environmental education for sustainable development in teacher education'.

Norwegian children have freer reins

'Helping children to care about nature and take care of it is not even on the agenda many places today. That is why the



TREASURE HUNTING: The Polish Norwegian project team looking for shells and creepy-crawlies together with children from Kristiansand. (Photo: Adamina Korwin-Szymanowska)

student teachers have to see how the theory and way of thinking work in practice,' says Vindal Halvorsen.

When the Polish contingent of the project group came to Norway for the first time, they visited a Norwegian outdoor kindergarten and were surprised to see how much free rein the children were given.

'The Polish team was not used to seeing kindergarten children whittling with knives and climbing trees. And that is precisely why outdoor activities and practical exercises were so important in our collaboration.'

Creepy-crawlies, worms and magnifying glasses

The University of Agder organised a field course at Randøya outside Kristiansand. The participants were kindergarten staff from Poland, teachers and the principal from a primary

school, teacher educators from the Maria Grzegorzewska University, and the team from the University of Agder.

They lived a primitive island life together in military barracks for four days.

'Fieldwork has some big advantages. When you both work and cook with people, you get to know them very quickly. The group discovered that everyone depends on everyone else to succeed. And, not least, you break with tradition by spending so much time in nature and not in a conference room or lecture hall.'

At Randøya, the Polish team got to experience Norwegian nature. They participated in many different practical exercises to promote collaboration, creativity and to discover diversity in nature and how everything is connected.



THE PROJECT TEAM: Together in Kristiansand, Norway. Behind the wheel: Stan Nitak, Adamina Korwin-Szymanowska, Ewa Lewandowska, Anna Witkowska-Tomaszewska In front: Jozefa Balachowicz, Kristi Vindal Halvorsen, Ligia Tuszynska.

On the beach, they found shells, jellyfish, crabs and crustaceans. Nitak says that all big and small discoveries were studied carefully using a magnifying glass.

‘That was really something! It’s not often that we can experience such varied nature in such a small area – the forest, the mountains, the plants, the ocean and life in it.’

‘There were so many innovative exercises that really opened our eyes to how we can teach children about nature. Just holding a worm in the palm of your hand, seeing how it moved and what it eats... It did something to us.’

‘Dead mouse’ teaching methods

Vindal Halvorsen emphasised more experiences and less planning, structure and teaching-oriented education.

‘In the partnership, we are interested in children’s participation. In Norway, children’s right to influence teaching is laid down in law. This is a democratic approach that aims to safeguard the interests of both pupils and teachers.’

Something called ‘Dead Mouse’ teaching methods made a particular impression on the Polish project team.

‘There is a story about a teacher who had planned for the children to go outside and find leaves from five different trees and learn their names. While they are looking for leaves, the children suddenly come across a dead mouse,

which really excites them. The teacher didn’t plan to find a dead mouse and asks the children to disregard the mouse and keeps telling the children to find the five different trees.’

‘We need less ‘Dead Mouse’ methods. Instead, we have to let the children themselves influence their own experiences and learning. What will they find out there when they go exploring? This can encourage children’s interest and understanding because their experiences are the focus,’ Halvorsen emphasises and adds:

‘That’s really what this project is about: participating and experiencing things on your own. Direct nature experiences are important.’

Hope for more outdoor teaching

Adamina Korwin-Szymanowska teaches at the Maria Grzegorzewska University and participated in the Polish project group as a teacher educator, translator and organiser.

‘The project was like opening a new book. I’ve learnt that

I’ve learnt that nature is the best teacher. The project was like opening a new book!

Adamina Korwin-Szymanowska,
Maria Grzegorzewska
University, Warsaw.

RESPECT FOR NATURE – RESPECT FOR OTHERS

Being in nature has an interesting ripple effect for the groups of kindergarten and preschool children:

‘Being outside instead of in a classroom or kindergarten does something to the children and how they relate to each other,’ says Vindal Halvorsen.

‘We observe less conflict between the children when they are outside. The children learn to respect nature and the environment while also learning to respect each other. We see that the children mix across gender and ethnicity groups and different groups of friends. This is very important for children learning social competence, which is also documented in several research reports.’

nature is the best teacher. We’ve changed our way of thinking about learning outside the classroom.’

The “Dead Mouse” methods made me understand how important outdoor activities are to the learning process. I’ve seen and experienced first-hand that it works.’

Korwin-Szymanowska uses the project actively in her teaching and is particularly concerned with kindergartens and preschools teaching children to take responsibility for themselves in nature.

‘Educational theory that focuses on children and not on the theory itself is more humanistic and democratic, and it yields good results. The time children spend at kindergarten and the early years of primary school is one of the most important stages of their lives. That is why we have to use our knowledge about teaching wisely, so that we can develop children’s capacities in the best possible manner.’

She now hopes that the Polish education system will undergo a permanent change.

‘I want to continue working for more outdoor activities for children in kindergarten and preschool. During the partnership, I have changed the way I work with my teacher students and I teach them how to develop attitudes that promote outdoor activities.’

Results and high production

The partnership resulted in five publications from the Polish project group. The books document the work and the discoveries made in connection with the partnership. The publications are also used in the teaching of teacher students at the Maria Grzegorzewska University.

‘Thanks to the partnership with Kirsti Vindal Halvorsen and her colleagues at the University of Agder, we now have ten teachers who already use the outdoor activities in their teaching.’

Today, children from five kindergartens and preschools in Warsaw spend at least one day twice a month outside together with a researcher from the Maria Grzegorzewska University. And more will follow. Both Stan Nitak from the environmental organisation Gap Polska and Adamina Korwin-Szymanowska are hopeful about the future, despite the challenges involved in the project.

‘One of the biggest challenges in the day-to-day work is probably getting an extra teacher to come along when the children go outside, since this is mandatory in Poland. It is also challenging that some parents are sceptical of the children spending so much time outside in all sorts of weather. But the biggest challenge is probably to break the teachers’ routine. That is why this partnership has been so important, and it is very important that the work is upheld and expanded to more schools and kindergartens,’ says Stan Nitak.

‘I hope more Polish teachers will develop a sustainable way of thinking. In the long run, that will make our lives and the next generation more sustainable. I really believe that this project is the start of a change for the better,’ says Korwin-Szymanowska.

GREEN COLLECTION: Leaves, plants, flowers and berries found during the field course at Randøya outside Kristiansand. (Photo: Adamina Korwin-Szymanowska)



In a cellar at Complutense University of Madrid, Miguel García Tecedor and Felix del Prado Hurtado are studying a series of microscope images of nanomaterials.

TEXT AND PHOTOS: CHRISTOPHER BJÖRK

Nanotechnology set to make solar panels cheaper

The two Spanish PhD students recently took part in a joint Spanish-Norwegian research project with a view to using nanotechnology to develop efficient and cheap materials for use in solar panels and batteries.

The goal was to find substitutes for indium tin oxide, a metal which is both expensive and difficult to get hold of, but which is used extensively in energy production and storage, as well as in numerous other areas.

The researchers experimented with tin, titanium and gallium oxides, altering the properties of these materials and applying them in lithium ion batteries and new types of solar cells.

Replaces rare earth metals

'There is still a lot of work to be done, but the results have been very encouraging so far,' says García, who together with Del Prado and a third PhD student have spent several months in Norway at the Institute for Energy Technology (IFE) in connection with the project.

The research is part of a big European initiative to reduce dependence on so-called rare earth metals: 17 elements that are used in the production of a wide number of technological devices we use on a daily basis. China accounts for over 90 per cent of the world's production of rare earth metals, and, in effect, controls the price and supply of indium and the other elements.

The project, known as SUSOX, or Sustainable oxide materi-



HEAVY EQUIPMENT: Dr. Julio Ramírez showing Complutense's state-of-the-art "Grand Arm," an atomic resolution electron microscope used in the SUSOX project. There are only a handful of these microscopes in Europe.

als and nano-structures for energy-related applications, was awarded almost EUR 80,000 in grants from the EEA Grants in 2013.

Tin, titanium and gallium oxides, like indium, are so-called transparent semiconductors, i.e. light passes through them

and they have good electrical conductance. However, scientists have added impurities to their crystal structure, so-called 'doping', to give them the same properties as indium.

Worked in turn

The project has run over 18 months, and the two institutions have worked in turn on the material.

'At Complutense, we have added dopants in the laboratory, and have then studied the materials' new properties under different types of microscopes,' says Assistant Professor Ana Cremades, one of the two project coordinators.

At IFE in Norway, they have created theoretical models to study how the different types of impurities affect the properties of the materials. Back in Madrid, the team has then developed new, improved combinations. Finally, the most promising combinations of materials have been tested in batteries and solar panels in Norway.

This division of labour enables both institutions to concentrate on what they do best. Complutense University has expertise in developing composite nanomaterials based on these elements, while IFE has more expertise in the theoretical modelling of materials and developing technology for solar panels and lithium-ion batteries.

Unique insight

According to Professor Bianchi Méndez, the other project coordinator in Madrid, the Spanish students who went on the exchange to Norway gained a unique insight into how their experiments can be used in the real world. During their stay in Norway, Del Prado worked on developing batteries, while García built part of a solar panel.

'Here in Madrid, we develop the materials, but we're not involved in the final testing, so we really don't know how

they'll work. We had to go to Norway to see what happens during the final stage,' says García.

Another advantage: Foreign stays qualify the candidates for a European PhD, an honorary title at Spanish universities that shows that a student has carried out and defended parts of his/her thesis in a language other than Spanish.

'This has been a very rewarding experience for our students,' says Méndez.

Commercial potential

The project has also generated other results. The group is now set to apply for a joint patent based on the experiments involving materials for solar panels, which they believe can be used in commercial products. Two private enterprises in Norway have already expressed an interest in the technology,' says Smagul Karazhanov, Senior Scientist at IFE, who led the Norwegian part of the project.

'We are also planning to register a patent based on the lithium-ion battery experiments, though that project is in an earlier stage.'

'When we started the work we didn't expect that this cooperation would end up with inventions,' Dr Karazhanov says. 'We always thought it was a very interesting area, but we didn't expect to advance this much.'

The SUSOX project has now been formally concluded, but Cremades, Méndez and Karazhanov have started looking for other sources of funding in order to continue the joint project.

We didn't expect that this cooperation would end up with inventions.

Smagul Karazhanov, Institute for Energy Technology, Norway

REWARDING EXPERIENCE: The two project coordinators, Bianchi Méndez (second from right) and Ana Cremades, with the two PhD students Miguel García Tecedor (left) and Felix del Prado Hurtado, at Complutense University of Madrid.



In a quiet village in Western Norway, a furniture designer is putting the finishing touches to the design of a new chair. Shortly after, the prototype is assembled at a factory in Romania, while the marketing department in Portugal is starting to plan the advertising campaign.

TEXT: ANDREAS KJELDSBERG PIHL

Cooperation without borders in the digital factory

This is an example of how a fictional company could use modern communication technology to shorten the time from idea to finished product despite big geographical distances. Digital models and 3D printing are examples of technology that makes this possible.

By travelling less often and reducing the need for physical transport of drawings and components, the company saves both time and money. In addition, the environmental impact is reduced.

More efficient production

‘The “digital factory” characterises a technological production system that integrates different planning and simulation processes and makes production more efficient and environmentally friendly,’ says Ioana Andreea Mircea.

She works in the International Relations Department at the Lucian Blaga University of Sibiu, Romania, and has administered an EEA-funded collaboration project between Lucian Blaga, the University College of Southeast Norway and the University of Évora, Portugal.

‘The European economy is struggling, and much low level production has already been outsourced to other countries. By educating experts and researching cutting-edge technology, we can strengthen our competitiveness and make

Europe a place for efficient, environmentally friendly and high-tech production,’ says Mircea.

In her opinion, developing modern, innovative factories that attract highly qualified labour is decisive for improving the European economy.

Useful to students

Through the collaboration, the three educational institutions in Romania, Portugal and Norway have taken various approaches and frameworks as a basis for production integration and management of technology-based enterprises.

‘The methods we describe are already frequently used in industry, but have not been featured extensively in the education system. So this is very useful to students,’ says Professor Lasse Berntzen at the University College of Southeast Norway.

He is an expert on ICT-based innovation and business process modelling and has been the project’s Norwegian contact person.

‘Companies that use technology in this way have a competitive advantage. They reduce travel activity and depend less on physical transport. That increases the production rate,’ says Berntzen.

Summer school in Romania

The project’s main activity was a two-week summer school in Romania where students and staff from the three educational institutions participated.

‘We divided the students into groups, with each group including at least one student from each country. They then cooperated on proposing different approaches to establishing a digital factory,’ says Ioana Mircea.

The students worked on topics such as workflow, outsourcing, offshoring and an overall handling of the supply chain from start to finish.

When preparing for the summer school, the project obtained expertise from various fields to ensure knowledge transfer in areas such as management of entrepreneurial enterprises, international sales, green business profiles and policy

FACTORY TOUR: Visiting manufacturing companies in Sibiu, the students could see for themselves how digital factory solutions are used by the car industry.

PHOTO: LUCIAN BLAGA UNIVERSITY



FACTS

PROJECT NAME

Digital Factory: Concepts, Implementations, Present and Future Challenges (DigiFact)

PROJECT PROMOTER

Lucian Blaga University of Sibiu, Romania

PARTNERS

University College of Southeast Norway

University of Évora, Portugal

development that supports business development and climate-friendly solutions.

Visits to factories

‘The students also learnt a lot from each other, as they had backgrounds from different educational fields. For example, the students from Norway and Portugal, who did not have an engineering background, had to learn the basics about prototypes,’ says Mircea.

The summer school included visits to manufacturing companies in Sibiu where digital factory solutions are fully utilised. The German tyre and car parts manufacturer Continental is one of several international companies that have set up business here and that are cooperating with the Lucian Blaga University. The company has factories on every continent.

‘Romania has done much to attract international companies. Here in Sibiu, many people speak German, which is a big advantage. Many of the companies here are German,’ says Mircea.

CUTTING-EDGE TECHNOLOGY: *In this laboratory, the students designed three-dimensional models of components and realized them using a 3D printer.* PHOTO: LUCIAN BLAGA UNIVERSITY

Close collaboration with business and industry

The car industry has equipped some of the university’s laboratories, which means that students can familiarise themselves with the machines and simulate the production process. In turn, this also makes it easier for students at Lucian Blaga to find jobs in the same industry.

Business and industry benefit from the collaboration in several ways. Mircea says that, among other things, the students who used the laboratories during the summer school provided input on how the companies can improve the safety and comfort of production line employees. That also helps to increase productivity, she points out.

New teaching methods

The experience that students and lecturers brought with them from their previous activities and studies gave the participants at the summer school a broader picture of how cooperation in international companies works, according to Mircea.

‘The biggest advantage of this project has been the teaming up of three educational institutions from different countries with different traditions and cultures. The knowledge transfer from each institution helped to improve cooperation, which everyone benefitted from.’

Mircea says that the lecturers learnt a lot from teaching students from different backgrounds. They also had a chance to test new teaching methods through activities in the companies and the practical work on prototypes.

A meeting of cultures

For the students, working together in international teams was an important experience.

‘Students from different cultural backgrounds were going to live together for two weeks, and we were a bit concerned about whether they would settle in well,’ she admits.

But the summer school participants got on well with each other and developed friendships that they have since kept up.

Berntzen at the University College of Southeast Norway also highlights the multicultural aspect.

‘A summer school is largely about learning things that aren’t study-related, such as working together across cultural boundaries. That is a useful experience,’ he says.

Expanding the collaboration

Berntzen and Mircea have nothing but praise for the project and the results the EEA funds have yielded. The success of the experience has also inspired collaboration in other areas.

I am very positive that the cooperation and relations that we have developed will be strengthened over the next years.

Ioana Andreea Mircea
Lucian Blaga University

are. This has encouraged more people to apply for funding,’ says Mircea.

The result was four new collaboration projects between the Lucian Blaga University and the University College of Southeast Norway, financed by EEA funds. The topics range from tackling the migration challenge and integration of Roma people to monitoring air quality and best practice for internationalisation in higher education.



SUCCESSFUL COLLABORATION: *Following the summer school, a number of other joint projects have emerged. Ioana Andreea Mircea works with international relations at the Lucian Blaga University of Sibiu.* PHOTO: LUCIAN BLAGA UNIVERSITY

These projects are of a shorter duration, but the two institutions envision continuing and expanding their collaboration in the next programme period.

Wants more exchange

‘Some of our students who have taken their practical training in companies in Vestfold were very pleased and want to do their PhDs there. Perhaps we can also encourage more students from Norway to come here,’ says Mircea. Staff exchanges and co-publishing articles are other relevant forms of collaboration.

Berntzen, who went to Sibiu in December 2016 to sign the new collaboration agreements, says the collaboration with Romania is academically enriching.

‘The Digital Factory project has been a door opener, a cornerstone for further collaboration. If I were to give just one example of a successful project, it would be this one, because it has subsequently yielded such good results,’ he concludes.





**NORWEGIAN CENTRE
FOR INTERNATIONAL
COOPERATION IN EDUCATION**

Office address:

Fortunen 1, 5013 Bergen

Tel: +47 55 30 38 00

E-mail: post@siu.no

www.siu.no

www.studyinnorway.no

www.utdanningiverden.no