



Senter for  
fremragende  
utdanning







# Annual report 2015



Photo: Valeriya. Winner of 1st Price in the 1st ed. of #LearningBiology2015 Photo Contest

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## 1 Summary

The bioCEED Centre of Excellence in Biology Education is now in full operation, with the project management and leadership structure in place and functional (WP0). A main focus in 2015 has been to gain momentum and visibility both internally and externally, and towards this end we have launched several important cross-cutting educational development projects in 2015:

- 🔗 An important bioCEED priority is to develop our **Teacher Culture** (WP1), based on Scholarship of Teaching and Learning (SoTL) principles. Towards this end, we have organised a range of meeting places and fora for educational development, reflection, and collaboration, including Teacher's Retreats, Seminars, and Collegial Teacher's courses for permanent staff and also for PhD students and Postdocs. Through these activities and the course evaluation system we work systematically with **Quality Assurance and Alignment** (WP4), and, as we recognize that educational development will only succeed if efforts are recognised and valued, we link these activities and communicate our perspectives actively to educational leadership (WP5, WP6)
- 🔗 We have launched a number of projects, large and small, towards developing **Active Learning** (WP3) and more generally, our **Learning Environments** (WP2), ranging from testing specific new tools and learning methods in single courses to more cross-cutting initiatives. A cross-cutting priority in 2015 has been the development of bioSKILLS, an online platform with supporting tools (tutorials, films, etc.) for transferable skills training and alignment (WP4) across the curriculum.
- 🔗 **The bioCEED Survey 2015** (WP4, WP7) is a baseline study of major tertiary-level biology educations in Norway and was distributed to >2500 respondents in higher education and in the biological workforce. The survey explores themes such as learning in practice, transferable skills, motivation, laboratory and field learning, didactics and society's knowledge needs, etc., and will be a rich data source for research and educational development, and an important tool for monitoring bioCEED progress and impact in the years to come.
- 🔗 Integrating society's needs, and more specifically private and public companies and employers, into a discipline-oriented university education setting is a main goal for bioCEED (WP7), and in 2015 we launched our new BSc-level **internship practice courses**. These new courses and the associated learning methods are accompanied by educational research, conducted by our PhD students and postdoc. Our work with internships and practice has attracted substantial interest, both in terms of press, institutional processes, and additional externally funded projects.

Along with these work areas or projects, a number of additional smaller and larger projects make up the bioCEED portfolio for 2015, as described in detail in the report and in the appendices.

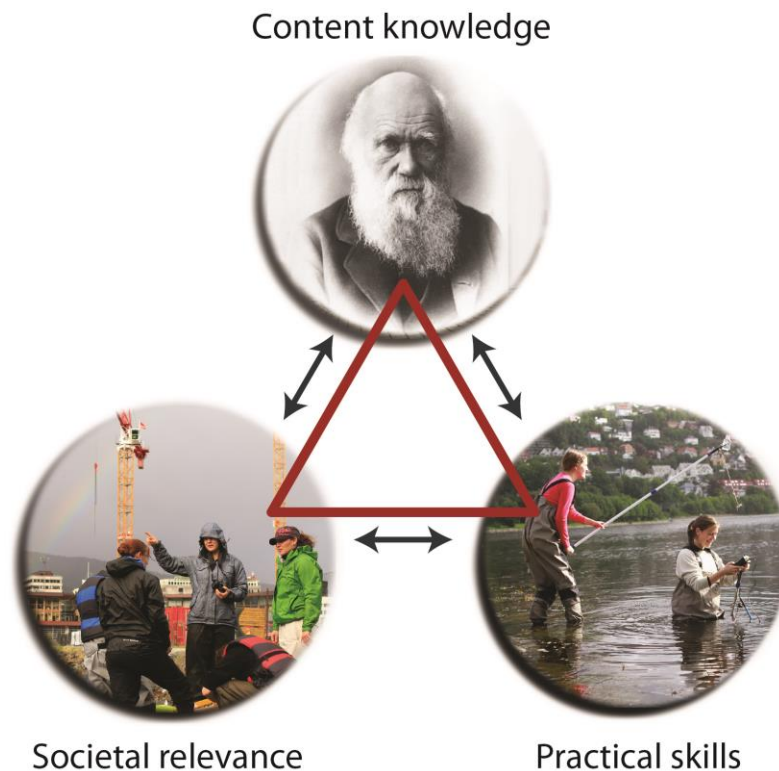
Educational development within bioCEED is research-based in two dimensions. First, our educations build on and link explicitly to our ongoing biological research. For example, we use and present current research practice and results in our courses, and our students participate in research through research practice courses, and through research components in a number of courses from BSc to PhD. Second, our educations are also based on and contribute to educational research and especially on links between educational activities, motivation, and learning.

The strong institutional support from the board and leadership at UIB and UNIS is continuing into the operation phase. In particular, we are actively involved in ongoing strategy processes at both institutions, and we have been actively used in institutional promotion.

bioCEED activities are progressing according to the Centre Plan and Budget, with only minor deviations. We hence do not see the need for any major adjustments or changes in 2016. We will, however, go through the organisation and WP structure in 2016 with the goal of simplification and clarifying responsibilities. Many of our big projects (see above) link to several work packages (and hence perspectives on educational development) and while this can be seen as a strength (i.e., indication of alignment in our activities) it is also challenging in terms of responsibilities and reporting. In addition, collaborating over WP activities between UIB and UNIS can also be challenging, and in revising our WP structure we will seek to develop models for closer collaboration over projects and WPs between the two institutions.

The bioCEED economy is sound. In addition to the 3000 KNOK NOKUT allocation, we have secured 8900 KNOK in own contributions, and a further 5700 KNOK in other external project funding

In 2016, we will follow up the activities started in 2015, largely following the plans outlined in the application. In particular, we will continue building up the bioSKILLS platform and use it in a wider selection of courses, carry out and conduct research on the transformation within our educations, continue to develop infrastructure, and work towards further developing the teacher culture, educational leadership, sector communication, and activity alignment.



**Fig 1. The 'domain of biology', can be defined by the interactions between the development of scientific content knowledge (theory, factual knowledge) and practices within biology itself, and society's applications of and needs for this knowledge and these skills.**


**bioCEED steering committee**
**Vigdis Vandvik**

Centre leader, Professor,  
Department of Biology, UiB

**Øyvind Fiksen/Sigurd Stefansson**

WP leader (1), Professor,  
Head of Education  
Department of Biology, UiB

**Janne Søreide**

WP leader (3), Ass. Professor,  
Arctic Biology, UNIS

**Øystein Varpe**

WP leader (5), Ass. Professor  
Arctic Biology, UNIS

**Torstein Nielsen Hole**

PhD candidate, bioCEED/PRIME

**Roy Andersson**

Ass. professor II, bioCEED,  
LTH, Lund University

**Tone Ulvatn**

Student representative bioCEED  
BIO, UiB

**Jonathan Soulé**

Chief engineer, bioCEED  
Dept. of Biology, UiB

**Tina Dahl**

Executive officer  
Arctic Biology, UNIS

**Pernille Bronken Eidesen**

Deputy Centre leader, Ass. Professor  
Arctic Biology, UNIS

**Sigrunn Eliassen**

WP leader (2), Researcher  
Department of Biology, UiB

**Arild Raaheim**

WP leader (4, 6), Professor  
Department of Education, UIB

**Gro van der Meeren**

WP leader (7),  
Institute of Marine Research

**Lucas Jenø**

PhD candidate, bioCEED

**Gaute Velle**

Project leader, PRIME  
Prof II BIO, UiB/Researcher, Uni Research

**Alexandra Poje/ Margot Nyeggen**

Student representative bioCEED,  
Arctic Biology, UNIS

**Anne Laure Simonelli**

Post doc, PRIME  
Dept. of Biology, UiB

**Oddfrid Førland**

Project coordinator, bioCEED  
Dept. of Biology, UiB

## 2 Results

The centre is now in full operation, with the project management and leadership structure in place and functional. The bioCEED educational development work is organized in Work Packages (WP, Figure 2), where each WP addresses a corresponding strategy linked to the goals of the centre as described in the [application](#). Activities are organized in a number of specific Actions, consisting of one or more small projects. Each Action and project is classified under a specific WP, but may have relevance and feed into other WPs as well. Some of the planned actions represent potential for radical transformation of our educational programs; others are more incremental but needed as part of a coordinated educational strategy. The plans and progress during 2015 for each of these actions are specified in the appendices (Appendix 5.1).

WP leaders are responsible for following up the work within their work package, as well as ensure links and cooperation with other WPs. This organization was made to ensure that we keep focus on all important aspects, both within education *sensu stricto* (the students, teachers, curricula, learning environments, and the links between them) and within the larger educational and societal landscape within which our educations are embedded. Relationships between WPs are seen in Fig.2. The work package organisation has proved useful in maintaining activity and attention to the different but clearly interlinked aspects of educational development at bioCEED. However, the structure is also complex with many work packages and the communication between Bergen and Svalbard, especially over daily matters, is sometimes challenging. In 2016 we will therefore evaluate and potentially revise the centre structure and organisation.

In 2015, we have focused on gaining momentum and visibility both internally and externally.

Towards this end we have launched several cross-cutting educational development projects:

- 🔗 Development of Teacher Culture (WP1), based on Scholarship of Teaching and Learning (SoTL) principles is an important bioCEED priority. Towards this end, we have organised meeting places and fora for educational development, reflection, and collaboration, including Teacher's Retreats, Seminars, and Collegial Teacher's courses for permanent staff and also for PhD students and Postdocs. Through these activities and the course evaluation system we work systematically with Quality Assurance and Alignment (WP4), and, as we recognize that educational development will only succeed if efforts are recognised and valued, we link these activities and communicate our perspectives actively to foster Educational Leadership (WP5, WP6)
- 🔗 We have launched a number large and small projects aimed at developing Active Learning (WP3) and more generally, our Learning Environments (WP2), ranging from testing specific new tools and learning methods in single courses to more cross-cutting initiatives. The development of bioSKILLS, an online platform with supporting tools (tutorials, films, etc.) for transferable skills training and alignment (WP4) across the curriculum, is a major milestone.
- 🔗 The bioCEED Survey 2015 (WP4, WP7) is a baseline study of major tertiary-level biology educations in Norway and was distributed to >2500 respondents in higher education and in the biological workforce. The survey explores themes such as learning in practice, transferable skills, motivation, laboratory and field learning, didactics and society's knowledge needs, and will be a rich data source for research, educational development, and monitoring bioCEED progress and impact in the years to come.
- 🔗 Integrating society's needs, and more specifically private and public companies and employers, into a discipline-oriented university education setting is a main goal for bioCEED (WP7), and in



2015 we launched our new BSc-level internship practice courses. These new courses and the associated new learning methods are accompanied by educational research, conducted by our PhD students and postdoc. Our work with internships and practice has attracted substantial interest, both in terms of press, institutional processes, and additional externally funded projects. Along with these work areas or projects, a number of additional smaller and larger projects make up the bioCEED portfolio for 2015, as described in detail in the report and in the appendices.

In the text below we describe the results achieved in 2015 in detail per work package.

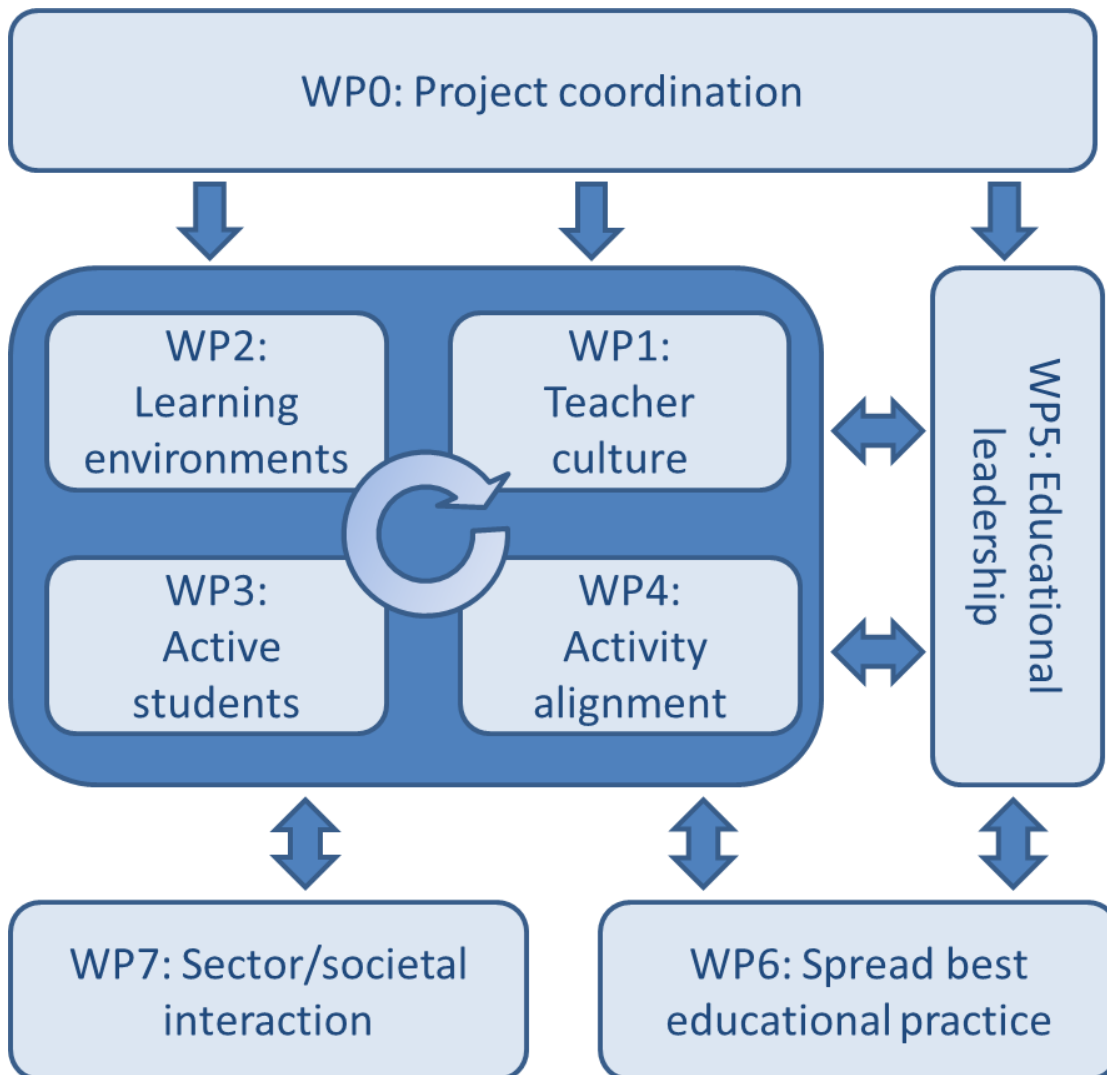


Fig 2. The organization of activities in bioCEED into work packages (WPs). The WPs are linked to the projects strategies, and represent different perspectives on education that each are important priorities in bioCEED. The four WPs within the blue central area represent important determinants of educational quality within educational activities themselves, *sensu stricto* whereas the outer WPs represent surrounding fields and processes that affect educational quality.

### 3 Plan for 2016 and the following period

Activities in 2016 will largely follow the original project plan. Specifically, we will follow up our large projects, including the surveys, student placements in industry and the public sector through PRIME, development of digital tools including ArtsApp, as well as the smaller projects within each WP focused on coordinating skills training, experimenting with learning methods, developing teacher culture and educational infrastructure (see details under each WP above).

In 2016 we will revisit our organisational structure to ensure efficient project leadership, administration and communication. We will consider a major upgrade of our web pages to facilitate sharing and spread of bioCEED results and learning modules.

The work with teacher culture and development of Scholarship of Teaching and Learning (SoTL) practice among our teachers (WP1) will continue in 2016. A number of structures and processes are now in place, and we will concentrate on filling these with activities and content. More than 75% of the permanent scientific staff is already involved in various bioCEED activities, and the goal is now to involve these in deeper transformational activities and to reach out to the remainder. Teacher culture development is tightly linked to support for educational efforts and success, and hence to educational leadership (WP5) at departments and institutions. We will work actively towards promoting educational focus of the leadership, both locally, institutionally and nationally.

Educational alignment (WP4) and experimentation with new learning methods (WP2) and student-active learning (WP3) will be a priority in 2016. We will carry out a range of small bottom-up projects on new learning methods and tools, but also continue the focused work on bioSKILLS and learning in practice that was initiated in 2016. Educational research will be closely linked to both large and smaller initiatives. We will also continue work towards adjusting student workload and aligning course content, learning methods and assessment, both within courses and programmes in relation to subject content and transferrable skills.

Sector and societal communication (WP7) is key aspect of bioCEED, which is secured and developed both through practice placements and through creating meetings and joint projects with companies and organisations in the sector. Publishing relevant results, opinions and insights in sector-specific fora is also important.

Our dissemination and sharing of best practice strategy (WP6) is multi-tiered, with different goals and approaches for local, national, and international communication. During 2016 we will work targeted towards specific goals at all these levels. We will publish the bioCEED Survey 2015 report, and write several papers based on this and other data collected during the first two years of bioCEED.

Important changes are taking place in the higher education sector in Norway, and bioCEED will speak up for educational quality, teacher culture, active students, activity alignment, and the importance of departmental and institutional support for educational development in all channels and fora available to us. We look forward to an active, educational, developing and challenging year.

Below, we outline for each work package specific plans for 2016 as well as any implications of what we have learnt in 2015 for long-term plans for the centre.



## WPO Leadership and coordination – WP leader Vigdis Vandvik

### Organization and management

bioCEED has a well-functioning and active **Steering committee** (see box on page 5), consisting of the centre leaders, work package and project leaders, PhD candidates and postdoc, student representatives, and designated administrative and technical staff in Bergen and Longyearbyen. The group meets weekly (at the three institutions, the meeting is transmitted over skype between institutions) to report on activities and projects, and to plan activities ahead. These meetings ensure effective communication, sharing, learning, and information flow across the consortium.

The first bioCEED **Board meeting** was held on May 26<sup>th</sup> 2015 in Bergen. Oddrun Samdal was elected Board Chair, and Ole Arve Misund Co-Chair<sup>1</sup>. The Board approved the 2013 Interim Board report 2013, the bioCEED activity report and accounting for 2014, and the bioCEED activity plan and budget for 2015. The Board noted the importance of involving all partners in bioCEED's activities, and also the Board's role and responsibility for ensuring that the outcomes of bioCEED's work are spread beyond the consortium.

The bioCEED **Advisory Board** will be meeting for the first time since the start-up meeting on Svalbard on March 15<sup>th</sup> 2016.

The strong **institutional support** from the Board and leadership at UIB and UNIS is continuing, bioCEED are still actively involved in on-going strategy and educational development processes at both institutions. We have also been actively used in institutional promotion vs. students and the HigherEd sector more generally (see Appendix 5.2).

### Physical and virtual infrastructure

We have established and are building up web pages, blogs, and Twitter and Facebook presence for communication both within the consortium, within HigherEd in Norway and internationally, and for public outreach.

In 2015 we expanded the centre staff with one Prof II in Biology educational development and research and an Educational Support officer (Tina Dahl, Svalbard) (for a full personnel overview in appendix 5.3). We have also hired personnel in various temporary positions to assist with specific tasks linked to bioCEED (bioCEED Survey, internships, ArtsApp, bioST@S, etc.). These positions have been funded over the bioCEED NOKUT funding, the institutional in-kind

<sup>1</sup> Misund has left his positions as director at UNIS and will be replaced in the bioCEED board by Børge Damsgård (Head of departement, AB)

### bioCEED Board

**Oddrun Samdal (Chair)**  
UiB

**Ole Arve Misund (Co-Chair)<sup>1</sup>**  
UNIS

**Øyvind Fiksen**  
BIO, UiB

**Astrid Tolo**  
PED, UiB

**Geir Huse**  
HI

**Tone Ulvatn**  
Student, UiB

**Alexandra Poje**  
Student, UNIS

### bioCEED Advisory Board

**Ivar Myklebust**  
Norwegian Biodiversity  
Information Centre

**Trond Schumacher**  
University of Oslo

**Gunnar Öquist**  
Umeå University

**Mette Marianne Svenning**  
University of Tromsø

**Anders Ahlberg**  
Gjennombrottet, Lund  
University

**Doris Jorde**  
Norwegian Centre for  
Science Education

**Jeremy Pritchard**  
University of Birmingham

**Päivi Kinnunen.**  
Aalto University

contributions, and other externally funded projects under the bioCEED umbrella (PRIME, ArtsApp, TransPlant)<sup>2</sup>

### **Student involvement**

The student representatives participate in the daily management and leadership of bioCEED. They are present at the bioCEED skype-meetings, and participate in ongoing projects and discussions. In particular, they are responsible for organising the open student meetings and for communicating student priorities and perspectives to the bioCEED leadership (see WP3). The student representatives at UNIS aided in a midterm evaluation of the bachelors courses by presenting student feedback to the course leaders and discussing ways to improve teaching and learning both short and long term. In November 2015, the student representatives attended the NOKUT seminar on Excellence in Education, where they got useful input on how other universities in Norway work with educational development. For an overview over meetings and seminars arranged at UiB and UNIS by the student representatives, see Appendix 5.2.

### **WPO Plans and priorities for 2016:**

- ♻ The centre leadership and organisation will continue along the same general lines as in 2015.
- ♻ Sigurd Stefansson is taking over as Head of Education at BIO, and will replace Øyvind Fiksen in his roles in bioCEED.
- ♻ To facilitate effective organisation and communication, the work packages structure and organisation will be evaluated and revised. Overlap and synergies are developing between the different WP's activities, and we will therefore consider merging WPs to achieve a more streamlined and effective organisation. This will require that WPs take responsibility for several perspectives simultaneously (e.g., teacher culture and educational leadership).

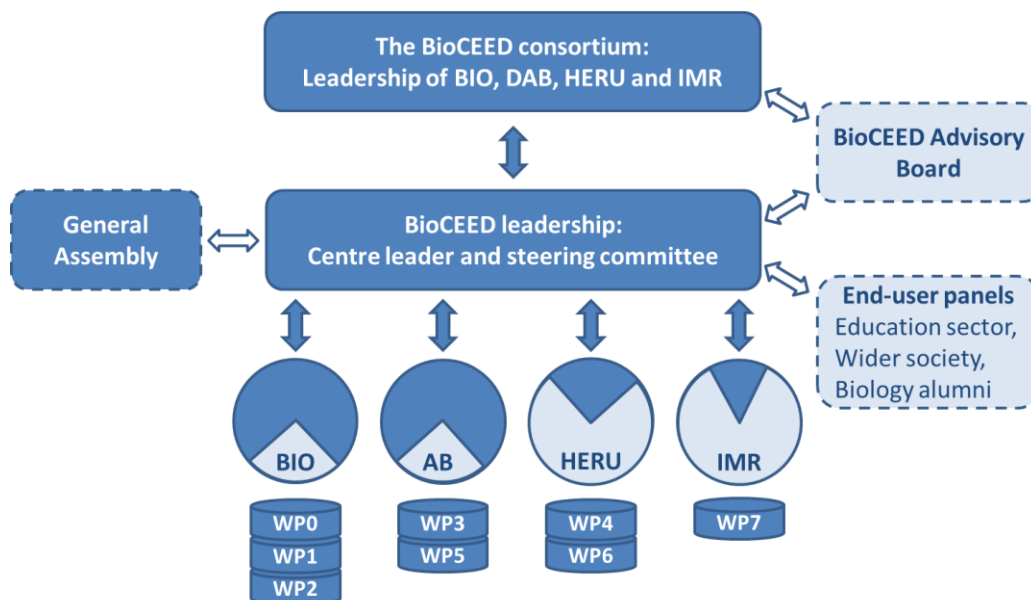


Figure 3. Project leadership, co-ordination, communication, and responsibilities. Governing (solid outline) and advisory (hatched outline) bodies are represented as rectangles, the educational activity at each of the partner institutions as circles, project work packages as stacked disks, and decision-making and advisory communication as filled and open arrows, respectively. Core bioCEED activities are indicated in dark blue, relationships to related activity at the partner institutions and with external bodies are indicated in light blue.

<sup>2</sup> Funded by the Research Council FINNUT programme, Norgesuniversitetet, and SIU.

## WP1 Teacher culture – WP leader Øyvind Fiksen

bioCEED's aim to build a collegial learning culture among teachers is crucial in achieving the desired reform of biology education. Priorities in 2015 have been the Teacher's retreats, seminar series, and Collegial Teachers' courses for permanent scientific, administrative, and technical staff, and for PhD's and postdocs. The programme board at BIO has been given responsibility for implementing this work package, and they have successfully implemented several activities:

### **Teachers' Retreats at BIO and UNIS (A5)**

The second **Teachers' Retreat at BIO** was held in December 2015 at Bjørnefjorden Gjestetun, with 43 teachers and technical and administrative staff from BIO and UNIS and invited guest speakers participating. Our guest speakers this year were Sehoya Cotner from University of Minnesota and Nina Qvistgaard from Denmark's Technical University. Cotner talked about 'Course-based undergraduate research experiences (CUREs) turn ALL students into scientists', and how scientific training and thinking can be integrated into biology teaching. Qvistgaard gave a lecture on 'Teacher training and educational development at DTU'. The main activity on the programme was four workstations: (1) Low-effort, high-impact strategies for making your class more active (Cotner); (2) Constructive alignment, feedback, developing conceptual understanding (Qvistgaard); (3) Assessment (Arild Raaheim); (4) bioST@TS - (Sigrunn Eliassen and Jonathan Soule). The general impression is that teachers are enthusiastic about coming together to discuss teaching, and that this is increasing the awareness of alternative teaching methods and stimulates many to change their courses and teaching activities. Teacher report that the retreat also strengthens the collegial sense of responsibility for our education quality.

**Teachers Retreat – AB** in November 2015 attracted 15 participants where the main topics covered were course alignment, involvement of PhD students in teaching, and assessment. The discussions were facilitated by Ivar Nordmo (Associate Professor in pedagogy, UiB)

**UNIS Learning Forum** was organized as a collaboration between bioCEED, Academic Affairs and ECOM (Education Committee), 17-19 November 2015. Learning Forum was a successful meeting arena for exchange of experiences and opinions on teaching and learning - facilitating and motivating change and development. The main topics was strategy planning for UNIS, bioCEED, field teaching and teaching challenges at UNIS with elaboration on combined master and PhD courses, peer evaluation and active learning, and student workload (see Appendix 5.6). Learning Forum had about 70 participants from all departments at UNIS. The participants were satisfied with the learning forum and teaching retreat, and there is a general wish that such seminars should be carried out at yearly basis at UNIS.

### **Seminar series and literature colloquia at the department level (A7)**

In 2015 7 literature colloquia were organized by bioCEED AB, with themes like: "How learning works. Research-based principles for smart teaching", "University students and teachers conceptions of teaching and learning in the biosciences" and "Teaching for quality learning at universities". The colloquia were open to all at the department and usually attract 3 – 6 participants.

At BIO, the bioCEED seminar series were running at approximately monthly intervals, with both internal and external seminar leaders, and focusing on experiences and sharing around themes like quality assurance and development, assessment, project-based and team-based learning, etc. These seminars are streamed, and freely accessible on the bioCEED web pages.

Further, a workshop on **Team Based Learning** was organised at the Bergen University College with participants from bioCEED.

### **Collegial Teaching Courses (A8)**

The first **Collegial Project course in Teaching and learning in Biology** (see app. 5.7 for course programme) for permanent scientific, technical, and administrative staff is now running, with 12 participants from BIO and 4 from UNIS. The course is taught by Roy Andersson and Arild Raaheim, and the participants are meeting for four workshops and doing group projects on topics relevant to teaching and learning in biology. The projects aim to enhance skills training alignment through the curriculum, map and balance course workload for students, and better align courses and learning (see WP3 and WP4). In addition, the Collegial Project course will contribute to develop Scholarship Teaching and Learning (SoTL) among our teachers.

**PhD/postdoc – course in teaching Lygra.** On the June 2-3, bioCEED offered a Pedagogic Training Course targeted at PhDs & postdocs with teaching duties. This group contributes a large fraction of the teaching at Universities, but typically receive very little pedagogic training. The course took place at the Heathland Centre, Lygra, and was led by Professor Arild Raaheim. Central themes were efficient teaching methods and students' learning. Course diploma was issued for completing the course. Number of participants: 18 (from BIO and AB).

### **Quality enhancement**

The programme board at BIO has established a practice of inviting the course leaders of all mandatory bachelor biology courses to present and discuss their course reports in board meetings. These reports are now becoming a source of evidence for educational change at BIO, with a growing number of high quality reports in place.

At UNIS, the Educational Committee (ECOM) has been established.

### **Recognition at UiB and nationally**

Christian Jørgensen and BIO100 was awarded the '[Læringsmiljøpris 2015](#)' from students at UiB. This was awarded for his effective teaching methods, and his engagement in the students. Upon accepting the prize, Jørgensen emphasized the collegial environment and bioCEED in the developments he had done. Jørgensen and Karin Pittman were awarded the national [Thon Prize](#), for teaching excellence, and Anne Gro Salvanes received a Thon Grant for developing new teaching methods.

### **Plans and priorities for 2016:**

🌿 **Continuing teachers' retreats (A5).** We will continue this now established bioCEED tradition, and we will also continue to develop the format and content of the retreat, and vary the theme over years, depending on departmental needs. At the time of reporting, we are in the process of selecting an appropriate location, theme, and time for the 2016 teacher's retreat.

- 🔗 **Teaching and learning course for staff and PhD students/ postdocs (A8).** There is a need to continue the training of PhD-students and postdocs in teaching and dissemination.
- 🔗 **Educational sabbaticals (A8).** We have had one outgoing and one incoming educational sabbatical (both with New Zealand). We will discuss the use of and aim for educational sabbaticals, and potentially target specific staff and/or courses with needs / plans for revision.
- 🔗 **Associate prof. II for student-active learning in bioCEED (A6).** Sehoia Cotner will be appointed in a 10% bioCEED position for three years starting in 2016. Cotner is a biologist with a main research focus on educational development in biology, with a particular focus on student active learning, research-based education, and research on biology students' learning. She will act as a resource for developing student-active learning methods, and for research on learning in biology, especially using quantitative tools like SCOPUS and TPI for mapping learning activities in our courses. Her contributions will be particularly useful towards the bioCEED mid-term evaluation.
- 🔗 **“bioCEED for all” - involving more BIO and AB staff actively in bioCEED activities (A8).** During 2015, 33 permanent scientific staff at BIO (73%) and an additional 9 other faculty (University Museum and adjunct faculty at BIO) and all scientific staff at AB participated in various bioCEED activities. While participation level is thus relatively high, there are still staff members that are not involved, and many of those involved participate in relatively low-effort activities such as the teacher's retreat, or at a specific seminar, etc. We are now developing plans to involve more staff, and involve them more deeply, in bioCEED activities. During spring 2016, we will tour the research groups with brown-bag seminars where we will inform about bioCEED activities and opportunities, aiming to reach out to and inform teachers/groups who are currently not sufficiently involved with bioCEED activities. The ambition is to activate untapped potential for educational development by involving more staff more actively in bioCEED activities/initiatives. AB will extend their literature colloquia and seminar at the department level to encompass all scientific staff at UNIS.





## Teachers retreat (BIO) and learning forum (UNIS)



Photo credits: Øystein Varpe, Emma Johansson-Karlsson, Inger Lise Næss.



## WP2 Learning environment – WP leader Sigrunn Eliassen

bioCEED aims to expand and develop the learning environment by effectively combining traditional approaches with novel field, lab, and digital approaches to support learning in biology education. In 2015 we have prioritized the development of a digital platform to support learning of transferable skill (bioSKILLS, see info box p. 16), with a special focus on numerical competence (bioST@TS). ArtsApp has also been under development, along with procurement and development of new equipment and platforms for active learning in various settings.

### **bioST@TS (A9, A10, A11, A12, A15, A29, A37)**

Statistics and mathematic modelling are important tools for biologists. Traditionally, general theory and numerical methods are taught early in the BSc, whereas the more applied perspectives are introduced later in the BSc or MSc when students learn to analyse biological data and model biological relationships. However, our experience is that students often lack basic skills and tools for tackling the challenges they meet in particular at the MSc level, and they are unable to activate the curriculum from the general mathematics and statistics courses for their biological course or project needs. With bioST@TS the aim is to streamline the teaching of statistics and numerical competences across our curriculum by

- 🔗 mapping the topics and tools used in different courses across the curriculum,
- 🔗 highlighting learning goals for numerical competence,
- 🔗 developing a coherent curriculum with a natural progression from BSc to PhD, and
- 🔗 providing an on-line resource platform with tutorials, learning material and examples for teachers and students to use.

The [online platform](#) is launched, and currently contains an introduction to spreadsheets and data manipulation, basic statistics, and tutorials in the statistical program R. While still under construction, the bioST@TS platform has already been made available to our first-year BSc courses. For instance, BIO100 (Fall 2015) has used the website to train students and provide them with assistance during exercises and exams. Course leaders at BIO101 (Spring 2016) have used bioST@TS to provide students with material and help with lab journals (January 2016). The aim is to further integrate the numerical aspects, practice exercises, and tutorials in the BSc level courses with a common set of references and also a clear progression in the skills training through the curriculum with focus on specific topics at each level.

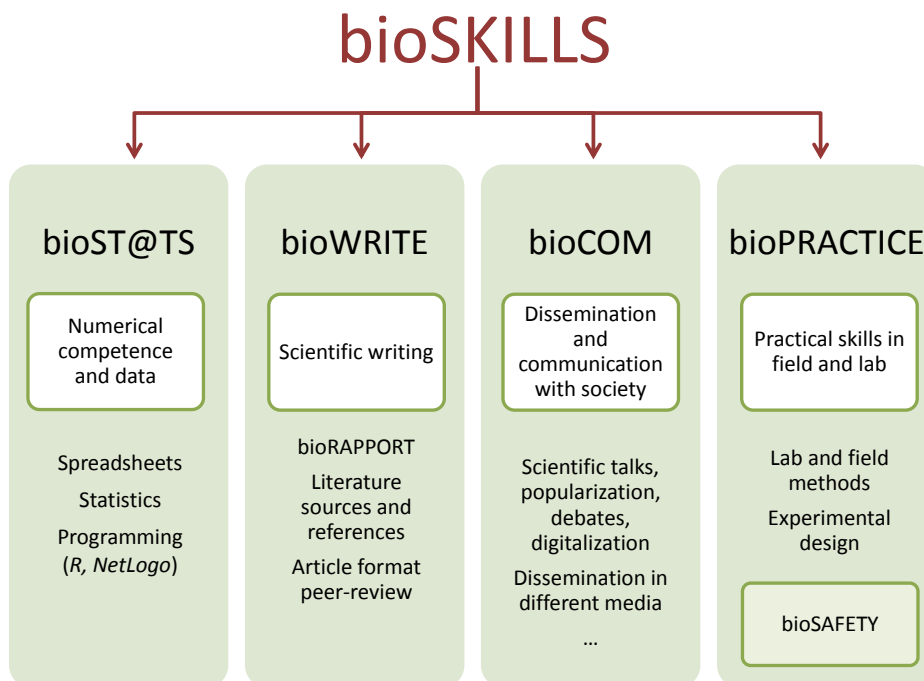
### **ArtsApp (A10, A12, A16, A31)**

An important priority for the field-course learning development has been ArtsApp, a digital species identification tool that has been developed by biology teachers and students at BIO. In collaboration with Centre for Science Education and the [Norwegian Biodiversity Information Centre](#), this app is now developed with full functionality for two species groups of plants, with geographical location information linked for one of the apps. In addition, students have developed pilot apps during field courses for macro algae and beetles (Carabidae). There is ongoing research on learning in biology linked to ArtsApp, including assessments of student achievement, intrinsic motivation and self-efficacy of ArtsAPP compared to the traditional learning method (identification keys in books), as part of Lucas Jenos' PhD research (see WP4). Read and see more about ArtsApp [here](#).

## ♣ bioSKILLS

With bioSKILLS we aim to:

- Focus on the importance of transferable skills in biology education
- Developing **learning goals** in numerical competence, dissemination, writing and practical skills in field and laboratory work at course and programme level.
- Streamline and link teaching and learning of skills throughout **the curriculum**.
- Focus on the skills training on relevance, methodology and practices - in close relation to **biological** applications and data.



### Podcast and video tutorials (A10, A12).

In collaboration with SFU MatRIC we are developing a series of high-quality video tutorials for introduction in basic statistical analysis. We have produced two videos which will be available online in 2016, and scripts and supporting material (animations) for 2-3 additional videos are being produced during the spring semester 2016. The videos will be used as a supplement to the classic teaching in statistics, but with a tight link between the numerical analysis and research questions, data and processes in biology.

### Digital learning tools (A10, A12, A14)

bioCEED has several projects developing and testing digital learning tools. In particular the use of student quizzes and **online feedback systems**, such as PollEv, has been implemented in several courses. The new **UIB learning platform** facilitates more interactive feedback and evaluation opportunities stimulating further development of the digital learning. We are offering students at all

levels a variety of learning tool in the form of digital support tools, and online tutorials in addition to podcast of seminars and lectures. **Blogging** is used actively as a learning, reflection, and assessment tool in several courses.

### **Climate stations (A10, A12)**

Weather stations installed at Lygra and Østerbø continuously store and transmit weather data. Data are collected on servers at UiB and made publicly available via the platform [www.bergensveret.no](http://www.bergensveret.no). In parallel, data are stored locally at bioCEED for preparation of future teaching activities linked to climate and climate change. Climate and climate change perspectives are important and the data enable students to actively monitor and study applied perspectives of climate adaptations and change.

### **Work practice (A10, A15, A17)**

One of the main hypotheses in bioCEED is that internships or placements in research, industry and the public sector can support learning also in disciplinary subjects like biology education. In 2015 BIO started offering internship-courses (BIO298 and BIO198) for biology students, enabling them to gain work experience for credits. These courses supplement the already existing research project course (BIO299), where students could conduct a small research projects under supervision. [Students blog](#) to document and spread their experience with work practice. Research on learning in a placement setting is conducted as part of Torstein Hole's PhD work.

### **Support staff (A13)**

We have recruited excellent educational support; a Chief Engineer for educational support at BIO and a Teaching Executive Officer at UNIS that both have a dedicated bioCEED focus. They give technical support to field and lab, courses, assist in video production and website development, and participate in various project including TE2LE and bioSKILLS (bioLAB, bioCOM, bioST@TS). The academic affairs administration at BIO and AB are actively involved in bioCEED projects and academic development work.

### **Plans and priorities for 2016:**

#### **🔗 bioSKILLS - transferable skills and practice in research, dissemination, teaching and practical field and lab methodology (A9, A10, A11, A12, A15, A20, A22, A29, A37)**

We are extending the bioST@TS concept to include a wider range of transferable skills, including academic writing, dissemination, and practical skills in the lab and field. The bioWRITE, bioCOM, and bioPRACTICE projects are under planning (see info box p. 16). A main focus will be on:

- **Web based resources** - further develop the bioSKILL platform including online tutorials, exercise and help pages. Emphasis on user interface, including the graphical presentation and content organization will be important at this next step.
- **TE2LE** - as part of the bioSKILLS project, several studies will be conducted during spring and fall 2016 where students involved in lab/field courses will produce tutorials in statistics of lab/field methods. Research on active student learning and creativity will be conducted as part of Anne-Laure Simonelli's postdoctoral work.
- **Pilot courses** Several courses both at BIO and UNIS will have a special emphasis on transferable skills training, including workshops and team based education in academic

writing, science talks and statistics (BIO100, BIO101, BIO103, BIO102, AB 201, AB202, AB203, AB204).

- **bioRAPPORT** – a common format for lab and field reports will be developed in collaboration between educators at the BCs level.
- 🔗 **Oracle service** is under development. Based on topic and level there will be experts, both staff and PhD students/postdocs, available to discuss student project and answer questions.
- 🔗 **Anatomy podcasts.** Production of a series of videos in fish anatomy that will tie together the theory (normally given through lectures) and the practical (lab course in fish anatomy). Professor Emeritus Harald Kryvi has repeatedly been recognized for his excellent pedagogic skills and highly interactive style during lab courses, and he will be featured in a series of short video presentations on that students can use to prepare for labs. This project is in cooperation with DigUiB at UiB.
- 🔗 **LMS.** Implementation of a new **learning platform** at UNIS.
- 🔗 UNIS is planning a **new building**, and bioCEED will take an active role in the planning phase to advocate development of rooms and facilities designed for more active student learning.

## Filming the first bioST@TS videos in Kristiansand, UiA

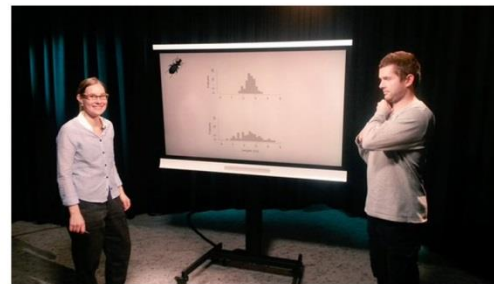


Photo credits: Lucas Jenø, Jonathan Soulé

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## WP3 Active students – WP leader Tove Gabrielsen/ Janne E. Søreide

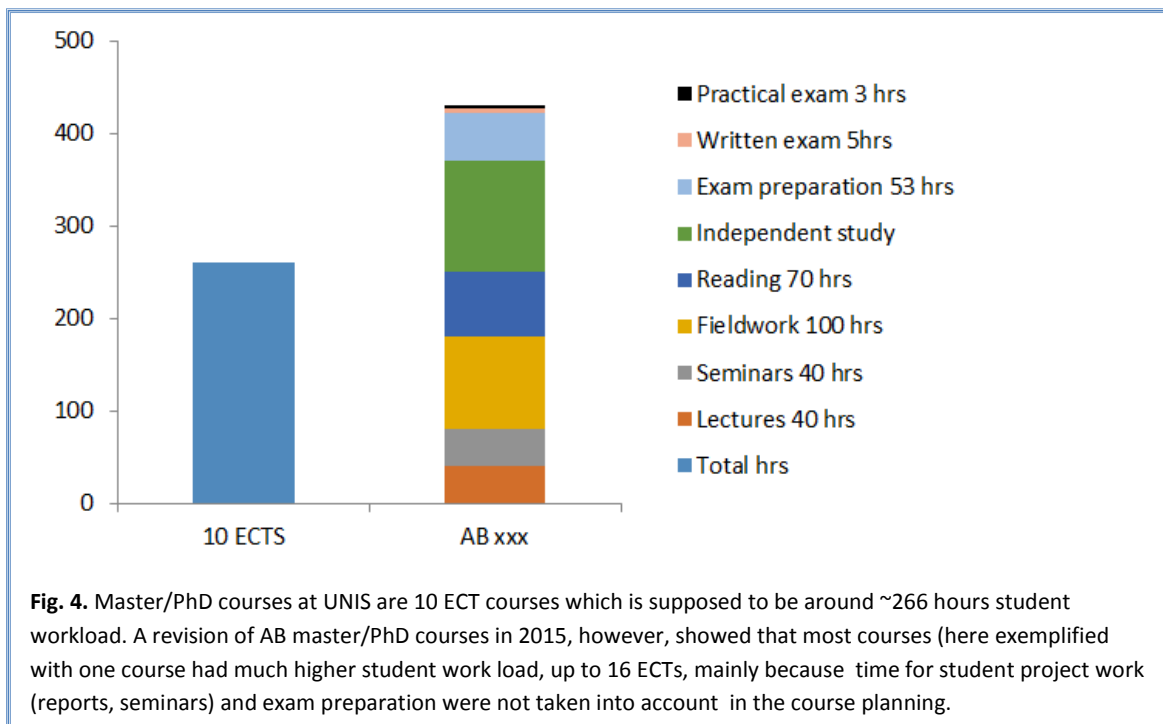
In WP3 we are actively working with redesigning our study programmes and courses. The aim is to set clearly stated learning outcomes and to achieve alignment between curriculum, learning activities and assessments to fulfil these learning outcomes. To improve the learning environment we also aim to enhance student-active learning. Activities in WP3 are tightly linked to WP1 and WP2. A full overview of activities can be found in appendix 5.1. In 2015, we have prioritised mapping student workload and activities in our courses, developing and researching new learning methods, and experimenting with placements in the private and public sector as a learning method in biology (PRIME).

### Redesign courses to enhance student learning (A14)

An investigation of the student workload<sup>3</sup> in AB courses revealed that the overall student workload were too high, particularly in master/PhD courses which commonly run over 4-5 weeks (Fig. 4). As a consequence of this mapping and report, many course leaders started reducing curricula and reorganize courses in 2015 to improve course alignment. A similar project is underway at BIO.

A critical review of the assessments methods were also started in 2015, both at BIO and AB, which resulted in changes. Students are now commonly evaluated by several different criteria within one course (e.g. report, oral/written exam, presentation and practical projects in groups). At AB, focus has been to ensure that students experience a variety of learning activities and assessment methods that do not overlap among courses.

bioCEED actively encourage and support teachers in testing and implementing student active teaching methods, like team based learning (in 2016 5 courses will start TBL at BIO and AB).



<sup>3</sup>Calculated using the methods in Karjalainen et al (2006). *Give me time to think. Determining student workload in higher education.* University of Oulu and Raaheim, A. (2013). *Råd og tips til deg som underviser.* Gyldendal Akademisk.



### **Transferable skills, learning-to-learn (A15) and student involvement (A16)**

A major project within these actions (A15, 16) is bioSKILLS (see WP2), where focus is on developing transferrable skills across the curriculum. Other examples of transferrable skills training are e.g; popular science communication of results (e.g. video making in AB203), and communicating “hot” biological topics through blogging in BIO347 and BIO298.

The students have been involved in bioCEED through regular **open student meetings**. The goal of these meetings is to get the students’ opinions on the different aspects of bioCEED’s work, by discussing subjects such as what makes good teaching and different teaching and learning methods. Biologists from the community were invited to one of the student meetings to give presentations of how their biology education aided them in their careers (AB). It is the student representative’s job to plan, coordinate and report outcomes from these meetings. bioCEED team members contribute to the discussion and content for the meetings. The goal is to have one or two student meeting within a calendar year at both AB and BIO. In 2015 there were two meetings at AB and one at BIO. This feedback is very constructive and will help bioCEED to focus our activities in alignment with student needs and interests.

In addition to the student meetings bioCEED’s student representatives coordinate **student seminars**. Topics for these seminars are set by the students, either by talking to bioCEED student representatives or using the bioCEED mailbox by the main entrance at BIO. The seminars focus on learning-to-learn and study skills (e.g. time management, group work and exam preparation. See App. 5.2).

### **Internships in the public and private sector (A17)**

**Learning through Practice in the private and public sector.** A major achievement in 2015 was the funding of the research project *How implementation of PRactice can IMprove relevance and quality in discipline and professional Educations* (PRIME) from the Norwegian Research Council FINNUT call. PRIME allows research on students’ experiences and learning in Internships and practice placements in the public and private sector. The placement courses BIO198 and BIO298 ran for the first time in spring semester 2015, and they now run every semester with increasing student numbers and with glowing feedback from students and placements hosts. The students blog about their experiences (read more [here](#)). IMR is closely involved in this work, both as a practice host and through arranging meetings with the other hosts. See also WP2 and WP7.

**Research Practice.** BIO has been running research internship courses for BSc students for several years (BIO299, 10 ECTS), and equivalent courses will start at AB in 2017 (Research Project in Arctic Biology, 15 ECTS). These courses give insight into ongoing research at UIB and UNIS and give students the opportunity to conduct their own defined research project, and us an opportunity for comparative research on practice courses in very different settings.

## **Provide certification for key skills (A18)**

In 2015, UNIS started to introduce cruise certificates (AB202) and this will be continued and improved in 2016. Students highly appreciate such certificates and actively use them as part of their CV. With UNIS as a model, bioCEED is developing a health, safety and environment course for biology students, with focus on field and lab HSE. The course ensures that master students at BIO have the necessary knowledge and competence to accomplish their MSc project at the lab, on cruise or on field in the best and safest conditions. In parallel, safety procedures are upgraded via implementation of new technologies. In 2015, BIOs MSc students tested a system for electronic registration of field activities. Additionally, a selected group of students tested a new procedure for immediate reporting of emergency situations in field via two-way satellite communication devices. As the test period continues, a dialog with the HSE department at UiB is initiated to develop this system and the corresponding procedures at the university scale.

## **Learning biology**

We have started an [online photo contest](#) where contributors are asked to share pictures that illustrate 'Learning Biology' in the widest possible sense on Instagram, Twitter, and Facebook. The students get challenged to think about when and why leaning happens, the winners get a cash award, and we get publicity and photos of varied learning situations.

## **Plans and priorities for 2016:**

- 🔗 **Course transformation.** Revising our courses to increase student-active learning, adjust workloads to realistic course expectation, and alignment of course and assessment with learning goals to promote effective student study behaviours will be continued in 2016.
- 🔗 **Student active learning.** Several courses have changed teaching and will now use student active teaching methods in 2016 (see WP3 App. 5.1).
- 🔗 **Dialogue meetings with students.** Continue the open meetings and workshops with the students at BIO and AB. Mid-term evaluation at AB has proven useful and will be continued.
- 🔗 **Improve student evaluation forms.** We will revise the student questionnaires and include more targeted bioCEED questions. This is to (1) make these evaluations more constructive and (2) enable measurement of outcomes of bioCEED activities (our effort of changing from a teacher-focused to an active student-focused learning form).
- 🔗 **Certification.** More formalised training of PhD candidates when it comes to teaching. BioCEED aim to offer PhD students to build up a teaching portfolio and to achieve a teaching certificate during their PhD degree.
- 🔗 **Internships.** As part of PRIME, BIO and AB students will be offered relevant internships, and we will research the impact of these internships on student motivation and learning.

## **🔗 #LearningBiology team**

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## #LearningBiology2015 Photo Contest



Photo credits: Inemox, hildesofief, 1drelygre, agajulie, petra\_svaskova and valeriyaandreivna @ Instagram.

## WP4 Activity alignment – WP leader Arild Raaheim

Aligning all activities so that curricula, learning approaches, assessment, and expected learning outcomes are well aligned, not only within specific courses but also across the curriculum is a considerable challenge. In 2015, bioCEED has worked towards this goal in the following ways:

### **Quality assurance and alignment (A19, A14, A23)**

The programme board at BIO has continued its work towards securing high quality course reports, and will actively use these reports in quality enhancement and development. At AB they will increase use of midterm student evaluations (see WP3) and improve student evaluation forms to give relevant feedback to teachers and administration/management.

Members of staff coordinating teaching programs have, in cooperation with representatives from bioCEED, worked on a systematic investigation of relevant courses in order to secure that ways of teaching and assessment are aligned with stated learning outcomes (constructive alignment).

In line with our stated objectives, changes have been made in order to reduce number of (traditional) lectures. Starting in January 2016, team-based learning is introduced in several courses (BIO201, BIO301, BIO210, AB201, AB202), and a systematic evaluation of students' expectations, experiences and learning outcomes, will be performed as part of PhD projects.

Using a standardised *Study Workload Calculation Sheet*, we have started a project which aim is to get a better overview of the time students spend on different learning activities. The results from this project will supply us with useful information when planning future teaching and learning activities.

### **Institutional learning (A20, A22)**

Associate Professor Roy Anderson from LTH Lund, is giving the **Collegial Project Course** –a collegial course on teaching and learning in biology targeted at experienced faculty teachers at BIO and AB. The projects of the 2015/2016 cohort (16 participants) focus on aligning numeracy and scientific writing through the BSc, student workload, and alignment (See WPs 1-3).

Similarly, we have developed a Teaching course for PhDs and Postdocs (see WP1).

**bioCEED student seminars** (see WP3) and the **bioCEED seminar series** (see WP1) are important meeting points and arenas for learning and sharing.

The two **PhD candidates** have been working on developing surveys of learning in biology targeted at biology students, teachers, and administrative staff. These surveys, along with our national survey of biologists in the workforce, will be a core data source for these students PhD research. See box on p. 26 for summary of main activities of the PhD students.

**Master projects.** A MSc student at the teacher education programme is involved in researching learning strategies in biology, and in developing a mapping tool for transferrable skills. One master student (Integrated Teacher Programme with Master in Science) is using data from the project "Together for better learning". Another MSc project investigates multiple choice as assessment form in BIO-courses. In cooperation with NOKUT we are also offering Master Scholarships for relevant projects.



## **Plans and priorities for 2016:**

### **🔑 The bioCEED Survey of learning in biology (A19).**

Comprehensive surveys among students, faculty, administrative personnel and workplaces were conducted in 2015. Data from these surveys form the basis for future cooperation with workplaces, as well as initiatives towards improvement in teaching and learning activities. A report that summarizes the results will be distributed to workplaces, participants and relevant parties.

### **🔑 Scale educational effort (A20, A23)**

We continue efforts related to the initiation of alternative teaching programs and alternative forms of assessment. These efforts are subject to systematic evaluation and reporting (e.g. PhD projects).

#### **bioCEED will:**

- Survey student time budgets at AB
- Perform work load calculations at all courses and programmes at BIO
- Monitoring teaching, aiming to reduce lecturing by 20% relative to 2011.

### **🔑 Project: Together for better learning (A30, A31, WP6).**

This is a co-operation between bioCEED, Faculty of psychology, Faculty of medicine and dentistry, and Faculty of humanities at UiB and SFU CEMPE. All participating partners have some external placement as part of their educational programme. The aim of the project is to map students', teachers' and external partners' experiences, and to compare different practices in order to establish a better understanding of how and what students learn in/from practice. This project continues into 2016. Results from the project will be reported in scientific journals. We will also organise a workshop with invited representatives from higher education institutions and workplaces.

### **🔑 Transferrable skills training (A22)**

Work related to mapping specific transferrable skills in biology education across our curriculum, following the work plan developed for biostatistics continues into 2016. We will identify practical skills and general competences taught in the different courses at BIO/AB (e.g. scientific writing, presentation, literature search, critical thinking, etc.), and develop comprehensive training in skills and general competences across the curriculum.

### **🔑 Seminar/workshop (A19, A22, A23) with focus on learning outcomes and the relationship between learning outcomes, teaching and assessment (constructive alignment). This seminar will be open to interested parties, and will include contributions from external parties, as well as from members of bioCEED.**

## 🔗 PhD and Postdoc projects

### **PhD Lucas Jenö: The antecedents and consequences of students' autonomous motivation**

Jenö investigate biology students' motivation and perception of the learning environment, and how this affects their academic achievement and learning. Experimental and quasi-experimental studies will be used to investigate how different teaching methods affect academic achievements in our BSc in biology. He will also do a cross-sectional assessment of achievement, dropout, and school satisfaction based on data from the bioCEED Survey. Finally, he will do a meta-analysis of how learning environment impacts on motivation and academic achievement. The data for the three first papers has been collected. Jenö has also assisted teachers to BIO in implementing new teaching methods, and has given student seminars on motivation and learning.

### **PhD Torstein Nielsen Hole: The role of practice learning in tertiary level biology education**

Practice or internships have potential to prepare students for employment, help them develop key skills, provide motivation, and reinforce campus-based learning activities. Practice as a pedagogical approach is widely accepted in professional educations such as teaching, medicine and nursing. Internships or work practice is less used in disciplinary tertiary educations like biology, and Hole will therefore make use of new practice courses developed through bioCEED / PRIME bioCEED/PRIME to study biology students' learning and reflections (based on data from student blogs) before, under and after a practice course. In second study he will investigate perceptions of different stakeholders (teachers, students, workplace and university leadership) to practice education, based on data from the bioCEED Survey 2015, augmented with data from stakeholder interviews in 2017. Finally, Hole will also study student learning during field work through observations and interviews.

### **Postdoc Anne-Laure Simonelli: Acquiring transferrable skills in biology**

Simonelli is interested in transferable skills, and especially how, when, and why students acquire such skills through the diverse experiences they encounter as biology students. She focuses on collaboration, critical thinking, communication and creativity, and maps the development of these skills in different learning situations. What is the role of interdisciplinary experiences and with the sciences education - society interface? The studies are based on interview data. Another approach to creativity in science is explored in the "Write a cutline" contest where students are asked to send a picture and a brief accompanying text to the "Learning biology" photo contest. This will be used to assess the creativity and communication skills of the students. Finally, in the "Teach to Learn" project students will create short tutorial videos for their peers, and gain important communicative, pedagogical and collaborative skills. The project will contribute to the bioCEED digital platforms with student-generated tutorials on different bioSKILLS (i.e. field; lab, statistical and writing skills).



## WP5 Educational leadership – WP leader Øystein Varpe

Educational leadership is key to developing educational quality. Educational leadership is needed to develop coherence and alignment across the curriculum, for furthering a collaborative rather than privatized teaching culture, and for valuing and ‘seeing’ efforts and development towards improved education. New practices, like developing a scholarly culture of teaching and learning, also requires inputs and a consistent encouragement from leadership. Leadership should be supporting, not commanding, and it is important that we also value and protect the individual staff members’ academic freedom to choose their own teaching style, method, and specifics of the curriculum, just as we value and protect the same academic freedoms in research. These directions require attention among university leaders and the same leaders need to be given arenas to discuss and learn about opportunities and alternative approaches. In 2015 bioCEED have worked towards:

**Facilitating national exchange of best practice.** We have established a National Forum for Educational Leadership, intended as a cross-institutional meeting and learning platform for Heads of Education (in Biology) at Norwegian universities. First regular meeting is at NMBU, 31 March 2016. Particular efforts have been taken to coordinate the new Forum with the existing Biofagrådet.

**Strengthening educational leadership.** BIO have obtained considerable experience with a dedicated Head of Education. The role is well established and experience so far in the process of being summarized and reported on. At UNIS the Education committee (ECOM) where Heads of Department meet to discuss and decide on education have been supported by bioCEED on several issues, including the annual UNIS Learning Forum.

**PhD and postdoc teaching.** We have continued our work to improve the allocation of PhD teaching hours and professionalise the use of the teaching resource that PhDs and postdocs represent.

**Incorporating teaching in staff reward systems.** The institutional departmental ‘accounting systems’ for scientific and educational output / success and teaching time management systems, educational prizes, etc., are all under revision.

**Strategic planning.** We are actively involved in ongoing strategy processes at both institutions. At AB the work on a new strategy has started and will be completed in 2016. BIO is similarly in the process of writing a new strategy. bioCEED perspectives are central both processes, particularly in aligning teaching and research. bioCEED have actively promoted a more balanced institutional valuation of research vs. teaching efforts towards UiB leadership, as this is key to increase the status of teaching. Recently UiB changed the salary policy to explicitly incorporate this balance. We are also working with UiB towards certification schemes that more explicitly recognising educational excellence among our teachers.

**Supporting competence and securing meeting places:** We have worked with the leadership at BIO and UNIS to secure various mechanisms for building competence and collegial collaboration over Teaching and Learning, including brown-bag seminars, colloquia, bioCEED seminars, Collegial Teaching Course, using the programme board efficiently, and general promotion of educational efforts and systematic work towards improving Teaching and Learning in all communication. The bioCEED Survey contains important data on how the current institutional support for teaching is perceived, received among staff, and opportunities for improvement.

**Dissemination.** bioCEED has given several talk and contributed to seminars and workshops on educational leadership, both internally and externally (see Appendix 5.2).

### **Plans and priorities for 2016:**

- 🔑 **National Forum for Educational Leadership in Biology.** Establish and run this new network and meeting place, including first national meeting coming up in March 2016.
- 🔑 **Literature review.** Continue our work on a review about research on educational leadership and relate it to the structures currently in place in our local institutions and departments, as well as at the other Norwegian universities.
- 🔑 **Meeting and learning platforms within departments (cf. WP1).** Continue our investment of time and resources into our colloquia series, bioCEED seminars, Teacher retreats etc. This to secure a stable and rich arena for exchange of ideas and for building a common knowledge base on theories and practices in teaching and education, including leadership practices.
- 🔑 **Leadership.** Continue empowering our ‘education leaders’ and establish these as part of our institutional organizations
- 🔑 **Strategy.** Ensure solid implementation of education in the department level strategies currently being developed.
- 🔑 **Reward.** Continue work towards incorporating teaching and education efforts and success into staff reward systems, including inputs into salary, sabbatical, and promotion regulations.
- 🔑 **Communication.** Explicitly promote education in our internal communication.

## WP6 Spread of ‘best practice’– WP leader Arild Raaheim

Dissemination and outreach from bioCEED has now reached a more operational stage. During 2015, our dissemination activities have evolved from the early-stage focus on bioCEED and its goals and background towards communication over projects, ideas and results. This has taken place both locally within our institutions and at the national and international level. As detailed in the bioCEED supplementary information to the application, our dissemination strategy and goals differ between scales (local, regional, national, international) and detailed WP6 reporting is therefore conducted under these four headings.

### **Local spread of best practice:**

Locally, bioCEED wishes to promote communication and sharing of experiences in biology educational development among the BIO and AB staff, and also to promote transferrable knowledge sharing within our institutions.

We now have several structures in place for sharing of best practice and experiences (see also WP1), some of these are also open for external participation, and we invite broadly for participants in our internal educational development for a, such as:

- 🔗 **bioCEED Seminar Series.** We are organising a monthly open seminar series over educational topics. These are streamed and podcasted seminars streamed, and therefore open to participation from outside.
- 🔗 **bioCEED web pages, twitter and Facebook accounts, and blogs (A29).** The bioSKILLS web pages and the tools developed there are open for external use.

Representatives from bioCEED are invited to contribute in meetings, seminars and workshops organised by different leaders at the University of Bergen, to give presentations on topics like:

- 🔗 Educational leadership; why, how, and in which context.
- 🔗 Assessment and learning; how can we best align assessment with learning activities and learning outcomes?
- 🔗 Going digital; digital exams and alternative ways of assessing students using technology (e.g. LMS).
- 🔗 On route to excellence; assisting departments and faculties in developing plans and strategies towards applications for Centre of excellence in university education.
- 🔗 Studying biology; reporting results from the different surveys conducted among students, teachers, administration and workplaces in 2015.

Some of these events have been organised specifically for department heads, programme leaders and senior administrative personnel. Other events have had an open invitation with participants from academic and administrative sector alike (see app. 5.2 for a full overview).

The WP leader has served as an expert for all faculties at the University of Bergen, commenting on all new study plans developed to meet NOKUT’s new standards. In total 15 full day meeting covering the months October-December (Faculty of Humanities, Faculty of Natural Sciences, Faculty of Social Sciences, Faculty of Psychology, Faculty of Medicine and Dentistry).

### **National spread of best practice:**

Nationally, bioCEED's dissemination strategy is to contribute to the development of biology education and to educational development in general. There has been considerable interest in bioCEED from across the higher education sector in Norway on both these fronts. We have been invited as speakers and panel participants at conferences and workshops across the educational sector in Norway, and we have been invited to write or contribute data about educational development in Norway. bioCEED has more actively taken initiatives to develop for a for dissemination and sharing in biology education. In the second year, we have prioritised communication about bioCEED results, and especially the bioCEED survey, ArtsAPP, and our work with developing the teacher culture based on Scholarship of Teaching and Learning (SoTL). See app. 5.2 for details.

- 🔗 During the reporting period, bioCEED has contributed 10 invited talks, 5 other talks and 8 other contributions in different fora.
- 🔗 The WP leader has been appointed leader of a national expert group on digital assessment (digital vurdering) 2015-2018 (Norgesuniversitetet).
- 🔗 We sponsored a session on 'ecology education' at the [Norwegian Ecological Society Annual conference in March 2015](#), which attracted >20 participants.
- 🔗 We have taken the initiative to develop an Educational Leader Forum under Biofagrådet as a meeting place for sharing experiences and discussing issues in biology education (See WP5)
- 🔗 We have attracted press coverage, and we are active on Twitter, Facebook, and in our practice blogs; contributing and commenting on bioCEED relevant issues in higher education, especially linked to student active learning, digital learning environments, teacher culture, and educational leadership.

### **International spread of best practice:**

Internationally, bioCEEDS dissemination strategy is more targeted towards sharing learning experiences in biology education. We have contributed talks and papers about bioCEED projects and findings at conferences and workshops internationally, and also at University Departments in other countries. We have also been invited to write or contribute data about educational development and at the European scale. Specifically:

- 🔗 We have given two keynotes at international conferences, at the FEBS-IUBMB Workshop on Education in Molecular Life Sciences and the [European First Year Experience conference](#), both of which got excellent feedback from the audience and organizers.
- 🔗 We have contributed 7 talks and given 5 other presentations at international conferences about higher education.
- 🔗 We co-arranged a trip for the BIO-leadership to Denmark (University of Copenhagen, DTU Aqua) and Sweden (Lund) to set up collaboration over educational development
- 🔗 We have recruited professor II's from Sweden (Roy Andersson, Lund) and the USA (Sehoya Cotner, Minnesota).
- 🔗 We have published two papers in international peer-reviewed journals.

### **Plans and priorities for 2016:**

- 🔑 We will organize a workshop with national and international participants around data from seven smaller projects under the project “Together for better learning”.
- 🔑 We are initiating plans for a conference on “Learning and teaching biology” to take place in 2017, in collaboration with DTU Aqua.
- 🔑 Results from the biology surveys will be published (general report, academic journals, media,
- 🔑 We will develop the web pages and streamline the bioSKILLS for external and internal users (Web forum A29)
- 🔑 Three international peer-reviewed publications are under preparation

## 🌱 Exchange of ideas and experiences across borders

bioCEED has during 2015 continued established initiatives and started new ones in order to increase the international collaboration. Last year, Pernille Bronken Eidesen spent parts of her sabbatical at the University of Otago, New Zealand. University of Otago is in the forefront of New Zealand universities in teaching, and has a good reputation for teaching standards internationally. In 2002, the Ecology program at the University of Otago was redesigned to implement inquiry based learning throughout the degree program with the intention of providing more research activity for bachelor students. To learn more about their teaching philosophy, Eidesen was back in New Zealand in February 2015 to join one of the main courses in the Ecology program. In return, Professor Kath Dickinson from the Botany Department at Otago University joined a bachelor field-cruise in Terrestrial Arctic Biology at UNIS, Svalbard (August 2015). Dickinson is strongly committed to research-informed teaching based on inquiry-based learning. This exchange generated mutualistic benefits, through generation of new ideas, exchange of knowledge and constructive feed-back. New teaching methods inspired by this exchange are already implemented in UNIS Bachelor courses with good feed-back from students.

International collaboration are further secured through two adjunct professors currently affiliated with BioCEED; Roy Andersson (Lund University, Sweden), and Sehoya Cotner (University of Minnesota, USA). Both are already involved in pedagogic training of faculty. Cotner has also initiated a comparative research project where data will be collected from BIO (UiB), AB(UNIS) and University of Minnesota, focused towards measures of teaching activity, engagement and learning. bioCEED has participated and contributed to several international conferences and seminars during 2015 (see app. 5.2), and bioCEEDs PhD student Lucas Jenö was a visiting scholar at the University of Rochester, New York, USA Aug-Oct 2015. He was invited by Professor Edward L. Deci and funded by WUN Research Mobility Programme.



Similar learning strategies can be used in very different ecosystems. Tree fern, New Zealand (left.), and Professor Kath Dickinson at Amsterdamøya, Svalbard (right.)



## WP7 Linking education and society – WP leader Gro van der Meeren

The main priorities under WP7 in 2015 have been to continue the work on the bioCEED survey, PRIME internships, and the annual career day at BIO. These activities are proceeding well according to plan. Internships have been offered for students, and 20 students have completed internship in 2015. Their blogged experiences can be read [here](#) (in Norwegian).

**The bioCEED Survey (A38)**, see box p. 34) was sent out to more than 500 participants in 43 public and private companies / organisations in 2015.

**Internship courses (A17)**. We have developed two new courses at BSc level offering internships in the public and private sector ([read more](#)). So far, 12 companies have signed agreements to receive students. The companies span from governmental institutes, public school, private research centres and NGO-run nature- and environmental workplaces. There is potential for expansion, as PRIME established contact with 43 companies / institutions during the mapping of relevant employers in 2014. After the internship periods, students gathered for a discussion of their experiences. The courses will continue and are announced for the spring term 2016, with ca. 20 applicants.

### **Sector contact in courses (examples):**

The first-semester introductory course in biology at BIO has had a practice day with the IMR.

[The course AB-335 Ecosystem-based Management of Arctic Marine Systems](#) at UNIS allows students first-hand experience with IMR research through participation in a 10-day cruise where they [work along-side researchers](#)

**Annual Career day (A33)**. Students, in cooperation with bioCEED, arrange an annual Career Day for Biologist. We are organising a meeting place for BIO students and relevant potential employers in April each year. The students arrange the day, with support from bioCEED and IMR.

### **Plans and priorities for 2016:**

Priorities in 2016 will be to follow up ongoing activities, and also to communicate over bioCEED at sector-specific fora. Presentations and posters at conferences will be prioritized. Initiatives towards a workshop with internship companies, for discussions between these on how the internship courses have been working, are in progress. The aim is to evaluate the experiences and procedures, and make suggestions for improvements to make the internship experience equally valuable for both students and companies.

- 🔑 IMR-day within BIO100. Questionary.
- 🔑 Collaboration between educational institutes and researcher/projects/ management tasks at the IMR Invite students for faunistic analyses on marine invertebrates and fish
- 🔑 Annual career
- 🔑 PRIME internship, prepare a series of short-term internships for the Bachelor level and longer-term internship for the Master level
- 🔑 Publish the bioCEED Survey
- 🔑 Arrange a one-day workshop for internship companies, IMR and UIB/UNIS, to evaluate and discuss improvements for the internship courses

## ♣ The bioCEED survey

The bioCEED Survey 2015 is a baseline study of major tertiary-level biology educations in Norway. The survey addresses themes such as learning in practice, transferable skills, motivation, laboratory and field learning, didactical approaches specifically relevant to biology education, knowledge needs and experiences of biologists in the workforce, etc.

The bioCEED Survey 2015 reports the results from four separate sub-surveys mapping the experiences, attitudes and opinions of students (sent out to 1771 subjects; 43% response rate) and teaching staff (486; 48%) from nine Universities and University Colleges in Norway, biologists (338; 68) employed at 43 workplaces in the private and public sector, and administrative and technical staff (49; 65%) to at the University Centre at Svalbard (UNIS) and the Department of Biology at the University of Bergen (BIO). The survey includes items developed by the bioCEED team and items adapted of published student and educational surveys.

Examples of findings from the bioCEED Survey (below): Students describe a variety of good learning experiences, many of which relate to *linking* different learning practices and bodies of knowledge. First-year students report to struggle more with *how to study effectively* that with the subject content.

### “Describe a good learning experience”

“when theory and practice ‘click’”

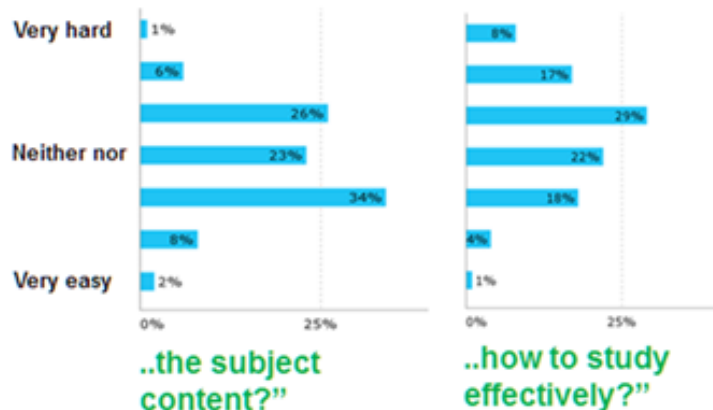
“dissecting a rat!”

“being a lab assistant – teaching others”

“EUREKA experiences – when you see the links”

“colloquia, discussions, explaining to others”

### “In your first year, was it easy or hard for you to understand...”



## 4 Appendices

### 4.1 Plans vs. activities in 2015

	<i>Indicators of progress</i>	<i>Achievements</i>	<i>Milestones and deliverables</i>			
			i	ii	iii	iv
<b>WP0: Leadership and coordination (BIO)</b>						
<b>A1</b>	Effective organisation and decision-making structures	<ul style="list-style-type: none"> <li>Steering group</li> <li>Board in the operation</li> </ul>				
<b>A2</b>	Set up and maintain physical and virtual infrastructure	<ul style="list-style-type: none"> <li>Office area in BIO</li> <li>Web page in place</li> <li>Facebook, Twitter, Blogs</li> </ul>				
<b>A3</b>	Advisory Board	<ul style="list-style-type: none"> <li>AB meeting planned March 2016</li> </ul>				<b>M</b>
<b>A4</b>	Daily management, monitoring and reporting	<ul style="list-style-type: none"> <li>Weekly steering group meetings</li> </ul>				<b>D</b>
<b>WP1: Teacher culture (BIO)</b>						
<b>A5</b>	Annual teachers retreat	<ul style="list-style-type: none"> <li>Teacher's retreat 2015 in BIO &amp; AB</li> <li>Learning Forum AB</li> </ul>				<b>D</b>
<b>A6</b>	Professor II positions	<ul style="list-style-type: none"> <li>Two appointed</li> </ul>				<b>M</b>
<b>A7</b>	Teacher groups	<ul style="list-style-type: none"> <li>TG in in operation BIO, AB</li> <li>Monthly seminars on education</li> <li>Literature colloquia at department level AB</li> </ul>				
<b>A8</b>	Teaching renewal through pedagogic courses and exchange	<ul style="list-style-type: none"> <li>Teaching course for PhD &amp; Postdoc course</li> <li>Collegial Project Course in Biology Teaching</li> <li>Pedagogic course offered UNIS staff every 2<sup>nd</sup> year (UPED)</li> <li>Sabbatical year (P.B. Eidesen, NZ)</li> <li>Participation at workshops on teaching and learning, TBL, teacher culture etc.</li> </ul>				
<b>A9</b>	Web forum	<ul style="list-style-type: none"> <li>bioSKILLS resources on web</li> <li>Facebook pages</li> <li>Practice blogs</li> </ul>				
<b>WP2: Learning environments (BIO)</b>						
<b>A10</b>	Expand learning environment; field, lab, digital	<ul style="list-style-type: none"> <li>bioST@Ts</li> <li><i>develop bioSKILLS</i></li> <li>ArtsApp, Podcasts &amp; video tutorials</li> <li>Digital learning tools</li> <li>PRIME practice placements</li> <li>Climate stations</li> <li>Moving more teaching activity from class room to field (AB)</li> </ul>				<b>M</b>
<b>A11</b>	Develop student spaces	<ul style="list-style-type: none"> <li><i>Oracle service under development</i></li> <li>bioST@Ts</li> <li>UNIS is in the process of planning new buildings. AB input to the planning on need for more and new kinds of student space</li> </ul>				
<b>A12</b>	Set up and experiment with digital tools for education	<ul style="list-style-type: none"> <li>ArtsApp, Podcasts, PollEv &amp; video tutorials</li> <li>bioST@Ts</li> <li>photo database of arctic marine species and nature types built by students in AB202</li> <li><i>Anatomy podcasts under development</i></li> </ul>				<b>D</b>

<b>A13</b>	Dedicated educational technical and administrative staff	<ul style="list-style-type: none"> <li>Educational technicians</li> <li>Educational administrative support staff</li> </ul>				
<b>WP3: Active students (AB)</b>						
<b>A14</b>	Redesign courses to enhance student-active learning	<ul style="list-style-type: none"> <li>Work load mapping</li> <li>More varied and better aligned assessment forms (AB)</li> <li>BSc courses – coordination of skills, knowledge, student active learning and different types of assessment</li> <li>Include questions of change and development in teaching in student evaluation forms</li> <li>Student active learning (TBL, field, seminars) tested in several courses (e.g. AB201, AB202, BIO201, BIO210, BIO301) – reduce amount of lecturing</li> <li>PhD study learning on field courses</li> </ul>				<b>M</b>
<b>A15</b>	Integrate learning-to-learn skills across curriculum	<ul style="list-style-type: none"> <li>Focus on problem-solving, individual and group work, scientific writing, presentations training and review (give constructive feedback (AB courses)</li> <li>Societal skills – communicate results in popular scientific way (video, blogs, presentations – AB203, BIO298, BIO347 etc.)</li> <li>Mapping of skills training</li> <li>bioSKILLS</li> <li>Research-based education</li> <li>Hands on experience</li> </ul>				<b>D</b>
<b>A16</b>	Use students actively in planning and education activities	<ul style="list-style-type: none"> <li>Students do midterm and course end evaluation</li> <li>Use PhDs in teaching and course planning</li> <li>Use students in planning new learning platform (UNIS)</li> <li>BIO297 Field course teaching</li> <li>PhD teaching training,</li> <li>ArtsApp – students continue developing app</li> <li>Open meetings with students</li> <li><i>Oracle service under development</i></li> </ul>				
<b>A17</b>	Offer internships in public and private sector	<ul style="list-style-type: none"> <li>PRIME internships in society and research BIO198, BIO199, BIO298 BIO299</li> <li><i>Planned internship module in new AB-course</i></li> </ul>				
<b>A18</b>	Provide certification for particular skills	<ul style="list-style-type: none"> <li>BIO 297</li> <li>Safety course and marine cruise certificates given to students (AB)</li> <li>HES training of master students (BIO)</li> <li>Tested a system for electronic registration of field activities</li> <li><i>UNIS plan new educational unit; Dept. of Safety training – including courses in biological field work</i></li> <li><i>HES in lab and field</i></li> </ul>				

WP4: Activity alignment (HERU)						
<b>A19</b>	Develop quality assurance and evaluation methods	<ul style="list-style-type: none"> <li>Focus on quality assurance, evaluation, documentation</li> <li><i>Develop teaching accounting system</i></li> <li><i>Scale educational effort</i></li> </ul>				
<b>A20</b>	Use quality assurance in institutional learning	<ul style="list-style-type: none"> <li>Teacher course: Collegial Project Course</li> <li>Teaching course for PhDs &amp; Postdocs</li> <li>Meetings with decision makers locally and nationally</li> <li>Student seminars</li> <li>bioCEED seminars</li> <li>bioSKILLS</li> <li>bioCEED Survey</li> <li>Project: "Sammen for bedre læring"</li> <li><i>MSc theses, Teacher education, on learning and assessment in Biology</i></li> </ul>				
<b>A21</b>	Two PhD students in educational science	<ul style="list-style-type: none"> <li>PhD projects progressing as planned</li> </ul>				
<b>A22</b>	Experiment with, and research, new learning methods	<ul style="list-style-type: none"> <li>Student led teaching (AB203)</li> <li>TBL &amp; other new learning methods in several course. See A 14. The PhD follow up with studies.</li> </ul>				
<b>A23</b>	Reduce lecturing by 20%	<ul style="list-style-type: none"> <li>In progress. New teaching methods and workload mapping. (see WP3)</li> </ul>				
<b>A36*</b>	National survey of biology education	<ul style="list-style-type: none"> <li>National survey of learning in biology among students, teachers, and administrative staff completed – <i>to be published 2016 (Biologist Survey)</i></li> </ul>				M
<b>A37*</b>	Transferrable skills alignment	<ul style="list-style-type: none"> <li>Mapping biostatistics and writing skills across the curriculum</li> <li>Mapping of transferrable skills across the curriculum</li> <li>Mapping transferrable skills in learning outcomes</li> <li><i>MSc theses in Teacher education programme</i></li> </ul>				M
WP5: Develop educational leadership (AB)						
<b>A24</b>	Appoint and empower education leaders	<ul style="list-style-type: none"> <li>Educational leaders</li> <li>PhD and postdoc teaching</li> <li>National Forum for Educational Leadership</li> <li>ECOM (UNIS Education Committee) established</li> </ul>	D			
<b>A25</b>	Align teaching and research in institutional strategies	<ul style="list-style-type: none"> <li>Input to ongoing strategy and policy processes</li> <li>Various presentations</li> </ul>				
<b>A26</b>	Identify and remove obstacles to change	<ul style="list-style-type: none"> <li>Teacher course projects</li> <li>Secure meeting places to discuss and develop education (Teacher retreats, colloquia, seminars etc.)</li> <li>Educational leaders MN UiO visit UNIS</li> <li><i>Literature review in progress</i></li> </ul>				D
<b>A27</b>	Incorporate teaching efforts in staff reward systems	<ul style="list-style-type: none"> <li>UiB giving teaching and research equal status</li> <li>UNIS put more weight on teaching</li> </ul>	M			



		experience in recruitment process <ul style="list-style-type: none"> <li>• UIB working on reward system with bioCEED input</li> <li>• Teaching prizes</li> <li>• Meetings, presentations, debate participation, etc.</li> </ul>				
<b>A28</b>	Promote education in internal communication	<ul style="list-style-type: none"> <li>• Activities continue</li> </ul>				
<b>WP6: Spread of best practice (HERU)</b>						
<b>A29</b>	Develop web forum to freely-accessible 'idea-bank'	<ul style="list-style-type: none"> <li>• Monthly bioCEED seminars streamed</li> <li>• bioSKILLS</li> <li>• R Code Club</li> </ul>				
<b>A30</b>	Publish project results in the education science literature	<ul style="list-style-type: none"> <li>• 3 published papers 2015</li> </ul>				
<b>A31</b>	Develop 'test cases' for use in other institutions	<ul style="list-style-type: none"> <li>• ArtsAPP</li> <li>• Practice &amp; research project courses</li> <li>• Courses for teaching staff</li> <li>• Projects on teaching, learning, assessment, and course design</li> </ul>				
<b>A32</b>	Arrange and participate in international conference in biology education	<ul style="list-style-type: none"> <li>• Several contributions on national &amp; international conferences on education (see Outreach), e.g. EFYE, MNT, IICE</li> <li>• <i>Start planning of international conference in biology education in 2017</i></li> </ul>	M			
<b>WP7: Sector / societal communication (IMR)</b>						
<b>A33</b>	Annual meeting between students and industry/sector	<ul style="list-style-type: none"> <li>• Career day annually from 2012</li> <li>• Invite students to participate in IMR analyses</li> </ul>		M		
<b>A34</b>	Arrange workshops with end-user panels	<ul style="list-style-type: none"> <li>• Survey completed (PRIME), workshop to be held in 2016</li> <li>• Sector contact in various courses</li> </ul>		M		
<b>A35</b>	Present project results in sector-specific fora	<ul style="list-style-type: none"> <li>• see Outreach</li> </ul>				
<b>A38*</b>	National survey of biologists in the workforce	<ul style="list-style-type: none"> <li>• Completed, <i>results will be published in 2016.</i></li> </ul>				M

\*new work packages that have been planned and initiated after the project was funded.

## 4.2. Dissemination and outreach

### 4.2.1. Talks, seminars, workshops, conferences with bioCEED contributions

Title	Occasion	Contribution	2015	Speaker
<i>Fremragende, liksom? Om SFU-status, kvalitet i undervisningen, planer for utvikling av biologiutdanningen, og samarbeid med FOU og 'sektoren' [Like, excellent? On centres of excellence in education, quality in education, plans for developing biology education, and collaboration with research and 'the sector']</i>	Norwegian Biodiversity Facility, Trondheim	Invited talk	13 Jan	V. Vandvik
<i>Kvalitetskultur i universitetene og høyskolene - finansiering og utdanning.</i>	Kunnskapsministerens kontaktkonferansen med universiteter og høyskoler 2015, Oslo	Panel discussion participant	20 Jan	V.Vandvik
<i>Educational leadership and student active learning</i>	Seminar, Dept. of Clinical Dentistry, UiB	Invited talk	04 Feb	Ø. Fiksen
bioCEED	Strategisamling, Klinisk institutt 2, UiB	Invited talk	05 Feb	Ø. Fiksen
<i>Utvikling av meir struktur og mindre forelesing i undervisningen</i>	Conference: <a href="#">Utdanningsledelse for kvalitetsutvikling i studiene</a> , Tromsø	Invited talk	12 Feb	Ø. Fiksen
bioCEED and UNIS	Int. conference; New perspectives in Science Education, Florence, Italy	Poster	17-18 Mar	T.Gabrielsen
<i>Veien fram til SFU [roadmap to Centre of Excellence in education]</i>	Seminar at TVEPS, UiB	Invited talk	10 Mar	V.Vandvik
<i>Fremragende, liksom? Om veien mot SFU-status [Like, excellent? Towards a centre of excellence in education]</i>	Seminar, Central Committee for Education, UiB, Bergen	Invited talk	11 Mar	V.Vandvik
<i>Teaching ecology effectively – is there a formula?</i>	2 <sup>nd</sup> Conference of Norwegian Ecological Society: Ecological change, changing ecology	Workshop session	11 Mar	Ø. Fiksen & C. Jørgensen
bioCEED and UNIS	2 <sup>nd</sup> Conference of Norwegian Ecological Society: Ecological change, changing ecology	Poster	12-13 Mar	T.Dahl
bioCEED for ECOM	ECOM (Educational committee), UNIS	Invited talk	16-17 Mar	Ø.Varpe
<i>ArtsApp – et verktøy for enklere artsidentifikasjon</i>	MNT-konferansen 2015: Teach less, learn more, Bergen	Paper presentation	19 Mar	Jeno, L. M. & Grytnes, JA
<i>Korleis utnytte forskarkulturen for betre undervisningskvalitet?</i>	MNT-konferansen 2015: Teach less,	Paper presentation	19 Mar	Ø.Fiksen/V. Vandvik

	learn more, Bergen			
"Why higher education should encourage learner-centered education"	Ireland International Conference on Education, Dublin, Ireland.	Poster presentation	20 Apr	L.Jeno
<i>Promoting Transferrable Skills in Discipline (Biology) Education.</i>	Ireland International Conference on Education, Dublin, Ireland.	Poster presentation	20 Apr	T.Hole
<i>Fremragende, liksom? Om SFU-status, kvalitet i undervisningen, planer for utvikling av biologiutdanningen, og samarbeid med FOU og 'sektoren' [Like, excellent? On centres of excellence in education, quality in education, plans for developing biology education, and collaboration with research and 'the sector']</i>	Institute for Marine Research, Bergen	Invited talk	22 Apr	V.Vandvik
<i>Fremragende, liksom? Om den norske SFU-ordningen, veien mot bioCEED, våre ambisjoner, planer, erfaringer [Like, excellent? On the Norwegian Centres of Excellence in Education, the road towards bioCEED, our ambitions, plans, and experiences]</i>	Aarhus University, Denmark	Talk	29 Apr	V.Vandvik
bioCEED	Norsk Villreinsenter, UNIS	Talk	29 Apr	Tina Dahl
bioCEED	Copenhagen University, Denmark	Talk	11 May	V. Vandvik
bioCEED	DTU Aqua, Danish Technical University, Copenhagen, Denmark	Talk	12 May	V. Vandvik
<i>bioCEED senter for fremragende biologiutdanning. [bioCEED centre of excellence in Education]</i>	NOKUT-konferansen om høyere utdanning	Invited talk	18 May	V.Vandvik
<i>Undervisningsleiing – mellom to kulturar [educational leadership – between two cultures]</i>	NOKUT-konferansen om høyere utdanning	Invited talk	19 May	Fiksen, Ø., Førland, O., & Vandvik
<i>Excellence in education – natural selection or deliberate breeding?</i>	European First Year Experience 2015	Keynote talk	17 Jun	V. Vandvik
<i>Shift from teacher-centered to student-centered learning. Bottom-up and top-down changes in an institution</i>	European First Year Experience 2015	Paper presentation	17 Jun	L. Jeno
bioCEED intro and status	Dekanmøte, UNIS, Svalbard	Talk	20 Aug	PB Eidesen
<i>Korleis jobbar bioCEED med undervisningsutvikling</i>	Biologisk mangfold - natur og menneske, Lærerkurs ved Skolelaboratoriet I realfag, UiB	Invited talk	24 Aug	O. Førland

SFU-ordningens ringvirkninger	NOKUT frokostmøte	Panel discussion	09 Sept	Ø. Fiksen
bioCEED and UNIS	Arbeidslivsdagene, Tromsø	Poster	10 Sept	T.Dahl
<i>Excellence in education – natural selection or deliberate breeding?</i>	FEBS-IUBMB Workshop on Education in Molecular Life Sciences, Oslo	Keynote talk	19 Sept	V. Vandvik
<i>Innovative Pedagogical Practices in Biology Higher Education</i>	EMSEA 2015, 3rd European Marine Science Educators Association's, Heraklion, Crete,	Poster presentation	28 Sept-1 Oct	AL Simonelli
<i>How can Departments work to systematically improve teaching and learning? – Lessons from bioCEED</i>	Comenius University, Bratislava	Talk	Oct	T.Hole
<i>bioCEED: Utgangspunkt og visjon-fremragende utdanning i praksis.</i>	Læringscenteret NMBU: åpningsseminar for utdanningsledelse	Invited talk	07 Oct	T. Hole
<i>Arctic Biology and bioCEED.</i>	Workshop for utdanningsledere MN-fakultetet, UiO, UNIS, Svalbard	Talk	08-09 Oct	Ø.Varpe
<i>Biologists's communication: how to better catch people?</i>	CREAT-IT, Int.conference, Creativity and education futures Inquiry based learning and Creativity in Science Education, Athens, Greece	Talk	9-10 Oct	AL Simonelli
<i>Nasjonalt forum for utdanningsleiing i biologi?</i>	Biofagrådet, Oslo	Invited talk	12 Oct	Ø.Varpe
<i>Excellence in education – natural selection or deliberate breeding?</i>	Biofagrådet, Oslo	Invited talk	15 Oct	V.Vandvik
<i>Å bli biolog?</i>	NOKUT seminar on Excellence in Education, Lysaker, Norway	Invited talk	04 Nov	V.Vandvik
How to make education a joint venture at higher education institutions?	NOKUT seminar on Excellence in Education, Lysaker, Norway	Panel discussion	05 Nov	O.Førland
<i>How do we build excellence in innovation, research and education through transatlantic collaboration? iSCOPE – integrating Science of Oceans Physics and Education</i>	Transatlantic Science Week, Boston USA	Talk	06 Nov	M. Nerheim

<i>How to make international collaborations work. Excellence Across the Atlantic: Best Practices from the INTPART Portfolio.</i>	Transatlantic Science Week, Boston USA	Talk	06 Nov	M. Nerheim
bioCEED	Learning Forum, UNIS	Talk	17-19 Nov	Ø.Varpe, PB Eidesen, T. Dahl, J. Søreide
<i>Field based education</i>	Learning Forum, UNIS	Talk	18 Nov	Torstein Hole
<i>Sentre for fremragende utdanning – erfaringer fra bioCEED</i>	MNT-dagene, Tromsø	Invited talk	19 Nov	V. Vandvik/ E. M. Lysebo
<i>Course alignment, assessment</i>	Teachers retreat, UNIS	Talk	19-20 Nov	Ø.Varpe, PB Eidesen, T.Dahl, J. Søreide
<i>“Reflections on developing the scholarship of teaching and learning” “Students as partners in learning and teaching in higher education”.</i>	Mick Healy, Workshop, NOKUT	Contributions	1 Dec	bioCEED team
<i>Korleis bli ein god endringsagent?</i>	Studiekvalitetsseminaret 2015, UiB	Talk	15 Des	O.Førland, J.Kolding, R.Olsen
Innspillseminar til arbeidet med stortingsmelding om kvalitet i høyere utdanning	Kunnskapsdepartementet	Invited talk	15 Des	Ø.Fiksen

#### 4.2.2. Seminars, workshops, conferences with bioCEED participation

Title			2015	
Frafall i høyrere utdanning	UiB	Workshop	09 Jan	L. Jenø
«Eg tvitrar, altså er eg»: Forskarar i sosiale medium		Seminar	13 May	AL Simonelli
Mathematical Modeling Colloquium	Matric, Kristiansand		28-29 May	Ø.Fiksen
EAIR 2015		30 Aug – 2 Sept	O.Førland	
Programseminar FINNUT	Oslo		18 Sept	AL Simonelli
Forsker GrandPrix	Aulaen, UiB		23 Sept	AL Simonelli
Team-based Learning	HIB, Bergen in collaboration with Duke University	Workshop	24 Sept	S.Eliassen, T.Hole, T. Dahl, PB Eidesen
Nordisk workshop om kvalitet i høyere utdanning	Kunnskapsdepartementet/Nordisk ministerråd	Workshop	09 Oct	V. Vandvik



Konferanse om forskningskommunikasjon i Norge			25 Nov	AL Simonelli
"Reflections on developing the scholarship of teaching and learning" "Students as partners in learning and teaching in higher education".	Mick Healy, Workshop, NOKUT		1 Dec	bioCEED team
Team- based learning – part II	HIB, Bergen in collaboration with Duke University (leonard White)	Workshop	9 Dec	S.Eliassen

### 4.2.3 Publications

Hole, T.N. (2015). Developing Collaboration as a Transferrable Skill in Biology Tertiary Education. *Literacy Information and Computer Education Journal*, 6(3), 1971-1975

Jeno, L. M. (2015). Encouraging Active Learning in Higher Education: A Self-Determination Theory Perspective. *International Journal of Technology and Inclusive Education (IJTIE)*, 5(1), 716-721

Jeno, L. M. (2015) Vanskelig å komme i gang? Motivasjonstips til deg som er student. Studvest. Hentet 14 september, 2015 fra <http://www.studvest.no/vanskelig-a-komme-i-gang-motivasjonstips-til-deg-som-er-student/>

### 4.2.4. bioCEED seminars, meetings and courses

bioCEED seminar series		
Topic	Speaker	Time
Using PollEv in teaching	Ass Prof. Christian Jørgensen, BIO, UiB	15 Dec 2014
Team Based Learning	Ass. Prof. Silje Mæland, Bergen University College	09 Jan 2015
Evaluation and Quality Development	Adjunct Prof. Roy Andersson, Prof. Øyvind Fiksen, Oddfrid Førland	17 Mar 2015
Student learning through research – some lessons learned in achieving and maintaining success	Prof. Kath Dickinson, University of Otago	18 Aug 2015
How Can the Scholarship of Teaching and Learning Improve my Teaching?	Ass. Prof. Robert Gray Jr, Dept of Education, UiB	18 Nov 2015
What is "Scientific Teaching" ?	Ass. Prof. Sehoja Cotner, University of Minnesota	01 Dec 2015
Studentaktiv undervisning - erfaringer fra grunnleggende kurs i fysikk	Prof. Anders Malthe-Sørensen, UiO	20 Jan 2016

bioCEED Teacher activities		
Collegial Teaching and Learning – in Biology Course	Bergen & Svalbard	Oct 2015- Mar 2016
Learning Forum	UNIS, Svalbard	18 Nov 2015
Teachers retreat	UNIS, Svalbard	19 Nov 2015
Teachers retreat	BIO, Bergen	2-3 Dec

bioCEED Student meetings & seminars			
Topic	Where	Who	Time
Intro about bioCEED	Information meeting UNIS	Ø. Varpe	Jan 2015
Discussion on teaching and learning	bioCEED meets the students, BIO	T. Ulvatn, L.Jeno & T.Hole	Mar 2015
«Om bioCEED og Biologundersøkelsen»	bioCEED meets the students, UNIS	T. Langbehn, A. Dobel, T.Gabrielsen og T. Dahl	29 Apr 2015
Tips og triks til eksamenslesingen	<i>Brunsj med Arild</i> . Student seminar	A. Raaheim	12 May 2015
Biologundersøkelsen	bioCEED meets the students, UNIS	T. Hole	12 Aug 2015
Intro about bioCEED	Student meeting, University of Tromsø	T. Dahl	10 Sep 2015
Gruppearbeid – How to do it right?	<i>Lunsj med Arild</i> . Student seminar	A. Raaheim	28 Sep 2015
Discussion on teaching and learning	bioCEED meets the students, UNIS	M. Nyeggen, A. Poje, PB Eidesen	11 Nov 2015
Studentforskning og studentpraksis Studiebarometeret	NOKUT visit, Open meeting with presentations from students, BIO	bioCEED team and NOKUT	18 Nov 2015
Motivasjon- og eksamenstips	Student seminar	L. Jeno	18 Nov 2015
Sosial fagdag	Biologisk fagutvalg - Biology student gathering	Ø. Fiksen, T. Ulvatn	19 Nov 2015

## 4.2.5. bioCEED in (social) media

### Twitter

@sfubioceed 2015

@VVandvik 2015 –. Tweets about biodiversity science, global change, higher education and environmental issues.

### Web pages & Facebook

<https://scholar.uib.no/bioceed>

<https://www.facebook.com/bioceed/>

bioCEED in media		
<a href="#">Kvalitet og finansiering på dagsorden</a>	Khrono	Jan 2015
<a href="#">Personalpolitikken et hinder for kvalitet</a>	På Høyden	Jan 2015
<a href="#">Vi skal utforske, utdanne, utvikle og utfordre</a>	StudVest	Mar 2015
<a href="#">Bedre sammen om utdanningskvalitet</a>	NOKUT	May 2015
<a href="#">SFU Magasinet</a>	NOKUT	May 2015
<a href="#">ForBio fortsetter den gode arbeidet</a>	Artsdatabanken	Sept 2015
<a href="#">Gjør fremragende satsing permanent</a>	Khrono	Sept 2015
Ny rapport støtter videreføring	Dagens medisin	Sept 2015
<a href="#">Forelesningen lider en sakte død</a>	Studvest	Sept 2015
<a href="#">SFU Magasinet</a>	NOKUT	May 2015
<a href="#">Nye styrer ved høyskoler og universiteter</a>	Kunnskapsdepartementet	Nov 2015
<a href="#">Kunnskap for nye tider</a>	Bergens Tidende	Nov 2015
<a href="#">Christian Jørgensen fikk Læringsmiljøprisen</a>	På Høyden	Dec 2015
<a href="#">Kontaktkonferansen 2016: Fra struktur til kvalitet</a>	Kunnskapsdepartementet	Jan 2016
<a href="#">Trenger ikke gjøre som i Mammon</a>	Khrono	Jan 2016
<a href="#">Vil ha studentene med på laboratoriet for å skape kvalitet</a>	På Høyden	Jan 2016
<a href="#">Lyser ut opptil seks nye Sentre for fremragende utdanning</a>	NOKUT	Jan 2016

## 4.3 Personell

Name	function in bioCEED	position	Unit
Vigdis Vandvik	Centre leader	Professor	BIO, UiB
Pernille Bronken Eidesen	Deputy Centre leader	Ass. professor	AB, UNIS
Oddfrid Førland	Coordinator	Administration	BIO, UiB
Jonathan Soule	Technical support (education)	Chief engineer	BIO, UiB
Tina Dahl	Administration and technical support	Executive officer	AB, UNIS
Magnus S Nerheim	Dissemination	Administration	BIO,UiB
Torstein Nielsen Hole	PhD candidate		bioCEED/PRIME
Lucas Jenø	PhD candidate		bioCEED
Anne Laure Simonelli	Post doc		bioCEED/PRIME
Roy Andersson	Ass. Professor II	Academic developer	bioCEED
<b>Additional scientific staff</b>			
Øyvind Fiksen *	WP1 leader	Professor, Head of Education,	BIO,UiB
Sigrunn Eliassen	WP2 leader	Researcher	BIO, UiB
Janne Søreide	WP3 leader	Ass. professor	AB, UNIS
Arild Raaheim	WP4&6 leader	Professor	HERU, UiB
Øystein Varpe	WP5 leader	Ass. Professor	AB, UNIS
Gro van der Meeren	WP7 leader	Senior scientist	IMR
Gaute Velle	PRIME project leader	Researcher, Professor II	Uni research/BIO, UiB
Student representatives			
Tone Ulvatn	student representative	Student	BIO,UiB
Margot Nyeggen & Alexandra Poje	student representatives	Student	AB, UNIS

\*replaced by Sigurd Stefansson from 01.01.2016

## 4.4 Accounting

These accounts are divided in two parts, budgets and results for bioCEED as planned, and additional funding due to new externally funded projects under the bioCEED umbrella.

### 4.4.1 Original funding sources and plans:

		Budget	Result	Deviation
		2015	2015	2015
<b>Personnel</b>	<b>BIO</b>	2 067 395	2 004 415	62 980
	<b>UNIS</b>	616 519	725 584	-109 065
	<b>Inkind BIO</b>	4 765 715 <sup>4</sup>	5 003 114	-237 399
	<b>Inkind MN</b>	1 618 000	1 614 773	3 227
	<b>Inkind AB</b>	1 000 000	1 000 000	0
	<b>Inkind IMR</b>	900 000 <sup>5</sup>	140 000	760 000
	<b>Inkind HERU</b> <sup>6</sup>	255 000	250 625	4 375
				0
<b>Expenditures</b> <sup>7</sup>	<b>BIO</b>	368 938	145 807	223 131
	<b>AB</b>	30 000	7 679	22 321
	<b>IMR</b>	20 000	0	20 000
	<b>Inkind BIO</b>	0	29 775	-29 775
<b>Development</b>	<b>WP1-5</b>	1 291 804	326 028	965 776 <sup>8</sup>
	<b>AB</b>	75 000	90 533	-15 533
	<b>Inkind BIO</b>	300 000	522 647	-222 647
	<b>Inkind AB</b>	100 000	100 000	0
<b>Dissemination</b>	<b>WP6-7</b>	120 000	42 431	77 569
<b>Total</b>		13 528 371	12 003 411	1 524 960
<b>NOKUT</b>		4 589 656	3 342 477	1 247 179
<b>Inkind</b>		8 938 715	8 660 934	277 781

BioCEED		Budsjett	Resultat	Avvik
		2015	2015	2015
<b>Personnel total</b>		11 222 629	10 738 511	484 118
<b>Expenditures</b>		418 938	183 261	235 677
<b>Development</b>		1 766 804	1 039 208	727 596
<b>Dissemination</b>		120 000	42 431	77 569
<b>Total</b>		13 528 371	12 003 411	1 524 960

<sup>4</sup> In kind BIO is increased versus the original budget in the application because this was underbudgeted originally.

<sup>5</sup> IMR professor II position are budgeted under IMR in kind, but reported under BIO in kind. Hence, negative deviation for IMR in kind reporting and positive deviation from BIO in kind reporting.

<sup>6</sup> 20% of Arild Raaheims position at HERU is allocated to bioCEED work, but is not formally transferred to and reported under BIO in the UiB project reporting system (reporting is done at HERU).

<sup>7</sup> All posts are increased vs. The original budget due to additional funding and low expenditures in 2014 (see last year's report)

<sup>8</sup> Many projects were started in 2015, and the expenditures will increase in 2016.

BioCeed		<b>Budsjett</b>	<b>Resultat</b>	<b>Avvik</b>
		<b>2015</b>	<b>2015</b>	<b>2015</b>
<b>Inkind</b>		8 938 715	8 660 934	277 781
<b>NOKUT</b>		4 589 656	3 342 477	1 247 179
<b>Total</b>		13 528 371	12 003 411	1 524 960



#### 4.4.2 Additional funding/projects:

Granted by	Project title	Project period	Funding	PI/partners
Research Council of Norway- FINNUT programme	ArtsApp: En applikasjon for enklere artsidentifikasjon (pre-project). NFR Project number: 237821	01.05.2014-30.04.2015	287 KNOK	PI: JA Grytnes. Partners: bioCEED, Centre for Science Education and the Norwegian Biodiversity Information Centre.
Research Council of Norway- FINNUT programme	PRIME - <i>How Implementation of PRactice can IMprove relevance and quality in discipline and professional Educations (knowledge building project)</i> . NFR Project number: 238043	01.08.2014-01.08.2018	7 MNOK	PI: Gaute Velle Partners: bioCEED, Uni Research
Research Council of Norway- FINNUT programme	Travel scholarship for developing projects – University of Otago	autumn 2014	160 KNOK	Pernille Bronken Eidesen
Norgesuniversitetet	Artsapp: En applikasjon for enklere artsidentifikasjon	01.01.2015-30.12.2017	550 KNOK	PI: John-Arvid Grytnes Partners: bioCEED, Centre for Science Education and the Norwegian Biodiversity Information Centre
Universitets- og høyskolerådet	Contribution to for talk at MNT-conference 2015 (technology and science)	18-19.03.2015	75 KNOK	Øyvind Fiksen, John-Arvid Grytnes
SIU- UTFORSK	TRANSPLANT. Student research experience linked to an international research project.	2014-2016	1109 KNOK	PI: V.Vandvik. Partners: BIO UiB, NMBU and Institute of Mountain Hazards and Environment, Chinese Academy of Sciences (CN)
UiB, PEK-programme	<i>Sammen for bedre læring</i>	03.04.14-03.04.15	280 KNOK	PI: A. Raaheim Partners: TVEPS, Dept of Education, UiB, Grieg-akademiet, bioCEED, CEMPE
WUN Research Mobility	Research stay at University of Rochester,	Sept-Oct 2015	36 KNOK	Lucas Jenó

Programme.	USA,			
SiU, IntPART	<i>IScope (integrating Science of Oceans, Physics and Education)</i> Project number 249718	2016-2018	4345 KNOK	Karin Pittman, Dept. of Biology, UiB
Thon Stiftelsen	Research project student-active research: <i>Økosystem, klima og variasjon i eit «mini-havøkosystem»: ein vestnorsk fjord</i>	2016-2018	1137 KNOK	Anne Gro Salvanes, Dept. of Biology, UiB
Thon Stiftelsen	Excellent Teaching Award	2015	500 KNOK	Christian Jørgensen
Thon Stiftelsen	Excellent Teaching Award	2015	500 KNOK	Karin Pittman
UiB	Learning environment Award	2015	50 KNOK	Christian Jørgensen
SiU - High North Programme	<i>TraitTrain Comparing climate change impacts on High North vs. Alpine ecosystems through research and training in trait-based approaches</i> HNP-2015/10037	2016-2018	1500 KNOK	PI: V. Vandvik. Partners: BIO UiB, UNIS, University of Arizona, and Chinese Academy of Sciences (CN)
Skipsreder Jacob R. Olsens og Hustru JG Olsens Legat	<i>Effekten av ArtsAPP på studenters læring og motivasjon</i>	2015-2016	47 KNOK	L. Jenø

## 4.5 Externally funded projects

Short descriptions of a selection of externally funded projects within bioCEED.

### ArtsAPP- En applikasjon for enklere artsidentifikasjon

**Funding source: Research Council of Norway- FINNUT programme and Norgesuniversitetet**

**Funding: 287 KNOK (NFR), 550 KNOK (Norgesuniversitetet)**

**PI: Professor John-Arvid Grytnes, BIO UiB**

Samfunnet har et overordnet ansvar for å ta vare på det biologiske mangfoldet og kunnskap om faktorer som påvirker og truer dette mangfoldet er viktig for en effektiv forvaltning. I dette forprosjektet vil vi, gjennom et samspill mellom utdanningsinstitusjoner på forskjellige nivåer utvikle et interaktivt læringsverktøy som vil gjøre det enklere å bestemme arter, og samtidig bidra med kunnskapsoppbygningen om arters utbredelse. Applikasjonen vil bruke informasjon om hvilke arter som er vanlige i et område til å snevre inn utvalget av arter som er sannsynlige å finne.

Denne piloten vil bli utviklet på en liten og velkjent artsgruppe og brukt til å undersøke potensialet og utfordringene som ligger i å utvikle dette videre til å bli en applikasjon for mobiltelefoner med muligheter for identifisering av flere taksonomiske grupper. Verktøyet vil innebære en kompetanseoverføring som endrer rollen til elever og studenter. I stedet for å være passive mottakere av kunnskap, og kan de selv bidra med informasjon om biodiversiteten fra eget lokalmiljø.

Vi vil i dette forprosjektet utvikle en pilot for en interaktiv elektronisk applikasjon for artsidentifikasjon spesielt rettet inn mot bruk i undervisning.

Delmål for forprosjektet

- 1) Utvikle en interaktiv og påbyggbar bestemmelsesnøkkel for arter i nærmiljøet, laget som en applikasjon til mobiltelefon.
- 2) Teste en pilot-app på feltkurs i biologi ved Institutt for biologi.
- 3) Identifisere potensielle brukergrupper innenfor undervisningssektoren og kartlegge deres behov.
- 4) Sikre at Artsdatabanken får data som kan brukes i utvidelsen av kunnskapen om det biologiske mangfoldet i Norge

### Effekten av Arts-App på studenters læring og motivasjon

**Funding source: Skibsreder Jacob R. Olsens og Hustru JG Olsens Legat**

**Funding: 47 KNOK**

**PI: Lucas Jenø, BIO UiB**

Studien ønsker å teste effekten, empirisk, av ArtsAPP på studenters motivasjon, engasjement og læringsutbytte. Studien vil ta sikte på å dele en gruppe studenter i to grupper, en eksperimentgruppe og en kontrollgruppe, hvor eksperimentgruppen vil ta i bruk arts-appen og kontrollgruppen vil ta i bruk tradisjonell nøkkelidentifisering. Studien vil gjennomføres i løpet av 2015 når studenter er ute i felt og identifiserer slike arter. I etterkant vil studentenes selv-rapporterte engasjement og motivasjon måles ved hjelp av spørreskjema. Til slutt vil studentene få en kunnskapstest for å måle læringsutbytte. Det antas at studentene som er i eksperimentgruppen (ArtsApp) vil ha høyere

motivasjon for å lære og få bedre skåre på kunnskapstesten, til forskjell fra kontrollgruppen (tradisjonell identifisering). Dette fordi ArtsAppen aktiviserer studentene i høyere grad, og øker interessen for identifisering av arter. Det vil således være viktig å kunne konkludere hvorvidt en slik Arts-App har en positiv effekt på identifisering av arter, motivasjon og læring. Dette fordi slik overnevnt aktiv læring kan bidra til fordelsaktive effekter for studenter ved høyere utdanning. Nåværende studie vil ekspandere ArtsAppen ved å legge til flere arter og sammenligne effekten av de ulike artene på læringsutbytte og motivasjon.

## PRIME How Implementation of PRACTICE can IMPROVE relevance and quality in discipline and professional Educations

**Funding source: Research Council of Norway- FINNUT programme - Knowledge building project from 2014 – 2018. Project number: 238043**

**Funding: 7 MNOK**

**PI: Adj. Prof. Gaute Velle, BIO UiB**

In 2014 bioCEED and Uni Research Environment<sup>9</sup> got funding through the Research Councils FINNUT Programme for the knowledge-building project *PRIME - How implementation of PRACTICE can IMPROVE relevance and quality in discipline and professional Educations* (full application text<sup>10</sup>).

Through this knowledge-building project we aim to reach our main goal through a set of sub- goals, each with a corresponding work package (WP):

- Aim 1.** Identify the key competences (disciplinary, transferrable) held by biologists entering the work force, as seen from the educator perspective, the student perspective, and the employer perspective.
- Aim 2.** Systematically review and evaluate current study programs and assess how different learning methods applied in those programs (theory, practice, and internships) contributes to build the key competences identified under Aim 1.

We will follow up the knowledge gained in Aims 1 and 2 by:

- Aim 3.** Develop and implement, at different stages in the study programs:
- a. Internship modules of various extent (single-day to whole semester), and for different specific objectives (learn the profession vs. put the theory into context)
  - b. Enhanced practice modules (field, lab, assignments) within our course portfolio to support both disciplinary and transferrable skills in our students.

In parallel with the work towards Aims 1-3:

- Aim 4.** Evaluate the effect of implementing different elements of internships and enhanced practice in both discipline and profession educations, and if effective, develop more of such training in our study programs.

- Aim 5.** Evaluate how different learning methods (traditional disciplinary training, enhanced practice, internships) influence post-study careers.

In parallel with the work towards Aims 1-5:

- Aim 6.** Communicate findings to relevant audiences within the Higher Education sector, the private and public sector where biologists find employment, and beyond

<sup>9</sup> <http://uni.no/en/uni-environment/>

<sup>10</sup> <http://biologi.uib.no/studier/files/PRIME%20final.pdf>

One of bioCEEDs PhD candidates (Torstein Nielsen Hole) will do his research within this project. PRIME is now in the process of recruiting a post doc for the project.

During 2014 PRIME has been in contact with over 40 companies and institutions that employ biologist (end users), and has now established collaboration with 12 companies/institutions. These end-users will offer internships and be important informants in the national survey.

### **TransPlant - Student research experience linked to an international research project.**

**Funding source: SiU- UTFORSK (project number UTF-2013/10074)**

**Funding: 1 109 KNOK**

**PI: Professor Vigdis Vandvik, BIO UiB**

**RCN Project: The Role of Seeds in a Changing Climate - Linking Germination Ecophysiology to Population and Community Ecology**

In order to understand and predict how climate change will affect natural ecosystems we need to scale up from detailed mechanistic studies of local ecological processes to regional and even global scales.

A key part of this research agenda is comparative research between regions. TransPlant will involve Chinese and Norwegian biology students in collaborative research and education to meet this challenge.

We will offer joint training course for Chinese and Norwegian students, followed by parallel field and lab work on similar field experiments and systems in Norway and China, leading to collaborative data analyses and writing of research papers. This project will train a new generation of Global Change Ecology students from BIO-UiB and IMHE-CAS, and the research outcomes will have implications for global change science and for habitat management and nature conservation strategies under climate change in both Norway and China. <http://www.uib.no/en/rg/EECRG/78461/transplant>

### **Sammen for bedre læring - Hva lærer studenter i praksis?**

**Funding source: UiB – Programme for evaluation and quality enhancement (PEK)**

**Funding: 280 KNOK**

**PI: Professor Arild Raaheim, PED UiB**

Prosjekt tar sikte på å gjennomføre en kartlegging av hva studenter, ansatte og representanter for praksisplasser innenfor ulike profesjoner og disipliner opplever at studentene lærer gjennom praksis, og hva ulike parter forventer å få ut av et samarbeid. I noen tilfeller vet vi at studentene skal utarbeide rapporter, skrive logger eller refleksjonsnotat knyttet til praksisoppholdet, men vi trenger mer kunnskap om hvilken type læring som finner sted for blant annet å kunne overføre erfaringer til den læring som finner sted innenfor institusjonen, i det ordinære klasserommet. Vi har heller ikke mye systematisert kunnskap om hvilket læringsutbytte praksisplassene har eller hva disse ser som muligheter og ønsker med hensyn til å bidra til studentenes læring og utvikling. Når flere undervisningsprogram etter hvert tar sikte på å innføre et praksiselement, innebærer det – i tillegg til ulike logistiske utfordringer - en utfordring knyttet til å etablere opplegg som oppleves som relevante

og hensiktsmessige både for studentene og for de samarbeidende praksisplassene. Følgende problemstillinger vil bli søkt kartlagt:

- Hva kjennetegner den læring som finner sted?
- Hva lærer studentene? (Av ferdigheter, generell eller spesifikk kompetanse, om egen læring).
- Hvordan lærer studentene?
- Hva tenker underviserne om hva studentene lærer (Av ferdigheter, generell eller spesifikk kompetanse, om egen læring?)
- Hvilke tanker har underviserne om hvordan den læring som finner sted i praksis kan overføres til klasserommet?
- Hvilket utbytte har praksisplassene av studentene?
- Hvilken rolle skal praksisplassen ha i utformingen av undervisningen, i vurdering av studenter og i den videre utviklingen av (fag, studenter..)
- Hvordan kan/bør utdanningsinstitusjonene og praksisinstitusjonene samarbeide for å oppnå best mulig læring for studentene?

I tillegg til å gjennomføre en spørreskjemakartlegging blant et utvalg studenter, ansatte og representanter for praksisplasser, vil vi ta utgangspunkt i materiale som allerede eksisterer og foreta en systematisk analyse av dette (studentrapporter, refleksjonsnotat, studentevalueringer, studieplaner). Kartleggingsarbeidet vil bli fulgt opp med tematiske gruppeintervju, ett for hver av de tre gruppene i de respektive miljøene. Når resultatene av studien foreligger vil vi arrangere en workshop over tema ved Universitetet i Bergen, hvor også representanter for praksisplasser og avtakerorganisasjoner vil bli invitert.

### iScope (integrating- Science of Oceans, Physics and Education)

**Funding source: SiU- IntPART, Project number 249718**

**Funding: 4 345 KNOK**

**PI: Professor Karin Pittman, BIO UiB**

#### Vision:

The creation of a suite of verifiably effective, innovative science pedagogies to make Norway a leader in the impact that marine biological research offers the global community.

#### Project summary:

iSCOPE brings together four partners (University of Bergen, Norway, University of California at Berkeley, USA, Concordia University in Canada, and Univ. College of Stord and Haugesund, Norway) to use transdisciplinary approaches on high-quality multinational case studies to identify and evaluate (yr 1), transfer and test (yr 2) and iteratively test (yr 3) excellent methods of educational intellectual stimulation in order to support and enhance University of Bergen and Norway's leadership in teaching and research in marine biological sciences.

### Økosystem, klima og variasjon i eit «mini-havøkosystem» - forskingsprosjekt studentaktiv forskning

**Funding source: Olav Thon Stifelse**

**Funding: 1 137 KNOK**

**PI: Professor Anne Gro Salvanes, BIO UiB**



UiB har tilgang på studiestader (td. Masfjorden – eit “mini-havøkosystem”) og infrastruktur (forskningskip) som, saman med verdslende forskning og utdanning innan marine fag, gjer eit unikt utgangspunkt for å utvikle forskingsbasert framifrå undervising. Med utgangspunkt i emnet Marine metodar vil prosjektet utvikle og utvide undervisingstilbodet til masterstudentar innan marine fagretningar ved å vidare styrke elementa av studentaktiv forskning

Vi planlegg i 2016 å vidareutvikla BIO310 Marine metodar gjennom

- i) utviding av kapasiteten slik at alle som studerer marine fagretningar skal få tilbodet
- ii) vidareutvikling av kurset for å ta i bruk nyare læremetodar
- iii) utvikla digitale læremiddel
- iv) utvikle lærebok i marine feltmetodar gjennom å trekke studentane inn i utviklingsarbeidet
- v) innovasjon og teknologiutvikling

### TraitTrain - Comparing climate change impacts on High North vs. Alpine ecosystems through research and training in trait-based approaches

**Funding source: SiU- High North Programme HNP-2015/10037**

**Funding: 1 500 KNOK**

**PI: Professor Vigdis Vandvik, BIO UiB**

High North and Alpine regions support important ecosystems that play key roles in the livelihoods and well-being of >25% of the world's population. These regions are now strongly impacted by climate change, raising concern linked both to nature conservation, resource management, and ecosystem service provisioning. High North and Alpine ecosystems share many characteristics, including treeless landscapes, slow nutrient cycling and species' traits, but they also differ in important ways, e.g. in annual climate variability, climatic and evolutionary history, and biodiversity. TraitTrain will exploit opportunities offered by already-existing research infrastructure and collaborative research in the High North (Svalbard), in mid-latitude alpine areas (Norway, USA), and in the largest low-latitude alpine areas of the world 'third pole' (the Himalayas and Tibetan plateau) to develop comparative research on climate change impacts on High north and Alpine biodiversity and ecosystem functions and services. Towards this end, TraitTrain will combine recent development in trait-based ecology, ecological theory and ecosystems ecology with state-of-the-art experimental and observational approaches to assess climate change impacts. We will combine existing and new climate change experiments and observational data, offer training in state-of-the-art empirical and analytical techniques, and exchange students and staff for short-term scientific visits, field work, workshops and research stays. The main partners, University of Bergen (Norway), the Chinese Academy of Sciences Institute for Mountain Hazards and Environments (China), the University Centre at Svalbard, and the University of Arizona each bring unique strengths, competence, and research infrastructure to the project. Main outcomes will be collaborative research, student training, and conservation- and management-relevant data and publications. A prior history of successful collaboration secures staff, student, and infrastructure resources to the project, ensures a high probability of successful project completion, and maximises probability for successful outcomes.

## 4.6 Learning Forum Programme

### UNIS Learning Forum and Departmental workshops 2015

Dear colleagues,

**I hereby have the pleasure to invite you to the 2015 UNIS Learning Forum, 17-19 November followed by Departmental workshops 19-20 November.**

One of the two main goals for UNIS is to perform the best possible high quality education using our geographical location here in Svalbard. The Learning Forum will focus on several key issues of the educational quality that we are all responsible for here at UNIS, and that I like all staff to be aware of and therefore to participate in. University teaching experts will be invited to provide input on specific topics as outlined in the below agenda for the Learning Forum. We will also have the possibility to use our participation through the AB department in the Centre for Excellent Education, bioCEED, to provide input on teaching methods and future aims for this especially for Arctic conditions. I want the Learning Forum to be a place where the entire UNIS teaching staff can share and gain knowledge regarding research based education, course construction and development. And therefore I also like to invite the adjunct staff to participate, as you are also an important part of our teaching staff.

The second main goal for UNIS is to perform high quality research using our location in the Arctic. We also might have a possibility to expand UNIS, and we are working on the Campus development plan for potentially expanding the existing building. Therefore, it is important for the departments to review their Action Plans, which ensures that we follow the Unis 2014-2010 strategy, including discussing potential future expansions within our existing scientific fields of Biology, Geology, Geophysics and Technology.

**Please let us know if you are able to attend the Learning Forum and/or the departmental workshop latest by 20 September by sending an e-mail to Ane H. Bjørsvik: aneb@unis.no**

#### **OVERALL TIME FRAME**

- 1) Learning forum: Afternoon (15:00) Tuesday November 17 – Lunch Thursday November 19
- 2) Departmental workshops: Afternoon Thursday November 19 – Mid-day Friday November 20
- 3) Friday Gathering: Friday November 20 – Tasting the new Svalbard beer!

#### **Preliminary AGENDA for the Learning Forum:**

##### **Tuesday November 17**

General introduction – relevant for all staff (scientific and administrative/technical)

- Introduction to the Learning Forum
- Key information on student statistics and development through the last years at UNIS
- Student recruitment: How can we announce UNIS better inside and outside Norway?

Dinner for all staff in the UNIS Canteen

**Wednesday November 18 (scientific staff and study administration)**

Educational Quality:

- Lecture on 'How do students learn the best possible way'
- Student workload: classroom teaching, lab work, field work, self-study, in regards to ECTS calculation. Experiences from this work so far at UNIS
- Challenges of combined 300- and 800-level courses – input from how this is done in the mainland universities and experiences from all the 4 scientific departments at Unis.
- New teaching methods – visions and experience from bioCEED
- UNIS course descriptions in relation to the Qualification Framework: Learning outcome – knowledge, skills, general competences.

Lunch and dinner in the UNIS Canteen

**Thursday November 19**

Educational quality continued

- How to perform high quality student active learning in the field?
- General outcome and evaluation of the Learning Forum 2015
- Directions for development/expansions of the existing departments – (all staff invited)

Lunch in the UNIS canteen

Departmental workshops – continues until Friday November 20

- Individual agendas developed by each department

Departmental dinners

**Friday November 20**

Departmental workshops continued

Lunch in the UNIS Canteen

Friday Gathering

I wish you all a Good Weekend!

Best regards

Ole Arve

## 4.7 Collegial Teaching and Learning Course

bioCEED – Centre of Excellence in Biology Education  
UIB/UNIS

2015/2016

### **Collegial Teaching and Learning – in Biology**

#### **Course Information**

*Collegial Teaching and Learning – in Biology* is an elective course in the pilot qualifying programme in teaching and learning in higher education run at bioCEED at UIB and UNIS. The course consists of two separate units corresponding to two plus one (= three) weeks of full-time work and is given in English. The course fully meets the learning outcomes issued by the Association of Swedish Higher Education (SUHF) 17 November 2005, which are mutually recognised by all Swedish Higher Education Institutions.

This course introduces you to current concepts of teaching and learning in higher education in order to develop your ability to improve student learning. The course is focused on discussing pedagogical topics specifically related to teaching and learning in Biology and is intended for educators who teach mainly in these subjects. The course requires no previous higher education teacher training and can be offered to both experienced teachers and those who are about to assume teaching duties.

The course is counted towards your educational activities ('undervisningsregnskap') at BIO-UIB / AB-UNIS.

#### **Application/Admission**

The application deadline is 1<sup>st</sup> of July 2015 by registering here:

<https://skjemaker.app.uib.no/view.php?id=1298970>

The application should include one or two suggestions/ideas/topics for the group projects that could develop and benefit the whole BIO/UNIS Educational Program. Note that the participants are expected to participate in at least 75% of the course activities (see below).

#### **Course directors**

**Roy Andersson**, Førsteamanuensis II, bioCEED UIB and Senior Lecturer, Dep of Computer Science and Genombrottet LTH. +46 46 222 49 07, Roy.Andersson@cs.lth.se

**Arild Raaheim**, Professor, Dep of Education UIB. +47 55 58 25 55, Arild.Raaheim@uib.no

**Øyvind Fiksen**, Professor, BIO UIB. +47 55 58 46 24, Oyvind.Fiksen@uib.no

#### **Assessment criteria**

For a pass on the first course unit corresponding to two weeks, participants must have attended at least 75% of the scheduled activities (session 1-4), and passed the course assignments (individual reading and group project).

For a pass on the second course unit corresponding to one week, participants must have attended the scheduled activities (session 5), and passed the course assignments (individual portfolio writing and peer-review).

## Scheduled activities (main topics)

**Tue 20 October 2015, kl 13.15-16.00 (BIO, Bergen)\*.**

Session 1: Introduction, Requirements, The BIO Educational Program at UIB.

**Wed 2 December 2015, kl 13.15-16.00 (BIO, Bergen).**

Session 2: Literature reporting, Project seminar

**Thu 4 February 2016.** Last day to submit a preliminary project report to be discussed at session 3.

**Thu 11 February 2016, kl 13.15-16.00 (BIO, Bergen)\*\*.**

Session 3: Feedback on project development

**Mon 14 March 2016, kl 14.15-17.00 (UNIS, Svalbard).**

Session 4: Final project presentations

**Tue 15 March 2016, kl 10.15-13.00 (UNIS, Svalbard).**

Session 5: Portfolio workshop

**Mon 2 May 2016. Last day to submit the individual teaching portfolio.**

**Mon 9 May 2016. Last day to submit the peer-reviewed portfolio feedback.**

\*) For the UNIS participants Tue 20 October is just a start date for the individual literature reading. Then they will have their own session 1 after they have finished the literature reading tasks Wed 2 December 2015, kl 10.15-12.00 (BIO, Bergen).

\*\*) UNIS participates via Skype.

## Literature

Biggs, J. & Tang, C. (2011), *Teaching for Quality Learning at University*, 4<sup>th</sup> ed, The Society for Research into Higher Education.

Handal, G. (1999), Consultation Using Critical Friends, *New Directions for Teaching and Learning*, 76, pp 59-70.

And other relevant literature to complete the course project.

## Instructions to the course assignments

### Literature reading (individual, part of the first course unit)

Before **session 2** the following reading and writing assignments has to be completed (corresponding to 20 hours):

Read Handal's article "Consultation Using Critical Friends, *New Directions for Teaching and Learning*, 76, pp 59-70".

- Read Bigg's article "What the Student Does: teaching for enhanced learning". Write a summary (½ page).

- Read chapter 10 in Biggs & Tang "Aligning assessment tasks with intended learning outcomes: principles".  
Write a reflective piece (½-1page) on your thoughts about the content.
- All participants: Choose and read a few relevant articles (of your own choice) about teaching and learning in biology.  
Write a reflective piece (½-1 page) on one of them where you also very short justify your choice of article and how it can benefit the education at your institution.

The writing assignments shall be handed in electronically to the course directors prior to session 2, where the assignments also shall be presented to and discussed with the other course participants in smaller groups.

### **Project work (in groups, part of the first course unit)**

The main component of the course is the group project, addressing a teaching issue of relevance to the participants' own teaching and learning situation. The project work corresponds to 40-50 hours of work per person and is reported orally and in writing (or similar). The final project product should be a stand-alone artefact, normally a written report but other forms are accepted as long as they meet the criteria below. In addition the other course participants will give adequate feedback on the project work.

- A week before session 3 shall a draft version of the final project product (and/or other relevant work material) be sent electronically to all participants and to the course directors. Then during session 3, all participants will give prepared feedback on the material orally in mixed groups.
- The final project product shall be finished before session 4, where the whole project work shall be presented (30 minutes).
- The final project product shall:
  - have departmental colleagues as target group
  - include/incorporate the use of relevant literature from the university teaching and learning field, properly referenced
  - have a developmental focus, i.e. have an improved student learning as a leading star
  - be able to work as a stand-alone product for future development use

### **Portfolio writing (individual, part of the second course unit)**

The portfolio writing unit of the course corresponds to 40 hours of work.

- During session 5 each participant will draft a teaching portfolio. The final portfolio shall be sent electronically to the course directors before the last day to submit the portfolio (see the schedule above).
- Then all participants will give written feedback on one other portfolio that have to be completed one week later (see the schedule above).
- The final portfolio shall:
  - have a reflective discussion
  - include/incorporate the use of relevant literature from the university teaching and learning field, properly referenced