

Dear all bioCEED mid-term assessment panel members,

Thanks for agreeing to participate in the bioCEED midterm evaluation site visit! The panel has asked to talk to students, teaching staff, end-users, and leaders, and your participation will help them understand what bioCEED is, and what bioCEED does at UIB / UNIS and beyond.

See below for your specific meeting time with the panel. Please come to BIO reception (Tormøhlensgate 53A) or be available at SKYPE ***no later than 30 minutes prior to that meeting time***, as we would like to meet with you and make sure everything is clear before you meet the panel.

<b>Students:</b>	<b>09:00 – 09:45</b>	<b>BIO reception: 08:30</b>
<b>End-users:</b>	<b>10.00 – 11.15</b>	<b>BIO reception: 09:30</b>
<b>Teaching staff:</b>	<b>12.00 – 13.00</b>	<b>BIO reception: 11:30</b>
<b>Managers:</b>	<b>14.15 – 15.45</b>	<b>BIO reception: 11:30</b>

This document and links are meant to update you on recent bioCEED activities and achievements (in case you don't have the full overview at your fingertips...) but is **not** meant to direct your answers to the committee's questions in any way!

- We start with a super-short overview over bioCEED and our activities (next page).
- Then there is a longer summary (the next 4 pages – please update yourself on this!).
  - Our [web pages](#) give an updated overview over activities and achievements and our [newsletter](#) tell recent bioCEED stories – you might want to check those out as well.
  - If you want the full gory detail of all things bioCEED you can see the [2016 annual report](#) and the [midterm self-evaluation](#).
- At the end of this document you'll find the questions the committee has asked us to comment specifically on for the mid-term evaluation (So these are questions for us, not you. We attach them for your information).

Again, thanks for being willing to join the panel – we hope it will be an interesting and rewarding experience!

On behalf of all bioCEED-ers,

Oddfrid, Tina, Pernille and Vigdis



### Super-brief background:

bioCEED was appointed Center of Excellence in University Education in 2014 based on the vision that the sharply increasing importance and the broadening scope of biology and biological research in science and society should shape not only the content of biology programmes and courses, but also how biology is taught. bioCEED therefore expands on existing collaboration to reshape biology education in response to changes in the biological sciences, in higher education, and in society's needs. **The centre will enables development and research-based assessment of learning practices that strengthen the knowledge base, skills sets, and vocational integrity of tomorrow's biologists.** The centre significantly promotes sharing of 'best practice' within bioCEED, across the educational sector, and with society.

### Specific information for stakeholders:

bioCEED aims to strengthen the links between education and the endusers of biology and biologists in society, and to increase societal relevance and skills training. Our main activities towards this end is to (i) introduce work practice courses in biology education, (ii) create tools and platforms to strengthen transferrable and practical skills training in biology education, and (iii) expand cooperation with endusers and society through creating meeting places.

### Specific information for students:

bioCEED promotes a shift from teacher focused to learner (student) focused teaching. Towards this end, we work with developing the teacher culture, the student culture, the content of our courses, and the institutional leadership. For example, we educate teaching staff by providing training and sharing for strengthening pedagogical competence, we support teachers that change their teaching and assessment to more student active learning, we develop digital tools for students and teachers to expand and improve the learning environment, and we work with the university leadership to ensure that they promote student learning and teacher excellence. The resulting new teaching practices and new tools are now being implemented in courses across the BSc and MSc programmes at BIO and AB.

bioCEED also work to strengthen the links between education and the end users in society at large, and to increase societal relevance and skills training in biology education. Our main activities towards this end is to introduce work practice courses in biology education, and expanding cooperation with endusers and society through joint meeting places.

bioCEED is built on the vision that biology, and biologists, emerge in the interplay between biological theory, the practical applications of biological knowledge, and the relevance of biological theory and practical knowledge for society (Fig 1). Biologists can be found on both sides of the table in societal and ethical debates. Biology education must therefore prepare our students for difficult and demanding roles in tomorrow's science and society.

We believe that this 'biological triangle' should have implications; not only for *what* we teach, but also for *how* our students are trained.

Towards this end, bioCEED will:

- ♻️ Make use of the whole biological triangle in biology education
- ♻️ Focus on the students, and what benefits their learning
- ♻️ Exploit the research culture to grow a collegial and scholarly culture of teaching and learning

bioCEED have four main focus areas; **teacher culture**, **innovative teaching**, **practical training**, and **outreach**.

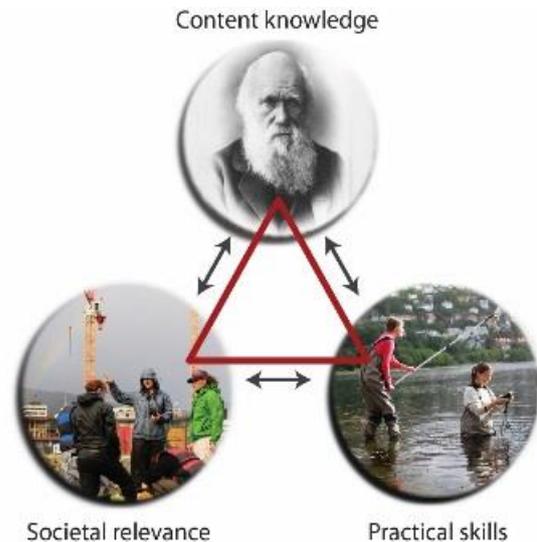


Fig 1. The 'domain of biology' as defined by the interplay between the scientific content knowledge of biology (theory, factual knowledge), the various skills and practices that are inherent parts biology itself, and society's applications of and needs for biological knowledge and skills.

## Focus area 1: Teacher culture and educational leadership

At the core of bioCEED's work is the realization that education, and development of educational quality, is a collegial responsibility and a collaborative activity. The partnership that shape the content and quality of our courses and programs include students and teachers, but also technical and administrative staff, course assistants, educational developers, and the departmental and institutional leadership make up.

bioCEED has worked to promote a scholarly and collegial (SoTL) teacher culture by:

- **explaining** and **motivating** the need for a cultural shift, and the benefits for education, educational quality, and individual teachers and students.
- building and strengthening **pedagogical competence** through offering teacher courses, seminars, workshops and providing literature

- creating meeting places teaching staff collaboratively can **develop** their pedagogical knowledge and skills and **document, share and discuss** teaching and learning<sup>1</sup>
- involve teaching staff and students in research and development projects (e.g. developing and using digital tools like ArtsAPP and bioSTATS, testing and using new teaching methods like team based learning – and examining the result of these new approaches through research)
- been a driving force in the implementation of a reward system for **Excellent Teaching Practitioners** (ETP), where teachers can be acknowledged for systematic scholarly work to improve student learning, and for contributing to the community. Awarded teachers form the Pedagogical academy that will work for educational quality and development at the Faculty of Mathematics and Natural Sciences
- strengthen and develop the responsibility of the **educational leadership**

#### Results:

- a transformation in the teaching practice and communication about teaching, and the attitudes towards teaching and learning and educational development are more informed, scholarly and nuanced
- teachers, students and educational support staff are involved in research and development projects, as well as collegial activities<sup>2</sup> to strengthen pedagogical competence

#### What's next:

- maintaining the cultural shift to a learning focused collegial teacher culture by continuing the activities
- ensure the full implementation of the teaching innovations to make programme wide impact and change

## Focus area 2: Innovative teaching

- bioCEED works to expand and develop the learning environment by combining traditional methods with novel field, lab, and digital approaches that support learning. Student motivation and learning outcomes are highly connected with using appropriate, student-active learning methods, and access to an appropriate learning environment. bioCEED develop, test, and conduct research on a series of methods ranging from specific tools and learning approaches in single courses, to more crosscutting programme-wide initiatives. active students – through student-active teaching methods and by students taking the initiative to, planning, and executing learning activities<sup>3</sup> transferable skills training and core competences in biology – through developing the learning platform bioSKILLS as a resource for students and teachers. Students are involved by producing the learning content (e.g. [Teach2Learn](#) video production). bioSKILLS aims to strengthen skills

<sup>1</sup> Such arenas now include annual [teachers' retreats](#), seminar series, the annual Collegial Project Course, and various workshops.

<sup>2</sup> For example, The Collegial Project Course (see footnote 9), Pedagogical courses for PhDs and postdocs, seminars, and workshops.

<sup>3</sup> Students are becoming more actively involved not only as participants, but also in planning and executing learning activities through initiatives such as [ArtsApp](#), [bioSTATS](#), [codeRclub](#), [Teach2Learn](#), [biORAKEL](#), and [bioBREAKFAST](#)

training and align this training throughout education - connecting the dots between biology, the support courses/topics, and the practical training (e.g. lab and fieldwork)

**Results:**

- since 2012, both BIO and UNIS have increased the amount of student active learning and reduced lectures. At UNIS especially there is less use of the traditional written exams (see self-evaluation report for figures)
- bioST@TS (supporting students and teachers with statistics in the context of biological studies) and Teach2Learn, are the first bioSKILLS modules to be populated and used in BIO/AB-courses

**What's next:**

- implement of learner-focused pedagogical practices in more courses, and balance work load
- further develop our platforms and teaching innovations
- establish skills training, active learning, and assessment for learning as integral parts and a requirement in programmes

### Focus area 3: Practical training

A main hypothesis in bioCEED is that internships or placements in research, industry, and the public sector has potential for strengthening student motivation, supporting learning and develop their biological competences.

bioCEED has developed work practice courses for biology students

- work practice course (([BIO298](#) 10 ECTS) as elective course in the BSc and MSc programmes
- supplement already-existing courses where students could conduct a small research projects under supervision ([BIO299](#), [AB207](#)).
- new dissemination project course ([BIO296](#)) spring 2017
- work practice course at UNIS is under planning
- skills training increased in courses
- sector contact is expanded across the curriculum
  - seminars with end user participation (student-organised) and invited talks in large-enrolment courses (e.g. BIO100) as well as in more specialized courses
  - research the impact of practice on student learning and thinking through the projects [PRIME](#) and 'Together for better learning'<sup>4</sup>.

**What's next:**

- making practice courses a mainstay of biology education, and by implementing the theory behind work practice (engaging with biology through work) in other courses

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<sup>4</sup> 'Together for better learning' is a bioCEED-initiated project including researchers from three HigherEd institutions in Norway (Departments of Biology/bioCEED, Education and Global Public Health and Primary Care at the University of Bergen; CEMPE at the Norwegian Academy of Music, Oslo; Department of Teacher Education at the Norwegian University of Science and Technology, Trondheim). The five involved parties have, based on a common guide, conducted focus-group interviews with students that have finished practical training periods, to try to disentangle the learning that takes place during placement. What characterizes students' learning during

## Focus area 4: Outreach

Sharing, communicating, and interacting with different audiences within academia and beyond over scientific developments, results, and their societal implications are integral parts of the research culture. Transferring these aspects into the educational culture is an important aspect of the 'cultural shift' within education that bioCEED aims to promote. Dissemination and outreach are thus important not only to promote bioCEED outputs, but also as a key part of the idea behind and goal of bioCEED.

We have been very, very active in the media, giving presentations and talks, writing reports, and publishing scientific papers on educational development! And large numbers of staff and students have been involved. This is something we are very happy for, and proud of!

See Annual report and Self-evaluation for details on outreach activities.

## IV. PLANS FOR THE SECOND PERIOD

Our three most important priorities for the second period are:

1. **Alignment** – we will make optimal use of our platforms, within-course initiatives, strategic program development, and quality assurance systems to develop truly constructively aligned study programs, focusing on developing key skills and competences through the curriculum.
2. **Mainstreaming** – we will develop mechanisms for mainstreaming successful innovations into our decision-making structures and programmes. This will ensure that good practices are implemented and exploited optimally, and also make room for new development projects.
3. **Project culture and research** - we will build on and further develop the emerging project-based collegial SoTL culture within our host institutions. This will benefit educational development, student learning, teacher job satisfaction, collegiality, and departmental outcomes. In particular, a collegial SoTL culture will promote educational excellence, development and documentation of teaching and learning outcomes, and research-based education (i.e., student research experiences; evidence-based best practice; and up-to-date course content).

## Questions from the evaluation committee to bioCEED

The external, international expert committee that evaluates bioCEED has outlined some main issues and questions that they wish to discuss with the centre at the site visit. We have summarized these, *along with our comments/replies*, in the following section.

**a) Overall comments from the evaluation committee on the self-evaluation document for all SFUs, with bioCEED replies/comments**

- **The introduced changes in biology education seem to only affect some courses and some students?**

*Reply: We do not agree with this statement. The idea behind bioCEEDs work process and planning is that we must first change the teaching and learning culture, before we can achieve program-wide impacts. We therefore focused on Focus area 1 from the start. A majority of teachers are now involved (see reports) and we are seeing clear indications of change (bottom up) in e.g., teaching and assessment. For Focus area 2 and 3, we have created infrastructure and tested various implementations, and we are now rolling them out.*

- **What mechanisms are in place to ensure “mainstreaming” (full scale implementation) of changes)?**

*Reply: bioCEED makes resources available, generates knowledge, etc. The program owners and employers (BIO and AB) mainstreams and implements through bottom-up and top-down mechanisms (compulsory activities, requirements, program revisions vs. motivating and stimulating and supporting change)*

- **How does bioCEED involve students?**

*Through representation in formal bodies (bioCEED steering committee & board, etc.), as participants in R&D, and as active partners and participants in various projects (See table in answers to review panel appendix).*

- **How will bioCEED ensure that students get involved in research (-based) activities?**

*Reply: In terms of bioCEED activities (i.e., educational research and development), we:*

- (i) involve student representatives in bioCEED project development [4 students/year],*
- (ii) advertise project funding openly for staff and students [ca 20 students participated so far]*
- (iii) involve students in project execution [ca 270 students involved so far],*
- (iv) implement project activities and result in BIO and AB courses [all students at BSc affected, many at MSc]*

*In terms of involving students in biological research more generally, this was not a bioCEED deliverable as our host departments were already very strong in this respect: we offer hands-on research-based education through both in-course and thesis-based research opportunities, and through courses closely aligned with the departments research, from BSc to PhD.*

○ **How will bioCEED strengthen their engagement in interdisciplinary practices?**

*Reply: Regarding interdisciplinarity, we have identified two main challenges: (i) creating links between biology and the other STEM subjects in our courses and degrees, especially at BSc level, to increase student motivation and learning outcomes, and (ii) to give students 'broader perspectives' through seeing biology's relevance in science and society.*

*We work towards (i) by collaborating with mathematics (at UiB, in Matric) to build and implement the bioSTATS platform as a part of our courses and programmes. This will later be expanded to different aspects of the broader bioSKILLS platform. We work towards (ii) through collaboration and work practice in science and society (BIO298, BIO299 etc.).*

**b) Key questions for the review with bioCEED replies/comments**

**1. How many staff and students have engaged with the bioCEED projects?**

*Reply: bioCEEDs approach makes putting set numbers to this question difficult. Much of our work aims to change the individual teachers practice in their meeting with the students. Several of the projects have a broad target group, including students and staff through activities embedded in the courses. The following numbers are an estimate of different categories of involvement.*

- *actively involved in developing educational R&D [students: 19 (8 AB, 11 BIO), staff: 35 (7 AB, 28 BIO)]*
- *as active participants in those projects [students: app. 270, staff: 36]*
- *exposed to projects and activities through taking or teaching in courses where they are implemented [students: all students exposed during their BSc or MSc-programme through mandatory and/or elective courses, in addition to open meetings and seminars, 25 of BIO- courses involved, and app. 60% of teaching staff at BIO participate actively in bioCEED activities like teachers's retreats and seminars].*
- *bioCEED Collegial Project Course - 21 UiB staff, 10 UNIS staff) = 100% AB staff, app. 26% BIO*

**2. What are the plans to roll out the project results to both organisations within the consortium, and those without?**

*Reply: We are working actively with the leadership at our departments, faculties and institutions to implement and mainstream the various projects and activities. At our departments, key activities are already being rolled out quite extensively under all four Focus Areas. In the departments, key components of Focus Area 1, Teacher Culture, is being rolled out (Teacher Course, Excellent Teaching Practitioner merit system, etc.). Nationally, we are working through Biofagrådet to collaborate with other intuitions over developing biology educations, and nationally and internationally we are sharing through collaborating with specific partner intuitions and through presenting at educational and scientific conferences etc.*

**3. What is the relationship between bioCEED and the Pedagogic Academy?**

*Reply: bioCEED is an SFU hosted by BIO, AB and IMR. The Pedagogic Academy (PA) will be a standing body/ committee at the Faculty of Mathematics and Natural Sciences at UiB, later to be made a UIB-wide entity. The PA will stimulate and coordinate educational development and collaboration at the Faculty / UiB. bioCEED@UiB, and BIO staff more generally, will participate in PA-initiated activities, apply for local funding of educational*

*development from the PA, alone and in collaboration with other departments at UiB, and contribute to and collaborate with the PA in any ways that both parties see fit.*

**4. In relation to the changed approach to assessment, how widely was this approach adopted and is it planned to disseminate this beyond Biology in the future?**

*Reply: The changes in assessment has not been 'implemented' by bioCEED as such, but has emerged as teachers have become more pedagogically aware, especially due to Focus Area 1 work. Teachers have then changed their teaching, and their courses, including assessment. This is picked up in reporting and data (which is what is reported in the self-assessment). The ongoing program revisions at BIO will be further supported and strengthened towards better alignment through bioCEED activities, initiatives, and resources. We therefore expect the trends in teaching and assessment to continue.*

**5. Are there any plans to attempt to link biology education with other scientific disciplines (particularly chemistry and physics)?**

*Reply: At BIO, programmes are already linked as students take courses in other disciplines (including physics and chemistry) as compulsory parts of the BSc programme. We are increasing and visualizing linkages, and stimulating student learning and motivation, both in biology and in other disciplines, through initiatives like bioSKILLS and bioPRACTICE.*

**6. How are students being involved as co-creators in bioCEED's work**

*Reply: Through representation in formal bodies (bioCEED steering committee & board, etc.), as project partners taking initiative to R&D, and as active partners and participants in various projects (There is a table in answers to review panel appendix...).*