Centre for Excellence in Education

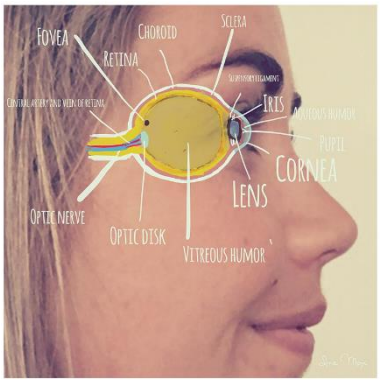
bioCEED Centre of Excellence in Biology Education

Interim evaluation – Centre for Excellence in Education (SFU) 2017:

# bioCEED Action Plan

# Phase Two

# Draft




# Preface

This Action Plan marks the final stage in bioCEEDs contributions to the SFU midterm evaluation. In this action plan, we are not repeating the information given in the annual reports, self-evaluation document, or during the site visit, but rather building on all these sources of information and specifying and refining our future plans in terms of specific action points. In doing this, we have paid particular attention to the two reports provided by the Evaluation Committee, as well as the points made by the committee during the site visit.

The development of the Action Plan has proceeded through a series of discussions in the Steering Committee during the assessment period. The process has been supported by input from the bioCEED Board and the bioCEED Advisory Board in the Board and AB meetings in May 2017, and especially from inputs from the joint bioCEED Board and AB seminar in September 2017.

Our objectives and actions for the second centre period builds on the goals and achievements from the first period. The original bioCEED action plan (2014-2018) was rather detailed, with 38 Specific Actions each with a number of under-activities, and with a detailed timeline with specific Milestones and Deliverables. These have been largely accomplished through the first centre period (see Annual Report 2016), giving us the opportunity to re-think the structure and functioning of the Action Plan. In developing the Action Plan for the second funding period, we realized that this format is no longer necessary as a tool for progress monitoring and resource allocation. This Action Plan is therefore more condensed, focusing on monitoring progress within each of the four focus areas identified in 2016.

As stated in the mid-term evaluation report, bioCEED will, during the second funding period, focus on aligning and mainstreaming our activites, while maintaining the project-based SoTL culture and the educational research focus we developed in the first funding period. **Mainstreaming** bioCEED innovations into the relevant formal structures and fora (e.g., programmes, institutional strategies and systems, decision-making structures, policies, rules and regulations at local to national levels) will secure continuity beyond the centre period, application beyond the centre and our host departments, and also free up bioCEED resources and personell for new activities. **Alignment** of different activites will allow us ot make optimal use of our platforms, within-course initiatives, strategic program development, and quality assurance systems. This will help to develop truly constructively aligned study programs, focusing on developing key skills and competences through the curriculum. Finally, the **collegial SoTL culture** and associated **educational research focus** benefits educational development and assessment, student learning, teacher job satisfaction, collegiality, and insitutional outcomes. As more actions are ready for mainstreaming, institutionalisation and policy changes, and as several actions come together and become aligned, the role of bioCEED change from being the driving force behind specific concrete interventions to a collaboration partner contibuting support and researching outcomes. This role will be strengthened in the years to come.

On behalf of the bioCEED team, we would like ot thank NOKUT and the panel for a constructive mid-term assessment process during 2017. We look forward to continuing our contributions to excellence in Higer Education.

Pernille B. Eidessen, Tina Dahl, Oddfrid T.K. Førland, and Vigdis Vandvik

# I. VISION

bioCEED overreaching vision is to develop relevant biology educations that fill future needs in science and society by connecting scientific knowledge, practical disciplinary and transferable skills, and societal applications. These connections are not something that should be done in hindsight, but rather a perspective that should guide the development of curricula and teaching and learning methods throughout the course portfolios and programmes.

bioCEED has functioned as a catalyst, initiating projects facilitating the interplay between the three corners of the biological triangle: biological theory, practical skills, and societal relevance (phase 1 in Fig 1). The interactions between them have created tensions and feed-back loops, which again have facilitated content curriculum development (i.e., a movement towards a more integegrated triangle; phase 2 in Fig 1). In the first funding cycle, bioCEED has thus progressed from a focus on "how" to teach and learn biology towards a focus that also concerns "what" biology education is or should be.

bioCEEDs vision for educating tomorrow's biologists entails integrating the content knowledge, practical research and subject skills training, and the societal relevance of biology. This is achieved through developing a quality culture among teachers and learners. In doing this we build on the research culture, so that educational innovations and practices are founded in relevant theory, and that learning outcomes are documented, tested, and critically assessed. Such a culture will both allow innovations and innovators to flourish, it will provide an ideal testing ground for those innovations, and it will allow ciritcal assessment of their role in an aligned curriculum.

This integration process will therefore be continued and strengthened in the second funding period. Many of the specific actions set out in the first period are now completed, allowing us to mainstream these into the daily operation of our departments and institutions. This creates room for new bioCEED priorities and actions and for higher-level contributions from bioCEED, allowing us to focus more on integration across the three 'corners' of the triangle.

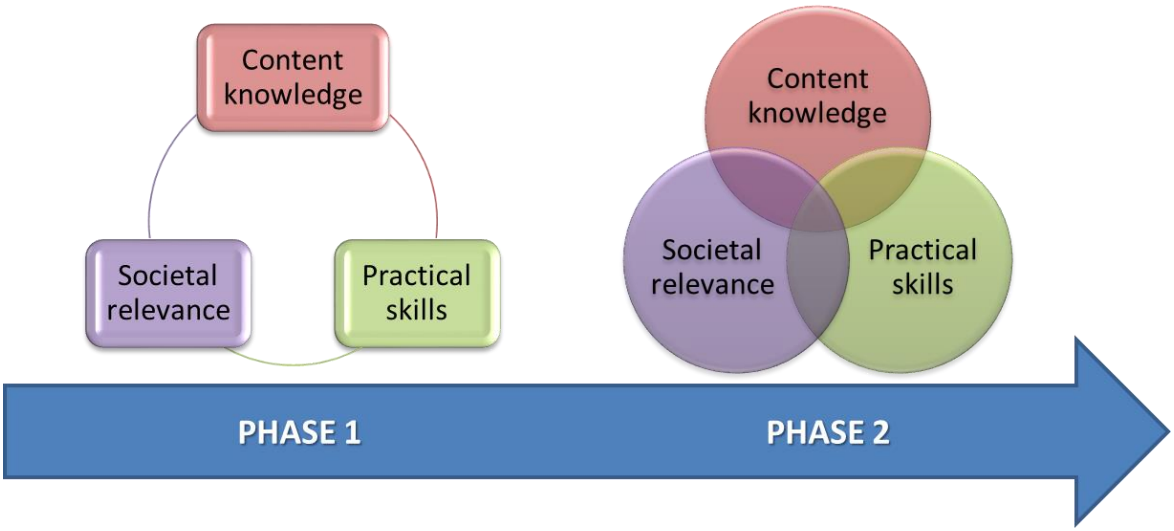



***Figure 1.*** *The evolution of how the bioCEED triangle has been understood and used – from the early-stage focus on interlinking three different and distinct aspects within the domain of biology, to the later-stage more holistic approach expanding the scopes of each of the three aspects, while also integrating and linking them more closely with each other.*

# II. CENTRE OBJECTIVES

We here describe the objectives and specific actions planned for the second funding period under each of the bioCEED focus areas. Note that the are actions targedted at different audiences (students, teachers, programmes, biology educations, leadership, policy, and the wider HigherEd community) and at different levels (locally, nationally, and internationally), and are each associated with specific assessment criteria. The planning and execution of these actions will involve different bioCEED and partner institution members, including our biology staff and students, technical and administrative staff, leadership, and local, national and international collaborators (see also IV). Care will be taken to involve students as partners at all levels and phases of the actions and projects.

## Focus area 1: Teacher culture and educational leadership

The development of a collegial teacher culture within our host institutions has been one of the major successes of the first phase of bioCEED. This cultural shift came about as the result of a targeted priority from bioCEED, and has made up the core of activities in the original WP1 and WP5. The emerging new collegiality around teaching and learning has proved to be an invaluable resource in motivating the staff to invest time and resources in developing their teaching, open up for increased collaboration around educational development, and learn new teaching methods and approaches. We see clear results in terms of shifts in teaching and assessment methods used in our programmes. This has also been one of bioCEEDs more high-profile 'exports' in that we have repeatedly been invited to tell the story about our approach to developing a collegial teaching and learning culture in various for a nationally and internationally.

In the second funding period, bioCEEDs role vs. this focus area will change. Within the partner institutions the key structures, processes and meeting places are now well established and operational, and bioCEED will withdraw from the daily operation (i.e., mainstreaming). This will free up resources to focus more on the quality and the spread of the collegial approach; facilitating effective collegial SoTL practice within and beyond our host institutions, assessing the impact on teaching and learning, and disseminating outcomes (i.e., further development, projects, outreach).

| Actions | Audience | Assessment criteria (target #s) |
|---|---|---|
| Stimulate collegial SoTL-based teaching development through offering project funding and support | Biology educators locally / nationally | Projects completed (15)<br>Innovations implemented (>10)<br>Impacts documented (>5 papers) |
| Work with the Pedagogic Academy to develop collegial meeting places and a SoTL culture at the faculty level | MN Faculty | Active and visible Pedagogic Academy Staff participation in fora (>40/yr) |
| In collaboration with the University Pedagogy Unit, develop courses for educators at different levels (TAs, PhDs, Tech/Admin, Teachers) | Partner institutions educators | Courses developed (4)<br>Good participation (10/course/yr) |
| Assess impact of participation in educator courses on teaching practice and student outcomes | HigherEd internationally | Conference presentations (6)<br>Published papers (2) |
| Contribute to development of educational leadership | Partner institutions, at all levels | EdLead training module(s) developed<br>EdLead has clear role |
| Contribute to the development and implementation of educational merit systems | HigherEd in Norway | Process participation (3)<br>institutional collaboration (2) |
| Develop a research project to assesses role of teacher culture for educational quality in HigherEd | RCN FINNUT programme | Project developed, funded, and successfully completed |
| Based on bioCEED projects, organize and contribute to workshops and research on SoTL culture development | Teachers, students, HigherEd internationally | Workshops arranged (>3)<br>Well attended (>30 participants) |

## Focus area 2: Innovative teaching

In the first funding cycle, bioCEED focused on development and application of a number of 'cases' of educational innovations, and the bioSKILLS platform. This work was largely carried out as a 'coalition of the willing' in that teachers and students were invited to develop and participate in projects. This resulted in a number of small and larger projects, including several high-profile initiatives and developments that have already been appreciated beyond our field and partner institutions. An important deliverable from this focus area has been research on the impact of these innovations on student motivation and learning, disseminated as conference presentations and scientific papers.

In the second funding period, bioCEED will focus on connecting these different projects and innovations into a more holistic framework, aiming to support and facilitate course and program-level curriculum development vs. key skills and competences in biology education (i.e., course and program alignment). This requires moving beyond the 'coalition of the willing' by identifying where in the programme specific components should be placed (requiring operational educational leadership).

A key success criterion for this focus area is involving students as partners in educational development and assessment of success. The ambitions of bioCEED vs. this focus area range beyond educational development within our host intuitions. We will collaborate with external partners, both within biology and beyond, to generalize some of the approaches developed and lessons learned beyond our institutions and subject area. Research on the impact of educational innovations will continue to be a key priority in this focus area.

| Actions | Audience | Assessment criteria (target #s) |
|---|---|---|
| Wider use of platforms across major courses, as a backbone for aligned bioSKILLS training across programmes | Teachers, students | Courses that use the platforms (>10)<br>Staff and students contributing to develop them (>50) |
| Develop and implement new bioSKILLS modules for key subject-specific and transferable skills | Teachers, students | Modules developed (4)<br>bioSKILLS is backbone of skills training through curriculum |
| Develop new virtual and physical model systems to support training key skills and competences | Biology educations, teachers, students | Development of model systems (>3)<br>implementation into courses (>6) |
| Develop program-wide learning outcomes for key subject-specific and transferrable skills and competences | Programmes, teachers, students | Analyse change in course and programme learning outcomes, focusing on skills and alignment |
| Develop quality assurance aligned with the above | Programmes, institutions, teachers, students | Analyse change in course and programme learning outcomes, focusing on skills and alignment |
| Stimulate educational innovation through project funding and support. Prioritize projects with students as partners. | Biology educators and students locally and nationally | Projects completed (>20)<br>.. with students as partners (>10)<br>Innovations implemented (>15)<br>Impacts documented (>7 papers) |
| Establsh student panel to advise development of innovative teaching modules and curricula | HigherEd | Panel meetings and reports (10)<br>Innovations tested, implemented (>10) |
| Research the impact of innovations on staff and student attitudes, learning, and motivation | Teachers, students, HigherEd internationally | Improved educational outcomes (>5)<br>PhD (1) and MSc (4) theses<br>Published papers (>5) |
| Organize workshops on educational development at biological scientific conferences | HigherEd biologists | Workshops arranged (>5)<br>Well attended (>50 participants) |
| Based on bioCEED projects, organize and contribute to workshops and research on innovative teaching | Teachers, students, HigherEd in Norway | Workshops arranged (>5)<br>Well attended (>50 participants) |
| Develop a research project on outcomes of student-active research and inquiry-based learning | RCN FINNUT programme | Project developed, funded, and successfully completed |
| New PhD project on impact of digital learning and assessment tools on student learning and motivation | HigherEd internationally | Research papers (4)<br>Presentations at conferences (4) |

## Focus area 3: Practical training

Developing and implementing practical training components, both through full-on work practice courses at external partners and through subject-specific and more generic skills training within the in-house courses, has been a major bioCEED priority. A possibly under-communicated aspect of this focus area is training in research skills, research-based education, and student-active research, which is, and always has been, a priority in both BIO and ABs biology educations. bioCEED has built on this strong tradition by researching to what extent research and transferable skills training and work-place integration contribute crucial components to the student's experience of becoming a biologist.

In the second funding period, we will make more systematic use of such courses (research practice, workplace practice, dissemination practice, etc.). Specifically, we will move from seeing these aspects as voluntary components of our programs to better exploit their impact and role in learning by making them an integral part of the biology programmes. The practical training courses offer unique opportunities for active student involvement in curriculum development and course planning and execution. In these courses, only the framework is given, and each student create, develop, document and report their own practice work and learning outcomes in close collaboration with the practice hosts and their university tutor. Through blogs and workshops, the students communicate directly among each other and with external user groups.

| Actions | Audience | Assessment criteria (target #s) |
|---|---|---|
| Revise and streamline the practice courses as a compulsory part of the disciplinary BSc programmes | Biology educations, teachers, students | Practice integrated in all programmes<br>All students have had practice course |
| Develop and document 'best practice of practice' for transferring experiences across disciplinary educations | Programmes, teachers, HigherEd | A manual for 'work practice for better learning in disciplinary educations' |
| Formalize network with partners in the private and public sector, staff, and students over work practice | Private sector, public sector | Regular communication, useful inputs, good collaboration over work practice |
| Establish a panel of end-users, staff and students to advise on biology education curriculum development to fulfill society's need | Private sector, public sector, HigherEd | Panel established and active<br>Recommendations followed up at programme and institutional level |
| Carry out bioCEED survey 2018 and 2022 | Programmes, teachers, students | Surveys completed and published<br>Papers on change over time in student, staff, and sector experiences (2) |
| Research the impact of different forms of practice on staff and student attitudes, learning, and motivation | Teachers, students, HigherEd internationally | Improved educational outcomes (>3)<br>PhD (1) and MSc (2) theses<br>Published papers (>4) |

## Focus area 4: Outreach

bioCEED has a well-developed and ambitious outreach strategy, as described in the self-assessment and additional information. The strategy describes in detail who (bioCEED personell, our staff and students), how, why, and what we will contribute targeted at different audiences and communication channels. Outreach activities are also key outcomes and assessment criteria of many the specific actions in Focus areas 1-3. The specific actions set under Focus area 4 are therefore relatively broad and generic, allowing us to assess the overall output from and usage of bioCEEDs own platforms, and our impact through contributions to other media and processes.

| Actions | Audience | Assessment criteria (target #s) |
|---|---|---|
| Develop and use bioCEED communication platforms; web page, bioSKILLS, newsletter, etc. | Teachers, students HigherEd | Platform content develops (10% yr)<br>Relevant reach locally and externally |
| Contribute to scientific literature, public debate, and policy development vs. quality teaching and lerning in HigherEd | Policy, society, teachers, students, HigherEd | Scientific papers (>5/year)<br>opinion pieces (10/year)<br>impacts on policy (1/year) |

## III. ORGANISATION AND MANAGEMENT

bioCEED consists of a consortium of four partners. The Steering Committee (core team), consisting of the centre leadership, WP leaders, administrative/technical staff, and student representatives, oversees the daily operation of the centre and ensures that centre objectives is met, and allocate resources to and responsibility for projects[1]. Students are involved as active and responsible partners in bioCEED at all levels.

An internal organizational change was made in 2016-17 where we rewrapped our internal organisation into four strategic focus areas to better reflect the major Centre aims, goals and activities[2]. The new structure will be evaluated and adjusted, if necessary, during Phase 2. A large fraction of bioCEED activities is related to externally-funded projects, and a key Phase 2 priority will be to increase the project portfolio while also achieveing a good balance of Centre activities between partners.

bioCEEDs Board oversees all centre activities, and has been involved in developing collaborations within our partner instiutions and vs. external partners in Norway and beyond. The Board is also involved in the midterm evaluation. We will continue to use the Bord actively in the second funding period. The international Advisory board has been an important resource for bioCEED vs. all matters of strategic importance. Members are appointed for two years, and bioCEED will evaluate the Advisory Board size and composition for Phase 2 in 2018.

Appropriate mechanisms are in place for dealing with challenges relating to organisation, projects, collaborations, and personnel and student relations.

## IV. CENTRE RELATIONS

BioCEED has strong institutional support from UNIS and UiB. This support entails allocation of staff resources and PhD positions, own funding, and involvement in and impact on institutional processes and policy development. Our host institutions will continue this level of support in Phase Two.

Student and stakeholder involvement in bioCEED is already strong (see Self Assessment for details). Students and stakeholders participate in the bioCEED leadership and management, as co-creators of R&D projects, as participants on panels and in meetings, and as participants in and target audience for innovations and projects. These aspects will be further strengthened and profiled in Phase Two through specific actions within all four focus areas, supported by quantiative assessment criteria associated with involvement (see Objectives).

Many actions also involve collaboration and partnerships with other biology educations in Norway and abroad, with the other SFUs, and across HigherEd more generally (see Self-Assessment and Additional Information for specific information). International collaboration is ensured through our two adjunct professors which are responsible for collaborative educational R&D and policy development projects and staff and student exchange, through networks (e.g. RIVA institute, ISSOTL) and through incoming and outgoing moobility with relevant partners internationally.

[1] see bioCEED self-evaluation p.9: Behind the Scenes: Centre organisation and management
[2] see bioCEED self-evaluation p. 10: Changes to bioCEEDs aims and objectives