

Review of Self-Evaluations of Centres for Excellence in Education: bioCEED

This review examines the self-evaluation report of bioCEED, which was awarded a NOKUT Centre for Excellence in Education in 2014 and is currently one of three Centres participating in an interim evaluation of their work. The review is written by the expert panel who are conducting the review, which consists of the following members:

- Professor Paul Ashwin, Lancaster University (United Kingdom), Chair
- Professor Celia Duffy, Royal Conservatoire of Scotland (United Kingdom)
- Professor Andreas Eichler, University of Kassel (Germany)
- Professor Stephanie Marshall, Higher Education Academy (United Kingdom)
- Professor Peter Maassen, University of Oslo (Norway)
- Professor Richard Reece, University of Manchester (United Kingdom)
- Trine Oftedal, Norwegian Union of students (NSO, Norway), Student

The purpose of this review is to identify key questions that the expert panel wish to explore during the site visit and within the interim evaluation as a whole. Thus the questioning focus of the review should not be understood as being critical of the work of the Centre or its self-evaluation. It is rather a starting point for better understanding the work of the Centre and helping it to further develop its aims and practices in the future. This is central to the overall intention of the interim evaluation which is to help the Centres to identify ways of enhancing their work and developing effective action plans for the next round of funding.

Section 1 discusses bioCEED's self-evaluation document and outlines:

- a) overall comments on the self-evaluation document;
- b) key questions for the interim evaluation of the Centre;
- c) particular people and activities that the expert panel would like meet or observe during the site visit;
- d) any additional information that the expert panel requires before the site visit.

Section 2 outlines cross-cutting themes from the self-evaluation reports of all three of the Centres for Excellence that are currently being reviewed.

1. bioCEED

a) Overall comments

The self-evaluation report and annual reports provide an excellent insight into the work undertaken by the consortium and the relative successes achieved so far. It is a very encouraging sign that the International Society for the Scholarship of Teaching and Learning (ISSOTL) have chosen to host their 2018 conference in Bergen within the consortium.

The self-evaluation document focuses on the efforts that the consortium has made in changing the culture of biology education within the partner institutions. Over the course of the funding period, the focus areas have developed into four parts:

- Teacher culture.
- Innovative teaching.
- Practical training.
- Outreach.

The concentration of effort into the four 'focus areas' from the original eight 'work packages' appears to be of significant benefit to the consortium.

Biology is an inherently experimental discipline. One of the primary drivers of many higher education systems within the discipline is to enable the training of the next-generation of researchers. There are three key aspects to this. First, biology students must be enthused to discover all they can about the world around them. Second, they must be taught to appropriately design, execute and interpret an experiment and the data generated from it. Third, biology as a discipline is becoming more and more dependent upon other scientific disciplines. While the interaction between biology and chemistry and medicine have been appreciated for some significant time, the relationships between biology and, for example, physics, mathematics, engineering and computer science are perhaps still evolving.

Whilst it is clear that BioCEED is engaging with the first aspect, described above, the evidence is less clear with respect to the second and third aspects. In relation to the second aspect, the most successful education programmes within biology marry together teaching

and research so that research informs teaching and teaching informs research. These need to go hand-in-hand to enable graduates to both appreciate the complexity and variety of biological systems and to understand how they can interrogate these interactions further. Indeed, a number of accreditation systems (such as those of the Royal Society of Biology in the UK) are based around the understanding that the research training given to students is at least of equal value to the knowledge transfer that occurs at the same time.

In relation to the third aspect, there was less of a sense in the self-evaluation report of the ways in which biology students and biology education might be thought of as a component part of a bigger scientific picture. Instead, the discipline boundaries appear to be even further defined rather than being broken down. This seems in tension with current research in biology, which is a complex array of interconnecting discipline areas. The majority of the focus in providing this practical and research training appears to rest on a small number of elective courses and providing opportunities for (some) students to experience internships. It is not clear that this will have the effect of instilling these experiences and skills within a large cohort of the student population.

The 'growing pains' of the consortium are succinctly outlined within the self-evaluation document. The move from the involvement of a 'coalition of the willing', in terms of the teaching staff, to a more inclusive environment where the norms have been altered will be a significant part of the second round of funding for bioCEED. Although this problem is carefully articulated, the mechanisms that will be employed to address it are less clear. There are, of course, several ways in which mainstreaming could be achieved. The experiences of the 'willing', combined with pressure from students, should enable (over time) changes to be enacted. Alternatively, an external force (*e.g.*, through NOKUT, or the Pedagogic Academy (PA), or through an accreditation driver) may be able to impose a more precipitous alteration.

The self-evaluation document clearly outlines the lack of initial baseline data upon which judgements can be made relating to the effectiveness of particular interventions. A specific aim for future funding rounds needs to be to develop data sets that will support evidence-based 'distance travelled' judgements to be made. The lack of baseline data has

hindered efforts to evaluate the effectiveness of innovations and interventions and the development of such data sets will enable a more rigorous approach to evaluation to be undertaken.

Overall, bioCEED has achieved a significant amount since its inception. Using the biology discipline as a frame, it has corralled best practice from the participating institutions and has introduced a number of pedagogic changes (particularly in the area of technology) that would seem to benefit the student population. There is, however, still some way to go before all students within the consortium, and within the rest of Norway, can be seen to benefit from these changes. A focus on how to achieve such wider scale change will need to be a central element of bioCEED's plans for the second period of funding.

b) Key questions for the review

1. How many staff and students have engaged with the bioCEED projects?
2. What are the plans to roll out the project results to both organisations within the consortium, and those without?
3. What is the relationship between bioCEED and the Pedagogic Academy?
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?
5. Are there any plans to attempt to link biology education with other scientific disciplines (particularly chemistry and physics)?
6. How are students being involved as co-creators in bioCEED's work?

c) Activities for the site visit

During the site visit, it would be very helpful to examine the research facilities available to students in the host institutions. We would also like to meet students who have had a variety of experiences of the internship programme and to gain a clear sense of the kind of research activities that they engage with as part of this scheme.

d) Requests for additional information to be provided before the site visit

No further information is requested from bioCEED at this stage.

2. Cross-cutting themes

Seven cross-cutting themes have been identified across the three self-evaluation reports of bioCEED, CEMPE and MatRIC. In outlining the challenges represented by these themes, it is important to be clear that they are challenges that cannot simply be addressed but are rather issues that Centres need to come back to in an ongoing and iterative manner. It is also important to be clear that engaging meaningfully with these challenges will be central to meeting the overall aims of the SFU initiative. The themes are:

1. The Centres would benefit from having more systematic accounts of their particular approaches to research and development-based education, so that there is clear evidence of a shift from the rhetoric of research and development-based education towards the development of explicit strategies and embodied practices that support research and development-based education.
2. The Centres need support to develop better evidence of their impact on their areas of specialism and how this relates to the size and shape of the sector as a whole, in terms of the number of students, academic staff and practitioners engaged in their area nationally and internationally.
3. The Centres would benefit from developing a clearer agenda for how they involve students in their research and development practices and how students benefit from their engagement with the work of the Centres.
4. The Centres would benefit from developing a clearer vision of, and rationale for, their engagement in interdisciplinary practices and how they define interdisciplinarity from the perspective of their specialist areas.
5. The Centres would benefit from developing more systematic approaches to dissemination and impact, which have a clear sense of how this approach develops synergies in their work locally, nationally and internationally.
6. The Centres need support to specify what they mean by 'cultural change' across their areas of specialism and how to develop criteria to judge their relative success in achieving this.
7. The Centres would benefit from developing more detailed strategies for how they will ensure the long term sustainability of their work.