
The Impact of the Centres for Excellence in Teaching and Learning (CETL) Programme: A Perspective from the Engineering CETL

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Abstract

The Higher Education Funding Council for England, in its largest single teaching and learning initiative (£315m), created 74 Centres for Excellence in Teaching and Learning in 2005 in areas of recognised strength. The Engineering CETL at Loughborough University received £1.645m capital and £0.5m per year recurrent funding for 5 years, to build on its strong links with industry and expand the role of the existing Engineering Education Centre. The engCETL is now approximately half way through the funding period and the paper reflects on some of the achievements and issues associated with this step change in funding levels. The capital funding provided the opportunity to develop bespoke high quality teaching space, which has raised the profile of the CETL at all levels across the University. The paper reports on the outcomes of the development of this space and the evaluation of its use. The recurrent funding has expanded the remit of the existing Centre, particularly in the area of pedagogic research and wider engagement across the University. Contact with academic departments has increased and the strategy of using seconded academics has been successful. The paper reflects on the impact of the recurrent funding and some of the issues that have emerged in managing the changes associated with large scale but short term grants.

Background

Background to the CETL Programme

The proposal for the formation of Centres of Excellence in teaching in England was made in the Government White Paper, *The Future of Higher Education* (DfES, 2003). The Higher Education Funding Council for England (HEFCE) then undertook a period of consultation with the sector (HEFCE, 2003), and published bidding guidelines for the CETL programme in 2004 (HEFCE, 2004 a&b). In January 2005, 74 CETLs were created in the Funding Council's largest ever funded programme for teaching and learning, with two main aims: *"to reward excellent teaching practice, and to further invest in that practice so that CETLs' funding delivers substantial benefits to students, teachers and institutions"* (HEFCE 2007). The total funding was £315m over five years with each CETL receiving up to £2.3m of capital funds and up to £0.5m a year of recurrent funding.

In 2007 the Funding Council commissioned an external evaluation of the CETL programme as a whole, which required each CETL to produce a self-evaluation document and in addition the external evaluators visited about half the CETLs to collect data. At the time of writing this paper the evaluation report has not been published but a presentation on the main findings was given at the 2008 National

CETL Conference and the authors draw on this. The report is expected to be published in June 2008.

Background to the Engineering CETL

Loughborough University is one of the largest providers of engineering education in the UK with a population of 3300 engineering students, of which about 2800 are undergraduates on accredited programmes covering Chemical, Civil, Electrical, Mechanical, Manufacturing, Aeronautical and Automotive Engineering. In 1998 the Engineering Faculty set up a Teaching and Learning Support Centre (EngTLSC) with three core posts and a remit to support engineering academic staff to develop learning resources using the emerging learning technologies. This strategy of providing discipline-based support directly to academic staff proved very successful as, over the next seven years, the Centre produced over 70 projects. All of these projects originated from individual academics who wanted to use the resource in their teaching, so priority was given to those proposals which could transfer to other areas and many resources went on to be used in other departments and, in some cases across the University, for example, Co-tutor an online tutorial companion to record and track meetings between tutors and tutees. The Centre was also successful over this period in securing £3m of funding from a variety of sources including the Teaching and Learning Technology Programme, the Fund for Development of Teaching and Learning, Masters Training Packages and the European Social Fund. This external income demonstrated the viability of the Centre to senior management, an important aspect in a research-led university, and, to reflect the broader range of activities within the Centre, the name was changed to the Engineering Education Centre (EEC) in 2002 (Figure 1).

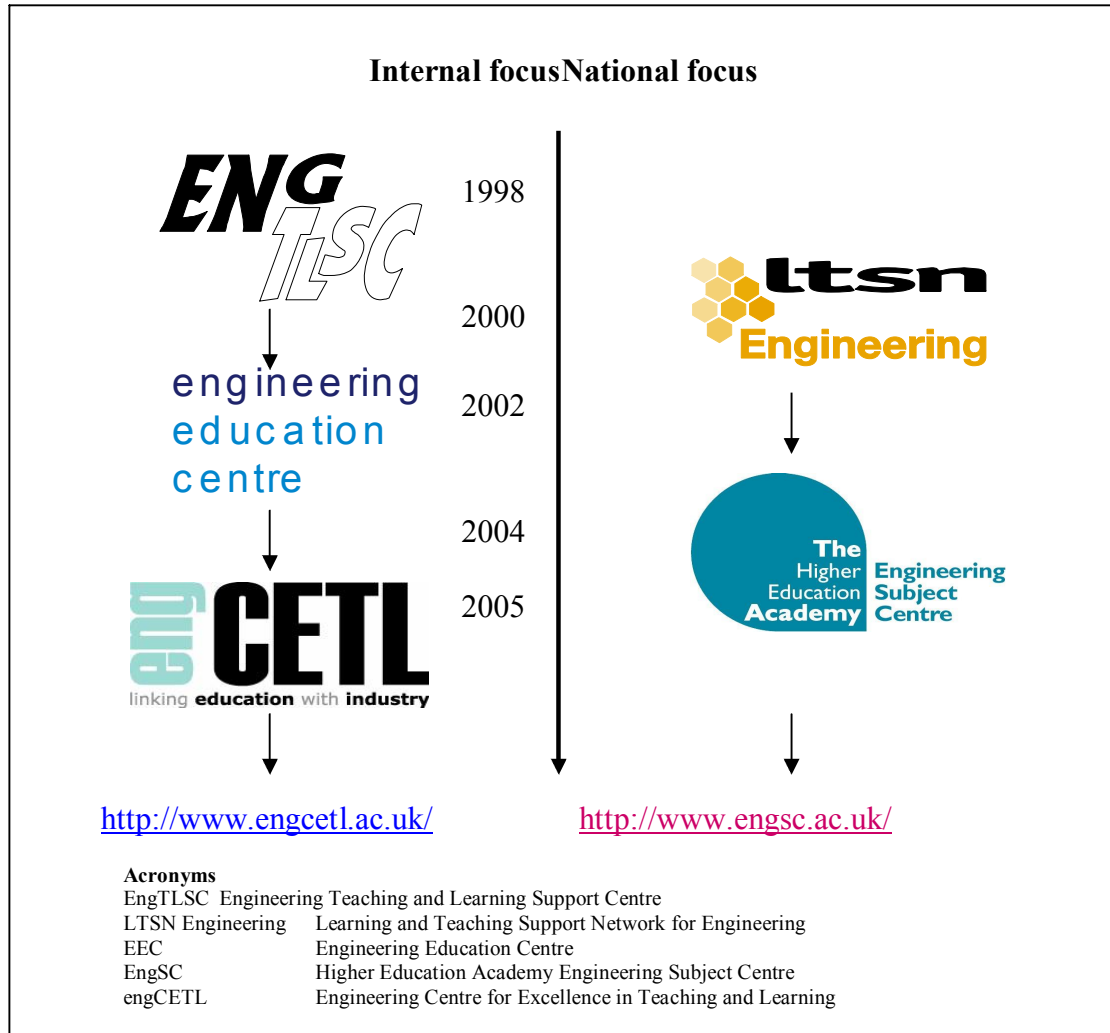


Figure 1 Engineering Education Support Units hosted at Loughborough University

The existence of the EngTLSC led to the University’s successful bid to host the Learning and Teaching Support Network for Engineering (LTSN Eng) which was formed in 2000 (see Figure 1) as one of 24 discipline-specific networks in the UK. EngTLSC led the bid for the LTSN Centre, some staff transferred to the national centre and the two centres were co-located. In 2003, LTSN Engineering was renamed the Higher Education Academy Engineering Subject Centre (EngSC), and by 2004 up to 20 staff across the two centres were working on learning and teaching support in engineering both within the University through the EEC and nationally through the EngSC.

In the bid for CETL funding, the case for excellence was based on the work of the EEC over a seven-year period and the strong links with industry that have been a feature of the University since its formation - particularly in engineering. The industry links existed in many areas including sandwich placements for undergraduates, sponsorship of students, industry input to curriculum design, input to design teaching, bespoke post-graduate courses and funding for research. It was a bidding requirement that the proposed work of the CETL articulated with the University strategy and this was explicit for both the industry links and the work of the EEC. Design teaching with industry input was identified as an area common to all the engineering disciplines and the lack of flexible teaching space for group design work was identified as an issue that the CETL capital funding could address.

CETL funding of £1.645M capital and £0.5M recurrent for five years started in March 2005. The impact of this was significant in raising the profile of teaching and learning within the University and also presented significant challenges in managing the change that this large increase in funding introduced. These challenges included the creation and management of new learning spaces, the development of pedagogic research capacity and closer engagement with academics at all levels across the University to deliver an impact on student learning. In the following sections the paper will briefly cover the impact of the CETL funding on three areas and then on the strategy for broader engagement across the University.

Impact of the CETL on Learning and Teaching Reward and Recognition

A key aim within the CETL programme was *“that CETLs will recognize, celebrate and promote excellence by rewarding teachers who have made a demonstrable impact on student learning and who enthuse, motivate and influence others to do the same”* (HEFCE, 2004a). This has presented a challenge for most CETLs as any reward for staff must align with university Human Resources procedures and promotion criteria are rarely based on teaching alone. Providing reward in the context of funding for small projects, conference attendance or related activities has been relatively easy to achieve.

All academic staff at Loughborough can put forward proposals annually for academic practice awards and mini projects:

- **Academic Practice Awards:** To recognise excellence in teaching or supporting learning and to encourage development work that support the institution's learning and teaching strategy. There are up to four awards annually of up to £5k. Applicants must provide evidence of the individual's excellence in teaching/supporting learning and a proposal for scholarly research-based activity that links to University strategic priorities.
- **Mini Project Awards:** Support practice-based projects that make a useful contribution to enhancing learning and teaching; they may be subject-specific or address a particular teaching-related issue. Applicants are not required to have a strong track record in learning and teaching development and the projects do not have to have a strategic dimension. Annually there are up to seven of these awards, of up to £2k each.

This reward mechanism is run centrally by the University. To ensure that we became integrated into the University reward system, the engCETL became involved in discussions about the awards from the outset in 2005. As a result, the CETL jointly funds the awards relevant to the engCETL activities and is represented on the panel which makes recommendations on which applications should be supported. The CETL has also supported academics in putting together their proposals, implementing projects, and disseminating outcomes through booklets, leaflets, publications and a seminar series. There have been more successful awards to engineering than either of the other two faculties in the first two years, with 12 engineering-related academics receiving awards. These engineering-related awards comprised 5 Academic Practice and 7 Mini Project Awards, the rest of the university received 2 Academic Practice and 6 Mini Project Awards.

An important engCETL method of working with academics on internal projects is based on a competitive bidding process:

- Individuals or groups submit project proposals.

- Proposals are peer reviewed by an advisory board against the stated criteria: improvement in quality of education, impact on student numbers, innovation, evidence of good practice, and transferability.
- The projects are undertaken by the engCETL staff in conjunction with the relevant academic(s).

This approach was implemented by the Engineering Education Centre from 1998 and was found to encourage staff to implement good practice and innovation in their teaching, particularly in the development of e-learning resources to support teaching and e-learning systems to improve teaching administration. This process also contributes to the reward agenda as academics receive the time of expert support staff to deliver a teaching resource without it having a major impact on their own workload.

The engCETL remit and step change in funding provided the opportunity to extend the project proposal system to include proposals for small-scale research and evaluation projects, development of industry links in teaching, and transfer of practice across departments. Over 100 projects have been undertaken in the EEC and engCETL to date. An example of a successful project is WebPA, an on-line peer assessment system which underwent substantial redevelopment in the CETL's first year following a successful project proposal. WebPA has now significantly increased in usage with staff and student numbers quadrupling from 9 staff and 790 students in 2005/6 to 43 academics and 3135 students in 2006/7. This led to a successful JISC bid in 2006 to develop it as an open source tool, which is now being embedded in other institutions.

In the third year of the CETL an external evaluation was commissioned (Tolley, 2008) to draw upon the experiences of the EEC and engCETL in relation to a sample of development projects. Key recommendations for the future in relation to this project proposal approach include:

- *“get beyond the converted ‘few’ to the ‘many’ in order to increase the pool of staff who are sufficiently motivated to submit proposals”*
- *“the adoption of an action research approach to developmental activities – a way of working into which formative evaluation was routinely integrated”*
- *“to broaden the sources from which development projects are initiated, invitations could perhaps be extended to students to come forward with proposals”*

The report's recommendations are currently being used to inform decision making and actions to enhance the way in which future projects are chosen, planned, implemented and evaluated.

The engCETL has also contributed, in part, to rewarding individual staff more directly and the University has awarded two personal chairs based partly on the individual's CETL work. Additional increments or lump sum payments have also been awarded to individuals based on their work within the CETL. The University/CETL awards have been used as evidence of teaching quality in promotion criteria and staff associated with the CETL have achieved external recognition through for example the National Teaching Fellowship programme and the Royal Academy of Engineering teaching awards.

Development of Teaching Space

The large injection of funding through the CETL capital allocation (£1.645m for engCETL) enabled development of new teaching and office space for the CETL plus

enhancement of teaching space and facilities within the seven departments associated with the engCETL (See Figure 2).

A needs analysis involving four sets of stakeholders that included focus groups with academic staff, CETL staff, students and industry was undertaken prior to the internal fit out of the CETL building. The needs analysis was used to prioritise the purpose of the space, layout, facilities and equipment.

The primary purpose of the teaching space which quickly emerged from the academics was to provide flexible rooms for students undertaking design projects. The needs analysis identified a number of other key drivers which are detailed by Willmot *et al.*, (2006) and include:

- *“The need for a sense of community and collaboration between staff, academics, students and industry”*
- *“Both formal and informal areas are needed and there was strong recognition that students should have a sense of ownership in the building.”*
- *“Students didn’t favour large design rooms with a number of project meeting areas as these always become too noisy. They required meeting rooms, each with a board room size table.*
- *“They [students] expressed the need for quality space when presenting to industry in order to project the right image.”*

The needs analysis from the stakeholder groups was distilled and passed on to the architects who integrated the key requirements into the building design. There was ongoing, regular communication between CETL staff, University Estates Services, project managers, architects and the contractors throughout the build process. The teaching space which was developed was completed on time and to a high standard. An external evaluation consultant was commissioned to determine whether the aims had been met and to recommend how the use of the space could be enhanced (Moore, 2007).

Key outcomes from the space evaluation included:

“The major impact of the needs analysis may be seen in the detail and in the equipment in the learning spaces. Beyond this, there were several further outcomes of benefit to the CETL programme:

- *Those staff from departments who were involved in the process became more engaged with the CETL and were more ready to use the learning spaces.*
- *There was a greater feeling of ownership of the space by the CETL team.*
- *The process raised the profile of the CETL across the university and has had an impact on it. The CETL is seen as a ‘flagship’ learning space for the university.”*

The report also highlights the two key elements which resulted in the successful design and build of the new teaching space: *“The significant portion of CETL time put into the start of the process together with the high level of funding resulted in a high quality learning space.”*

Pedagogic Research

From the outset of the CETL concept there was an emphasis on pedagogic research as the HEFCE (2004a) invitation to bid for funds indicated that CETL funding might be used to: *“deepen staff involvement in critical scholarly reflection and evaluation of current teaching by strengthening the CETL’s research and administrative infrastructure”*. Bidding for CETL funding was a two-stage process and within the stage 2 guidance (HEFCE 2004b) the emphasis on pedagogic research increased so

that it was a requirement that *“the costing of all business plans should show: ... the costs of building in capacity for pedagogic scholarship and research to inform and further develop excellence”*.

Prior to the engCETL, pedagogic research in engineering was mainly restricted to a small number of projects by individual academics and publications describing development work and evaluation supported by the Engineering Education Centre. To increase the emphasis on engineering education research, the engCETL has adopted several approaches to encourage more active engagement.

Engineering academics at Loughborough can now bid for support in undertaking pedagogic research, which is provided through two Research Associate posts, with one funded by the CETL and the other by the University. All research projects are designed to align with engCETL aims and objectives, and are intended to provide an evidence base, to increase the capacity to conduct pedagogic research and to demonstrate excellence. Research support provided to academic staff has enabled them to evaluate newly introduced teaching activities specifically designed to support students in the transition to learning at university. In addition to enabling evidence-based enhancements to their teaching, academic staff have reported that engCETL support has enabled them to develop a greater understanding of the value of, and to have confidence in, qualitative research methods. Examples of engCETL research projects and the process of engaging colleagues is described in more detail by Morón-García (2007).

The CETL funding has also enabled the funding or part-funding of six PhD studentships. The students are jointly supervised by enthusiastic teaching academics from six of the engCETL departments. Additional supervisory support is provided by the engCETL Pedagogic Research Consultant, Prof George Brown. The studentships explore areas of particular interest to engCETL namely:

- The impact of work placements on transferable skills.
- The impact of industrial sponsorship on students, academia and industry.
- Closing the distance: development of a web-based tele-laboratory for process control education.
- Appraising the benefits of project-based learning in engineering.
- The use of real-time data capture and display in the teaching of electrical machine theory.
- An investigation into the curriculum for the study of digital industrial design.

Other research activities include a JISC-funded project to research evaluate and disseminate an engCETL project resource, extending an EPSRC research project on sandwich placements and gender, several successful research events, a seminar series and numerous publications. Since inception, engCETL achievements in pedagogic research have raised the status of this work and added a new dimension to the research profile of the Engineering Faculty.

Engagement

The change that CETL status brought to the EEC increased the range of stakeholders and required a fundamental change in the way the CETL engaged with them. The EEC largely engaged with individual academics in engineering and reported through the Associate Dean for Teaching to the Engineering Directorate which comprises the Dean, Associate Deans and Heads of Engineering Departments. The CETL needed to deepen its engagement with engineering departments, beyond that of the EEC, and engage across the University and externally to maximise the impact of the activities undertaken and meet the key aim

to “further invest in that [excellent teaching] practice so that CETLs’ funding delivers substantial benefits to students, teachers and institutions” (HEFCE 2007)

Senior Management

The award of the CETL funding was recognised by University senior management as important and provided a focus for raising the status of teaching. The new space created has provided a clearly visible icon for learning and teaching - important visitors are regularly shown the facilities and senior managers have organised University meetings in the Centre. There is no doubt that the capital funds, in creating a high quality presence for the CETL, have made a significant contribution to raising the profile of teaching, thus achieving one of the original aims of the CETL programme.

CETL Departments

The CETL includes two departments from other faculties in addition to the five engineering departments that the EEC worked with (Figure 2).

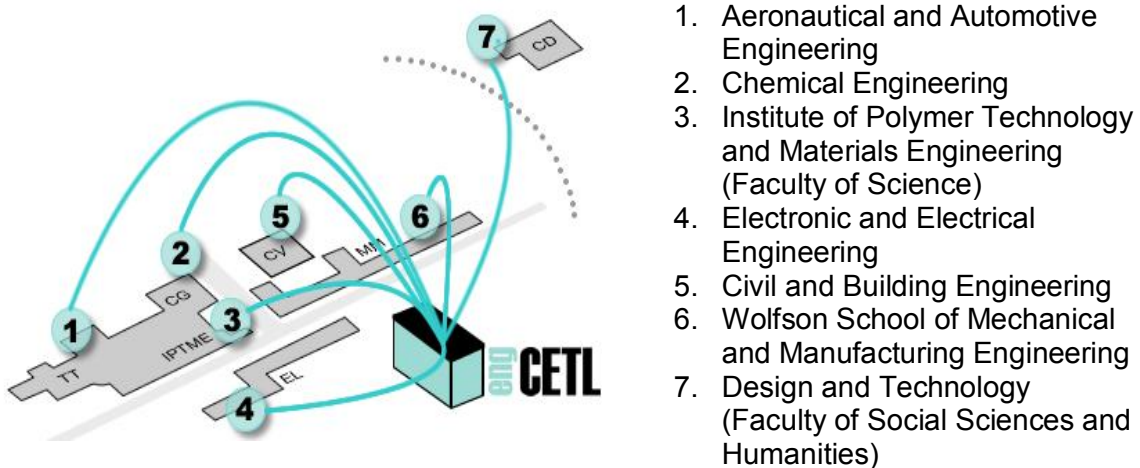


Figure 2 Departments supported by the engCETL and their relative location.

To increase the impact of the engCETL beyond that of the previous EEC, there was a need to engage different academics, and to further recognise and reward excellent teaching, this would involve operating at a broader level with these departments. The strategy adopted was to appoint a seconded academic from each of the CETL departments. These were identified at the bidding stage and departments were allocated funding to buy out their time. It was important to secure commitment to this strategy from departments at the proposal stage. The identified academics were mainly those who undertook the role of learning and teaching co-ordinator within their department, so they were already recognised as dealing with the management/administration of teaching activity by their colleagues. The effectiveness of this strategy was evaluated by the CETL’s external evaluator (Tolley 2006) as it was identified as a critical activity if the CETL was to fulfil its remit. The evaluation was based on a survey conducted by means of one-to-one interviews with all seven seconded academics. The conclusions of this evaluation included:

- *“The role fulfilled by the Seconded Academics is an important one in engCETL’s development plans – it is difficult to see how the centre could pursue the objectives of those plans without them.*
- *Thus far, the experience of Seconded Academics has been positive - not least in terms of job satisfaction and enhanced communication about pedagogy, across the Faculty and the wider university.*

- *“Other benefits at the departmental and student level and beyond are beginning to accrue and are expected to increase now that the new facilities and equipment for teaching and learning have materialised and the foundations have been laid for the CETL’s work.”*

Engagement with departments continues to be focussed through the seconded academics, although links have broadened as other academics have engaged with the CETL.

The evaluation also highlighted the importance of working within the existing culture of each department. Even among engineering departments at the same university the way to engage with academics differs and the creation of seconded academics enabled the CETL to work within this culture rather than to fight against it. The evaluation also highlighted an issue that is not uncommon within UK universities: although the seconded academics were ‘bought out’ for one day per week, it is not always possible to achieve a commensurate reduction in their existing workload. If this is not sensitively managed, it may result in overload for an individual and subsequent disengagement.

In addition to the work of the seconded academics, CETL engagement was helped at an early stage by allocating a small amount of capital funding (£30k) to upgrade a teaching facility in each department. These facilities were badged as being CETL funded, so raising the profile with both staff and students. The use of the CETL teaching space by staff and students has also contributed to the embedment of the CETL into the University.

University

The engCETL is discipline based but many of the outcomes are sufficiently generic to be transferable across the University. It is also important, for the sustainability of the Centre’s activities after the funding ceases that it is embedded as far as possible into the University. The process for doing this has been to include CETL staff in University learning and teaching committees and planning groups. The Director, through his role as Associate Dean for Teaching, has a place on all the Faculty management committees and the University learning and teaching committees. Other staff have been involved in the planning and implementation of a new VLE for the University, membership of the teaching awards panel, Quality Enhancement groups, and student skills awards. Evidence of the success of this strategy includes the inclusion of the work of the CETL in the University Strategic Plan - Towards 2016 (Loughborough University, 2007) and a number of University-funded posts including quality enhancement and Online Learning support are based in and managed by the CETL. The recent draft QAA Institutional Audit Report in March 2008 commended the University on how well it had integrated the work of the CETL and on the thorough approach to the promotion and management of industrial links.

The Wider Engineering Community

The CETL is now three years through the five-year funding period and the focus of activities is shifting from being primarily for the benefit of students and staff at Loughborough to include more external dissemination.

The main engCETL dissemination route with the wider academic community is through the Higher Education Academy Engineering Subject Centre. The two centres have links at all levels and have developed a range of methods of working together, including disseminating key activities and outputs from the engCETL to the wider academic and engineering community.

Examples of these activities include

- Jointly run pedagogic research workshops for UK engineering academics (Morón-García, S. & Willis, L. 2007) in conjunction with the engCETL Pedagogic Research Consultant. This will now be disseminated further with the aid of a mini project award from the Higher Education Academy to create an Engineering Pedagogy Research Toolkit.
- Producing commissioned reports based on engCETL research activities (e.g. Morón-García 2006) and publishing papers (e.g. Willmot and Crawford, 2007) through the Engineering Subject Centre Journal – ‘Engineering Education’.
- Both EngSC and engCETL employ Academic Coordinators and they meet at regular intervals throughout the year to plan events and other dissemination activities.
- The two centres also collaborate on a number of nationally-funded learning and teaching projects. These projects have been hosted both by Loughborough University e.g. DART the Disabilities Academic Resource Tool, which offers online advice and guidance on providing a more accessible curriculum (Crawford *et al*, 2005) and by the EngSC e.g. Engage, which facilitated dialogue between Employers and Engineering Academics in Higher Education.
- The centres also collaborate jointly with external partners e.g. the Inter-Disciplinary Ethics Applied CETL to produce a series of ethics case-study teaching resources which are specific to engineering.

It is envisaged that the strong links which have developed between the EngSC and the engCETL will continue with ongoing collaborative activities beyond the CETL funding period, in the same way that there was substantial interaction prior to CETL funding. This collaboration should be to the benefit of both centres with outcomes disseminated to the wider engineering academic community.

Conclusions

This paper has described some of the activities of the Engineering CETL and identified some of the impact that the large scale project funding has had. There are two CETLs at Loughborough University, Engineering and SIGMA the Centre for Excellence in Mathematics and Statistics Support, between them they have contributed to raising the profile of learning and teaching in the University, particularly with senior management. Capital funding has provided a building that has given the engCETL a recognisable identity which, because of its high quality is associated with excellence. The teaching space is valued by both academics and students and has contributed to evolving University strategy on new teaching space.

There has been some success in moving beyond academics who are very enthusiastic teachers, but there are still only a limited number with a high level engagement. There has been increased focus on pedagogic research in engineering, through the research associates, academics and research students but there are challenges in maintaining these activities, for example, the number of studentships available after CETL funding ceases.

It has been important to integrate the work of the CETL into the institution to maximise the number of students and staff engaged in CETL activities and particularly to achieve long term sustainability. If the activities of the CETL do not fit with the operational strategy of the University then sustainability of activity beyond the project funding period is unlikely.

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