



Background to the engCETL Development Project Case Studies

Professor Harry Tolley



engCETL

 **Loughborough
University**

Background

Development projects are central to the way in which the Engineering Centre for Excellence in Teaching and Learning (engCETL) at Loughborough University is seeking to achieve its strategic objectives. In 2007-2008, a small sample of those projects were the subject of a detailed external evaluation aimed at providing the centre with formative feedback on the effectiveness of this chosen way of working. Evidence collected for this evaluation was extensive, and feedback suggested that it would be appropriate for further analysis from a different perspective, producing six stand-alone case studies, forming a series charting engCETL's successes in developing projects in engineering-related disciplines.

Development projects

Development projects are a major component of engCETL's strategic and operational plans, as they were in those of its forerunners, the Engineering Education Centre (EEC) and the Faculty of Engineering Teaching and Learning Support Centre (EngTLSC). As such, development projects are an important method by which the centre seeks to achieve its aims and objectives of:

- Engagement with academics, their departments and their industrial partners.
- Promotion of scholarly activity.
- Advancement of pedagogic research.
- Improvement of students' learning experiences.

Consequently, the encouragement of academics to write and submit project proposals that have the support of their departmental colleagues, the short-listing of the bids received, the final selection of which projects to support and which to reject, and the subsequent implementation, dissemination and provision of aftercare support, all receive substantial inputs of engCETL staff time, energy and expertise.



Development project 'life histories'

All of engCETL's projects have similar 'life histories', in that they go through comparable developmental stages though not necessarily over the same timescale – some projects take much longer to complete than others. The stages through which all of the CETL's projects progress are as follows:

- Potential projects are identified as a means of tackling practical problems encountered by engineering staff (or staff from related disciplines) with regard to some aspect of the teaching and learning for which they are responsible.
- Initial ideas for such projects are then shaped into written proposals, which are submitted for consideration at the selection stage in the process.
- The selection of projects involves the use of clear and transparent procedures and the application of pre-determined assessment criteria.
- Successful project proposals are then implemented through collaboration between engCETL staff with the relevant specialist expertise and the people responsible for the proposal (plus their departmental colleagues). It should be noted that most of the project bids are for an input of expertise from engCETL staff and not resources, and are thus 'cost free' to the proposer – other than making timely contributions to the project's development and evaluation.
- The outcomes of projects are disseminated beyond those engaged in their development (e.g. to other users in the same department, to other departments in the same Faculty, to the university as a whole and to other HEIs). The transfer of practice between departments is encouraged, and assists in widening and deepening the institutional impact of development projects over their lifecycles.
- Support and aftercare needs are identified and met in the project's post-development stage.

Development project evaluation

Development projects therefore, are deeply embedded into engCETL's formal and informal working practices, and the ways in which its work is structured and organised. It was for these reasons that the ways of working associated with its development projects was chosen as the subject of a detailed external evaluation, which was initiated in spring 2007, and culminated in the submission of a final report early in 2008. A sample of six development projects was chosen as the basis for the evaluation using criteria derived from the ideas of Yin (1989) on 'theory-generating case studies' and hence selection on the basis of 'extreme cases' (Walker, 1989) and 'maximum variation sampling' (Maykut and Morehouse, 1994).

In practical terms this resulted in the selection of a sample of projects, which collectively were a reflection of differences in:

- The age of projects – some dating back to as early as 1998 before the award of CETL funding and other being much more recent.
- The duration of projects – some being sustained over several years, others being much shorter.
- The collaborating academics and their departments.
- The problems faced and the methods chosen to address them, including the use of technology.
- The inputs of specialist expertise provided by engCETL.

Information about the six development projects, which satisfied these selection criteria, is summarised in the table below. Once chosen, qualitative evaluation data concerning each of these development projects were collected by the External Evaluator from two main sources: archived information (e.g. project proposals and progress reports) and an interview survey of key stakeholders (typically the academic proposer and the engCETL developer).

The resultant evaluation report concluded that the study had enabled “*important issues to be raised for consideration concerning the ways in which engCETL’s development projects are initiated, selected, implemented and disseminated*”. It was also noted that it had “*allowed some ideas to be surfaced (and related to the wider literature) on the ways in which the Centre might begin to address those issues in a theoretically informed manner*”. Finally, it has been argued that “*the rigorous application of such an approach would increase the potential of the Centre’s development projects for enhancing the students’ experiences, furthering scholarly activity and advancing pedagogic research*”.

Development Project	Collaborating Department(s)	Project Description
Automated Assessment Using MATLAB (1998-2004)	Wolfson School of Mechanical and Manufacturing Engineering	Automated marking of students’ MATLAB scripts, including the online provision of formative feedback
WebPA (1998-2008)	Wolfson School of Mechanical and Manufacturing Engineering & Business School	A web-based system for the moderated peer assessment of students’ group project work
Information/Inspiration Sustainable Design Website (2005-2006)	Design & Technology	Web-based sustainable design tool combining design-focused information with inspirational case studies
Enhancing Students’ Strategic Use of Computer Assisted Design (CAD) (2005-07)	Design & Technology	Web-based resource for use by industrial design and technology students to develop their CAD modelling skills
Furthering Links with Industry: Diploma in Industrial Studies (DIS) Website (2004-2006)	Wolfson School of Mechanical and Manufacturing Engineering, then piloting in all five Engineering Faculty departments, plus the Department of Materials	Web-based resources for use in connection with (DIS) industrial placements and the students’ personal development planning (PDP)
Enhancement of Industry-based Teaching in the Department of Materials (2006-2007)	Department of Materials	The CETL’s Industrial Liaison Officer developed new links between the Department of Materials and industry to promote its postgraduate courses, recruit part-time students and increase DIS placement opportunities.

Table 1 Development Projects: Evaluation sample

engCETL's reponse to the evaluation

As a Centre for Excellence, engCETL are continually striving to improve their working practices and respond to feedback to make the entire project proposal process both fair and transparent. After due consideration, the CETL reponded positively to the feedback and recommendations provided in the evaluation report by making a number of changes aimed at improving its established ways of working in relation to the selection and implementation of its development projects. These changes were reflected in the following updates to the Spring 2008 call for proposals process:

- The announcement of the opening of the process was by email as usual, but the information and selection process was also published on the engCETL website for transparency. <http://www.engcetl.ac.uk/activities/bid/> A webpage was also written to provide information on how engCETL differs from other calls for projects around Loughborough University and the Higher Education sector http://www.engcetl.ac.uk/activities/bid/other_funding/
- It was decided to trial targeted marketing for one department per call for proposals, to see if increased effort resulted in a rise in the number of proposals from that department (for 2008 it was Electronic and Electrical Engineering). Also it was decided that the process would start to think more about external collaborations, by approaching other University departments with specific enhancements to existing projects, rather than just concentrating on the seven engineering-related departments.
- The 2008 call prioritised new bidders, departmental or group bids and collaborative bids above single bidders, although all bids were considered
- All project management plans were updated to include a requirement to build evaluation into the project lifecycle

Development project case studies

As part of the post-evaluation review, it was also concluded that the data collected for the purposes of the evaluation should be used as the basis of a series of six development project case studies. These case studies have all been written to a common format, which puts the educational problems addressed by each project in context, lists the aims, sets out the key dates, offers an account of the actions taken, and summarises the main outcomes and impact. Each study is then concluded with a brief discussion of some related pedagogic issues. The re-working of the evaluation data in this way has enabled them to be viewed from a different perspective, and in so doing for a new set of conclusions to be drawn from across the case studies. This new analysis suggests that effective development projects have a number of common characteristics as follows:

- Successful projects focus on addressing authentic problems relating to aspects of teaching and learning that have been identified as being important by staff in the relevant department(s).
- Successful projects deliver solutions (e.g. in the form of e-tools), which are both 'usable' and 'fit for purpose' in the context(s) for which they were developed.
- The problems addressed, and the solutions sought, are aligned with departmental and institutional policies, and are consistent with the main aims of engCETL.

- Individual projects are not conducted in isolation as ‘one-offs’, but are part of wider programmes of work that build upon the successful outcomes of previous projects and wider initiatives.
- Each project requires a short-term input of specialist expertise from engCETL, which at the time is not available to the proposer’s department or from other sources.
- Project implementation involves working towards common purposes as a ‘community of practice’ (Lave and Wenger, 1991; Wenger, 1998). In other words, successful outcomes are achieved through close collaboration between engCETL and staff and students in a department and with other partners, where necessary.
- A ‘climate of readiness’ is created in the collaborating department(s) for the adoption and use of the outcomes of the projects.
- The transfer of project outcomes is actively promoted, not just by the dissemination of information at the end through the use of ICT systems and by means of In-Service Education and Training (INSET) events, but also by supporting its ‘champions’ and building and sustaining practitioner networks throughout a project’s life (Beadle, 2003; Cox and Smith, 2004).

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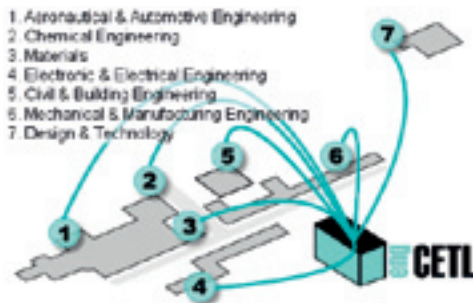
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Further information

The Engineering Centre for Excellence in Teaching and Learning (engCETL)

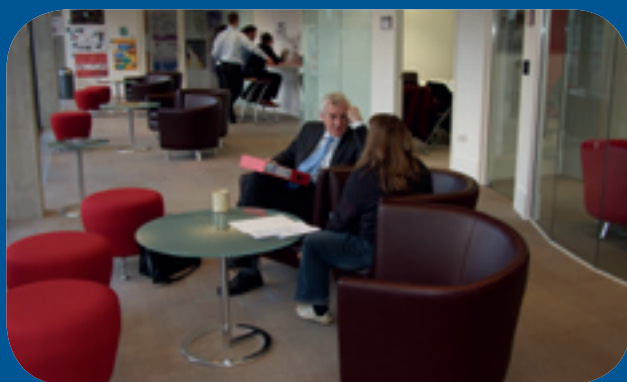
The CETL was established in March 2005 with the aim of building on Loughborough's long standing reputation for excellence in industry-focused teaching and learning in engineering and for the provision of pedagogic support to academics, first through its Faculty of Engineering Teaching and Learning Support Centre (EngTLSC, 1998-2002), and later by means of the Engineering Education Centre (EEC, 2002-5). Through its activities, engCETL is seeking to enhance the learning experiences of at least 4,000 students, and in so doing contribute to the development of graduates who are employable, entrepreneurial, productive and innovative.

The work of the centre is focused on collaboration with engineering-related departments, while also reaching out to engage with other subject disciplines at Loughborough and then beyond to other Higher Education Institutions (HEIs) through the dissemination of the outcomes of developmental activities. Consequently, it works closely with the five departments of the Faculty of Engineering (Aeronautical and Automotive, Chemical, Civil and Building, Electronic and Electrical and Wolfson School of Mechanical and Manufacturing) as well as with the department of Design and Technology, and the Department of Materials (previously the Institute of Polymer Technology and Materials Engineering or IPTME). The wider dissemination of engCETL's activities is achieved through working closely with the Higher Education Academy Engineering Subject Centre (EngSC), which has a remit to provide support for learning and teaching for the UK Higher Education engineering community, and which is co-located at Loughborough University. The seven departments at Loughborough University with which engCETL is directly involved with are:



Centres for Excellence in Teaching and Learning (CETL)

The Centres for Excellence in Teaching and Learning (CETL) were set up following the 2003 White Paper on *'The future of higher education'*, which proposed the establishment of such centres to reward excellent teaching practice and to invest in its on-going improvement. A bidding process resulted in the selection of 74 CETLs in England, funded by the Higher Education Funding Council England (HEFCE). The Engineering Centre for Excellence in Teaching and Learning (engCETL) bid from Loughborough University attracted £0.5 Million annual recurrent funding, with an additional £1.6 Million for enhancing teaching and learning facilities within departments and a state of the art facility located in the heart of the Faculty of Engineering.



Contact us:

Engineering Centre for Excellence in Teaching and Learning (engCETL)

Keith Green Building Faculty of Engineering
Loughborough University Leicestershire LE11 3TU UK

Tel 01509 227191

Fax 01509 227181

Email engcetl@lboro.ac.uk

Web www.engcetl.ac.uk

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