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Developing Activity Led learning in the Faculty of Engineering and Computing at Coventry University through a continuous improvement change process

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Abstract

This paper focuses on organisational change and faculty development in Activity Led Learning (ALL) within the Faculty of Engineering and Computing at Coventry University. The Faculty is a large multi-disciplinary faculty which brings together the work of several decades on problem based learning (PBL), project led learning, and industrially focussed learning in engineering and computing.

Set against this history the Faculty has the opportunity of a new multi million pound building for engineering and computing and to create an overarching teaching and learning vision, strategy and implementation plan that will inform the design of this new building. The overarching teaching and learning vision places ALL at its heart. ALL takes many forms and has a range of definitions in the various subjects, but can be illustrated by the integration of student led discovery, complex problem solving activities, and work-based learning.

This paper describes both the history and development of this innovative Faculty wide learning and teaching initiative and the change management approach being adopted. The Faculty is diverse in its history, intake and disciplines, and given this and other change management considerations, needs to adopt an appropriate continuous improvement change management approach for this ALL initiative.

This paper explores the change management approach being adopted which combines a 'top-down' teaching and learning vision, marking out the Faculty's overall strategic direction, with a bottom-up, project-led approach. In line with the continuous improvement change management process being adopted, on-going review and evaluation initially within an action research framework, will help shape this initiative and its on-going form.

Keywords: faculty development, organisational change, activity led learning, continuous improvement

1. INTRODUCTION

The Faculty of Engineering and Computing (EC) at Coventry is a large multi-disciplinary faculty encompassing mathematics, computer science, knowledge management, mechanical engineering, civil engineering, aerospace engineering and engineering manufacture and management. Within many of these disciplines there is a strong emphasis on employer and profession focussed education.

Set against this history the Faculty has the opportunity of a new multi million pound building for engineering and computing and to create an overarching teaching and learning vision, strategy and implementation plan that will inform the design of this new building. This development presents an opportunity to take the best of what has gone before in E&C and to develop it further to enhance student retention, engagement and achievement. The overarching teaching and learning vision places Activity Led Learning (ALL) at its heart. ALL takes many forms and has a range of definitions in the various subjects, but can be illustrated by the integration of student led discovery, complex problem solving activities, and work-based learning.

The aim of the initiative is to develop graduates and postgraduates who have greater confidence in their ability, a keen capability to achieve in a professional environment as reflective practitioners, and the capacity to innovate and renew their knowledge and learning. This will be achieved through the incorporation of professional skills in an ALL teaching environment. The new building will bring together teaching space, project learning spaces and laboratory spaces in a way that encourages a professional linkage of these activities.

The faculty L&T vision therefore, is to build a community of learners, through employer and profession focussed activity led education (see appendix A for summary of the Faculty's vision). This teaching and learning vision is informed by the recognition that learning is more likely to be effective when students are active participants in the learning process. That is, the learning experience is more likely to have significant positive gains for the learner if they are active rather than passive recipients within it (see e.g. Race [1] and McCowan and Knapper [2]). As McCowan and Knapper [2, p. 633] point out:

“Learning in a passive system has a much greater tendency to be both superficial and quickly forgotten. Active involvement in learning helps the student to develop the skills of self-learning while at the same time contributing to a deeper, longer lasting knowledge of the theoretical material....[and] ...it is almost the only effective way to develop professional skills and to realise the integration of material from different sources.”

Thus Activity Led Learning is defined by the Faculty as a pedagogic approach in which the activity is the focal point of the learning experience and the tutor acts as a facilitator. An activity is a problem, project, scenario, case-study, research question or similar in a classroom, work-based, laboratory-based or other appropriate setting and for which a range of solutions or responses are appropriate. Activities may cross subject boundaries, as activities within professional practice often do. Activity Led Learning requires a self-directed inquiry or research-like process in which the individual learner, or team of learners, seek and apply relevant knowledge, skilful practices, understanding and resources (personal and physical) relevant to the activity domain to achieve appropriate learning outcome(s) or intention(s). To be appropriate, the learning outcomes or intentions must be consistent with the aims, outcomes and intentions of the programme of study with which the student is engaged.

2. HISTORY AND DEVELOPMENT

The Faculty of Engineering and Computing has a long history of thoughtful and experimental learning design with programmes designed specifically to enhance employability and professional skills. This thoughtfulness however has never been on a cross-discipline, whole Faculty scale; a large investment in a new faculty building has provided just such an opportunity to do this. The Faculty has therefore been exploring its own history and experience, viewing excellent examples of teaching and learning around the world and through this has begun a debate to define a strategy, and the operationalisation of that strategy, for future teaching and learning.

The history of the Faculty includes innovative learning programmes such as problem-based approach to learning in Automotive Engineering Design [3]. This was the first time that a UK mechanical engineering derivative was accredited at Chartered Engineer level with no examinations. More recently, building on past work, there has been innovative curriculum development within Motorsport BEng course [4]. Other examples are the work done by the department of the Built Environment on engaging part-time learners in the support and professional skills development of full-time students [5]. This work built on earlier research by Davies on the part-time student experience and their better average achievement levels (scores) when compared to full-time students [6]. In computer science there has been a radical review of computer science learning resulting in moves into new subject areas, while the Faculty's excellence in mathematics support is recognised as a national centre of excellence in teaching and learning with two national teaching fellowship holders.

In support of this Faculty members have been engaging in a major review of international examples of thoughtful teaching and learning in engineering, computing and mathematics. By way of illustration of this, discussions have taken place with colleagues at the University of Strathclyde, Department of Mechanical Engineering, where radical thinking was applied to the physical act of teaching in order to address issues about retention and engagement. With the University of Aalborg, Denmark, who are internationally renowned as a centre of problem-based learning and the University of Southern Denmark, who make interesting use of building space to facilitate learning activities. Queen's University, Canada, who have designed space to much better develop professional skills development in engineering students, and where very interesting 'use' is made of the students to effectively engage them in the whole process of learning. Links and discussions are taking place with the University of Colorado, Boulder, the University of Queensland, Brisbane, the University of Sydney and the Laurea University of Applied Sciences in Finland. In relation to the latter, see for example Vyakarnam et al's [7] report on Laurea's 'learning by developing' pedagogical approach.

In the 2006/2007 academic year, armed with much of the above evidence, a small group developed an initial vision statement to set out the aims and principal objectives for the changes to the Faculty learning and teaching approach. This was developed in parallel to the initial brief for the design of the new Faculty building. This document then provided a base for the development of a working group, comprising interested, enthusiastic members of the Faculty's academic community. This working group met in November 2007 and then January 2008 to further refine the vision – see appendix A for the vision summary.

3. FACULTY CONTEXT

As indicated above the Faculty is a diverse one when viewed from a number of perspectives not least the range of subjects taught within its seven departments each catering for its own mix of students including full-time, part-time, and overseas from Europe and further a field.

The EC faculty at Coventry is currently comprised of seven departments (although this structure is currently under review), these seven departments and their indicative disciplines are shown in the table below:

EC Departments	Indicative disciplines (not exhaustive)
Built Environment (BE)	Civil Engineering Building Surveying Built Environment Studies
Computer Science (CS)	Computer Science Network Computing Multimedia Computing Creative Computing
Engineering & Manufacturing Management (EMM)	European Engineering Business Management Manufacturing Systems and Technology Manufacturing with Management
Knowledge and Information Management (KIM)	Business Information Technology Information Management
Mathematical Sciences (MS)	Mathematical Sciences Mathematics
Mechanical Engineering and Design (MED)	Automotive Engineering Mechanical Engineering Motorsport Engineering
Systems Engineering (SE)	Aerospace Systems Engineering Aerospace Technology Electronics Technology Digital Forensics & System Security

TABLE 1. Departments (and indicative disciplines) within Engineering and Computing as at Feb 2008

The progression statistics in Table 2 below shows the percentage of students progressing to next year or stage of study for each of the Faculty's departments and also gives the Faculty average. The progression rates for Stage 1-2 for EMM and MS departments are unrepresentatively high as they relate to small cohorts and can be discounted from this particular analysis. For the other departments the rates range from 60% to 73%. The highest rate of 73% was achieved by the BE and MED departments which are the two departments making the most use of ALL approaches in their teaching with larger cohorts of students (see e.g. Booth and White [4]; Davis and Davies [5]). One of the key drivers for the development of ALL across the Faculty is the improvement of student engagement, progression and retention in all departments.

Department	Stage 1-2 (full-time)	Stage 2-3 (full-time)	Stage 3-4/ Award (full- time)	No. of enrolled full-time undergraduate students
	%	%	%	Number enrolled
BE	73	81	95	445
CS	67	80	87	470
EMM	100	95	96	534*
KIM	72	72	89	277
MED	73	80	97	585
MS	80	83	90	98
SE	60	70	85	297
Faculty	70	79	93.4	2706
				* majority level 3 direct entrants

TABLE 2. Progression statistics for full-time undergraduate students for Departments within Engineering and Computing for the academic year 2006-07

The above table 2 also serves to illustrate the diversity within the faculty which provides for a complex and unique change management environment.

As indicated above, the Faculty leads one of Coventry University's three HEFCE (Higher Education Funding Council for England) funded Centres for Excellence in Teaching and learning (CETLs) and has two National Teaching Fellows.

Sigma is a HEFCE-designated Centre for Excellence in Teaching and Learning (CETL) in University-wide support in Mathematics and Statistics. Although Sigma supports students from across the University the majority of its users are from within the Faculty. One initiative that Sigma has pursued has been the development of a community of learners. This has been particularly successful with students in the mathematical sciences department. In previous years, this group of students had developed small communities based around year groups, but this has now been taken further into the creation of a single coherent group which incorporates students from all year groups.

Several factors have been important in developing this learning community. Of particular importance has been the provision of an appropriate learning environment. Initially this was the University's Mathematics Support Centre (MSC). The MSC is staffed for 32 hours per week with tutors who provide support on a drop-in basis to individuals or small groups of students. CETL funding had allowed the Centre to be completely refurbished, making it a very attractive environment. This combination of a pleasant physical environment with academic support immediately available made the MSC an ideal venue for the community's base room. Interestingly, as the group became more established, so the amount that its members called on the Centre staff for assistance diminished as peer support became much more prevalent. However, as the mathematical sciences learning community grew, the MSC (whose primary purpose is to function as a drop-in support facility for students of any discipline) could not cope with both its main audience and this new community. Consequently, a separate study room was provided for the mathematical sciences students.

Whilst the physical environment is very important, it was not the only factor contributing to the development of the community. The community's cohesion has been strengthened through the use of social networking technology, in this case Facebook [8]. At the students' request, a Facebook Group, Coventry Maths, was established with student members from the different years of the course and also several staff members. Although much of the interaction within Facebook has been social there have been several strands related to the students learning. The social interaction has been important in creating a sense of belonging in a way that has been non-threatening. The more academic interactions, which are initiated by students, have usually been at a level considerably above issues relating to specific exercises and assignments - for example "Why do we study linear algebra?" These discussions show the students reflecting on their studies in a deeper way than has previously been apparent.

A final factor has been more serendipitous. It has been the presence within the group of key individuals who have promoted collaboration and co-operation. These individuals have taken advantage of the physical and virtual environments to bring together their colleagues into a true learning community. Lessons learnt from this experience have influenced the change management approach the Faculty has adopted for this ALL initiative.

4. BRINGING ABOUT CHANGE

Given the above diversity, and the Faculty's existing teaching and learning expertise in PBL and other areas, such as those located in its CETL, the Faculty needs to adopt an appropriate change management approach for this ALL initiative which does not assume 'one size fits all'. To reflect this, the change management approach adopted relies more on continuous improvement as in Senge's notion of the 'learning organisation' [9] than Lewin's pre-planned three-stage model of unfreezing, changing and then refreezing [10] according to a pre-determined plan or agenda. The approach adopted also acknowledges, as authors such as Trowler et al [11] do, that pervasive change takes time, that it is important to find good practice where it already exists and to work with it, and that one should expect and anticipate different outcomes in different locales. With reference to introducing Problem Based Learning, a teaching and learning approach embraced by the ALL term, TREE [12] note that "The success of changing to PBL depends on the faculty to adapt the educational method to [its] needs" [12 p.22]. This quote also illustrates the importance of the faculty understanding its needs in relation to ALL and thus refining its vision and allowing for a variety of interpretations within its different disciplines and cohort groups.

4.1 Change strategies

In their summary of strategies for change, Kolmos and de Graaff [13] cite the work of Chin and Benne, 1985 who identify three types of strategies that can be applied when changing an organisation: empirical-rational; normative-re-educative; and power-coercive (Chin and Benne cited in [13], p.35). Each strategy is based on different implicit beliefs about human nature. Bearing in mind Kolmos and de Graaff's [13] observation that "managing a large institute like a university faculty is at times compared with the navigation of a super tanker....The inertia of mass precludes any abrupt change of course" [13, p.35], it is probably sensible to adopt a little of all three change strategies within EC at Coventry. However the dominant strategy of choice is normative-re-educative which "...is best suited for long term effectiveness, aiming at creating conditions for growth rather than immediate results" [13, p.36]. However this does not preclude shorter term 'wins' through power-coercive 'bottom up' projects i.e. short term projects which show quick visible results. The Faculty's Learning Teaching and Assessment (LTA) mini-projects – see appendix C – provide an opportunity for such results, although they also serve other aims within the change process, as outlined below. Nor does it preclude the appeal to the rational – where the advantages of the new teaching and learning vision and the ALL initiative within it are pointed out and individuals 'buy in' to achieve personal gain for themselves and their students. The vision summary outlined in Appendix A, could appeal to this rational element of human nature.

4.2 The current Faculty position

Table 2 above indicates, to some extent, the Faculty's current position in terms of student retention and achievement. These figures indicate areas which are working well and those areas where there is room for improvement. How do staff perceptions compare? Since her appointment in September 2007, the Faculty Teaching Development Fellow has had meetings with all the Heads of Departments, as well as some other members of the teaching staff, to find out about staff perceptions of student retention, engagement and achievement in their areas and the teaching and learning approaches being deployed. As one would expect (and in line with the diversity suggested in table 2) different Heads and staff members have identified different areas of strength and different aspects of retention, engagement and achievement that can be improved. For example Davies [6] has identified that part-time students are outperforming full-time and as a result, in conjunction with a colleague, has put forward a module enhancement which is being supported and evaluated through the LTA mini-project framework (see Davis and Davies [5] for further exploration). This example illustrates the use of bottom up project initiatives as a way of supporting quick visible results that may support longer term development and improvement.

Informal interviews and conversations with Heads of Department and other staff members, indicate an openness and willingness to engage in what Senge (influenced by the work of Schon and also Argyris) refers to as 'learningful' conversations that balance inquiry and advocacy [9]. That is, conversations where people are able to expose their own thinking effectively but also open up that thinking to the influence of others. All of the documentation outlined in the appendices is also an attempt by the authors of this paper and other 'agents of change' within the Faculty to open up the vision to 'learningful' conversations.

The willingness to engage and debate aligns well with a normative-re-educative strategy and also the notion of the learning organisation:

"The organisations that will truly excel in the future will be the organisations that discover how to tap people's commitment and capacity to learn at *all* levels in the organisation." [9, p.4]

So having identified the strategy how is it to be implemented? Clearly willingness to engage in 'learningful' conversations is not sufficient to gain significant levels of improvement across the whole Faculty.

4.3 Continuous improvement change management model (supporting change within EC)

As already identified, the Faculty is currently adopting a continuous improvement model in line with a predominantly normative-re-educative strategy. While the notion of phases or stages of change may not always be helpful in a continuous improvement context, a model by Kotter, 1995 cited by Kolmos [14], and Kolmos and de Graaff [13] does usefully illuminate the process and how it might be supported. This model highlights the importance of vision, and identifies eight phases of change: establishing a sense of urgency; forming a powerful guiding coalition, creating a vision, communicating the vision, empowering others to act on the vision, planning for and creating short-term wins, consolidating improvements and producing still more change; institutionalising new approaches. Kolmos and de Graaff [13] indicate that Kotter's eight phases are consistent with normative-re-educative strategy and in particular emphasise the vision element as a key component of a successful change process within a Faculty setting. Kolmos and de Graaff [13] also note that in such an academic setting, where leaders are seen more as colleagues than directors, it is important that the formulation of vision is regarded as a common process amongst colleagues even though the leaders must ultimately formulate and communicate that vision (a tricky balancing act!).

Hence as outlined in section 2 above, the initial vision statement was drafted by an initial working group and then refined and developed (but still in draft form) at subsequent working group meetings. The Learning, Teaching and Assessment (LTA) projects (see Appendix C) also offer an opportunity for those engaging with ALL-related projects 'on the ground' to feed back what they find through the LTA group (see Appendix B for LTA terms of reference). The LTA group is an advisory group for the Faculty's policy making Quality, Learning and Teaching group and can (amongst other things) advise on required updates to the vision document.

Another change management author Knoster, 1995, cited by Kolmos [14] and Kolmos and de Graaff [13], also identifies the importance of vision but rather than identifying phases of the process indicates *elements* that must be in place: vision; consensus, skills, incentives, resources, action plan. Knoster also identifies what will 'go wrong' if one of these elements is lacking – see table below:

Vision +	Consensus+	Skills +	Incentives+	Resources+	Action Plan	= Change
	Consensus+	Skills +	Incentives+	Resources+	Action Plan	= Confusion
Vision +		Skills +	Incentives+	Resources+	Action Plan	= Sabotage
Vision +	Consensus+		Incentives+	Resources+	Action Plan	= Anxiety
Vision +	Consensus+	Skills +		Resources+	Action Plan	= Resistance
Vision +	Consensus+	Skills +	Incentives+		Action Plan	= Frustration
Vision +	Consensus+	Skills +	Incentives+	Resources+		= Treadmill

TABLE 3. Factors in managing complex change (Knoster cited in [13-14])

This model provides a useful framework for reviewing the design of the EC change initiative and also for investigating its effectiveness. For example if things are working well is it because all the above elements are in place aligned to Kotter’s framework? If there are problems and concerns, for example highlighted by interviews or conversations with staff do they link to a lack in one of the above elements that needs to be rectified?

Preliminary analysis based on the Teaching Development Fellow’s conversations with staff in formal and informal meetings including the LTA first meeting in February 2008, indicates that consensus around the vision needs building (as one might expect). For example, staff agree that retention, engagement and achievement are an issue in some form or other, but do not necessarily agree that ALL as currently conceived is the best way forward. However they are starting to engage in ‘learningful’ conversations to explore the ALL concept in relation to previous things they have tried and/or things they might be planning to do. Such a dialogue is a necessary part of the continuous change process and the stewards of the vision, and those questioning it, must both be prepared to shift their positions. In this continuous change process however it is helpful that the vision is not permanently fixed and that the ALL definition is not too tightly constrained so it is open to (valid) re-interpretation. What is not up for debate is the Faculty’s need to shift its teaching and learning approach to be more engaging, student centred and activity led. This to promote student professional, employability and meta-cognitive development.

4.4 Change management approach

Based on the analysis above the Faculty is combining a ‘top-down’ teaching and learning vision, marking out the Faculty’s overall strategic direction, with a bottom-up, project-led initiative. This approach is also supported by other research in the engineering field such as that by Arlett et al [15] whose paper suggests that small-scale funding aimed at improving learning and teaching is more likely to succeed when ‘top-down’ institutional support coincides with ‘bottom-up’ enthusiasm from funded academics.

In this bottom-up Learning Teaching and Assessment (LTA) project initiative each of the Faculty’s seven departments is invited to put forward a small project which engages with some aspect of Activity Led Learning and also has the aim of improving some aspect of student retention, engagement and achievement. Thus relating this to Knoster’s ‘element’ model above, these projects provide support for refining the vision and building consensus as well as starting to develop staff skills including pedagogic research skills that will be key for on-going continuous improvement. The LTA projects provide some incentive to engage in the change process and also help to identify skills, resources (including learning space resources), incentives and action plans (including staff and curriculum development action plans) required for future development.

One of the aims of this funded project structure is to support innovation for the longer term by building a community of practice for pedagogic research and evaluation in Activity Led Learning (see Wilson-Medhurst [16] for further exploration). For example, the LTA mini-project could be a pilot from which it is anticipated that exemplars will be produced which will subsequently become embedded in practice. Alternatively they may identify further relevant aspects of the student experience, assessment or curriculum design that need to be explored further and so help to shape and refine the learning and teaching vision and its implementation plan.

Wilson-Medhurst, S. Dunn, I. White, P. Farmer, R. and Lawson, D. (2008). *Developing Activity Led Learning in the Faculty of Engineering and computing at Coventry University through a continuous improvement change process*. Proceedings of Research Symposium on Problem Based Learning in Engineering and Science Education, Aalborg, Denmark, June 30 - July 1, 2008.

To facilitate the overall change process all project leaders of these LTA projects are invited to be members of the E&C LTA group (see Appendix B) chaired by the Faculty's Teaching Development Fellow. From the point of view of the change process, in addition to the points raised above, the LTA group supports the innovators (those leading the LTA projects) by providing them with a mechanism to share and discuss their LTA experiences and therefore improve understanding about how to implement ALL. Saunders et al [17], refer to these formative evaluations (in this case sharing of experiences e.g. in the form of depictions, vignettes or case studies) as 'bridging tools' or understandings that provide some provisional stability for the innovators and thereby allow them to "...create adjustments, strategies and future direction" [17, p.7], i.e. allow them to plan and innovate.

The LTA projects themselves are action research projects, similarly the LTA project framework being put in place to support the change process, particularly with regard to pedagogic research capacity building is also an action research project (see Wilson-Medhurst [16] for further details).

As a final note on change management, it is worth noting that while this initiative was largely (but not exclusively) started from the 'top' of the Faculty in 2006/7, culminating in the drafting of an initial vision statement in May 2007, the subsequent working group that met in November 2007 and January 2008 was not just comprised of the Faculty's senior management group. The working group that developed and refined the vision, and an initial definition of Activity led Learning, was drawn from all 'levels' of academic staff including Associate Deans, Heads of Departments (or their nominees) and experienced and new staff, as well as a Sigma CETL representative, Faculty Academic Manager for the Student Experience and the Faculty Teaching Development Fellow. These working group members are now all potential 'agents of change' operating at all levels within the Faculty and its departments.

5. CONCLUSIONS

This paper focuses on organisational change and faculty development in Activity Led Learning (ALL) within the Faculty of Engineering and Computing at Coventry University. Operating within a complex multi-disciplinary environment the Faculty has been exploring its own history and experience, viewing excellent examples of teaching and learning around the world and through this has begun a debate to define a strategy, and the operationalisation of that strategy, for future teaching and learning centred around Activity Led Learning.

This paper explores the change management approach for this Activity led learning initiative which is combining a 'top-down' teaching and learning vision, marking out the Faculty's overall strategic direction, with a bottom-up, project-led initiative. Analysis of the change management approach being adopted against various change management models, indicates that the approach is conducive to effective vision building and staff ownership. However the analysis also recognises that the consensus building process will take time, and that there needs to be flexibility and 'learningful' conversations for ownership and control to pass to those who will effectively implement the vision through their contact with students. On-going review and evaluation, initially within an action research framework, will help shape this initiative and its on-going form.

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Appendix A

A vision for learning and teaching in the Faculty of Engineering and Computing

Introduction

The aim of this summary is to present the Faculty's vision for learning and teaching. The Faculty wishes to maintain and develop its national and international reputation for high quality professionally focussed graduates and the learning experience that it provides. This approach to learning and teaching is motivated by the desire to produce graduates who have

- Confidence in their ability
- Capability to achieve
- Capacity to reflect, innovate and renew

To achieve this the Faculty wishes to develop a reputation for a radical activity led learning culture, building on existing areas of good practice. All students will experience a development of their professional skills through activities related to their subject.

The Faculty has a one-off opportunity, through a £60,000,000 project to create an environment planned and designed to support the delivery of this high quality experience which will incorporate leading-edge learning and teaching practice.

Vision

The Faculty is committed to developing communities of learners through employer and Profession focussed, activity led education. In this stimulating environment students will become fully engaged in the learning process, resulting in them becoming highly employable graduates who are able to lead and develop society through their enhanced research, team working and project management skills.

The key aspects of this statement are:

- Communities of Learners – An environment for learning comprising students and staff where all members contribute to their own learning and the learning of others.
- Employer and Profession focussed education – A close partnership between the Faculty, employers and Professional bodies to develop appropriate curricula and learning environments through inputs from practising professionals, student placements, sponsorship, part-time study, projects, case studies and visits and ultimately leading to employment opportunities.
- Activity Led Learning – Our students will be engaged through challenges requiring them to develop and apply their technical and scientific knowledge, simultaneously developing their team working, leadership, problem solving and life-long learning skills and utilising life-wide learning.

The key benefits of this approach will be:

- Better engagement of students and staff in the learning experience
- Improved student retention and progression
- Enhanced standards of student achievement
- Increased graduate employment rates
- Confident, self-motivated and successful members of society
- Enhanced reputation leading to increased student recruitment
- Greater staff and student satisfaction
- A vibrant learning community attractive to students and staff

This vision acknowledges the explicit links between research and teaching:

- Applied research (pedagogical) to inform teaching practice and applied research (within discipline) to inform teaching, with parity between the two.
- Researchers as contributors to the teaching practice and part of the learning community.

Appendix B

Faculty of Engineering and Computing (EC) Learning Teaching and Assessment (LTA) Group

Terms of Reference and Statement of Membership

Membership

Chair: EC TDF;

Deputy Chair to be selected from the members at the first meeting;

Up to two representatives per EC department (or nominee if the dept rep(s) can't attend)¹;

One representative from the Sigma CETL;

EC Academic Manager for the Student Experience;

Secretary.

Meetings

Normally one per term.

Purpose and scope:

Over-arching purpose is to promote innovation in teaching, learning and assessment as well as educational development activity / research and scholarship into HE practice by:

1. Supporting the implementation of those aspects of the EC L&T strategy that focus on the above innovation, development, and pedagogical research areas, and advising the EC QL&T committee of any key issues for their attention and action.
2. Receiving and discussing reports on key L&T projects within the faculty that seek to pilot and subsequently embed innovative practice within the curriculum, and referring key learning points to EC QL&T committee for consideration and action.
3. Acting as steering group for EC L&T events for staff. These events will bring in internal and (where appropriate) external speakers to highlight good practice and what has been learnt about the 'perils and pitfalls' of implementing L&T initiatives. Internal presenters are likely to include those involved with the L&T projects mentioned in (2) above.
4. Other activities consistent with the group's over-arching purpose and scope.

¹ In 2007/8 session (and subsequently for review) one of these departmental representatives will normally be the project leader for the faculty funded departmental LTA project

Appendix C

Faculty of Engineering and Computing Learning Teaching & Assessment (LTA) Projects

Introduction

A major element of the Learning and Teaching Strategy for the Faculty is to develop new approaches to pedagogy. These approaches will be instrumental in guiding the design and use of the new Engineering & Computing Building. The aim of this short paper is to propose a methodology for encouraging innovation and the further development of existing good practice, for evaluating the success and fitness for purpose of these new approaches and for encouraging a more widespread adoption of these new approaches within the Faculty.

Approach

1. A small fund will be made available to support one innovative pilot project in learning, teaching and assessment based in each of the seven departments in the Faculty.
2. Each department would be allocated an additional £2000 to their part-time staffing budget. This would be used to give nominated permanent members of staff in the department time that would be dedicated to the LTA project.
3. Each department will be asked to submit a brief outline of their proposed project on one side of A4 for approval by Deans Advisory Group (DAG) and Faculty Teaching Development Fellow (TDF) before the funds are made available. The project should satisfy the following criteria:
 - Focus on some aspect of improvement in student retention, engagement and achievement.
 - Be consistent with the general aims to develop a Communities of Learners, encourage Employer and Profession focussed education and engage in Activity Led Learning.
 - Have a clearly defined approach and outcomes that can be evaluated.
 - The project outline must include a paragraph that describes the evaluation approach and identifies the resource required to complete this evaluation.
4. Each project would be guided and monitored by the EC LTA group chaired by the TDF. An aspect of the TDF role is to provide guidance and advice for these projects. Regular progress updates would be made to the LTA group for evaluation and dissemination.
5. On evaluation of the project at completion a short report would be submitted to the LTA group who would act as a key vehicle for review and wider dissemination of effective developments.
6. The results of the project should be disseminated at ELATE and/or other appropriate fora such as an HE Academy subject centre conference see e.g. <http://www.ee2008.info/>.

An LTA project may focus on (but is not limited to) one of the following, and, as outlined above, is appropriate as long as it is consistent with the general aims to develop a Communities of Learners, encourage Employer and Profession focussed education and engage in *Activity Led Learning*:

1. Improving engagement of students and staff in the learning experience
2. Improving student retention and progression
3. Enhancing standards of student achievement
4. Increasing graduate employment rates
5. Encouraging the development of confident, self-motivated and successful members of society
6. Engendering greater student and staff satisfaction
7. Developing a vibrant learning community attractive to students and staff
8. Utilising learning technologies (beyond the CUOnline minimum standard) to enhance the student and staff learning and teaching experience

The development of the outline project brief within each department should derive from open and inclusive debate within the department. The TDF is keen to be involved in these discussions.