

Implementations, change management and evaluation: A case study of the centre for excellence in teaching and learning in reusable learning objects

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Abstract

This paper describes an e-learning project in the area of reusable learning objects (RLOs) that has attempted to bring about technological and cultural change across three diverse universities. The three partner universities in the Centre for Excellence in Teaching and Learning in Reusable Learning Objects (RLO-CETL) are London Metropolitan University (LMU), the Universities of Cambridge (CAM) and Nottingham (NOTT). The goal of our study was to gain an improved understanding of the following question: what are the cultural differences across three organisations in the management of people and change? The work described in this paper draws on an institutional change model and grounded theory to provide a framework for the qualitative analysis of data from practitioners from the three partner sites. A key facet of our change model is the notion of the tipping point; this is a point at which enough individuals in a system have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining. It appears that key pockets in some of the partner sites have hit the tipping point. Various other findings are presented on the basis of our qualitative analysis, which draw out the cultural differences across the three sites. The paper concludes by asserting that the qualitative analysis has raised various issues, which are worthy of further research, particularly the under-researched role of students as key change agents.

Keywords

e-learning
institutional change
culture differences
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1. Introduction

This paper describes an e-learning project in the area of RLOs that has attempted to bring about technological and cultural change across three diverse universities. The narrative of our study is one of examining the horizontal relationship between this small network of institutions whilst at the same time probing the vertical change factors involved within each institution. The focus within our change programme is on the transformative and cultural effect of e-learning on stakeholders in a range of different subject areas during the change process.

The Centres for Excellence in Teaching and Learning (CETLs) represent a big United Kingdom national intervention in Higher Education (HE) (see DFES 2003). The CETLs initiative has 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. Following the completion of a two stage bidding process for funding, a total of 74 CETLs, of which 19 are collaborative, were approved. Funding of CETLs will total £315 million over 5 years from 2005–06 to 2009–10. Each CETL will receive recurrent funding, ranging from £200,000 to £500,000 per annum for 5 years and a capital sum ranging from £0.8 million to £2 million. This initiative represents the UK's Higher Education Funding Council for England's (HEFCE's) largest ever single funding initiative in teaching and learning. The CETL in Reusable Learning Objects (RLO-CETL) is being funded by HEFCE to develop a range of multimedia learning objects that can be stored in repositories, accessed over the Web or on mobile phones, and integrated into course delivery. London Metropolitan University is the lead site, in partnership with the Universities of Cambridge and Nottingham. The RLO-CETL started operations on 1 April 2005 and will be funded at least until 2010. The aims of the CETL are to build on the strengths of the existing partnership through a programme of parallel processes that will:

- advance the pedagogical and structural design of RLOs,
- build a common development framework for producing and sharing a critical mass of RLOs,
- share and evaluate these RLOs with a minimum of 2000 students per year across the three institutions
- achieve this through an innovative and extensive staff reward programme designed to harness expert knowledge and transform it into engaging interactive shareable content (known as the Wolfson Reward Programme – described below)
- engage in a vigorous programme of dissemination to spread the impact of the RLOs beyond the CETL partner institutions and to form mutually productive partnerships with other national and international partners where appropriate.

There is some controversy over the term 'learning object'. No universally accepted definition of an RLO exists. Wiley (2001) applies the term to any

web-based digital, multimedia resource. Others describe them as small packets of learning, based on a single learning goal (Leeder, Wharrad and Davies 2002), giving them a high degree of granularity and flexibility (Weller 2004) and conformance to international technical standards for packaging and metadata ensure their interoperability (IEEE 2002) and facilitate their management, storage and availability within repositories. Underpinning all of this is the overarching goal of reusability, offering the possibility that the costs and benefits are shared across institutions (Campbell 2003). The RLO-CETL approach is partly based on Boyle's (2003) notion of decoupling and cohesion, which is taken from software engineering. Each learning object we develop is characterised by being a cohesive learning resource focused on one clear learning goal. Each learning object is also decoupled in that there are no 'link outs' to external resources; this is crucial for reuse. This approach enables teaching staff, multimedia developers and students to become involved in an iterative and highly creative process of learning object design, implementation, evaluation and reuse. Developing these multi-disciplinary groups or 'communities of practice' are core to the RLO-CETL's aims since the groups work towards common goals, i.e. the development of high quality RLOs. This encourages collaborative working and engenders a sense of ownership of the products, thereby enhancing the likelihood that the RLOs will be reused (Windle et al. 2007). The Wolfson Reward programme provides a focus and a catalyst for the development and nurturing of the communities of practice. The main event is a 3-day residential experience based at Wolfson College in CAM, where the RLO-CETL groups can attend workshops on RLO development processes, secure some protected time to work on their own RLO projects and seek specialist guidance or support from colleagues.

Detailed targets and milestones have been set for the first 2 years of the CETL; years 3–5 are in outline form and will be revised through continuous formative evaluation of the CETL programme and Management Group consultation. The areas in which RLOs are being developed include: Evidence-based Practice for Health Sciences, Clinical skills, Pharmacology, Foundation Sciences, Inter-professional Learning, Maths for Medics, Vets and Engineers, Music, Numeracy, Sports Science, Study Skills, Working with Information Sources, Marketing, Languages (French) and Statistics for social science.

Each major strand is being subject to thorough evaluation that will inform the ongoing development of the CETL. A selection of learning objects that have been developed can be found at: <http://www.rlocetl.ac.uk/>.

2. Organisational contexts

The cultural mix of the three partner universities is interesting, ranging as it does from the ancient to the new. In order to orientate the study described below, we will now introduce the organisational context of the partner universities.

The University of Cambridge is one of the oldest universities in the world and one of the largest in the United Kingdom, with a reputation for outstanding academic achievement. Founded in 1209, by scholars taking refuge from hostile townsmen in Oxford, by 2004 the University had 31 Colleges with over 17,000 students and a total annual income of over £525 million. The University had 48 departments rated 5 or 5* in the UK Funding Council's 2001 Research Assessment Exercise (RAE) and was ranked as the top university in the world for science, top university in Europe and second in the world overall (second only to Harvard) in the Times Higher Education World University Rankings 2006.

London Metropolitan University brings together over 150 years' experience of providing quality education in London. Its roots go back to 1848 with the establishment of the Metropolitan evening classes for young men. LMU ranks as London's largest unitary university with over 34,000 students, including almost 7000 international students from 155 different countries. In 2003/04, LMU was ranked the most popular university in London for international students and the third most popular in the United Kingdom. LMU has more than 2,000 students aged 40 and above, with some over the age of 80. LMU has nine research institutes and 34 research centres providing services to external clients and organisations within London's communities and businesses providing invaluable real-world experience for students.

The University of Nottingham is a leading research and teaching university and a member of the Russell Group, and Universitas 21, a global network of research-led universities. The University can trace its origins back to the founding of an adult education school in 1798. By 2005, it had more than 32,000 registered students including over 4,000 international students from more than 100 countries. The University has four campuses in Nottingham and two international campuses in Kuala Lumpur, Malaysia and Ningbo, China. The University had 26 departments rated 5 or 5* (internationally excellent) in the United Kingdom 2001 RAE. The University is one of the top four UK universities for receiving research funding from private industry and commerce for the year 2005–06 reaching over £122 million.

In summary, CAM and NOTT are older universities with a strong research culture and income. All three universities have very different organisational structures and strong teaching and learning (T and L) programmes. The profiles of their students differ markedly with LMU attracting a more diverse student population.

3. Institutional change model

The work described in this paper draws on an institutional change model developed by Cook (in Cook, Holley and Andrew 2006). This model has been used to orient the analysis described below. The institutional change model is a synthesis developed from three sources (Shaw 2006; Brynjolfsson, Renshaw and van Alstyne 1997; Gladwell 2000). It has drawn heavily on

the original model (Brynjolfsson, Renshaw and van Alstyne 1997) in an attempt to elaborate a model that can help managers and stakeholders to identify critical interactions among processes and emphasises the need to recognise interdependencies between technology, practice and strategy. The model has three phases. In the first phase, we have the important self-inspection phase, where critical process and interactions within the organisation are identified. The second phase involves looking at pockets of change as the process of redesign gets underway. In phase 2 transition interactions and stakeholder analysis will take place. There is a need here to determine the degree of difficulty in shifting from existing to target practices. At the end of phase 2, we hit the Tipping Point. The Tipping Point (Gladwell 2000) is similar to the idea of the 'critical mass', which originated in physics and is defined as the amount of radioactive material necessary to produce a nuclear reaction. The critical mass in innovation research indicates the point at which enough individuals in a system have adopted an innovation so that the innovation's further rate of adoption becomes self-sustaining. This is especially relevant for interactive communications technology, such as e-learning, where a critical mass of individuals must adopt the technology before the average individual can benefit from the system. Thus, once the tipping point threshold has been passed we are into phase 3, which is where large-scale transformations, innovations and change that are self-sustaining take off.

4. Method

The goal of our study was to gain an improved understanding of the following question: what are cultural differences across three organisations in the management of people and change? Particularly there were five important secondary research questions for our study. They are:

1. What are the critical success factors for institutional change?
2. How did RLO-CETL embed e-learning into institutional practice?
3. What were the problems we faced and how did we address them?
4. What mistakes did we make?
5. How did RLO-CETL change the student experience?

The longer-term goal of our research takes the view that if models of successful change in UK universities can be built, then we will have a basis to scale-up e-learning in HE across the sector.

Grounded theory was used to guide our research. Strauss and Corbin (1990) suggest that grounded theory is especially useful for complex subjects or phenomena where little is yet known (as is the case in our study). This is because of the methodology's flexibility, which can cope with complex data and its continual cross-referencing, which allows for grounding of theory in the data thus uncovering previous unknown issues.

For ethical reasons, at the early planning stage it was decided that permission would always be obtained in writing from all study participants to

use the data gathered for reporting anonymously in our research. Data from questionnaires completed by seven university workers have been transcribed and analysed (five female and two male). A total of seven practitioners were interviewed, two tutor/lecturers from each institution were interviewed, plus one practitioner who was also a Reader from NOTT. We acknowledge that this is a modest sample size but point out that the detailed analysis gave rise to indicative findings in an under explored area that the sector will find informative. We will use the convention NOT1 for the first colleague from NOTT, CAM2 for the second colleague from CAM, etc, in order to refer to individual responses. The profile of respondents was as follows:

CAM1 – Teaching Statistics in Social Sciences. Male.

CAM2 – Teaching Maths for biologists. Female.

NOT1 – Teaches in the Graduate Entry Medical School on the (shortened) medicine programme. Female.

NOT2 – Lecturer in the School of Nursing mainly on the diploma of nursing programme (pre-registration). Female.

NOT3 – Lecturer and Researcher in Education and Health Informatics. Female.

LON1 – Teaching Marketing and Business Studies. Female.

LON2 – Staff Development, based in Centre for Academic Development. Male.

The change model described above was used to orient the analysis. Following an initial examination of the corpus (transcribed interviews), initial low level theorising then took place in the form of category and concept formation. Grounded techniques were used to guide the research, where concepts (43 were identified) are classified and grouped together under five higher order, more abstract formations called categories (which were: ‘innovation issues’, ‘communication’, ‘management support’, ‘students’ and ‘staff issues’). Atlas.ti qualitative analysis software (<http://www.atlasti.com/>) was used to assist this process. The first author then coded the corpus using the above grounded concepts and categories. The occurrence counts reported below refer to the number of times a concept was identified in the corpus by the coder. These concepts are highly interrelated, but previous work using grounded theory (Cook and Smith 2004) has proved very helpful in identifying emerging issues and processes.

5. Results

In this section we present the main results from our grounded study. First the most frequently occurring concepts are presented and illustrated with some example quotes. Secondly the emergent, higher level categories are tabulated.

Figure 1 shows the top seven scoring concepts; a score of 10 occurrences or higher was deemed a useful cut off point, and although the scores

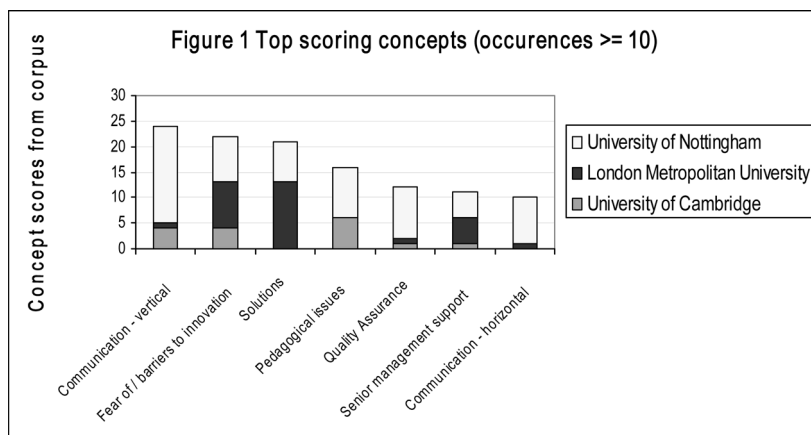


Figure 1: Top scoring concepts (occurrences ≥ 10).

for each partner site were not equally weighted (as an extra person from NOTT was interviewed) this never emerged as a problem when using the tables to identify cultural differences between the three CETL organisations.

Five emergent higher level categories that were identified were: ‘innovation issues’, ‘communication’, ‘management support’, ‘students’ and ‘staff issues’. These categories are shown in Table 1, with their subordinate concepts listed below them along with their scores.

6. Discussion

There were complex relationships between the organisational behaviour, structure and culture of the three universities. The commonest ‘concepts’ will be discussed first followed by a discussion of the five higher order categories. This narrative will address our primary question: what are the cultural differences across the three CETL organisations in the management of people and change?

6.1. Commonest concepts

6.1.1. ‘Communication vertical’

This concept refers to single universities’ communications; it can include communications issues across the whole of a single organisation. This was the highest scoring concept overall, and for NOTT, driving the score up to 24 occurrences in the data (Table1).

Examples of ‘communication vertical’ included quotes 1–3, taken from the coded corpus:

1. CAM2: ‘Very difficult to persuade the faculty to do a better job to pointing the students towards it [RLOs]’.
2. LON1: ‘We also ran a series of staff workshops on re-use, resulting in a small number of projects for next year – so getting staff onboard is crucial’.

Category/Concept	CAM	LMU	NOTT	Total occurrences
Innovation issues				
Committee work	0	1	0	1
Core services issues	1	0	1	2
Evaluation	3	0	6	9
Fear of/barriers to innovation	4	9	9	22
Quality assurance	1	1	10	12
Repository	0	0	2	2
Reuse	0	0	3	3
Size organisation	0	1	1	2
Solutions	0	13	8	21
Strategic e-learning	1	1	1	3
Structured approach to innovation	0	0	3	3
Sustainability	0	0	1	1
Unstructured approach innovation	2	0	0	2
<i>Sub total</i>				83
Staff issues				
Collaboration	0	2	7	9
Demands of research led institution	1	0	1	2
Departmental recruitment issue	1	0	0	1
Disciplinary perspective	1	0	0	1
Leadership	0	0	1	1
Pedagogical issues	6	0	10	16
Perceived status of e-learning	2	1	6	9
Staff autonomy	0	0	1	1
Staff time	0	1	8	9
Staff training	0	1	1	2
Status of reward programme	0	1	7	8
Technical issues	2	0	2	4
<i>Sub total</i>				63
Communication				
Communication – dissemination	0	0	5	5
Communication – horizontal	0	1	9	10
Communication – vertical	4	1	19	24
Student communication issue	5	0	2	7
<i>Sub total</i>				46
Students				
Student access	1	0	1	2
Student autonomy	0	1	0	1
Student choice of course	1	0	0	1
Student learning	1	3	4	8
Student motivation	0	1	0	1
Student perception	3	1	0	4
Student preference	0	0	3	3
Students giving feedback	4	0	3	7
Students involvement in design	2	3	2	7
Students involvement in Wolfson	0	0	1	1
<i>Sub total</i>				35
Management support				
General management	0	1	1	2
Middle management support	0	3	4	7
Reward system	1	0	0	1
Senior management support	1	5	5	11
<i>Sub total</i>				21
<i>Total coded concepts</i>				248

Table 1: Higher level categories with related concepts.

3. NOT1: 'All very well at the grass roots, but need to involve people who run courses and can make the links to the materials in their modules'.

The issues raised in the above quotes are common to all partner sites and although informative do not throw light on the cultural differences between each organisation.

6.1.2. 'Fear of/barriers to change'

With 22 occurrences, this concept was weighted towards LMU. There is reference in the corpus to a fear of using technology for change or barriers that may exist in an organisation to change. Examples of this concept included quotes 4–6:

4. CAM1: 'Note also there is a general paranoia with getting students' complaints because of the Teaching and Learning Assessment Exercise, so introducing any changes provokes thoughts of the kind: "What if the students don't like it? What if there is negative feedback?" So there is very cautious approach to it . . . For most courses in the department they have stayed the same for the twenty years I have been in Cambridge, with people giving a combination of lectures and then the Cambridge supervision system. This offers a high proportion of small group teaching compared with any other university'.
5. LON2: 'Not managing to deal with all the political players at the right time – not that it would be possible! . . . Too many stakeholders and power battles'.
6. NOT3: '. . . [the lack of] joined up IT [Information Technology] systems to support e-learning and slowness in implementing systems such as VLEs [Virtual Learning Environments] – consequently systems aren't joined up – not enough funding is put into implementing new e-learning systems so that they work for all schools'.

The above quote from CAM (4) seems to caution because of fear of negative student feedback. Indeed, CAM has a personal tutorial system that is unusual for the university sector in the UK. CAM is a late adopter of e-learning and can possibly be seen as only experimenting cautiously with e-learning. LMU and NOTT, however, seem to be further down the e-learning route. The quote from LMU (2) indicates that there may be a struggle taking place between many stakeholders within LMU who may see e-learning as part of an empire building opportunity. Quote 6 from NOTT tells a very telling story, namely that once innovation gets underway, one of the biggest barriers to scaling up is the barrier related to IT services not 'joined up'. A related concept is 'Core services issues', which can also be seen as a barrier, as quote 7 below illustrates.

7. CAM2: 'Changing anything on the university website requires a lot of bureaucracy and does not allow incorporating quickly enough instructions to find the materials'.

6.1.3. 'Solutions', 'structured approach to innovation' and 'unstructured approach to innovation'

The 'Solutions' concept indicated where some way forward or a solution to change was implied. With a score of 13, this was the highest scoring concept for LMU, possibly indicating that LMU are used to coming up with creative solutions due to a perennial lack of resources (when compared to the resources available, say at CAM). Interestingly CAM scored zero on this concept, and although we need to consider the small sample size here these contextual findings in qualitative research throw light on the meaning attached to a process. CAM also made the only score for the related concept of 'Unstructured approach to innovation' (see Table 1). However, this may also reflect the novelty of e-learning for an ancient university like CAM; another factor may also be the college system in CAM: each college is strongly independent making large-scale change difficult. Examples of the 'Solutions' concept from the corpus responses included quotes 8–9 below:

8. LON1: 'E-learning incorporated within the strategic plan ... E-Learning then disseminated further via policy documents – e.g. the Teaching and Learning Strategy that goes to HEFCE, our main funder'.
9. NOT3: 'Having IT support and e-learning experts within the school (rather than at institutional level) ensures a community of practice develops where everyone is working towards the same school aims and they understand how the school works, the nature of the students and subject area – this promotes the right culture and leads to adoption and change'.

Quotes (8) and (9) show high levels of sophistication in terms of how these participants analyse where they are, how they got there and where they want to go. Indeed, NOTT made the only score in the related concept of 'Structured approach to innovation' (Table 1), possibly indicating that NOTT is making some progress in terms of its change management approach to e-learning. The following is a quote from this concept:

10. NOT3: 'The University started a scheme in the mid 90s offering TandL grants to foster innovation – these were small (£5–10,000) but did get many e-learning projects off the ground. A small CAL group was set up as a central university resource – in the mid 90s this consisted of 4 or 5 technologists for the whole institution – this group is slightly larger now but is not enough resource to support major institutional change in e-learning. The university has just part time seconded an academic to be Director of e-learning for the institution – but this is only for 2 days'.

6.1.4. 'Pedagogical issues'

This was the fourth highest scoring concept overall and the highest for CAM. LMU scored zero on this, but there is a higher level but related category

‘students’ (see below) and it is likely that LMU’s comments are coded here. Examples of the ‘pedagogical issues’ concept from the corpus responses included quotes 11–12 below:

11. CAM1: ‘[Regarding the RLO change strategy] I might not be the right person to ask since this is the first time I am going through an exercise like this. I enjoyed it a lot, I felt very well-supported, many other people around to get support from. It seems to me the way we did it was the most effective way to address the creation and development of materials’.
12. NOT3: ‘You can see from the students’ faces when they use the RLOs or when you show them in lectures that they are impressed – for some of our mature students the fun element and the multimedia helps them to overcome resistance and anxiety in using computers for studying’.

6.2. *Emergent categories*

In the category ‘*innovation issues*’ we have already discussed the two top scoring concepts i.e. ‘Fear of/barriers to innovation’ and ‘Solutions’. ‘Quality Assurance’ obtained the third highest score in this category. Interestingly, the vast majority of occurrences for this concept came from the NOTT study participants. This is perhaps not surprising given that the Schools of Nursing and Medicine, where much of NOTT’s work is conducted, involves safety critical procedures for workers in such areas as pharmacology and clinical practice. Get it wrong and there are serious consequences.

In the category ‘*Staff issues*’ the concept of ‘Pedagogical issues’ has already been discussed. ‘Perceived status of e-learning’ and ‘Staff time’ received joint second highest scores. The following quotes are representative of the concept ‘Perceived status of e-learning’:

13. CAM2: ‘I don’t think that people at the university as a whole see this as a sensible thing to do in your teaching; they see it a little bit like an add-on’.
14. LON2: ‘Focus of attention [on the CETL] raises profile [of e-learning] within the institution’.

CAM as a research led university may be treating innovations through RLOs as an “add-on”. NOTT, also research led, may be shifting towards the recognition of T and L as a basis for promotion. LMU as a post-1992 New University is teaching-led and quote 14 seems to indicate that the CETL has raised the profile usefully within the university. ‘Staff time’ is not a new concept and emphasises for innovation projects to be successful staff need time release. The concept ‘Status of Reward Programme’ is also part of the category ‘Staff issues’ and received the fourth highest score (8) for this category (mainly from NOTT). The following quotes are representative of this concept:

15. NOT2: ‘Biggest criticism, it’s all too matey at the moment. Need to be more ruthless. At the Wolfson, we all told each other how great it is without really looking at the problems’.

16. NOT3: 'The Wolfson reward programme is excellent – it would be good to run more events like that locally – protected time is key for academics and being able to work in a team with students and learning techs'.

The Reward Programme is seen as a key strength of the CETL and receives good evaluation feedback from participants. However, quote 15 (and others not reproduced here) indicate there may be a need to move towards a more critical debate at these sessions. Indeed NOT2 (not quoted here) also expressed the view that although the Wolfson workshop had been important; they felt that it appeared to be a lot of effort and expense aimed at a relatively small number of people. The reason why this concept scored zero at LMU may be because by the time the questionnaire was administered to LMU colleagues (February/March 2006) plans were well in hand for a local LMU away day. Such an event is clearly being called for at NOTT (16). The issue of face-to-face on a local level as well cross-institutional level clearly requires a balancing act.

In the category '*communication*' we have already discussed 'Communication – vertical'. The second highest scoring concept within this category was 'Communication – horizontal'; this refers to communications between the three partner sites. NOTT colleagues accounted for all but one of the ten comments identified. This is clearly relevant to our primary research question regarding cultural differences across the three CETL partners.

17. LON1: '. . . communication with CETL partners was a bit limited, and we have tried to address this with a Wiki site (didn't work) and now are trying a newsletter'. [NB. a Wiki is an online conference and blogging system, a blog being an online diary.]
18. NOT1: 'Need to be able to tap into things elsewhere in the CETL . . . Need to find ways of sharing ideas and peer review. Perhaps the developers should work in teams more. This might be a new way of working for the developers, but would allow them to look at what others are doing/solutions to particular problems. This is a two way street. Developers need to show us what is possible before we can decide what we want to do, but at the same time authors need to explain to developers what they want to do in order for developers to think about what is possible'.
19. NOT3: 'Developers and authors in the different institutions doing their own thing – should there be more communication and agreement on templates etc? Can we ensure quality'?

Various measures have been put in place to address this horizontal communication issue, The Wolfson sessions play a key role, as will more local events, the Newsletter, SharePoint (an online tool), the RLO Repository and an up to date News section on Web site, all aiming to improve

communication. The concept 'Student communication issues' also belongs to the 'communication' category (seven occurrences); the following quotes are representative of the concept:

20. CAM2: 'Next year we'll give the students a handout with instructions to find the materials – in my experience they hold on to bits of paper. That will hopefully address the issue of students using the materials [i.e. not being able to find them]. But ideally students should be reminded by the teaching staff of the existence of the materials. Difficult in Cambridge to reach the teaching supervisors as there is no email list'.

This 'Student communication issue' is really about raising awareness of RLOs to the student population and making RLOs easy to find and use. Below we examine student involvement from a broader perspective.

The category '*students*' contains a range of concepts (see Table 1). The concept 'Student Learning' scored highest (eight occurrences), which is not surprising as 'How did RLO-CETL change the student experience?' was a question asked in the interviews. Furthermore, the two concepts 'Students involvement in design' and 'Students giving feedback' gained joint second highest score of 7 each. The following comment relates to the concept 'Students involvement in Design', and shows that there is a real sense of optimism within the CETL regarding the inclusion of students in the design process (this takes place on local sites, also students are given bursaries to attend the Wolfson Reward sessions to engage in the design of RLOs):

21. CAM1: 'It is very unusual the opportunity the CETL offers to students to contribute to the creation of teaching materials and they value that . . . Having students producing the learning materials makes you understand the students. There are two ways to learn it: teaching it and do a project on it. So anything we can do to involve students in the teaching process and in activities that allow them to see what they can get out of it, is the direction to go in'.

The following comments relate to the concept 'Students giving feedback':

22. CAM2: 'For the students who used the resources, it did make a big difference. Many students thank me personally and said they think they would not have been able to cope without the materials. Those students who found the materials very useful are mainly those who did not come to university through the standard route. These materials helped them with the anxiety issue'.
23. NOT2: 'Ask them, ask students, feedback from students is going to be very important, and it needs to be thorough and on going, possibly using longitudinal studies'.

The above comment by CAM2 about improving access is interesting, i.e. students who enter via non-standard routes; future work could try and gather more evidence about this. Students could play a bigger part in the process of e-learning development.

The fifth and final category is '*management support*'. This category contains four related concepts with 'Senior management support' scoring highest (11 occurrences) and then 'Middle management support' scoring 7. Interestingly, this category appeared mainly in the comments from colleagues from LMU and NOTT (Table 1); for these two universities management support was seen as having a profound affected on transformation within and across the institutions. Again, CAM has a devolved structure and so this may account for the variance. LMU on the other hand has a very Executive Director structure, with the Vice Chancellor wielding a lot of power. One LMU study participant (quote 24) noted that there was top level support but that middle management support (Head of Department level) was proving hard to obtain, and went on to comment about her own role as a change agent within the LMU:

24. LON1: 'Has to be top management commitment – otherwise nothing changes at the bottom in a bureaucracy . . . E-Learning represented at a strategic level in the University committee structure – for example I am on the e-learning committee chaired by our Deputy Vice Chancellor'.

A study participant from CAM (not quoted here) also extended the notion of management support to include the need to factor in staff 'Reward system'.

We end this discussion section by suggesting that the analysis has raised some interesting issues that the CETL will wish to take further, and these will be summarised in the conclusions.

7. Conclusions

This paper describes an e-learning project in the area of RLOs that has attempted to bring about technological and cultural change across three diverse universities. The work described in this paper drew on an institutional change model and grounded theory to provide a framework for the qualitative analysis of data from practitioners from the partner sites. It should be noted that results and interpretations presented in this paper are based on the qualitative research paradigm; by examining systematically and in detail interviews from individuals, we have uncovered contextual findings that throw light on the meaning attached to a process that stakeholders in an organisation regard as important. We acknowledge, however, that this is a modest sample size but point out that the detailed analysis gave rise to indicative findings in an under explored area that the RLO-CETL and the sector as a whole will, we hope, find informative.

A key facet of our model is the notion of the tipping point; this is a point at which enough individuals in a system have adopted an innovation

so that the innovation's further rate of adoption becomes self-sustaining. Thus a key question, which relates to our model of change, must be asked: Has the RLO-CETL reached a tipping point yet? The answer for each institution is no, but we are getting close in terms of the redesign of courses in pockets within each university, e.g. Business Studies at LMU and the Nursing School at NOTT. Furthermore, the penetration of e-learning into aspects of CAM's practice is seen as a success. We predict that a Tipping point will be achieved over the next 3 years within the Departments/Schools containing these significant pockets of activity. This emerging pattern of innovation through careful course redesign has similarities with the work of Carole Twigg and the Pew Foundation (Twigg 2003), where the courses targeted for transformation were very carefully selected (they were already close to achieving transformation).

Our primary research question was: what are the cultural differences across three organisations in the management of people and change? The qualitative analysis identified 43 different concepts, which were classified and grouped together under five higher-order, more abstract formations called categories. The key similarities and differences that emerged from the data for the three RLO-CETL partners are:

- CAM is, for the moment, experimenting cautiously with e-learning.
- LMU was found to be adept at coming up with creative e-learning solutions due to a perennial lack of resources (when compared say to CAM).
- CAM as a research led university may be treating innovations through e-learning as an 'add-on'.
- NOTT, also research led, may be shifting towards a recognition of teaching and learning excellence as a basis for promotion.
- LMU is teaching-led and the RLO-CETL seems to have raised this profile usefully within the university.
- NOTT colleagues raised several concerns over communication across the partners and measures have been put in place to address these.
- Unlike CAM, LMU and NOTT felt that management support was having an affect on transformation within and across the institutions. The divergence may be because CAM has a devolved independent college structure whereas the organisational structure at LMU maintains a very Executive Director structure, with the Vice Chancellor wielding a lot of power over a flat management organisation.
- There is a need for the inclusion of students in the process of e-learning development. This is also an interesting innovation and deserves further attention.

In summary, this small qualitative study has identified a number of issues which are worthy of further research particularly the under-researched role of students as key change agents.

It will also be interesting to see how these trends within the institutions and between the partners develop as the RLO-CETL moves into its next phase.

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