

Understanding the prospects for transformation

By David Nicol, University of Strathclyde and Steve Draper, University of Glasgow

Introduction

In 2004 the Scottish Higher Education Funding Council (SHEFC), since renamed the Scottish Funding Council (SFC) with a remit for Further Education as well as Higher Education, launched its e-Learning Transformation Programme (ELTP). Bids were invited from Scottish higher and further education institutions for projects that would promote 'transformational' change in teaching and learning facilitated by information and communication technologies (ICT). One definition of transformation given by the SFC was the following:

"Transformational change will require a conscious and deliberate decision made by one or more institutions to do something differently in a systematic way across the whole institution, on a defined timescale of two or more years."

The authors of the present paper are members of one of the six project teams funded under the ELTP. Their project is entitled "Re-engineering Assessment Practices in Scottish Higher Education" (REAP). The SFC based the transformation programme on a report commissioned in 2003 on e-learning developments across HE and FE (Tripp et al. 2003). Both the SFC and the report's authors were clearly influenced by the Program in Course Redesign (PCR) funded by the Pew Foundation in the USA.

There is a long-standing belief in society that computer applications are a driving force for radical change. This belief also exists in education. For example, Papert (1980) promoted the transformative power of computers for conceptual development. However, while few would dispute that computer applications have resulted in dramatic change in education, there is little direct empirical evidence that such changes are for the better. Almost all applications in education have cost more and few have led to improvements in educational quality when compared with traditional methods (Russell, 1999; Twigg, 2003). For the first time, however, the PCR has provided a concrete demonstration of wide-ranging benefits through the application of ICT in the tertiary sector. It has reported that all 30 of its projects achieved cost reductions while maintaining, and in most cases measurably improving, learning outcomes (Twigg, 2003). Funders cannot afford to ignore this evidence: achieving widening participation nationally depends on being able to find and exploit such cost-quality benefits.

So what are the real prospects for transformation, and what are the features of the PCR that might have been important in its reported success? In general, this paper is concerned with the inferences that can be drawn from the PCR and their application to the UK context. More specifically the questions addressed are: what are the crucial causes or enablers of improvements

in teaching and learning (in tertiary education), and hence what kind of initiatives might be most effective, whether undertaken individually by course teams, or stimulated by policy and/or funding initiatives.

The goal of the REAP project, funded by SFC under the ELTP, was to develop through course redesign new models of assessment practice supported by technology across three universities in Scotland and to embed these changes institutionally. There are similarities between PCR and REAP in approach, and indeed, the REAP proposal for funding drew on the PCR research. Since REAP is larger than any single project within the PCR, and itself tackled finding, funding, assisting, and writing up a considerable number of course redesigns, this paper analyses the prospects for transformation by comparing the PCR approach to that of ELTP-REAP. Following a brief overview of the PCR and SFC-REAP approaches, the paper compares and contrasts them with respect to a number of dimensions.

The paper ends by setting out some questions that senior managers might wish to consider when planning for the application of technology to support teaching and learning in HE.

Overview of the PCR and ELTP-REAP approaches

Program in Course Redesign

The PCR, conceived and directed by Carol Twigg and funded by \$8.8M from the Pew charitable foundation, ran from 1999-2002. It distributed \$6M to 30 course teams across the USA to redesign large introductory courses. The stated goal of the PCR is to support 'colleges and universities in their efforts to redesign instruction to *achieve quality enhancements as well as cost savings*' (Twigg, 2003, p30). The courses spanned many disciplines (including English, Maths, Chemistry, Engineering, Psychology), and institutions of many kinds from community colleges to private four-year universities. Twigg has reported extensively on the outcomes of the PCR. Impressively, all 30 redesigns showed significant cost reductions averaging 37% (range 15% to 77%) and 25 showed significant measured improvements in the learning outcomes. According to Twigg (2003), 'collectively the thirty redesigned courses affect more than 50,000 students nationwide and produce savings of \$3.6 million each year'.

SFC's E-learning transformation programme

The SFC ELTP (E-learning Transformation Programme) is a two year initiative 2005-7 with around £1M awarded to each of six project teams, each multi-institutional and roughly equally divided between FE and HE. Whereas the requirements in the PCR were the same for all projects (course redesign), there were three categories of ELTP projects: (i) 'the FE-HE transition', (ii) 'support for students and promotion of effective learning' and (iii) 'collaborative delivery of specialist content'. Four criteria were used in selecting bids for funding. Proposals had to show that:

- The process of change will mean that certain aspects of teaching and learning will be conducted in a new way
- The process of change is consistent with, and embedded in, institutional strategies and is not a peripheral process driven solely by the possibility of external funding
- The intended outcome is sustainable, and is expected to result in long-term change in activities beyond the period of external funding
- The process will yield measurable benefits to the institutions and its learners.

From the perspective of the SFC, the intended outcomes from these projects are demonstrations of enhanced educational practice through the use of technology as well as models of institutional change that are embedded and sustainable. The SFC is also committed to the dissemination of good practice resulting from ELTP across the FE and HE sectors.

The ELTP-REAP project

The REAP project was funded under category (ii) i.e. support for students and promotion of effective learning. REAP is similar to the PCR in a number of respects. Although the REAP project has a focus on assessment this is broadly conceptualized to encompass both assessment for learning and assessment of learning. A key goal in REAP has been to redesign assessment and feedback processes so they support the development of learner self-regulation. This broad definition recognizes the different sources of assessment and feedback information – peers, self, tutors and those external to the course. When students work in structured group tasks they often get feedback from each other (peer feedback). This feedback supplements that provided by teachers and also models experiences in employment. In some courses students might be asked to evaluate each other's work (peer assessment). While engaging in assessment tasks students generate their own feedback by reflecting on and self-assessing their progress. Developing the skills to monitor, manage and self-assess learning is a key requirement for lifelong learning.

Hence the REAP bid envisaged a complete re-design of courses rather than a limited modification of an assessment method. In addition, like, PCR, REAP has been targeted at large enrolment first year classes (ranging from 160-900 students). Three Scottish HE institutions are involved in the REAP project. In the lead institution (University of Strathclyde) the original plan was that one course in each of the institution's five faculties would be redesigned in the first year with roll out to new courses in subsequent years. In one of the partner institutions (Glasgow Caledonian University) course redesign was implemented across a whole faculty - the business school, and in the third partner institution (Glasgow) redesign was piloted in a small number of courses. Also like PCR, the stated goal of REAP is to demonstrate learning quality enhancement and efficiency gains in the way academic staff use their time. The REAP project has been running for 20 months and 20 courses have been redesigned involving 6000 students.

As will emerge in more detail below, although there are some similarities in aims, there were differences in priorities and approaches across the US and the Scottish projects. One key difference is that all the ELTP projects, including REAP project were asked to deliver on transformational change as well as course redesign. While the PCR aimed to establish a strong evidence of cost and quality benefits through course redesigns the ELTP-funded REAP project not only promoted course re-designs (with assessment as the driver) but also has been tasked with establishing the parameters for enduring transformation within an institution.

Grant awarding selection process

Pew's Program in Course Redesign

Within the PCR there were three rounds of funding with 10 applications funded per round. The first round was conducted a slightly differently, but in the subsequent two rounds, applicants participated in the four-stage application process shown below.

Stage 1

1. An open call was made to all 3,400 higher education institutions in the USA or rather to all teams delivering large introductory courses in all those institutions
2. 135 applications were received

Stage 2

1. 40 were selected for consideration by the program committee based on specific ***institutional readiness criteria*** (see Table 1)
2. For each of these 40 proposals, a three-person team (including senior staff from the HEI) attended a one-day workshop on how to produce the next stage of the application, how to redesign pedagogically and how to plan for cost saving and measure results.

Stage 3

1. 20 were then selected based on specific ***course readiness criteria*** (see Table 1)
2. The core teams from the 20 proposals attended a one-day workshop on developing plans and budgets for the redesign. Considerable individual assistance was provided as the proposals were being prepared including review and feedback on drafts.

Stage 4

1. 10 were finally selected for funding with complete plans in place for what would be done and how outcomes would be measured.

This process was clearly highly selective, structured, and required a lot of unpaid design work by the applicants, but it also offered significant amounts of (free) external consultancy input into the re-designs and into the plans for evaluation. By the time of the final award a detailed implementation plan that satisfied both the course teams' own aims and those of the funders had

been produced. The process also required from the institutions active and visible involvement by senior management as well as leaders of the course teams.

Institutional Readiness Criteria

1. The institution must want to reduce costs and increase academic productivity
2. The institution must view technology as a way to achieve its strategic goals rather than as a general resource for academic staff and courses
3. The institution's goal must be to integrate computing throughout the campus culture
4. The institution must have a mature IT organisation to support the integration of technology into courses or must contract this out to external providers.
5. A substantial number of academic staff must have understanding and experience of integrating computer based instruction into existing courses
6. The institution must have demonstrated a commitment to learner-centred education
7. The institution must have established ways to assess and provide for learners' readiness to engage in IT-based courses.
8. The institution must recognise that large-scale course redesign using IT involves a partnership among academic staff, IT staff and administrators in both planning and execution.

Course Readiness Criteria

1. Improvements in the course must have a significant impact on the curriculum
2. The course must offer the possibility of capital for labour substitution
3. Decisions about curriculum in the department, program or school must be made collectively
4. Academic staff must be willing to incorporate existing curricular materials (home-grown and purchased) in redesign rather than create materials
5. The project participants must have the requisite skills
6. The expected learning outcomes of the course and a system for measuring their achievement must be identified
7. Academic staff members must have a good understanding of learning theory
8. There must be a business plan to sustain the redesign in the future

Table 1: Institutional and Course Readiness Criteria (Basis of Pew Program, and derived from Twigg, 2003)

ELTP-REAP

In designing the process of inviting bids for transformation funding, the SFC deliberately tried to improve on the operation of previous funding schemes by having a consultation meeting to seek the views of those in the FE-HE sectors about how the process should run and the nature of the bids that should be supported. This resulted in a staged bidding process with general and specific feedback as follows:

Stage 1

1. An open call was made to the 43 FE and HE institutions in Scotland for expressions of interest. The four criteria mentioned above formed the basis of the bids – changed teaching and learning, embedding, sustainability and measurable benefits. There was also a clear requirement for cross-institutional and/or cross-sector (FE-HE) collaboration.

Stage 2

2. 140 bids were received and SFC provided general feedback on the types of bids that would be funded and on how to improve the bids as well as brief but specific feedback on each bid.

Stage 3

3. 26 full applications were received

Stage 4

4. 6 projects were selected, and funded after some negotiation about details such as the need to provide cost-savings from the use of technology in teaching and learning over the long term. In relation to the REAP project a letter from the Funding Council specifically asked for 'targets...such as quantifiable reductions in conventional assessment activity, measures of time freed for other teaching practices...' (SFC, 2004)

Stage 5

5. Funding within REAP for course redesigns has been similar to the PCR. Course teams within each institution have been given small grants to implement redesigns. The key criteria for courses selected for funding were that they involved first year classes with large student numbers and that there was a commitment to redesign by the head of department as well as the course leader. Educational and technical support within REAP has been provided on an ongoing basis by a central team located within the Centre for Academic Practice and Learning Enhancement (CAPLE) at the University of Strathclyde.

Commentary

A number of issues are raised when one compares the PCR and the SFC grant awarding processes. Firstly, the PCR had a single and well-defined objective (cost and quality enhancement) in advance of making a call for proposals and the organization and structuring of all bidding processes was geared to the achievement of that objective. Each institution selected had to show an exceedingly high level of readiness at both institutional and course level. This level of readiness could not have been required from SFC-funded institutions as it would have been unlikely, at this time, that any Scottish institution would have met the readiness criteria at least at the level defined by Pew. Hence it might be argued that the PCR institutions were not really engaged in radical transformation of the kind being sought by the SFC. An evolutionary process

had already taken place at institutional and course levels. The changes made could be viewed as merely the next step in this evolutionary process.

A second aspect of the PCR was the level of support provided in developing the redesign models at the planning stage. 'National experts...provided consultation and oversight regarding the assessment of learning outcomes to ensure that the results are reliable and valid'. In addition, each institution was supported in developing a detailed cost analysis of both the traditional and the redesigned course formats. This level of support at the project initiation stage differs from that available through REAP and within almost all UK funded projects.

Thirdly, the highly selective nature of the PCR, particularly in terms of readiness criteria, meant that while any successes are demonstrations of what is possible. They were not necessarily representative, and so in themselves might provide little information about how easily and widely the models derived might transfer to other institutions. The PCR was designed by Twigg to establish a 'proof of concept' regarding cost reductions and learning quality enhancement through technology. This had not been demonstrated before in a convincing way and Twigg was keen to evidence, both to the HE sector and to US Congress, that educational access could be widened through such cost savings.

The level at which the intervention is focused

Pew's Program in Course Redesign

In the PCR, change was implemented solely at the course level by course teams. Change was not required at the institutional level even though some of the PCR redesigns if implemented in the UK would require significant institutional-level actions (e.g. some of the PCR redesigns involved moving to the use of huge computer labs with over 500 students). However, the readiness criteria ensured that the institutional context was already supportive of course changes involving increased use of technology. The PCR was also not concerned with creating multiple instances of course redesign in the same institution or with rolling out course redesigns within or across institutions during the development stage. Indeed, the selection criteria did not encourage cross-department (in the same institution) or cross-institutional collaboration.

ELTP-REAP

ELTP-REAP differs from the PCR in its focus on institutional change as well as course redesign. A key requirement of ELTP was that projects should show intra-institutional impact and institutional embedding and sustainability beyond the funding (see above). Another requirement was for cross-institutional collaborations both within and across the HE and FE sectors. This was linked to the ELTP vision that any successes would provide lessons that could be shared both within and across institutions. The ELTP thus incorporated an important element of rollout in the programme definition.

Commentary

In the REAP project both Strathclyde and Glasgow Caledonian Business School (CBS) implemented multiple instances of course redesign. At Strathclyde two first year courses in each faculty have been redesigned and at CBS all core modules in the undergraduate business degree have been redesigned. This clustering of redesigns in the same institution has had a positive influence on strategy development. In CBS, the clustering and sharing of innovative developments (and the evidence of their effectiveness) has resulted in the original REAP assessment principles being integrated into the business school teaching, learning and assessment strategy. At Strathclyde the REAP developments have resulted in an institution-wide consultation about assessment with a developed set of assessment principles deriving from REAP now being incorporated into a revised institutional policy on assessment.

While the PCR managed to remove the obstacles at the institutional level as a variable (consistent with the priority of producing clear proof of concept cases), the ELTP wished in part to explore them and so produce a better understanding of them. This requirement influenced the REAP proposal which not only made a commitment to embedding but also proposed that the project would 'identify the barriers to transformational change at both the departmental and institutional levels'. In REAP many of the course teams have had to overcome significant obstacles to the implementation of technologies (e.g. e-portfolios, widespread use of electronic voting systems) at departmental and institutional level. In addition, considerable effort has gone into documenting how new approaches to assessment impact on other processes, services and systems (IT, quality, staffing) and to embedding REAP thinking into other ongoing e-learning developments across the institution (assessment policies, e-learning strategy).

The ELTP requirement for cross-institutional partnerships also has advantages and disadvantages. One advantage of such partnerships is that the course redesigns benefit from a wider pool of expertise available when more than one institution is involved. For instance, the large-scale introduction of EVS in CBS was supported by technical, pedagogical, and evaluation advice and personnel from the partner institutions. A second benefit is that partnership arrangements bring forward dissemination processes: the robustness and the transferability of the redesign models can be piloted at partner institutions before being rolled out across other FE/HE institutions. A third benefit of partnerships is that they help to distribute risks; if one partner fails to deliver then this would not end the project. There are also drawbacks to the partnership approach. In particular, the REAP project has shown that a great deal of effort is spent by the partner institutions coordinating cross-institutional activities. This effort, at least at project start-up might dilute what is achieved within a single institution.

Pedagogy

Pew's Program in Course Redesign

Pedagogy here means the approach to, or methods of, teaching, learning and assessment. The PCR was underpinned by some general pedagogical ideas, in particular, conceptions of active learning and learner-centered provision (i.e. offering differently tailored resources for different students). However, each course team implemented their design in a way 'that varies according to the discipline involved, the particular student audience and the preferences of faculty' (Twigg, 2003, p30). A post-implementation analysis by Twigg identified six distinct course redesign models: the supplemental model (adds technology-based activities to existing teaching), the replacement model (replaces some face-to-face meetings with online activities), the emporium model (learning resource centre approach featuring online materials and on-demand personalized assistance), the buffet model (flexible diet based on student needs) and the fully online model (all learning activities online).

ELTP-REAP

The ELTP had as one selection criterion that 'certain aspects of teaching and learning will be conducted in new ways', although it did not require having a pedagogical rationale for the proposed changes. Different projects in the ELTP have different educational rationales. The REAP project is underpinned by a robust pedagogical rationale; it draws on relatively recent ideas from educational research on how to use assessment processes including self, peer and tutor assessment and feedback methods, to develop student autonomy in learning (Boud, 2000; Knight and Yorke, 2003; Black and Wiliam, 1998; Nicol & Macfarlane-Dick, 2006, Nicol and Milligan, 2006). Some clearly defined principles of assessment and feedback have guided project development based on the work of Nicol and Macfarlane-Dick (2006) and these have been tested and refined during the project.

Commentary

The REAP team, inspired by the PCR results, initially anticipated that course teams would engage in complete course redesigns in a similar way to the PCR teams. However, a number of obstacles were encountered. Although course teams usually had a fairly clear idea of the issues they wished to address - dropout rate, low exam scores, shallow student understanding, low lecture attendance - they usually did not possess readily available ideas about how achieve this.

The PCR supplied support in pedagogical redesign as required as part of the bid application process. In the REAP projects this kind of support has also been provided as part of the project activity. However, the REAP project has shown that more time is required to create the kinds of changes evidenced by Twigg's teams. Most course teams in REAP did not go to full implementation but instead initiated small pilots before engaging in a complete redesign. Also,

exemplars of innovative designs supported by technology proved critical given that many staff had little experience in redesigning learning within traditional courses let alone for technology-enhanced courses. In the roll-out of REAP to new departments and course teams the strategy now being piloted is that the REAP team work with teaching staff on redesigns before they begin implementation rather than expect staff to develop the redesigns themselves from scratch. In order to encourage this collaboration, funding for the projects is only provided if the REAP team are happy that the redesign meets stated criteria. These criteria include reference to the assessment and feedback principles underpinning REAP. One result of this change is that course teams are more willing to seek pedagogical support and evaluation advice at the design stage. Hence the REAP team have moved somewhat towards the PCR approach.

Measuring gains

Both the PCR and the ELTP were concerned that institutions had procedures to evaluate changes. In both cases the types of gains of interest were cost reductions and learning improvements.

Pew's Program in Course Redesign

In terms of cost evaluation, the PCR employed a rigorous methodology in order to show cost savings through redesign. This required that staff identified all activities associated with teaching – planning, delivery, assessment and support – and to cost these inputs. This had to be calculated in advance both for current teaching model and for the new model to be implemented. In the PCR, course teams also had to agree, as part of their design, how learning outcomes would be measured. Most used standard tests independent of the course. This was possible because in the US ‘large introductory courses...have more or less standardised curriculum, outcomes that can be easily delineated, and content over which staff are relatively less possessive’ (Twigg, 2002, p4). Other evaluation measures included student dropout or evidence about a shift in quality of learning (e.g. depth of understanding). The important point is that the course teams had identified what their measures would be in advance, considered whether they aligned with their main aims in the redesign, and agreed them with an evaluation consultant.

ELTP-REAP

Although the SFC was interested in the learning benefits and cost savings the method for achieving this was not planned out in any detail with project teams in advance. However, an external evaluation team was employed by SFC with a remit to support project teams in collecting baseline data to enable the evaluation of the impact of the project and the programme as a whole. The intention was that the identification of cost-benefit measures would to be developed during project implementation. This approach is more akin to a research investigation than the PCR's proof of concept approach.

Within REAP there have been considerable difficulties in comparing performance before and after course redesign. One reason for this is that standardised curricula and tests do not exist in the HE sector in the UK. Another reason is that after funding was agreed there was insufficient time to collect performance data from previous student cohorts (i.e. those taking the same courses in previous years). However, even if that had been possible, redesign through REAP often means changing summative assessment practices as well as teaching and learning methods. This contrasts with the PCR standard tests approach and makes pre to post comparisons of student performance more problematic.

Commentary

Despite these difficulties it has been possible to collect qualitative data in REAP. One approach has been to identify the issues raised before redesign (e.g. poor levels of student writing, insufficient feedback on written work) and to focus on the changes in these areas after redesign. Another approach has been to use process measures of learning gains. REAP has a clearly defined framework for evaluating learning enhancement based on the extent to which first year courses help students learn how to become masters of their own learning: seven principles of good assessment design (processes) have been identified from the published research that if implemented would support the development of such learner self-regulation (Nicol and Macfarlane-Dick, 2006; Nicol, 2006). By examining course designs against these principles (including additional principles developed during the project) it has been possible to make indirect pre and post process measures of educational effectiveness. For example, it is easy to analyse changes in opportunities for learner reflection or self-assessment of academic work before and after course redesign. Other approaches have been to identify the added value of the technology and to use student and staff satisfaction data derived through focus groups, interviews and questionnaires.

In terms of measuring costs of instruction, the PCR was able to achieve a detailed analysis of costing from their course teams. In part, this was due to funding conditions where this information was required in advance as the basis of funding. However, there might also be attitudinal differences in approaches to such measurements. In the UK, there is considerable resistance to the costing of staff time. Many HE staff believe that if teaching were to show efficiency gains this would simply result in the allocation of extra work rather than a reward. Possibly fuelling this perception is the observation that many of the cost reductions within the PCR were actually achieved through specialisation of labour within course teams, for example, using cheaper staff such as graduate teaching assistants for some tasks.

A key problem relevant to the REAP project has been to identify ways of measuring institutional change and of proving embedding and sustainability. The current strategy has been to attempt to evaluate changes in relation to indicators in each institution's e-learning strategy and to promote embedding by linking REAP activities to other strategic initiatives in the institutions.

Money as a driver for change

Pew's Program in Course Redesign

The PCR provided a considerable sum of money to the course teams selected, and left them entirely free to spend it as they wished. However, to be selected for the program, course teams were required to identify in advance the cost reductions they would make in course delivery (i.e. this was a criterion for project selection). In the US at that time, few believed that cost reductions (without lowering quality) from new technologies were possible. Money might therefore be seen as a motivator, paying for taking on the risk and the added managerial effort of change in the absence of good evidence that benefits would result. In the post-PCR era, Twigg is engaged in a new program for course redesigns but this program does not involve direct payments. The rationale for this new strategy is that cost-quality benefits are now a realistic expectation - demonstrated through PCR - hence this should be enough of a motivation for course teams to participate. The new program, however, still provides extensive support for redesign and for cost evaluation.

ELTP-REAP

The ELTP also offered considerable money to projects. Within REAP this money has been used to pay for a core project team and to support participating teams in departments. In the lead institution, course teams were provided with a fixed sum of money paid in four installments over two years to engage in course redesign. However, in the roll-out, in year two of the project where new course teams are being funded, this strategy was changed – both the sum of money was reduced and the criteria for participation were altered. Course teams must now produce a redesign plan that addresses both their own drivers for change (efficiency and quality drivers) but that also addresses the overall goal of the project which is that the redesign should enhance the development of learner self-regulation in first year courses. Funding now comes in two tranches with half provided for the redesign plan and the other half provided for the write up of the project including its evaluation. Course teams are however supported as they develop their plans, during implementation and evaluation and when they write up the case study for publication.

Commentary

Is money useful or effective in promoting worthwhile change? The paradox here is that many funders expect new methods will save money, in which case surely teachers and institutions should adopt them without any other inducement: offering money to do so seems a contradiction. In PCR, money was important at a time when perceptions of risk were high because of lack of good evidence. However Twigg is now working on demonstrating that course redesign can now be promoted based on the evidence rather than on financial inducements.

It is possible, then, that funding directed at creating convincing evidence may be the most effective strategy in the long run. This is consistent with some indications within the REAP project that

supplying educational evaluation (as a service) to course teams is more welcome than just money. However the truth may be more complex. Perhaps money is best at getting teachers' attention, both privately and organisationally (and at gaining the department's agreement to allow change); and this in turn then enables redesign to be considered, even if the money isn't actually essential to the implementation. In REAP the money allocated to course teams has mainly been used either to fund a project manager whose job is to manage the logistics of the change with the course teams actually designing the educational changes or to pay for technology (e.g. electronic classroom voting technology) or external input (e.g. in one redesign, content input from a practising pharmacist).

Dissemination

Pew's Program in Course Redesign

A special feature of the PCR is that Carol Twigg, the program director organised the writing and publication of reports in a standard format from all 30 projects. She drew and wrote up some conclusions about the patterns derived from the set of projects as a whole (the five redesign models discussed above). This took some deliberate effort, since whatever their obligations, not all projects supplied immediately usable material for the standard reports, so significant effort in rewriting was required from the program team. The advantage, though, has been considerable - reflections across all 30 projects and availability of a wide perspective thus providing a better opportunity for general educational conclusions. Some projects have also carried out their own dissemination through their disciplinary channels. Thus both perspectives (discipline-specific, and general educational) are supported.

ELTP-REAP

Within REAP, the core project team is supporting course teams as they write up their redesigns and are also producing the educational overview cataloguing all the redesigns in relation to established educational principles. In addition, many course teams are targeting disciplinary journals to publish their findings. There is also an independent evaluation team for the ELTP programme as a whole. This team will provide an overview across six transformation projects in the programme.

Commentary

Dissemination of learning and teaching knowledge, as opposed to research, is an important but neglected issue. The drivers of research dissemination are absent from work on learning and teaching. Teachers are not usually rewarded for, or motivated to communicate their methods and discoveries. Educational researchers do disseminate but there are questions about whether such dissemination, perhaps good at informing other educationalists actually has a large impact on teachers in the disciplines. As indicated earlier, actual uptake of innovations requires not just

conceptual accounts of benefits but also requires that practical know-how be shared. This might require considerable support not just the communication of findings published on a website.

The vast extra effort of addressing the inherent disciplinarity of the organisation of higher education is also a consideration. There are in fact not one but two dissemination jobs required in projects such as these: to the education literature community, about generalisations across all disciplines, and to each and every discipline that might introduce a new practice to its teaching. To have an impact on HE as a whole, the message has to be reformatted (rewritten) for each one of the target disciplines. Thus to take a theoretical educational idea and make it effectively available to practising academics in different disciplines may require developing a good example in every major discipline. Mazur's (1997) Peer Instruction is much better disseminated than many innovative teaching methods, and this is partly because he has published both in the education literature (for researchers) and in a monograph aimed at physics practitioners. Yet even so, the impact of his work is only now moving outside physics-related subjects (see Banks, 2006).

In the UK, the Higher Education Academy subject centers were deliberately established to enable dissemination of effective practice within disciplinary contexts and in Scotland the Quality Assurance Agency Enhancement Themes are also trying to address this issue.

Key Questions for Readers

1. Given the analysis above readers might like to consider what approach should be adopted to encourage 'transformational' change of the kind sought for by the Scottish Funding Council. Are the lessons from PCR relevant to the UK context? What recommendations would one make based on the above analysis to

- Teachers in disciplines
- Course leaders in disciplines
- Academic Deans
- Institutional Managers
- Policy Makers

2. You can't get cost savings from redesigning courses without reducing learning quality. Discuss.

3. Projects to explore the use of new technologies, as opposed to tackling identified learning problems, never show learning gains. Discuss

4. Most crucial to success in redesign seems to be the provision and acceptance of pedagogical and evaluation advice to course teams during redesign. Discuss.

Note

This paper is a shorter version of a paper that has been prepared for publication.

References

- Banks, D.A. (2006) *Audience Response Systems in Higher Education: Applications and Cases*. Information Science Publishing, London.
- Black, P and Wiliam, D (1998), Assessment and classroom learning, *Assessment in Education*, 5(1), 7-74.
- Boud, D. (2000) Sustainable assessment: rethinking assessment for the learning society, *Studies in Continuing Education*, 22(2), 151-167.
- Knight, P and Yorke, M (2003), *Assessment, Learning and Employability*, Society for Research into Higher Education and Open University Press, Berkshire, England
- Mazur,E. (1997), *Peer instruction: a user's manual*, Prentice Hall, New Jersey.
- Nicol, D. J. & Boyle, J. T. (2003), Peer Instruction versus Class-wide Discussion in large classes: a comparison of two interaction methods in the wired classroom, *Studies in Higher Education* 28(4), 458-473
- Nicol, D.J. and Macfarlane-Dick, D (2006), Formative assessment and self-regulated learning: a model and seven principles of good practice, *Studies in Higher Education* 31(2), 199-218
- Nicol, D. J. & Milligan, C. (2006), Rethinking technology-supported assessment in terms of the seven principles of good feedback practice. In C. Bryan and K. Clegg (Eds), *Innovative Assessment in Higher Education*, Taylor and Francis Group Ltd., London.
- Papert, S.A. (1980), *Mindstorms: Children, computers and powerful ideas*, Basic Books: New York.
- REAP website, www.reap.ac.uk
- Russell, T.L. (1999). *The no significant difference phenomenon*. Raleigh: North Carolina State University.
- Tripp,A and others (2003) Joint SFEFC/SHEFC E-Learning group: final report
http://www.sfc.ac.uk/publications/pubs_other_sfefcarchive/joint_elearning_report_july_2003.pdf
visited 1 July 06
- Twigg, C.A. (2003), Improving learning and reducing costs: new models for online learning, *Educause review*, Sept/Oct pp.28-38

