

# TRANSFERRING INNOVATION THROUGH COLLABORATION: DOES PARTNERSHIP WORK?

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## ABSTRACT

If Computer Based Learning in Science is to continue to spread in an effective manner, then it needs to be able to demonstrate that CBLIS enhances and enriches student learning. To do this it firstly needs to be able to demonstrate that any pilot innovation is effective. Secondly there needs to be some credible means by which a pilot innovation can be transferred embedded and evaluated into another curriculum context.

This paper discusses the subject and University contexts to such partnerships, and what it means to be a dual professional with expertise in both a subject and also in teaching. By way of example it reports on the Built Environment Appropriate Technology for Learning project, BEATL, which is funded by the United Kingdom Higher Education Funding Council for England through the Teaching and Learning Technology Project (Phase 3). It aims to develop effective and efficient methods of integrating technology-based materials into the delivery of modules partnered across the undergraduate modular programmes of three different Universities. The syllabi of the partner modules typically include similar subject topics, and the module staff have a shared interest in embedding technology-based materials. These 'experimental test-beds' finally result in outcomes that are designed to be highly transferable to other institutions.

This paper reports on the BEATL process of cross-institutional partnering and collaboration in one partnership, the pilot module being Structures and Ground Engineering (University of the West of England), and the associate module being Construction Technology 3 (De Montfort University). The material embedded included a range of computer-based tests with associated visual and textual reference material and interactive diagrams. The pilot module evaluation was passed onto the partner team to help implement the innovation in the associate module.

The paper particularly provides an account of the implementation and evaluation process of the associate partner. This also involved material from CALVisual, another Teaching and Learning Technology Project (Phase 3) project. It discusses issues relating to the transferability of innovations in teaching, learning and assessment from pedagogical and technological perspectives, including:

- the relative success of innovations using generic or specific tools;
- the role of the ETO with regard to resourcing and staff support;
- the professional development of staff to successfully handle change;
- the effect of institutional organisation on successful embedment;

The paper concludes that the evidence from BEATL and elsewhere asserts that:

- successful transfer of innovative pedagogy supported by appropriate learning technologies is possible, but requires significant time and attention;
- associated embedment and evaluation methodologies could be of generic value to Universities seeking to enhance their student learning experience in response to changes generated by the ever gathering W, C & IT revolution.

## INTRODUCTION

*How it is, all too often, in our Universities:  
“valuable activities take place in an uncoordinated & unconnected way:  
information is collected but not disseminated;  
problems are identified but not acted upon;  
changes are made but their consequences are not monitored”*

*(IMCHE Unit 3 Guide, p8, 1998).*

The background to this paper lies in the way that both the principle and also the practice of partnership has been affected by the changing environment of Universities and the changing nature of subjects. This is especially focused in the issue of the lived reality of the dual subject and teaching professionalism of Higher Education teachers and how this has impacted on professional identity and collaboration. These factors are briefly discussed in this paper.

The paper then considers the BEATL project, which is funded by the United Kingdom Higher Education Funding Council for England through the Teaching and Learning Technology Project (Phase 3). BEATL aims to develop effective and efficient methods of integrating technology-based materials into the delivery of modules partnered across the undergraduate modular programmes of three different Universities in the United Kingdom. These 'experimental test-beds' result in outcomes that are designed to be highly transferable to other institutions. Each collaborating module is supported by an Educational Technology Officer who works with the module tutor to find the best way to embed the technology-based materials, and to conduct the evaluation.

This paper provides an account of the implementation and evaluation process of an associate partner module. The pilot module evaluation was passed onto the partner team to help implement the innovation in the associate module. The material embedded included a range of computer-based tests with associated visual and textual reference material and interactive diagrams.

The paper considers this example of transferring innovation through collaboration via the BEATL partnership(s), and discusses issues relating to the transferability of innovations in teaching, learning and assessment from the perspective of both pedagogy and technology, as outlined in the abstract. It seeks to draw out from the evaluation some lessons as to whether the BEATL partnerships are working. More lessons from other examples of innovation transfer are also considered briefly.

The paper concludes with 10 tips to enable successful innovation transfer through partnership. In particular it concludes that the evidence from BEATL demonstrates that successful transfer of innovative pedagogy is possible, and that associated embedment and evaluation methodologies could be of generic value to Universities.

## PARTNERSHIP AND THE CHANGING ENVIRONMENT OF UNIVERSITIES

*'To underpin it's view of 'the European University in 2010' Utrecht University recently conducted a survey of Rectors, Vice-Chancellors, Presidents and members of Boards of Governors throughout Europe, which revealed that the values most shared throughout Europe are:*

- *freedom of research and teaching as a fundamental principle of University life;*
  - *the University's contribution to the sustainable development of society as a prominent element in a University's mission;*
  - *research and teaching remaining inseparable at all levels of University education;*
  - *national Government bearing as much responsibility for higher education in 2010 as it does today.'*
- Utrecht University, August 1997*

**Universities operate in an international context** both by choice and by default. This globalisation of education not only has an economic and political outcome, but globalisation also works as a discourse of time and space, a discourse which emphasises the tension between fragmentation and homogeneity. This is reflected in the way that the collegial, bureaucratic and market models of academic organisation which originated respectively in the United Kingdom, Continental Europe and the United States respectively [Dill, 1992] are increasingly converging internationally. The related issues of massification and the market place, and their impact on Higher Education Institutions are now of central importance, not least in the United Kingdom with it's tradition of elite Higher Education. Yet real resources from government continue to reduce to a greater or lesser extent, especially in the United Kingdom where the cultural impact of privatisation and the market economy have been considerable over the last 20 years. In the United Kingdom and Continental Europe privatisation in Higher Education has been partial and de facto by stealth, especially through deregulation initiatives targeted at the governance, management and marketisation of Higher Education Institutions.

Such examples illustrate the changing shape of the 'triangle of tension' [Williams, 1995] between the forces of the state, academia and the market. The evaluative state is now adding its force more to that of the market, through the student as consumer, rather than as sponsor of academia with their forces aligned. Thus for example the evaluative state is using the University as an agent of performance measurement via the satisfaction of the student customer.

Yet the recent changes in the environment of Universities outlined above, which are highly significant, are thrown into longer-term relief by this recent challenge to all Higher Education Institutions:

*'I call on Universities to ensure they keep their essential intellectual values while going through the inevitable change process. The University has to face a radical and irreversible reformation of it's role ... if we create market Universities, run purely on market principles, they may be of their age, but they will not be able to transcend it. If they only chase and adapt to circumstances, rather than fulfil an anticipatory role, Universities will not, anymore, be able to shape the future ... it is up to the people to set the priorities, not the market ...'*

*Dr Federico Mayor, Director General of UNESCO, September 1997*

This call suggests that a certain degree of collegiality needs to be retained within Universities as well as subjects, whether at Department, Faculty or University level. It also suggests that operational **partnerships** between Universities Faculties, Subjects etc are an important feature of pedagogy transfer, as implied by TLTP, FDTL etc project funding criteria and the flexible and transferable environments they seek to encourage. It also suggests that the core task of Universities remains knowledge formation and processing through Research / scholarly work / teaching

## PARTNERSHIP AND THE CHANGING NATURE OF SUBJECTS

Other changes in the national environment of Higher Education in the United Kingdom, which are especially pertinent to the transfer of pedagogical practice in a University, include:

- establishing the national **Institute of Learning and Teaching** with a view to accrediting Higher Education lecturers in terms of their learning and teaching expertise, so moving towards dual professionalism of subject and of teaching;
- the establishment of national **Subject Centres** in 24 cognate subject areas to support learning and teaching good practice more generally on a subject basis;
- the national **Subject Benchmarking** exercise with a view to, effectively, establishing a national Higher Education curriculum in terms of arrays of assessed learning outcomes;
- the **Quality Assurance Agency** assessment of the overall quality of the delivery of learning every 4 or 5 years;
- the **Research Assessment Exercise** cycle every 4 or 5 years.

It is notable that they are all subject based, which suggests that the power of the subject is paramount. The subject, as defined by its knowledge domain and its value base, will remain a crucial feature or protocol of pedagogy transfer and associated **partnership** and collaboration. They also suggest that the primacy of subject knowledge and its units will continue whatever their associated characteristics and loose couplings.

Key features relating to understanding the nature of the subject in the University include:

- the primacy of the subject knowledge, and how that differentiates and fragments the basic units of an Higher Education Institution [**Clark, 1983**];
- the importance of the associated characteristics of those units [**Biglan, 1973**];
- the often loose yet recognisable attachments and couplings that take place within an Higher Education Institution between the differentiated units of the Higher Education Institution [**Weick, 1976**];
- The fundamental difference between traditional mode 1 knowledge formation which is homogeneous, rooted, hierarchical and single subject in form, and “post modern” mode 2 knowledge formation which is heterogeneous, changing, pluralistic and interdisciplinary in form [**Gibbons, 1995**].

These sources of differentiation arise supremely at subject or department level [**Becher and Kogan, 1992**] of the normal four levels within Higher Education and can be very powerful. For example, regarding consensus in an academic field, the **subject characteristics** of History of Art and Design have changed profoundly over the last 15 years. A traditional 'elitist' chronological approach has been supplanted by a much broader 'eclectic' approach. This has redefined the subject as the study of the history of cultural products, allowing for social context, interdisciplinary dialogue, etc., and is becoming embedded in delivery to a correspondingly wider range of students.

Against such a background the need for integrating systems across Departments, Faculties and Universities is clear, from the level of information processing networks to the level of full academic partnerships collaborating in the transfer of innovative and best practice. Potential tensions between the University and the Subject are also clear thus underlining the need for partnership and collaboration. Thus the necessary counterbalancing sources of integration need to come from similar or senior levels within the organisation. Informal sources of integration include shared academic culture [**Clark, 1983**] (now weakened significantly at most levels within Higher Education Institutions), internal markets [**Massy, 1996**] (c.f. cost / responsibility / value centres) and the distribution of organisational authority in its varied forms, levels and contexts. The ways in which subjects and/or departments are grouped (into Faculties, for example) is important, as information flows across groupings are much weaker than within groupings. Thus information processing systems and their capacities are a central feature of formal sources of integration using some form of 'horizontal' linkage mechanism [**Geiger, 1990**]. These considerations regarding the University's task therefore present the general background to defining protocols for pedagogy transfer between subjects and between Universities. In particular this analysis suggests that an effective **University organisational focus** of some proactive form and an **effective communication system** are both vital in supporting the transfer of best practice in pedagogy, not least in partnership.

*'The traditional institutions have to accept that the learning landscape, and they within it, will change perhaps beyond recognition ... This will firstly challenge teaching. When students are no longer a homogeneous group of beneficiaries of the system, but a disparate array of investors in that system, a radical shift of emphasis occurs ... with such a high premium on quality in teaching, it cannot remain less important than research in determining individual careers or the status of a department or institution...'*

*Dr Federico Mayor, Director General of UNESCO, October 1998*

## COLLABORATION AND PROFESSIONAL IDENTITY

The situation in the United Kingdom probably represents the most complex situation for an academic member of staff, as they have to operate within the context of two discourses. [**Seden and Rice, 1999**].

It could be argued that the recent emergence of the ILT in the United Kingdom, and the subject-based developments outlined above, have together newly strengthened a modernist discourse as

mediated through the subjects and disciplines. The professional response to this of academic staff to date has been largely, though not exclusively, subject based. This has been part of the developing story about teaching professionalism, which has largely taken place within clear subject bounds to date.

By way of contrast, a post-modernist discourse has been mediated through Universities, which now design and deliver increasingly modular and commodified curricula [Trowler 1998] to promote accessibility and flexibility in the market place. The professional response of academic staff to date in the last decade or more has been largely, though not exclusively, through the redesign of the curricula, which has involved considerable change.

Thus it may be argued that there is now a new impetus to dual professionalism, firstly in the conservation of the subject and the expansion of its knowledge base, and secondly in the effective communication of that knowledge. This dual professionalism inevitably brings with it a new complexity fuelled as it is by two different types of discourse or story.

A further complexity involves the rise of inter-disciplinarity, which by its very nature also tends to reflect both discourses. The process of existing subject differentiation, de-differentiation as boundaries are blurred, and re-differentiation into new categories, means that the subject knowledge domain becomes ever more complex for staff. This in turn invites a professional response involving either new challenges to received **subject definition** or ever-greater specialisation.

Finally the rise of Communications and Information Technology in all its manifestations is revolutionising the design and delivery of Higher Education. The professional response will probably be profound in terms of how knowledge transmission is effectively supported, with the academic's role changing to, for example, that of learning support and learning management. The way in which an innovation in pedagogy uses **learning support systems** is thus important.

Above all, though, it is clear that the battle of the discourses is being played out at every level in Higher Education, not least in the individual professional role. Protocols for pedagogy transfer are a key element in enabling the academic member of staff to handle the widening range of demands on their professionalism. **Professional development structures** that enable staff to do this will be vital at each University.

## DUAL PROFESSIONALISM AND INNOVATION

The above discussion expresses the complexities with which subject based professional staff must work in a professional learning and teaching context and in an organisational context. Equally the Higher Education context has changed greatly with the commodification of the curriculum in the 90s and the rise of the ILT. Finally the challenges of inter-disciplinarity and the rise of Web, Communications and Information Technology re-emphasise that the subject professional is now inevitably a dual professional living daily with complexity. These realities must impact on any innovation transfer, and are vital to understand when considering transferring innovation and best practice.

## AN EXAMPLE OF TRANSFERRING INNOVATION THROUGH COLLABORATION: THE BEATL PARTNERSHIP

BEATL is a Teaching and Learning Technology Project (Phase 3) funded project led by the University of the West of England (UWE). The other members of the consortium are De Montfort University (DMU), the University of Westminster (UW), and the Subject Centre for Education in the Built Environment at the University of Cardiff.

The project aims:

- to embed new technology-based learning materials into the delivery of modules in the built environment undergraduate modular programmes at the partner universities: UWE, UW and DMU. The Subject Centre plays an advisory role.
- to share with, and promote to, all higher education institutions and their staff good practice in embedding technology-based learning materials.

Project objectives include:

- to embed appropriate technology - based applications and learning materials into 25 built environment modules, including large interdisciplinary modules;
- to evaluate the impact of these sub-modular applications and materials on the quality of the student learning experience in the module, and evaluate the full resource implications of the project innovations;
- to introduce collaborative arrangements among the consortium universities and their faculties for testing transferability of good practice;
- to prepare a staff handbook on good practice for embedding appropriate technology, and run professional staff development programmes for staff in Universities nationally to promote good practice in the embedding of appropriate technology;

Initial examples of experiments in modules include:

- Computer supported tutorials;
- Video & web-based self assessment;
- Axonometric drawing support using CAD;
- Use of computer-assisted-assessment in financial mathematics
- Housing budget simulation exercise
- Security of tenure self-assessment exercise

A key feature is the concept of the module **partnership** between modules that pilot an innovation, and partner modules that re-embed the innovation in their curriculum at another University. It is governed by the **module agreement**, which covers:

- agreement on the contribution a module will make towards the project;
- confirmation of the main features of an innovation plan;
- information on the support a module can expect to receive from the project team;
- information on the resource remuneration a module can expect to receive.

The module leader signs the agreement. The project is provided with **learning support** by the resource of a part-time Educational Technology Officer at each University.

This project is now halfway through its contract time and has involved a high level of attention from the Educational Technology Officers (ETO's) in the design, delivery and evaluation of an experiment.

Educational Technology provision has been variable across sites. The ETO's who have had strong and secure links with well established central Educational Technology and Development Units have been in a stronger position to advise and support staff in specific developments, due to the wider overview and perspective such an arrangement offers. It is also notable that those ETO's who are not from the subject area do not report this to be a significant barrier. This suggests a high degree of transferability in terms of ways of working to enable transfer of best practice within and between subjects.

BEATL, as most Teaching and Learning Technology Project (Phase 3) projects, is mainly focused on embedment and evaluation. However experience to date is that nearly all experiments have involved an element of development, at the very least at the level of customising a learning delivery item when it is transferred from one curriculum to another. It is possible that one conclusion of the project will be that the most successful transfers are those using the most generic tools or covering the most generic subject matter, especially at Part 1 degree level.

## AN EXAMPLE BEATL PARTNERSHIP IN ACTION

The initial pilot module, *Structures and Ground Engineering* took place at UWE in semester 2 of 98-99 academic year. The module innovation was introduced to guide students through instructional material including simulations (Java applets) and self-assessment quizzes. Customised spreadsheets for structural steelwork design enabled students to check their calculations. Laboratory sheets were also introduced to provide instruction, check data and calculations, and record results. The medium for introducing this material was a module website.

In brief, the aims at UWE were to:

- encourage students to complete course work exercises.
- provide rapid feedback.
- support laboratory supervision by non-academic staff.



Following discussions with the module leader at UWE the DMU module leader decided that some of the material could usefully be embedded into a year two module, *Construction Technology 3*. A videoconference took place in June 1999 where the DMU module leader had an opportunity to look through the materials available on the Structures and Ground Engineering website, and begin to make decisions about which material would be appropriate.

There were a number of differences in the mode of use finally decided upon. A key issue of the partnering process is an acceptance that blocks of material are rarely going to be appropriate for complete transferral to the new context. The major differences in the use of the resources at DMU compared to the pilot module were as follows:

- The UWE module had a much more quantitative approach to structures, making use of a lot of calculation-based worksheets. The DMU module is more qualitative in its approach thus the selection process was granular, choosing elements to re-use in an explicit way, and elements which would act as learning support to be used by the students as they felt appropriate. Sections of the UWE resources were discarded entirely.
- As a direct result of the less quantitative approach at DMU, much of the material selected was intended for self-study and not integrated into either the classroom sessions, or into assessment. However, some material was clearly integrated into 3 of the classroom sessions. The quizzes were only used for formative assessment rather than summative assessment as at UWE. This was a deliberate decision as a lot of material was being repurposed for the module, and new resources introduced. It was felt unwise to jump straight into summative assessment with a brand new system, particularly one which had not been commercially developed.

General information on the module in HTML format was written to build into the module website and lecture and tutorial handouts were mounted on the web at intervals throughout the module.

New material using 54 images and hypertext was created and incorporated into the structure of the website to support lectures on the construction process. The images were sequential and were of the construction of a building incorporating a general steel frame and a portal steel frame on a city centre site, which had been subjected to archaeological excavation. This latter example demonstrates how the BEATL partnering process often gives rise to the generation of new material. The text-image hypertext materials mentioned above were generated as part of the development of this module.

A further additional innovation introduced as a direct result of the partnering process, and something that was not incorporated at UWE was the use of computer conferencing. This was introduced to allow accessible exchange of information and queries between the module leaders and students.

## EVALUATION AT DMU

The module leader and the ETO undertook the evaluation. Feedback was elicited from the student user group, and the module tutor. Student feedback was obtained by an electronic questionnaire administered using WebCT, an evaluation focus group conducted with all students completing the questionnaire, and tutor feedback by means of a structured interview. The student evaluation session was built into the timetable for the module to ensure that feedback could be

elicited. With the student group, both the module tutor and the BEATL ETO were present. The role of the module tutor was to probe more deeply about discipline-specific issues. It was considered important to use a range of evaluation instruments to ensure a representative response.

Key points arising from the evaluation most relevant to the issue of cross-institutional collaboration were as follows:

**Perceived benefits of the partnering process** - The principal benefit of the BEATL partnering process was the acquisition a wide range of teaching and learning resources previously evaluated elsewhere. However, it is important to note that it is unlikely that the material would be integrated without a certain amount of customisation of content, as was the case in this partnership. The material had to be edited in some cases, and extended to fit in with the scope of the associate module. The degree of flexibility possible with customisation will vary from resource to resource. In this case the materials which were developed non-commercially using Perl and JavaScript, and were complex to customise with limited documentation.

**Pedagogical Issues** – The differences in the focus of the two modules meant that less material was integrated into the DMU module. Fuller integration of the materials would have encouraged students to use them more in their own time. Students also commented that building more of the materials into taught sessions and assessment would have encouraged them to make more use of the website. Building this type of material into coursework and assessment is clearly important. The more varied visual material (text and images) also made more impact with implications for selecting and using resources in an electronically managed learning situation where such resources support face-to-face contact.

## ARE BEATL PARTNERSHIPS WORKING? SOME LESSONS

The partnering process within BEATL as a whole has drawn out the following key points.

- A **learning support system** is crucial. ETO's have been vital for encouraging initial interest in participating in module innovations, and in maintaining the momentum of the innovations. They also provide an effective means of ensuring smooth links between technical and academic staff. In some cases where module tutors were particularly under pressure, some innovations would not have taken place without the support of an ETO.
- The **module agreement** is crucial for commitment and successful embedment.
- **Evaluation and testing of the innovations** is important particularly in the case of associate modules that had greater confidence in implementing an innovation that had proved to be useful elsewhere.
- **Generic** innovations have been most useful, i.e. those technologies that can be applied to many contexts, e.g. assessment systems, web-based technologies etc.
- **Customisation** is likely to be necessary in embedding materials developed elsewhere, as a complete curriculum match is unlikely to occur. Customisation in BEATL has meant anything from repurposing worksheets to editing Javascript.

- Those requiring **technical** customisation are the most difficult to transfer, particularly those systems that have not been commercially developed. The least time-consuming innovations were those involving the Adsetts Case Study, an off-the-shelf multimedia case study. In the latter case, the benefits of the partnering process came in the generation of ideas on how to build the case study into project work and assessment.
- **Partnership between Universities** can be successful at a range of levels. In the case of BEATL successful partnership has been evident at the level of project management, between module leaders, and between ETO's.

## OTHER PARTNERSHIPS: DID THEY WORK? MORE LESSONS

Many other transfer examples exist and some are reported elsewhere [Seden and Rice, 1999]. In summary they included:

1. An MA Research Methods development project (module), where strategic & **professional development** barriers inhibited change;
2. Structures software suite which was used successfully for 10 years (sub module), but transfer did not occur due to:
  - **Staff change & professional development;**
  - **Lack of resource** to update software technology (Ditto)
  - **Student expectations**
3. Exhibition module in computing (module) which ran very successfully for 7 years due to:
  - **Value base to subject** implicitly changing, leading to ...
  - Transfer between **non-cognate** subject areas;
  - Initial barriers being overcome with **persistence and support**, partly due to ...
  - Ongoing **feedback, evaluation and action**, which were vital re credibility.

## CONCLUSIONS

These are firstly presented in the form of 10 tips to enable successful innovation transfer through partnership:

1. Engender a **collegial** (not competitive) culture and ...
2. Set up working partnerships as **clearly** as possible;
3. Attempt **appropriately sized** transfer experiments and ...
4. Use a clear & appropriate **embedment** methodology;

5. **Resource** your learning support systems and ...
6. Encourage **professional development** structures;
7. Set up effective **communication** systems and ...
8. Work with your **best practice networks** based on: your institutional Centre for Learning and Teaching, your national Subject Centre, your institutional excellence/Teacher Fellow system etc;
9. How do you know the innovation works? **Evaluate!**
10. Reflect on your subject **value base**

More generally, we conclude the evidence from BEATL and other transfer experiments we have assessed supports the assertions that:

- successful transfer of innovative pedagogy supported by appropriate learning technologies is possible, but requires significant time and attention;
- associated embedment and evaluation methodologies could be of generic value to Universities seeking to enhance their student learning experience in response to changes generated by the ever gathering Web, Communications and Information Technology revolution.
- the output of projects such as BEATL will be important in supporting the professional development of academic staff to provide the necessary skill base to enable the transfer, embedment and evaluation of innovative pedagogy.

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