ACADEMIC CULTURE, FLEXIBILITY AND THE NATIONAL TEACHING AND LEARNING DATABASE

Koppi, A. J., Chaloupka, M. J., Llewellyn, R., Cheney, G., Clark, S., and Fenton-Kerr, T.

New Technologies in Teaching and Learning,
University of Sydney, Australia.
Email: tony@nettl.usyd.edu.au

ABSTRACT

Academic culture is perpetuated mainly by example and peer support. Traditional academic teaching practices are not typified by flexibility. Flexible learning is characterised by being student-centred. This paper is concerned with the other side of the coin – that of teacher flexibility within the academic culture – and how the National Teaching and Learning Database accommodates normal teaching practices.

Tertiary teachers are generally creative individuals and experts in a particular field. They are generally also critical thinkers and maintain an objective distance from the work of their peers. This combination inclines the teacher to design unique courses commensurate with personal experience and knowledge. In Australia in particular, this personal course development is accepted practice to the extent that cross-institutional formal evaluation and comparison of courses does not generally occur. An academic will not normally adopt another academic's course without personalising it. A key feature of academic culture is idiosyncrasy that is ardently defended under the rights of academic freedom.

Against the backdrop of this culture, technology for teaching and learning has become available. Consistent with the cultural practices and funded by governments globally, individual academics, or small groups of academics, put together (idiosyncratic) courses. Consistent with the cultural practices, few other academics in the same discipline adopted these inflexible courses. The reason for the lack of adoption is less to do with the so-called 'not invented here syndrome', than with the mistaken expectation that academics will behave counter to the culture and adopt someone else's course in toto.

An academic will utilise parts of the work of other individuals, e.g., in assembling a course, a teacher will weave together a unique fabric of personal experience and selections from published works – a chapter from here and a journal reference from there etc. Utilising a programme that cannot be teased apart or modified has little place in this culture. It is not flexible.

The moral here is that the uptake of technology by the teacher will only occur if it is based upon the academic culture. That is to say, whatever the technology or learning material, it must be flexible enough to suit the teachers' practices. This paper is concerned with the development of National Teaching and Learning Database that is commensurate with the way academics work and behave.

KEY WORDS

Academic culture, idiosyncrasy, flexibility, learning technology, national teaching and lLearning database.

1. INTRODUCTION

Here, 'flexibility' is concerned with teaching and learning and the context of this flexibility is the academic culture. That culture has been fairly static and conservative with minimal change in response to external pressures. Indeed, the resistance to change that involves technology is strong (Hesketh *et al*., 1996; Crawford and Crawford, 1997).

Flexibility has probably as many meanings as there are people thinking about it. Broadly, the notion has been equated with freedom. From the student's point of view, this represents the freedom: to learn whatever, whenever and wherever; to access information and communicate with others; to make one's own destiny by personalising and pursuing one's knowledge interests; and not to follow someone else's prescribed learning. This freedom includes the ability to access continuing education while in the workforce.

From the teacher's point of view, the notion of flexibility may acknowledge student freedoms (or at least the desires for the realisation of these freedoms) but is also constrained by the rewards, values and aspirations of the academic culture to which most teachers probably subscribe. These constraints may be fundamentally determined by the need to enrol students and provide them with structured learning programs that can be managed and assessed.

2. THE DIALECTIC OF ACADEMIC CULTURE AND FLEXIBILITY

The time-honoured academic culture is teacher-centred, supports teacher independence and creates student-dependency. These traits are at odds with notions of student flexibility and providing learning on demand. There would appear to be a fundamental paradox between the inflexible academic culture and flexibility. There is a dialectical tension between the academic culture and the convenient access to learning. The academic culture generally has the teacher as the central figure whereas flexibility places the student in control. The teachers set the curriculum and design the courses whereas flexible approaches enable the student to choose the learning materials and set the goals.

In many places, the academic culture is where the teacher describes the path the student is expected to follow, whereas in flexible mode, the student describes a personally relevant path. The end of the path is a place that must be recognised and acknowledged. The academic culture, having itself defined the end point, recognises that end and rewards attainment by awarding a degree or certificate. In a flexible environment, the learners may (satisfactorily to themselves) attain their own end and goal that does not correspond to the prescribed one.

The academic culture is not just manifest by teaching and learning but also the other major activity that occupies universities – discipline-based research. Institutional objectives, priorities and values affect the ambience of any particular culture within which the individual is able to express themselves. In many (not all) disciplines, research is spatially dependent, that is, the academic staff and students have to be in a particular location (at least some of the time) to do the research. It is in the interests of universities to foster spatial dependence in order to achieve one of the major goals of the institution. Spatial dependence is at odds with notions of flexibility.

3. SETTING COURSES

Once the broad curriculum has been described, academics set courses according to personal desires. Most academics personalise a course and do not adopt one without changing it to suit them. That course is developed from a combination of personal experience and external resources assembled to support the personal experience and beliefs of the academic. Generally the content is assembled as a result of a mix-and-match approach (a book chapter here; journal paper there etc) which results in an idiosyncratic course. How that subject is taught depends on a combination of the content, teaching and assessment methods. (It is well known that the assessment methods (usually time-honoured) often drive the teaching and learning.) Different institutions teaching the same subject may have variations in content and teaching and assessment methods producing a more-or-less similar course.

It might be argued that the idiosyncratic nature of the academic culture is perpetuated by a lack of benchmarking and inter-institutional comparisons. However, even if such comparisons were made, the culture is not one that would result in the same course being taught at different institutions. This has implications for educational technology programmes particularly large-scale developments.

4.   LEARNING TECHNOLOGY AND THE ACADEMIC CULTURE

Within the context of universities, many learning technology developments are not used or taken up beyond the person or group responsible for the innovation (Scott *et al.,* 1997).

It has been suggested that staff resistance for the slow uptake of computer aided learning (CAL) packages is because of poor IT skills (Dearing, 1997). This may well be true but we can also ask the question: if IT literacy was very good amongst all academic staff, would that greatly increase the uptake of CAL packages? We believe that the answer would be negative because the academic culture that promotes idiosyncrasy would be unchanged simply by increasing IT literacy skills.

CAL programmes have to be viable within the academic culture. This viability means that digital teaching and learning materials have to have certain qualities consistent with the way academics work, specifically: they have to be customisable (Jones *et al.,* 1997) and capable of being changed and combined with other digital and non-digital course components. The ability to mix-and-match learning materials to support the teacher's experience and consequent course construction is essential. For these reasons, learning materials should be small and object-oriented (Chaloupka and Koppi, 1998).

5.   THE ACADEMIC CULTURE AND THE NATIONAL TEACHING AND LEARNING DATABASE

5.1   THE NATIONAL TEACHING AND LEARNING DATABASE IN CONTEXT

The need for developments in educational technology to facilitate ways for flexible-delivery learning (particularly through CAL programmes) to sit easily within the prevailing academic culture has produced a demand for a major resource of electronically-accessible information. While this information is intrinsically highly varied in content and presentation, it needs to conform to the characteristics already mentioned, in that it should be available in small, customable, and easily-integrated packages which are generally environment-neutral.

Recent advances in courseware development and delivery and the underlying philosophy of utilising the Internet have created mechanisms for the development of flexible delivery of teaching materials and access to learning in ways which are responsive to teacher and student needs and which support, rather than supplant the existing academic culture. This is an important development, where the electronic course provides a level of interaction with the user which is not only familiar and expected, but which in 'clever' applications can deliver a greater degree of student-teacher and student-student interaction than more traditional methods.

A new direction in electronic delivery of courseware may involve 'object-oriented' courseware development (Chaloupka and Koppi, 1998). In simple terms, 'objects' are discrete pieces of information to which the course constructor may refer by inserting electronic links in the course, and which the student can access according to her/his educational requirement. Such courseware provides a flexible learning environment that utilises the 'objects' to provide the majority of the course content in a dynamic and customisable fashion. As an additional benefit, individual objects can be re-packaged for other uses, such as professional development, 'life-long education', 'just-in-time' training, and even research use. It is expected that universities will increasingly contribute to this much broader spectrum of educational activities in future, and that CAL will be a principal means of delivering to the broader market (McCann, Christmass, Nicholson and Stuparich, 1998).

'Objects' may range from an image-plus-text record of a physical item such as a teaching specimen or example through to small multimedia, interactive learning modules in which a basic principle is demonstrated or a simple experiment performed. Almost any discrete 'package' of information can be an 'object', and may include any or all of text, still image, video, and sound individually or in combination.

The development of 'object-based' courseware depends upon access to a significant body of 'objects' from which to assemble courses. Such objects need to be readily located, in a sufficiently common format to ensure that users can adopt them without needing advanced programming skills, and of sufficient spread and quality that course developers can approach the construction of new courseware with confidence that the desired resources will be available.

Object-based courseware does not embed the information within the shell of the course, but simply adds links to data held in on-line databases which are accessed as required over the Internet. Course developers can easily include multiple examples of particular types of information drawn from a number of sources, enriching their content presentation. They can also provide pointers to information paths which students can choose to follow to improve their knowledge and understanding of specific or general aspects covered by the course. This latter facility empowers the student to extend the boundaries of the presentation beyond the content prescribed by the academic to suit the student's individual requirements – a facility not available in the traditional large lecture situation, at little if any 'cost' to the teacher and without impact on other students.

Adoption of object-oriented course development strategies will be severely constrained until there is a significant resource of easily-accessible objects. The lack of ready access to a comparable electronic resource has, in the past, made the construction of courseware time-consuming, expensive, and demanding of considerable computer technical prowess. This has mitigated against a more general acceptance of the desirability to develop CAL packages by academics who do not wish (and for whom it is usually quite inefficient) to become so skilled. For this reason, a co-operative project involving the University of New South Wales, the University of Queensland, the University of Sydney and the Department of Education, Training and Youth Affairs has been established to develop a major object resource access facility: the National Teaching and Learning Database (NTLD) (1998). The NTLD will provide a co-operative, on-line national resource of learning material described according to international standards, which will complement rather than duplicate existing print-based learning resources such as libraries and archives.

The majority of simple objects on the NTLD will be images and accompanying text describing three-dimensional objects held primarily in teaching and research collections of Australian Universities. These objects have been collected over many years for the express purpose of supporting teaching, learning and research, and there are hundreds of thousands of such items in university collections. Universities and other organisations contributing to the NTLD will ensure that the most appropriate material is given priority for inclusion in the NTLD, and the probability is that the development of the NTLD will be significantly 'demand-driven'.

More complex software 'objects', such as small interactive experiments (e.g., vignettes), will also be available on the NTLD. These may be new developments, although there is significant opportunity for the development of material through 'de-constructing' current monolithic courseware, thus realising residual value not generated from expected but unattained re-use.

Linkages for many individual items will be added to the Australian Universitiy Museums On-Line (AUMOL) (1997) database to support effective, simple searching both within and across disciplines. AUMOL is an existing facility supported by a consortium of, currently, six Australian universities. It already contains more than 75,000 records and 12,000 images of items held in university research collections – material capable of further broadening the scope of courseware, and some of which is already being used in courses (e.g., Macquarie University Archaeology).

The NTLD will develop facilities to allow institutions to determine access and use restrictions, and where appropriate, to levy a charge or a scale of charges depending on the user/type of use, for material contributed. While the development of the NTLD will promote sharing of information resources between institutions nationally (and also promote possible international demand for use of these resources) it is recognised that such material is never without cost to its holding institution, and may be of considerable commercial value. The function of the NTLD is to facilitate access to material, not to prescribe conditions under which material must be made available.

The NTLD will be developed to accommodate virtually any data standard, as many disciplines have standard taxonomies/data schemas. However, there will be some practical standards to be considered which reflect the primary medium of delivery (the Internet). These considerations include: image resolution, browser independence, and platform independence. The goal of relative browser and platform independence is intended to achieve a compromise between flexibility of courseware development and flexibility of courseware use.

The NTLD will be developed in accordance with the emerging international meta-data standard being developed by the Instructional Materials System Project in the USA, which will open the way to international use of Australian educational material. The implications of virtually no-cost delivery of Australian educational material to the world market are obvious, especially at our highly competitive exchange rate, although the quality of our resources should also make them highly attractive. The object-oriented approach to resource access will foster idiosyncratic use without restricting re-use, thus avoiding problems of conflict with academic culture without restricting potential use of any resource.

The opening of access to institutional resources inevitably raises the issue of tension between collegiate spirit and institutional competitiveness. While this will probably never be completely resolved to the satisfaction of all players, it is recognised and strategies to ameliorate the situation have been adopted.

The NTLD has a strong national focus. A Project Management Committee including representatives of the first participants is directing its initial development phase. Additional participants are being sought. The University of Sydney is providing technical support, data gathering and manipulation services, computing facilities and project management services for the development phase. The NTLD office will develop support and training material and undertake other activities associated with promoting its development.

A consortium, expected to be functioning by mid-1999, will provide the necessary infrastructure to operate and further develop the NTLD. The NTLD itself will become a distributed database, with many institutions responsible for holding their own material, and the central NTLD database holding the index in the form of object meta-data to all material available on the system. There will be a central core of administrative and technical/standards support staff required to manage the development of the system, but it is expected that the majority of activities will be undertaken by content suppliers themselves, and that institutions will generally want to maintain control over access to their data. This is not inimical to development of the NTLD, although it will obviously lead in some cases to negotiated settlement for access to data, particularly in the area of generating reciprocal rights management arrangements.

The NTLD will function as both a 'clearing-house' and a repository for teaching and learning material. In many cases, contribution of material to the national database will not be the primary objective for the creation of data – although such contribution may well be a factor in decisions to undertake 'digitisation' projects and to adopt the object-oriented approach to courseware development.

Material in the NTLD will often be or have been created initially in a form optimised for its primary use, while the NTLD-accessible version will normally be optimised for general web presentation. This is particularly true of images/multimedia presentations that require large file sizes and therefore take considerable storage space and transmission time. Equally, where the data delivery utilises a client-server approach which requires the client to run obscure or even unique software, the user may have significant difficulty in accessing the data at all, and may even be unable to run the specific software even when this can be downloaded.

The NTLD will hold a wide variety of learning objects, ranging from simple 'image plus text description' of non-print material to developed multimedia vignettes, supporting the widest possible range of academic preference in material for inclusion in courseware. The NTLD standards will have no (or very minimal) impact on the development of the actual information content of the data. They will, however, support common access and delivery strategies and technologies, and will support future developments in machine-based derivation of information constructs (e.g. recognition and recording of conceptual rather than logical links between data).

Academics will rightly not commit to following a path for course development unless they can be assured that the path leads somewhere. One of the most important factors in the development of the NTLD will be the achievement of 'critical mass' – a sufficient amount of content so that it becomes an effective first point for searching for useful data, and hence the 'natural' location for the contribution of data. The project funding received from DEETYA will allow the development of a core of data and accompanying standards and procedures to demonstrate the potential of the NTLD. Selection of material with immediate demand for the development of courseware (e.g., the Graduate Medical Program (1998) at the University of Sydney) will demonstrate actual functionality of the concept in a real learning situation within a short time.

Universities have significant resources of information already in existence either partially or completely in electronic form which in many cases will not need much processing to be turned into teaching and learning objects consistent with NTLD standards. This material may be in use for e.g., faculty web-sites, or simply have been created/stored in electronic form for purposes of convenience of management.

While few institutions have either the will or the resources to undertake such work without expectation of some tangible benefit within a realistic time-frame, there will be cases where either complementary work is already planned/underway (e.g., the development of a faculty teaching web-site) or there is unrecognised demand elsewhere in the sector. It is a priority of the NTLD development team to discover and maximise such opportunities.

The NTLD will also be promoted as a vehicle through which elements of existing electronic courseware may be re-packaged and delivered. While the very low incidence of re-use of large monolithic courseware (far lower than most expectations) has already been discussed, the 'building-block' approach to courseware development is far more conducive to the re-use of individual objects. This has potential to allow institutions to realise residual value in already developed courseware through 'de-construction' and contribution of elements, especially learning 'vignettes' contained within a course. To accomplish this will often require some level of both 'de-construction' and conversion to comply with NTLD standards.

The DETYA survey of electronic courseware currently being conducted will provide a most useful guide to resources in this area, as well as to potential users of and contributors to the NTLD.

Promoting the adoption of object-oriented courseware will largely be accomplished by identifying and providing access to appropriate informative material. In order to channel existing /proposed courseware development projects to the use of object-oriented courseware, the NTLD development team will provide not only general information about the techniques and benefits of using the object-oriented model but also a level of direct technical support.

The development of new categories of users of electronic courseware supports the DETYA objective of providing access to learning beyond the provision of formal tertiary courses to areas including lifelong education, professional development and 'just-in-time' education. (West, 1998). These are roles that universities espouse but find the development of mechanisms to provide efficient delivery of services to be difficult and costly in the 'traditional' environment.

The NTLD is a natural vehicle for the delivery of access to the results of information-creation projects. Such projects may include consortium participation in specific learning development projects, quid-pro-quo provision of access to data in exchange for reciprocal benefit, or satisfaction of a commitment to widespread access to data resulting from an ethical or organisational undertaking.

The NTLD will be used in a routine production way as early as possible to demonstrate actual courseware developed and delivered using it. Since medical material is an NTLD initial priority, the coverage of useful material will be expanded as quickly as possible, and anatomical teaching material from UNSW, UQ and USyd is the first category to be tackled. The addition of radiological, pathological and histological material in some quantity is a highly desirable objective, and one that is can be reasonably easily achieved. There are over 50,000 objects held in the medical teaching collections of UNSW, UQ and USyd alone; nationally, there are over 70,000 such objects.

The initial NTLD development will also seek to incorporate the records generated by work on a CUTSD project already underway at USyd to develop a database of radiological teaching data-plus-images. It is estimated that this will provide more than 2,000 records with immediate demand not only for the development of GMP courseware but for professional development and reference for the Australian College of Radiologists. Integration of this sort of opportunistic development will materially improve the coverage and effectiveness of the NTLD.

The NTLD development team will document areas of potential and actual non-academic demand for access to material from the NTLD, e.g. for professional development / reference (such as the Australian College of Radiologists potential use of the radiology material), for support of lifelong education, to support trade and community interest courses and reference etc.

In the light of the wider community role for university educational delivery foreshadowed in the West Report, the NTLD development team will extend its the field of vision for development of the NTLD beyond the provision of services and products specifically designed to support the gaining of formal academic qualifications. The West Report envisages the use of university facilities to provide a range of educational activities for which flexible delivery of education mechanisms supported by the NTLD is a natural vehicle.

One possibility already under consideration is the integration of joint interest from professional organisations that rely on post-secondary educational resources as a major source of reference data. One possible such project (in the area of medical education and professional development) for which the NTLD is a perfect delivery vehicle has already been identified. This project could work as an excellent model for co-operative development of a service with a high level of existing demand, for multiple-use access extending beyond Australia.

5.2 CURRENT STATUS OF THE NTLD PROJECT

The project has moved beyond the initial establishment and test phase to production capture of medical learning material from the current three participating universities. In addition, the CUTSD radiology project mentioned earlier is also in 'production' development mode with material from Westmead and the New Children's Hospital, selected for suitability for use as Graduate Medical Program and a significant potential addition to the range and depth of material in the NTLD.

In early 1999 we will be looking at broadening the data types, focusing on areas where demand for material already exists but also looking for academically and technically interesting examples.

The NTLD web-site (http://ntld.nettl.usyd.edu.au) contains both private pages for viewing by the NTLD Project Management Committee and Advisory Group members, and publicly-accessible pages which disseminate promotional material and general information and allow feedback from interested parties. The most recent development is a shell for searching material according to IMS meta-data content, which we will examine briefly during the remainder of this session.

6.   CONCLUSION

The academic culture is one that encourages idiosyncrasy and this affects the way teachers make courses. Teachers make courses to suit themselves and generally do not adopt whole courses made by others, and that includes CAL packages that cannot be customised. Flexible learning (with the emphasis on learning) is student-centred whereas flexibility needs to include the teacher who is working within the academic culture.
The National Teaching and Learning Database has been designed and is being developed to operate in keeping with the academic culture. This will empower academics to utilise resources to make online courses in the way that they usually work, and also enable students to access learning resources in a non-prescriptive manner.

7.   REFERENCES

Alexander, S, McKenzie, J. and Geissinger, H. (1998) An evaluation of information technology projects for university learning. *Commonwealth of Australia.*

Australian University Museums On-Line (AUMOL) (1997) http://aumol.usyd.edu.au

Chaloupka, M.J. and Koppi, A.J. (1998) A vignette model for distributed teaching and learning. Association for Learning Technology, *6, 21-49.*

Crawford, K and Crawford, S. (1997) Agency, Technology and Vision: The Dynamics of Learning. *Novae Research Group, University of Sydney, Sydney.*

Dearing, R. et al. *(1997)* Higher Education in the Learning Society: Report of the National Committee of Inquiry into Higher Education. *London: HMSO and NCIHE Publications.*

Graduate Medical Program (1998) http://www.gmp.usyd.edu.au

Hesketh, B., Gosper, M., Andrews, J. and Sabaz, M. (1996) *Computer-mediated Communication in University Teaching*. DEETYA. Australian Government Publishing Service, Canberra.

Instructional Management Systems (1998) http://www.imsproject.com/

Jones, P., Jacobs, G. & Brown, S. (1997) Learning styles and CAL design: a model for the future. *Active Learning* **7**, December, pp 9-13.

McCann, D, Christmass, J, Nicholson, P & Stuparich, J: Educational Technology in Higher Education, Canberra, Dept. of Employment, Education, Training and Youth Affairs, March 1998.

National Teaching and Learning Database (NTLD) (1998) http://ntld.nettl.usyd.edu.au

Scott, B., Ryan, S., Patel, D. (1997) Embedding TLTP and other resource based learning materials into the curriculum. Virtual Campus Real Learning, Association for Learning Technology Conference, University of Wolverhampton, Telford, Shropshire, UK, September 15–17. Conference Proceedings, pp. 68–69.

West, R. (1998) Review of Higher Education Finance and Policy. Learning for Life - Final Report ('the West Report'), Canberra, Department of Employment, Education, Training and Youth Affairs. http://www.deetya.gov.au/divisions/hed/hereview/default.htm