# Emerging Issues in the Practice of University Learning and Teaching

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# A C K N O W L E D G M E N T S

Dr Rowena Murray, University of Strathclyde, for her excellent facilitation of the Writers Week in Delphi, Connemara.

The University of Limerick for creating the concept of the Writers Week and allowing the writers the opportunity to avail of their workshop.

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Finally to the 20 writers who gave generously of their time, creative energy and commitment to writing in the area of teaching and learning.

# F O R E W O R D

The idea for this unique collection was created by the need for literature on the emerging issues related to teaching and learning in Irish higher education. The project was a collaboration between Dr Sarah Moore, in the University of Limerick, Dr Barry McMullin in Dublin City University and myself in University College Dublin.

The collection explores a range of the current theory to practice learning and teaching issues in Higher Education in the Republic of Ireland. It is written for the new to competent Lecturer in Higher Education who is dealing with teaching and learning issues on a daily basis. The more experienced Lecturer and students on postgraduate teaching and learning Diplomas/Certificates should also gain some useful insights from the readings. The collection is the result of a Higher Education Authority (HEA) funded collaborative writing project with contributions from 20 writers involved in the development of teaching and learning in Higher Education in Ireland.

The introductory chapter described the collaborative writing process in this project, which included a 'writers-week' workshop in Delphi, Connemara, Ireland. The book is then presented in three parts to deal with different aspects of learning and teaching in higher education:

- Part 1: Working in the Changing World of Learning and Teaching in Higher Education
- Part 2: Moving the Focus from Teaching to Learning
- Part 3: Developing and Growing as a University Teacher.

The chapters in each section were based on issues that were identified by the group as being important in the current climate of higher education in Ireland and therefore include areas such as, scholarship of teaching, theories of teaching and learning, student-centred learning, active learning, curriculum design, feedback on student learning, e-learning, professional development of the lecturer and resources for the lecturer. The emphasis in each chapter is on practical advice based on the current literature.

The writers were all members of a recently formed Irish Educational Developers group, and were employed in a range of units such as Centres for Teaching and Learning, Academic Development Centres, Quality Assurance Centres, Libraries, and Education Departments.

This model of collaboration in writing not only links the often divided teaching and research agendas but also highlights that academic writing need not necessarily be an activity done in isolation. In order to support the dissemination of these writings, the collection is also available online on the All Ireland Society for Higher Education website (AISHE):
`http://www.aishe.org/readings/2005-1/`

The energy created and acquaintances made in producing this collaborative piece has drawn together a community of scholars in higher education, which will benefit the sector in the years to come.

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# C O P Y R I G H T

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C O N T E N T S

## INTRODUCTION CHAPTER:



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## PART 1: Working in the changing world of learning and teaching in higher education



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## PART 2: Moving the focus from teaching to learning

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## **PART 3:** Developing and growing as a University teacher



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# WRITERS' WEEK: A VEHICLE FOR COLLABORATIVE WRITING AMONG EDUCATIONAL DEVELOPERS

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## Background

The original idea for producing this series of papers came about (as many ideas do) as the result of a conversation. The conversation focused on the difficulties, obstacles, problems and challenges associated with academic writing, as well as the importance of many of the interconnected themes in the area of educational development. All of us in the Irish educational developers group had witnessed the struggles associated with the role that academic writing plays within the walls of higher education institutions. In addition, we all had ideas to share about the practice of educational development, and were eager to find ways of disseminating these insights in ways that could be accessed in a coherent way by more than just the relatively small group of professionals we encountered at our inter–university meetings.

It was the combined motivation to explore and participate in the writing process more fully, and that associated with our collective sense of having something important to say, that fuelled the impetus for this project. The proposal was supported through funding by Ireland's Higher Education Authority, whose commitment to this kind of dialogue and output continues to be crucial as a supporter of change, development and collaboration in Higher Educational Institutions.

## The educational developers' writers' week

Based on a professional development template that has been used at the University of Limerick for several years now (Moore 2003; Murray 2005), a writers' week experience was planned and subsequently took place in September of 2004. The planned project drew heavily from, but was also significantly different to the writers' 'retreats' that have been part of the University of Limerick's professional development landscape since early 2001. While the features of the retreat experience were very similar to those run at UL, this was the first time that colleagues had met together in the same dedicated space and time to produce a series of writings on similar and interconnected themes, with the aim of producing a single cohesive written output for dissemination.

Thus, the pressures on the group may have been more intense, but also the levels of possible collaboration and peer support were also stronger and more relevant than was the case with previous writers weeks where academics came from a wide range of diverse fields of expertise.

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## Rationale for a writers' 'retreat'

The rationale for a writers' week is based on previous evidence that people and the quality of their ideas can derive enormous benefits from a short-term intensive writing environment (Grant and Knowles 2000). Writers' retreats have already been found to facilitate the achievement of an exclusive focus on writing by creating an arena in which the normal distractions of work and life are temporarily removed (Moore 1995). This can serve to initiate, to nourish or to accelerate writing, even if standard writing habits need to be sustained in different ways during the normal course of professional daily life. Despite operating in educational environments, university faculty (including educational developers) report that it is often difficult to achieve an exclusive focus on writing in a way that can be facilitated by a retreat environment (Cameron 1998). Furthermore, given the dispersed nature of Ireland's educational developers network, we hoped that the logistics of collaboration, interaction and peer support would be much more easily achieved on this five day, residential programme.

Essentially, the retreat environment was seen as a context within which a community of practice could be created and enhanced, a set of concrete outcomes could be achieved, and a precedent for collaborative dialogue (both written and spoken) could be set. This rationale echoes the objectives originally associated with the UL writers' retreats i.e.: '*to create an atmosphere of trust and safety for productive writing; to help participants to learn from each other about the process of writing; to create a multidisciplinary community of writers who would provide support and advice to one another both during the retreat and beyond; to explore the important links between teaching, research, writing and scholarship; and to have a productive working experience in which each participant would commit to a specific writing goal and try to achieve it* [within the time frame of the retreat]' (Moore 2003:335).

## The format of the week

Writers' retreats have been designed then to operate as temporary writing 'sanctuaries' away from the normal rhythms of professional life. Because it is still an unusual and unconventional way of working and collaborating, it often feels like a daring and somewhat complicated experiment and one that requires much planning and preparation both on a personal and a professional level. Despite these complexities, the format tends to be simple: Participants gather in a remote location equipped with ideas, data and literature they have gathered in order to be prepared to complete a piece of academic writing. Each of the five days is devoted to individual writing time, punctuated with opportunities for feedback from colleagues, group or paired meetings to discuss progress and opportunities to exchange shared writing experiences. Every day begins with a facilitated session that provides structured advice on writing. Participants gather in the evenings for social interaction and dinner in a central location, and for further discussion on the writing projects in which each of them is engaged.

All of these features were part of the educational developers writers' week that gave rise to this document. In order to gauge participants' expectations and goals and to ascertain their perceptions about the extent to which these were met, views were sought at the beginning and the end of the experience. These views were captured on pre and post writers' week questionnaires, which contain qualitative insights about the value and the impact of the experience.

## Positive expectations

While existing research on the writers' retreat format shows that participants tend express the need to 'get started', to 'hit the ground running' and to initiate a writing project (Moore 2003; Grant and Knowles 2000), the motives of the participants in this instance seemed to focus more on completing, on finishing and on pulling together many ideas in the form of a series of written pieces. This can be attributed at least in part to the pre-work and preparation in which members had participated in the months leading up to the writers' week. It may also be the case that the educational developers group is one that is characterised by a particularly strong need for space

and time in which to contain and articulate the many ideas and experiences that they encounter in the course of their professional lives. Indeed, the majority of participants specifically highlighted the importance of creating space and time in which to write, a function of the week to which they seemed to attribute the most value. In articulating their expectations, they talked about the importance of sharing wisdom, of getting feedback from their peers, of forging new links, of enhancing 'serious writing', and of the opportunities for creativity, collegiality, collaboration and enhanced commitment. In terms of more tangible outcomes, they highlighted the importance of producing a useful, experience–based set of papers/chapters that could be disseminated beyond the group and that could generally inform educational development and academic practice in meaningful ways.

## Concerns

Like almost any new endeavour, the participants did not come without at least some concerns. They wondered if they would be able to write effectively without the normal framework of information access that they could avail of in their educational settings, they had concerns about building and maintaining project momentum, they worried that they might get side tracked by distractions, be unable to co-ordinate and integrate their writing and they had some concerns about the consistency of writing styles among the group. These concerns were subsequently discussed during the course of the week. This final product represents a negotiation of the different voices of the members and may also echo some of those concerns.

## Outcomes

In addition to the tangible output, participants also expressed some behavioural and attitudinal changes in their approach both to academic writing and to educational development. They felt that the experience had reinforced the principles of inter–institutional co-operation, a dynamic that they felt needed nourishment and support. They sensed that they had developed new strategies for producing important written work within the field of educational development. They mentioned that the week had helped them to refine, to structure, to express and to display ideas in a way that was personally empowering. Several participants highlighted that the dialogue and writing that had occurred during the week had the potential to have a strong impact both within the educational institutions that were represented and beyond. Generally, a sense of group cohesiveness among educational developers was seen as an important 'by-product' of the week.

## Conclusions

Recently, Grant and Knowles (2000) have argued that writing in academia needs to be reframed. It may be much more constructive to position writing as a community–based, collaborative, even social act, dynamics that stand in sharp contrast to private, isolated, individualistic processes that often prevail (Haines et al. 1997). Certainly, the educational developers' writers' week, of which this document is the first concrete output, demonstrated again the power and the momentum that can be derived from the creation of a collaborative community of practice. We believe that despite the temporary nature of the intervention, its impact has traveled back into the educational organisations that it represented, and there is a greater likelihood that dynamics to which it gave rise can in some way become embedded in academic practice across a range of different institutions.

This project has reinforced the importance for educational developers to be part of the dialogue of academic writing, to bring scholarship to their own work and to share that scholarship with others. Overall, we believe that the voice of the Irish inter-university educational developers group has become stronger as a result of this endeavour and we continue to endorse the collegiality and collaboration that it has strengthened.

## References

Cameron, J. (1998). *The right to write: an invitation and initiation into the writing life*. London: Macmillan.

Grant, B. and S. Knowles (2000). Flights of imagination: academic women becoming writers. *International Journal of Educational Development 5*(1), 6–19.

Haines, D., S. Newcomer, and J. Raphael (1997). *Writing together: How to transform your writing in a writing group*. New York: Pedigree.

Moore, S. (1995). *Intensive writing program, progress reports*. Melbourne: Victoria University of Technology Collaborative Research Group Scheme.

Moore, S. (2003). Writers' retreats for academics: exploring and increasing the motivation to write. *Journal of further and higher education 27*(3), 333–342.

Murray, R. (2005). *Writing for academic journals*. Berkshire: Open University Press.

# THE SCHOLARSHIP OF TEACHING AND ITS IMPLICATIONS FOR PRACTICE

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> Poised on the cusp of a new century in a world that wrestles with a multitude of difficulties, the university must fulfil a more well- rounded mission. New generations of college- goers need scholarly teachers to help them prepare for a time when global interdependency is much more than a slogan. Knowledge, for all the glory and splendour of the act of pure discovery, remains incomplete without the insights of those who can best show how to integrate and apply it. (Glassick, Huber, and Maeroff 1997:10)

## Introduction

In the context of the changing role of the university teacher, this chapter sets out to explore how Ernest Boyer's (1990; 1997) four scholarships (of discovery, application, integration and teaching) have made it possible to bridge the traditional gap between teaching and research. By providing us with a new paradigm for thinking about research in all its complexity, he has shown us a way forward which has begun to redefine how we now look at research, teaching and learning. This chapter is an attempt to chart and define the pathways of this new route. It is our experience that the process of reflective practice and the documentation of that in various portfolio formats appropriate to harnessing teaching and learning, have provided ways of acquiring and developing a scholarship of teaching and learning in keeping with the changing face of third level education. The following questions are kept in mind as the chapter progresses:

1. How is scholarship defined in the context of higher education?
2. What is the scholarship of teaching and how does it define research into teaching and learning?
3. What are the implications of the scholarship of teaching for practice?
4. How can the portfolio process advance the scholarship of teaching and learning?
5. What general lessons have we learned in UCC from our experience of the portfolio model and portfolio seminars as a way of documenting scholarship?

## Overview

The chapter begins with an overview of Boyer's perspective, synthesising his thinking as it emerged in *Scholarship Reconsidered* and *Scholarship Assessed*. We then develop his thinking further, by focusing on the distinction between scholarly teaching and the scholarship of teaching, as defined by Shulman (2004:158) and by focusing on the idea of learning as part of the scholarship of teaching. The chapter will then tease out some implications of scholarship for current practice, focusing on how such teaching is to be documented and developed.

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## Scholarship Revisited

In giving us perspective on the concept of scholarship, and on the false dichotomy between teaching and research, Boyer (1990:15) reminds us that the word "research" is only a recent addition to the language of higher education, the term being used in England in 1870's for the first time to mark Oxford and Cambridge out as places of learning (research), as well as teaching. The term 'research' began to emerge in American education only in 1906. Boyer further adds that scholarship originally referred to a variety of creative work, whose "integrity was measured by the ability to think, communicate and learn" (1990:15) not, therefore, by the number of publications a scholar produced, as has become the norm:

> Scholars are academics who conduct research, publish, and then perhaps convey their knowledge to students or apply what they have learned. The latter functions grow out of scholarship, they are not to be considered part of it. But knowledge is not necessarily developed in such a linear manner. The arrow of causality, can, and frequently does, point in both directions. Theory surely leads to practice. But practice also leads to theory. And teaching, at its best, shapes both research and practice. (1990:15–16)

Boyer's point is that a more inclusive view of what it means to be a scholar is needed: "a recognition that knowledge is acquired through research, through synthesis, through practice and through teaching'" (1990:24). Hence the necessity of positing four dynamically interrelated scholarships, 'pure research' being co-dependent on the other forms of scholarship. Such a repositioning of the traditional view of research is even more pertinent in 2004, where huge funding can make research attractive as an end in itself and as the chief means of promotion. Such dislocation of research is short sighted, since research has to be communicated, synthesised and tested in the real world and be of value to the discipline, the students and the community. It is not an end in itself. As Shulman (2004:16) points out:

> The intellectual and political message of *Scholarship Reconsidered* is that we need a broader conception of scholarship – one that points to the power of scholarship to discover and invent, to make sense and connect, to engage with the world and to teach what we have learned to others. Boyer and his colleagues wanted these different scholarly activities to be seen as of equal value to the broader community.

If we are to take Boyer's challenge seriously, we need to look closely at each scholarship and tease out its implications for lecturers in the $21^{st}$ Century.

## The Scholarship of discovery

This type of investigative scholarship comes closest to what is traditionally understood by research and its focus on publication. However, "The scholarship of discovery at its best contributes not only to the stock of human knowledge but also to the intellectual climate of a college or university. Not just the outcomes, but the process, and especially the passion, give meaning to the effort" (1990:17). In the new order, such scholarship also includes the creative work of scholars in the literary, visual and performing arts – hence the inclusion of all disciplines. Boyer's focus on the words "process" and "passion" are pertinent, already signalling other embedded forms of scholarship within this one. The question behind this kind of research as Huber points out is, "What do I know and how do I know it?". An answer to this question surely points in the direction of other forms of scholarship – for the how of knowing is dependent on making connections (integration) and on application of what is known; equally teaching others is one valid way of knowing what I know. Hence, the dynamic nature of the research even as it is conceived.

Our own experience of meeting regularly together in the university and discussing our disciplines and the challenges of trying to teach them, bears this out. The scholarship of discovery is linked with so many more pedagogical and practical discoveries once the area of expertise and

original scholarship has to be taught. Once the student enters the picture, the scholarship of discovery has to become interactive and dynamic, or remain inert and inaccessible to all but the few students whose intelligence profile is on the same plane as that of the lecturer. If the lecturer is to become a teacher, who transforms rather than informs, and who is inclusive and interactive, then the scholarship of discovery has to leave the traditional realm of "research" and find new directions. Indeed, Boyer's four scholarships can be seen as the new directions that guide the compass of learning. To extend the metaphor, they are our north, our south, our east, our west. To neglect one would be to cancel all - for the centre would not hold; the compass could not function.

## The Scholarship of Integration

In proposing *the scholarship of integration*, Boyer highlights the need for scholars to give meaning to isolated facts, putting them in perspective and making connections within and between disciplines. This form of scholarship has much to do with purpose and with the goals of a general education, as Boyer realised in his own experience (Boyer 1997:2) and is therefore asking the question: What do the findings mean? Such a question calls for critical analysis and interpretation. Thus, the specialised knowledge of research is placed in a larger context, "illuminating data in a revealing way, often educating non-specialists too" (1990:18). Boyer goes on to point out that the scholarship of integration is closely related to discovery. It involves, first, "doing research at the boundaries where fields converge" (1990:19). Such work, he continues is increasingly important as traditional disciplinary categories prove confining, forcing new categories of knowledge:

> Today, interdisciplinary and integrative studies, long on the edges of academic life, are moving towards the centre, responding both to new intellectual questions and to pressing human problems. As the boundaries of human knowledge are being dramatically reshaped, the academy surely must give increased attention to the scholarship of integration. (1990:21)

It is our contention that unless lecturers start sitting together, sharing the same space as well as their research areas, such scholarship will find it difficult to thrive. This process of sharing does not happen over night, as is well documented in our research to date (Lyons et al. 2002; Hyland 2004). Here in UCC, as part of the Teaching and Learning Support programme, we have spent the past three years learning to build sense of community, of trust and have struggled with working out a common language. Before this time, a smaller group of lecturers met regularly to discuss, develop and represent their practice. Integration is, then, as much attitudinal and habitual, as it is aspirational; it will only happen in the doing, when there is an audience to whom one must account and whose very presence demands their inclusion.

The *scholarship of integration*, therefore, also includes interpretation, fitting one's own research – or the research of others – into larger intellectual patterns. Boyer points out that "such efforts are increasingly essential since specialisation, without broader perspective, risks pedantry" (1990:19). In an age of increasing specialism, such a caution is worthy, especially for the young lecturer who can find herself isolated. Hence, again, the importance of sharing practice and research with others and of creating the culture and climate where this is possible. Our own experience of the portfolio seminars at UCC is indicative of the effort necessary over time to make the scholarship of integration possible in practice: "The scholarship of integration is serious, disciplined work that seeks to interpret, draw together and bring new insight to bear on original research" (1997:9). Part of this drawing together has to do with making time for lecturers to share and investigate their work. We found, for example, that lunchtimes were productive meeting times – if lunch were provided – a case, indeed, of providing food for thought!

## The scholarship of Application

The third element, *the application of knowledge*, moves, in Boyer's words "towards engagement", as the scholar asks, "How can knowledge be responsibly applied to consequential problems?

How can it be helpful to individuals as well as institutions?" (1990:21). This is where theory meets practice and one informs and reforms the other. Boyer provides us with some interesting perspectives on the idea of service, which permeates this form of scholarship. He cautions that colleges and universities have recently rejected service as serious scholarship because of its vague definition and disconnected nature: Too often, "Service means not doing scholarship but doing good" (1990:22). To be considered scholarship, Boyer continues: (1990:22–23)

> service activities must be tied directly to one's special field of knowledge and relate to, and flow directly out of, this professional activity. Such service is serious, demanding work, requiring the rigor – and the accountability – traditionally associated with research activities. ... The scholarship of application, as we define it here, is not a one way street. Indeed, the term itself may be misleading if it suggests that knowledge is first "discovered" and then "applied". The process we have in mind is far more dynamic. New intellectual understandings can arise out of the very act of application whether in medical diagnosis ... shaping public policy or working with public schools ... In activities such as these, theory and practice vitally interact, and one renews the other.

A key point of learning for us in this university, is to hear, in our regular seminars, how our colleagues have applied their expertise in various settings and how these, in turn, have impacted on the discipline itself – how, indeed, practice has transformed theory. Dr. Anthony Ryan's article on *Teaching Resuscitation and Stabilization of NewBorn Infants in Ireland* (Lyons et al. 2002:Chapter 7) is an excellent example of this and of how the scholarships of application and teaching collide and sustain each other.

## The Scholarship of Teaching

In relation to *the scholarship of teaching*, Boyer cautions that the "work of the professor becomes consequential only as it is understood by others" (1990:23). He, therefore, underlines the point that teaching is about learning. Teaching in his terms, is not some "routine function, tacked on, something almost anyone can do. When defined as scholarship, teaching both educates and entices future scholars" (ibid). Throughout his discussion of a scholarship of teaching, Boyer's (1990:23–24) weaving of the many strands that are intertwined in its web speaks for itself, issuing us with many challenges and resetting the compass once again for us:

> Teaching is also a dynamic endeavour involving all the analogies, metaphors, and images that build bridges between the teacher's understanding and the student's learning. Pedagogical procedures must be carefully planned, continuously examined, and relate directly to the subject taught ... knowing and learning are communal acts. With this vision, great teachers create a common ground of intellectual commitment. They stimulate active, not passive, learning and encourage students to be critical, creative thinkers, with the capacity to go on learning after their college days are over.

Note Boyer's commitment to life-long learning here and his pointing to the idea that it is the lecturer's job to teach students how to learn, not what to say or regurgitate. He also foregrounds the idea of Teaching for Understanding here, central to our work in scaffolding teaching and learning in UCC, by highlighting the process of planning, of making connections, of active learning and ongoing assessment that underline a scholarship of teaching. Of equal importance then, is the idea of seeing the teacher as a learner: (Boyer 1990:24)

> Further, good teaching means that faculty, as scholars, are also learners. All too often, teachers transmit information that students are expected to memorise and then perhaps, recall. While well prepared lectures surely have a place, teaching, at its best, means not only transmitting knowledge, but transforming and extending it as well ... In the end, inspired teaching keeps the flame of scholarship alive.

In terms of this publication, it is this form of scholarship that is our catalyst, our calling and our constant challenge.

## Shulman's challenge

In his latest work, *Teaching as Community Property*, which is a collection of his many essays on higher education, Lee Shulman, who has now filled Boyer's shoes as president of the Carnegie foundation, critiques and develops Boyer's work and raises the bar for all of us in making real the following distinctions in terms of the work of CASTL (Carnegie Academy for the scholarship of Teaching and Learning):

> Scholarly teaching is what everyone of us should be engaged in every day we are with students in a classroom or in our office- tutoring, lecturing, conducing discussions, all the roles we play pedagogically. Our work as teachers should meet the highest scholarly standards of groundedness, of openness, of clarity and of complexity. But the scholarship of teaching requires that we step back and reflect systematically on the teaching we have done, recounting what we've done in a form that can be publicly reviewed and built upon by our peers. It is this difference that moves scholarly teaching to a scholarship of teaching (Shulman 2004:166).

In another article in this collection, on the distinction between scholarly teaching and scholarship of teaching, Shulman (2004:149) elaborates on this concept by highlighting that scholarship has "three additional central features of being public, open to critique and evaluation, and in a form others can build on". He builds his case here by quoting from himself in *The Course Portfolio*: (Hutchings 1998:6)

> A scholarship of teaching will entail a pubic account of some or all of the full act of teaching – vision, design, enactment, outcomes and analysis – in a manner susceptible to critical review by the teacher's professional peers and amenable to productive employment in future work by members of the same community.

It is this concept of the course portfolio and that of its sister, the teaching portfolio, which has provided the scaffolding for our collegial work together over the past three years, the adventures of which can be read as already cited.

## References

Boyer, E. (1990). *Scholarship Reconsidered: Priorities of the Professoriate*. San Francisco: Jossey–Bass. The Carnegie Foundation for the Advancement of Teaching.

Boyer, E. (1997). Scholarship a Personal Journey. In C. Glassick, M. Huber, and G. Maeroff (Eds.), *Scholarship Assessed: Evaluation of the Professoriate*. San Francisco: Jossey–Bass. An Ernerst Boyer Project of the Carnegie Foundation for the Advancement of Teaching.

Glassick, C., M. Huber, and G. Maeroff (1997). *Scholarship Assessed: Evaluation of the Professoriate*. San Francisco: Jossey–Bass. An Ernest Boyer Project of the Carnegie Foundation for the Advancement of Teaching.

Hutchings, P. (Ed.) (1998). *The Course Portfolio: How Faculty Can Examine Their Teaching to Advance Practice and Improve Student Learning*. Washington, DC: American Association for Higher Education (AAHE).

Hyland, A. (2004). *University College Cork as a Learning Organisation*. Cork: UCC.

Lyons, N., A. Hyland, and N. Ryan (2002). *Advancing the Scholarship of Teaching and Learning Through a Reflective Portfolio Process: The University College Cork Experience*. Cork: UCC.

Shulman, L. (2004). *Teaching as Community Property: Essays on Higher Education*. San Francisco: Jossey–Bass.

# IT WORKS IN PRACTICE BUT WILL IT WORK IN THEORY? THE THEORETICAL UNDERPINNINGS OF PEDAGOGY

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## Introduction

The chapter begins with a justification of learning theory and the ways that theory can be useful to the practitioner. It then presents two major philosophical approaches – one based on ideas and the other based on experience - an enduring dichotomy in Western thought. We then discuss the three most influential theories in the Western world – Behaviourism, Cognitivism and Constructivism and show how key aspects of current practice, as discussed in the literature, relate to these theories.

We write this chapter from a Constructivist perspective and our own position and values influence our choice of material and the way we present it. It is neither possible nor desirable to be value-free in such an important area of human endeavour as education. However, it is up to you, the reader, to engage with the ideas presented from your own values and perspectives.

When speaking of learning in general terms we refer to the 'learner'. When we are discussing teaching activities we use the more specific term 'student'.

## Justifying Theory

Underlying the chapter is the maxim that there is 'nothing as practical as a good theory' (Lewin 1943:35) and as a practitioner you will base your professional practices on some aspects of theory, however derived. Educational theory may be considered as the distilled experiences of others (Carlile et al. 2004:4) and the purpose of this chapter is to share with you the experience and conclusions of those who have thought deeply about what goes on in learning. For instance, there is no single agreed definition of learning. It depends on the theory that you hold. This chapter offers a number of different theoretical perspectives, each of which will imply a slightly different definition of learning. For a Behaviourist, to learn is to demonstrate a more or less permanent change in behaviour; for the Constructivist, to learn is to see the meaning or significance of an experience or concept. Your key role as a facilitator of student learning is dependent then upon the theory of learning that you hold.

It has been claimed that: "Theory matters because without it education is just hit and miss; [...] we risk misunderstanding not only the nature of our pedagogy but the epistemic foundations of our discipline" (Webb 1996:23).

Consciously or unconsciously, you hold theories of learning since all action is based on assumptions which may or may not have been articulated or tested. These have been developed through your own years of formal education, of learning things on your own, and of developing learning strategies for students. You may not be aware of what your theories are, and they may never have been challenged. We hope that this chapter will help you to become aware of alternative views so that you can more readily analyse your own. It may be the case that on reflection

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

your own views form a coherent whole; alternatively you may hold scraps of theory that are in fact incompatible. It is important not to have principles which clash, so bringing them to light will help you organise them more coherently so that you can use them more consciously and engage in ongoing enquiry.

## Benefits of Theory

### Insight and Affirmation

We hope that, by the end of this chapter you will have acquired a set of concepts and corresponding vocabulary that you can use to gain insight into your own theoretical position(s). It can validate your existing practice and become self-affirming.

### Reflection

Having these concepts will allow you to manipulate and develop them in a reflective process. For example, current practices of maintaining a learning journal or reflective log depend on some knowledge of your own theoretical position.

### Problem Solving

When problems arise, a theoretical understanding offers you a tool for recognising, analysing and dealing with the issues in a more focussed, logical and effective manner.

### Sharing

Shared reflection, as is demonstrated in the process of peer review, also relies on a joint discourse which needs a theoretical shared vocabulary in order to explore epistemological and pedagogical issues.

### Scholarship

This shared discourse and communication of ideas is also necessary if you are to engage in the scholarship of teaching. It enables expertise to be shared and best practice to be disseminated. As well as acting as a focus for your continuing questions about teaching and learning it is often necessary to articulate your own practices and values to a wider audience.

### Justification

An important aspect of your professional practice will be the justification of your practices to others, whether they are colleagues, administrators, academic managers, policy makers or other stakeholders.

### Power

Finally, knowledge is power. Awareness of the discourse will empower you, allow you to explain, justify and promote your ideas about teaching; to communicate with colleagues, to engage in scholarship and to develop clearly thought-out strategies and tactics to enhance your teaching.

## Philosophical Approaches

### Idealism

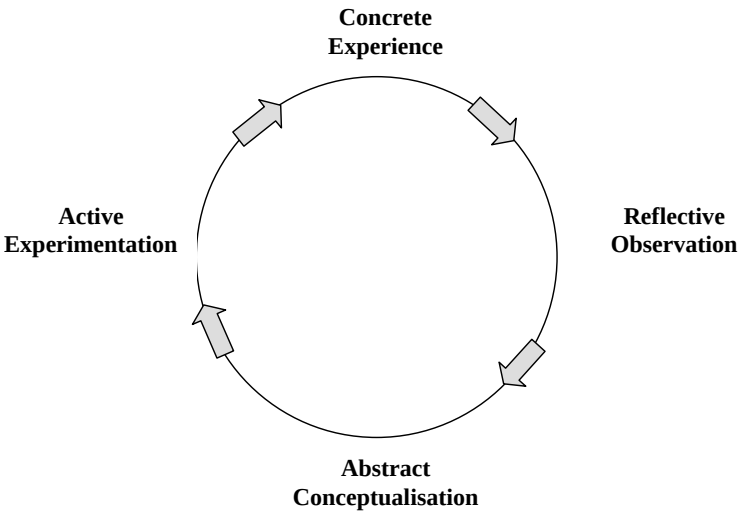
There is a long-standing tradition in Western academic thought of valuing ideas over experience or action. We still think ideas are important. The prioritising of concepts, principles and theory is also an assumption behind the claims made above about the importance and value of theory. The Idealist tradition finds its clearest exponent in the Greek philosopher Plato who thought that ideas constituted reality, and that sensory experience was suspect. The value that we place on ideas is shown in the way that we present principles before practice, for example teaching Ohm's Law to students before they apply it in practice in the laboratory.

A standard view of curriculum is that knowledge consists of knowing the epistemology or ways of knowing in different subjects. For example, there is a different 'way of knowing' in Chemistry than there is in History. The aim of education on this view, is that a student must acquire the specific way of knowing and the principles of the discipline studied. The popularity of the 'Teaching for Understanding' movement exemplifies the importance of understanding the key ideas behind a subject rather than simple content.

### Empiricism

Empiricism stresses the role of experience and active learning. The scientific revolution of the $16^{th}$ century and the overthrow of metaphysical systems led, particularly in North European cultures, to a new interest in the observable world, and to the role of experience in learning. The English philosopher Locke claimed that "There is nothing in the mind that was not first in the senses" (Locke 1690). This argument that ideas are developed from experience was pursued by later educationalists. In the $18^{th}$ century Rousseau claimed in *Émile* that, instead of formal education, children should learn from nature and the real world.

A modern version of this stress on active learning is that provided by the American educationalist (Kolb 1984). He suggests a cycle of learning which begins with experience and progresses to reflection on that experience. The next stage of the cycle is that of conceptualisation or the acquisition of key ideas. These may arise from the reflective process or may be derived from established theory. This will lead on to the next stage. The synthesis of experience, reflection and theory leads to a modification of the learning cycle. The iteration of the learning cycle leads to a growth in knowledge, depth of understanding and improved practice.




*Source:* Kolb (1984)

**Fig. 1:** Kolb's Learning Cycle

This cycle has been influential in curriculum planning, in the popularity of active learning, and in the identification of the specific learning orientations of students. Kolb's own instrument (Smith and Kolb 1986), and that derived from it by the UK psychologists Honey and Mumford (1992) seek to identify learners along the four dimensions identified above. Kolb's theory points to the diversity of learner styles and the importance of different learning strategies.

The empirical emphasis of experimental psychology in the $19^{th}$ century led to the first major scientific theory of learning – that of Behaviourism.

## Behaviourism

Behaviourism concentrates on observable behaviour without considering motivation or other mental processes. It developed from a number of experimental studies with animals, including Pavlov's celebrated dog, and progressed to experiments with rats, pigeons and higher animals. It argues that you can 'condition' or train any organism, including human beings, provided that you think very carefully about key aspects of the conditioning. This includes you, the trainer, acquiring a clear view of the behaviour you want to change; (introduce, strengthen or eliminate), the sequencing of events or 'stimuli' to bring about this change, the association or link between the stimuli and the subject's response and the importance of reward or punishment in motivating the learner (reinforcement).

**Tab. 1:** Key Principles of Behaviourism

| |
|---|
| **Reinforcement**<br>Positive or negative feedback which will lead the learner to form a strong association between the stimulus and the desired behaviour<br>(carrot or stick) |
| **Contiguity**<br>The more immediate the feedback the stronger the association<br>(strike while the iron is hot) |
| **Repetition**<br>The more frequent the stimulus-response the more likely is the desired outcome<br>(practice makes perfect) |
| **Variation**<br>Varying the pattern of the stimulus generalises the response<br>(the more the merrier) |
| **Intermittent Reinforcement**<br>Not rewarding the response every time is found to be more effective than constant reward<br>(keep 'em guessing) |
| **Extinction**<br>If the stimulus-response bond is not reinforced the association will die<br>(use it or lose it) |

*Source:* Carlile et al. (2004:9)

One implication of Behaviourism is that the learner or subject is completely passive, and you, as the teacher, or more correctly 'trainer' hold the key to learning success. This is shown by Tyler, the US Behaviourist, who had been responsible for effective mass-factory training in the Second World War. When called in to advise the US government in 1947 on falling standards in US public schools, he stated that the trouble was with the teachers who couldn't teach, and were unaware of any teaching principles or strategies. His book on the principles of curriculum design aimed to rectify this deficiency (Tyler 1949).

The influence of Behaviourism on education has been both malign and benign. Behaviourism assumes, at its most sinister, the kind of authoritarian manipulation of people you find implicit in the kind of 'conditioning' that Anthony Burgess attacked in his book *A Clockwork Orange* (Burgess 1962). Behaviourism allows little room for creativity, independent learning or for the concept of mind at all.

In its favour, Behaviourism builds on aspects of practice that you know are effective. These include the importance of repetition in learning, of presenting strong and varied stimuli (avoid boring the group), of careful planning and the sequencing of learning events, and of specifying achievable and verifiable learning objectives in the form of learning outcomes.

Some of the key developments in modern curriculum planning are Behaviourist. In the 1950's Bloom categorised the different worlds of learning into the Cognitive, the Affective and the Psychomotor domains, as demonstrated in observable behaviour (Bloom et al. 1956). The writing of objectives or goals in the form of tangible learning outcomes is a consequence of Behaviourist thinking. With regard to planning and delivery of learning, the specification of what should hap-

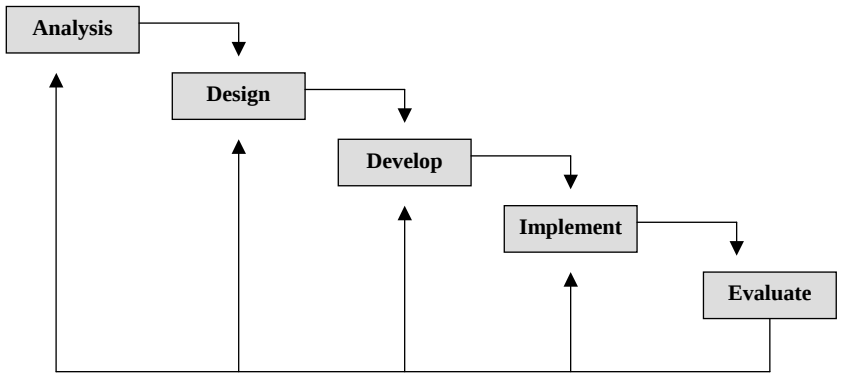
pen in any learning sequence, as provided by Gagné, is still highly influential in the training world.

**Tab. 2:** Gagné's Nine Key Instructional Events

| **Teacher/Designer Action** | **Response of learner** |
|---|---|
| 1. Gaining learner's attention | Readiness |
| 2. Stating session objectives | Knowing what to expect |
| 3. Reminding what was done before | Stimulation of long term memory |
| 4. Highlighting key features | Perceiving what is important |
| 5. Structuring learning | Creating links and associations |
| 6. Encouraging activity | Performing |
| 7. Providing feedback | Learning awareness and satisfaction |
| 8. Evaluating progress | Strengthening learning |
| 9. Signalling future learning | Gaining learning overview |

*Source:* Gagné and Medsker (1996:140) (adapted)

Behaviourism works best in the teaching and assessment of competencies, where you want to test and verify that the student or trainee does indeed possesses the requisite skills or competencies. Behaviourism also provides the underlying principles of instructional design as shown in the standard model of instructional design developed by Royce (1970).




*Source:* Royce (1970)

**Fig. 2:** Phases of Instructional Design

Computer-based training (CBT) for example is greatly dependant on the precise sequencing and chunking of learning materials, the stress on repetition and practice, and the importance of the reinforcement of behaviour you desire.

Overall, while the training world, particularly in the US, is still dependant on Behaviourist 'rational' principles, Behaviourism becomes more problematic when you are dealing with higher level learning, and acquisition of concepts, problem-solving and originality. It is not a model that suits the general view of university or higher level learning.

**Tab. 3:** Implications of Behaviourism for Practice

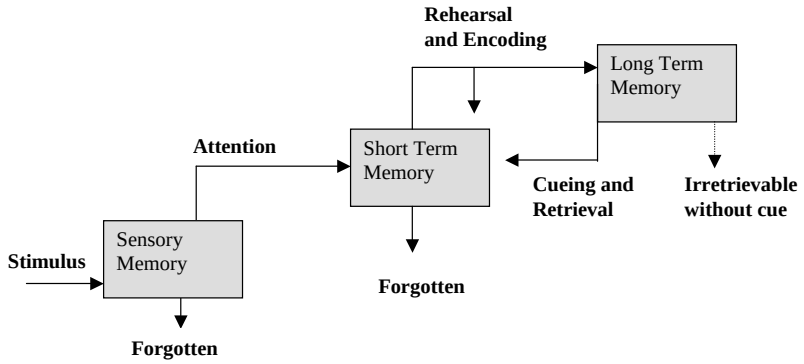
- List the learning outcomes (Bloom's Taxonomies show how these can be categorised)
- Assessment must be based on these learning outcomes and nothing else
- Break the material down into small units
- Carefully sequence these units according to the desired learning
- Present the rules for learning the topic
- Ensure that the learner actively responds (does things)
- Provide opportunities for frequent learner feedback
- Reinforce correct behaviour with immediate rewards

*Source:* Carlile et al. (2004:10)

## Cognitivism

Cognitivism, based on an investigation of human thought processes, is diametrically opposed to Behaviourism which disregards mental activity or motivation. Cognitive theory developed from experimental work carried out on memory, perception and attention, such as Miller's well-known work on the number of items that can be held in short-term memory (Miller 1956:81–93). Work on artificial intelligence and the attempt to replicate mental processes by computers also stimulated Cognitivist thinking.

Cognitivists focus on the ways that learners gain and organise their knowledge and they have developed 'information processing input-output' models of learning. The following diagram illustrates the way that sensory input may be processed through short-term memory, and organised or 'encoded' before being lodged in long-term memory, and learning takes place.




*Source:* Carlile et al. (2004:12) (adapted)

**Fig. 3:** Mental Processing

Many current ideas intended to facilitate student learning draw on our awareness of the mental processing outlined above. For example, Ausubel (1968) recommends the use of 'advance organisers' where you present a patterned outline of material to students before you introduce them to more detailed content. This draws on the importance of encoding material prior to transfer to

long-term memory. The concept of 'Mind-mapping' as a form of effective note-taking developed by Buzan (1974) draws both on concepts of encoding and those of dual coding- that is, of presenting material in more than one medium to increase learner retention. Work carried out on levels or types of learning also draws on our knowledge of short and long-term memory stores. For example, work by Marton and Saljo (1984:36–55) identifies two clear types of students – 'surface learners' who try (and generally fail) to retain the material held in short term memory because of information-overload, and 'deep learners' who attempt to understand and encode material so that it can be transferred to long-term memory and more effectively learnt. Strategic learners are also effective, but are more instrumental in learning, working only towards the specific goals they wish to achieve.

The most famous Cognitivist was Piaget and Inhelder (1990) who argued that knowledge is acquired by the natural development of mental structures as the child responds to experience. The concept of 'readiness' is therefore important in order for the child to move on to the next stage of conceptual development, and this idea has been picked up by some later theorists. While Piaget's work concentrates on child learners, there has been more general interest in his concept of 'de-centring' or being able to see the world from different points of view - an important stage in the development of abstract thinking. His concept of 'de-centring' can be applied to older learners too, since a mark of an educated person is the ability to 'generalise' and see the world from a number of different perspectives.

For Cognitivists then, learning is developing strategies for thinking. It is not surprising therefore that Cognitive approaches underlie the Critical thinking movement which has gained prominence in recent years and is increasingly used as a tool in problem-solving in specific disciplines.

The Accelerated Learning movement, a late Cognitivist development which is attracting much popular attention, draws on a variety of sources. You as the teacher need a knowledge of neural processes, the importance of water, sleep and exercise, visualisation, music, and the techniques derived from neuro-linguistic processing (NLP). With these you can foster and 'accelerated' learning. You can find a growing number of Accelerated Learning Workshops run both in the formal and informal education sector, though concentrating on child learners.

Cognitivists however, like Behaviourists, still place the teacher or curriculum designer firmly in control. You need a knowledge of mental processing or of how to produce the desired behaviour in order to reinforce or direct learning, but it is still your responsibility to control it. As a subject specialist you will want your students to adapt particular strategies that are effective in your domain. For example Mathematics teachers are not very concerned with the answer to a problem. Their focus is on the cognitive strategies needed to arrive at a solution.

As the student moves up through the educational system from primary, to secondary, to higher educational levels, the pedagogical approach becomes more Cognitive. At primary level there is an emphasis on the acquisition of facts (Bruner 1996), whereas at higher levels there is an emphasis on general principles, methods and ways of knowing. This is also shown in assessment procedures and examinations where lower level papers ask for description and reproduction of facts whereas higher level papers require analysis, discussion and debate - Cognitivist approaches.

**Tab. 4:** Implications of Cognitivism for Practice

- Promote active listening
- Don't overload short term memory by presenting too much material at once
- Don't lecture for more than twenty minutes without a break
- Chunk material into groups or categories to facilitate retention
- Make the structure and patterning of the material explicit for learners
- Present material in more than one form to facilitate transfer to long term memory
- Give learners the opportunity to revisit topics to strengthen retention
- Use key words and terms as memory cues
- Outline the meta-cognitive strategies needed for your subject

*Source:* Authors

## Constructivism

The last of the meta-theories is not one, but a broad group of theories that can offer you a different explanation of the way that people learn. Constructivists claim that people 'construct' their own meaning by building on their previous knowledge and experience. New ideas and experiences are matched against existing knowledge, and the learner constructs new or adapted rules to make sense of the world. 'Constructs' are created which are representations of the world. These are used to measure and validate current experience and to predict new experience. Constructivism therefore is a dynamic process where small localised changes in these 'constructs' may lead to this change in overall understanding.

Constructivists believe that learning is a desire to find the meaning in situations, and this meaning will be an individual one, since we have all had different experiences of being in the world. You, as the teacher, cannot be in charge of your students' learning, much as they may like you to be. How then can you cater for everyone when their views of reality will be so different, and students will come to learning already possessing their own constructs of the world? They may easily accommodate the concepts you offer them, or there may be a clash between different representations of the world. Whereas the Cognitivist tries to take charge and direct the students' thinking, the Constructivist accepts the autonomy of the student, and instead acts as a facilitator or mediator. The Constructivist helps the learner to discover meaning and understanding, rather than simply to accumulate information.

Some modern trends in learning which have been developed from a Constructivist perspective include student-centred learning which stresses the centrality of the learner, and the fostering of independent learning through the use of negotiated learning strategies and of learning contracts.

One of the underlying principles of Constructivism is its stress on diversity in learning given the different constructs of the world held by learners, and this brings together a number of other well-known theories. Teaching in higher education is increasingly concerned with adult students who construct knowledge in a different way from children. Knowles (1980) states a number of different ways in which adult learners are different from child learners.

Learning Style theories also demonstrate diversity in claiming that there are clear learner preferences. Learner preferences are influenced by effective past learning, by habit, or the learner's own strengths. There are many different types of Learning Style models. A popular model is that based on personality constructs (Myers-Briggs 1980). The VARK model is based on visual auditory, read-write and kinaesthetic modalities (Fleming and Mills 1992). Another is based on

**Tab. 5:** Pedagogy versus Androgogy

| **Child learners** | **Adult learners** |
|---|---|
| Rely on others to decide what is important | Decide for themselves what is important |
| Accept information at face value | Use experience to validate information |
| Don't expect learning to be immediately useful | Expect what they learn to be immediately useful |
| Have little or no experience to draw on | Have much experience |
| Cannot act as resource to group | Significant ability to act as resource to group |

*Source:* Knowles (1980)

preferences for specific stages of the learning cycle as identified by Kolb (1984). Learning Style Theory implies that you, as the teacher, should adopt a range of teaching strategies. Otherwise you will privilege one group by teaching to their chosen style, and disadvantage the others. Reflection on the use of learning style could also lead you to a consideration of your own learning and teaching and how it correlates with student learning.

An interest in diversity in intelligence rather than a single unitary intelligence comes from the US Harvard-based psychologist Gardner (1999) who explicitly claims a Constructivist perspective. His Multiple Intelligence (MI) theory posits a number of intelligences rather than one overarching organising intelligence.

**Tab. 6:** Gardner's List of Intelligences

- Linguistic Intelligence
- Logical-mathematical intelligence
- Spatial intelligence
- Bodily/kinaesthetic intelligence
- Musical intelligence
- Interpersonal intelligence
- Intrapersonal intelligence
- Naturalistic intelligence
- Existential or spiritual intelligence (under consideration)

*Source:* Hyland (2000:32) (adapted)

According to Gardner, all individuals have a 'jagged intelligence profile', developed from innate potential, experience, practice, and motivation. Like Learning Styles, MI theory implies that you should adopt a range of teaching strategies and assessment strategies, including self-assessment, so that students can know, build on, and be judged on their strengths.

Formative assessment is an important tool for the Constructivist teacher as it reveals the existing mental constructs held by the student. If these constructs are inadequate or flawed the teacher can then present counter examples or scenarios that challenge the existing constructs and prompt the student to a readjustment.

Whereas Cognitive Science has researched measurable cognitive processes, such as the duration of memory or attention-span, Constructivism is interested in the whole mind, and the affec-

tive domain, including the place of volition and emotion in learning. Barnett (2004) claims that, in learning, volition is more important than intellect. If this is the case then it requires an interest in strategies designed to strengthen volition and motivation in learners, and in the part played by values. Values are closely linked to purpose and so relate back to volition and motivation of learners. The values associated with a subject and of the education community can influence students' perception and response. The role of values therefore needs to be made more explicit to students so that they can be either accepted and affirmed, or subjected to debate and challenge.

Emotion is now recognised as a major element in learning. This is quite natural when you consider the way that our perceptions of the world are influenced by the way we feel. The limbic or primitive brain developed prior to other areas of the brain, and therefore exerts a powerful influence over attention, perception and memory. We know for example that long-term memory retention is greatly aided by the emotional associations of that memory, and memory loss occurs when their emotional associations are too painful.

The emotions are central to the interpersonal and intrapersonal domains in Gardner's multiple intelligences theory. Recent work by Goleman (1996) has led to the development of a number of instruments designed to identify EQ or emotional intelligence. One area of particular interest is in the emotional intelligence of you as the teacher or facilitator in recognising and responding to the emotions and moods of your students in order to facilitate engagement and motivation.

Strategies that emphasise the emotional aspect of learning include the use by students of reflective journals, together with such techniques as 'critical incident' and storytelling because these techniques incorporate the emotions along with the cognitive and narrative elements of experience therefore promoting deeper levels of meaning.

**Tab. 7:** Implications of Constructivism for Practice

- Approach material from the learner's perspective and values
- Acknowledge and accommodate student diversity (ability, age, gender, culture, nationality)
- Encourage reflection through the use of learning journals etc.
- Present an overview of the topic including purpose and objectives
- Explain the relevance of the topic
- Build on what it is already known
- Encourage active and discovery and independent learning
- Give timely feedback on performance
- Constructively align objectives, strategies and assessment

*Source:* Carlile et al. (2004:17)

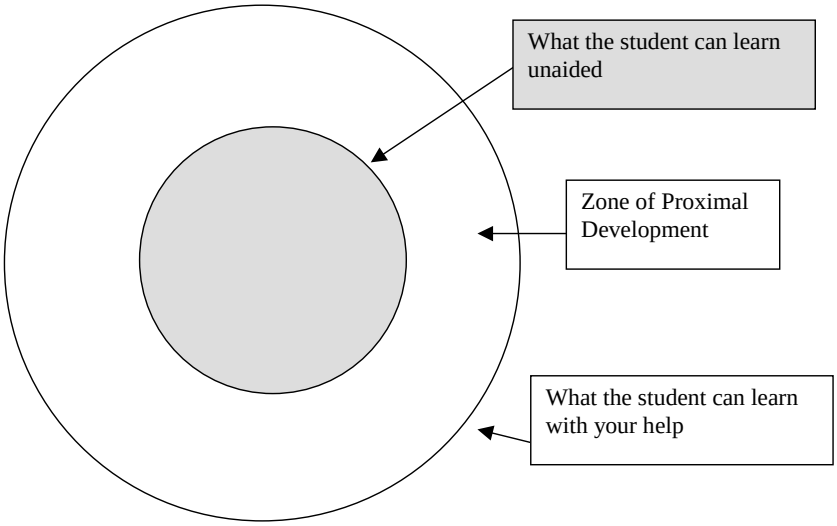
## Social Constructivism

Western theories of learning have tended to focus on the individual rather than the group (though this is not the case in eastern philosophies where the group is perceived as more important than the individual member). However, some key insights on the social aspect of learning are emerging, both in relation to the role of others as mediators of meaning, and on the importance of culture in learning.

The research of the Russian psychologist Vygotsky (1934) demonstrated the importance of others as learning mediators. In the first instance he showed that in infants, communication (between the mother and infant) is a pre-requisite to the child's acquisition of concepts and language. To

look at this in reverse, he showed that without communication, there can be no thought. Thinking does not exist independently of the world, nor of other people. A number of linguistic theories stress communication and dialogue as being key elements of Constructivism in facilitating meaning.

The second important way in which Vygotsky thought learners interacted with each other was through what he called the 'Zone of Proximal Development' (ZPD).




*Source:* Carlile et al. (2004:20)

**Fig. 4:** Zone of Proximal Development

A certain amount can be learnt by a student on his or her own. However, with your help more can be learnt. You can recognise the stage the student is presently at, and offer suitable material, encouragement and prompts to move him or her on to the next level of learning.

As the learning mentor you provide 'scaffolding' or support to help students to a higher level, while gradually withdrawing this support so that the student becomes more independent. You help your students to internalise external knowledge and make it their own.

Collaborative learning is another area of growing interest, not just for instrumental reasons of dealing with ever-larger groups in higher education but for sound pedagogical reasons.

Peer tutoring, where students in the same group tutor one another, has the advantage of increasing self-esteem and developing social skills. It also facilitates meaning in both parties, in a way that you as a teacher may not perceive, since you may not see the problem in a topic from a student's perspective. The benefit for the peer tutor is that teaching is a sound method for clarifying understanding. You may have found that your lecturing has increased your own understanding of your subject. Peer assessment can also be used as a tool in student learning, since students learn to develop the criteria for making judgements and evaluating their own performance.

Many sociological studies have shown the significance of the peer group in creating a culture that can be either open or hostile to learning. The role of culture in learning is a complex one. For Bruner (1996) the intellect of the learner is framed by the surrounding culture and learning is a sharing of that culture. All learning then is induction into a culture, including all the tacit values of that culture. In Bruner's view, to be culture-free is to be intelligence-free.

Different cultures have different views on the purposes of learning and education and as a teacher or educationalist you need to be aware of these differences. For example, some socially or economically disadvantaged groups do not consider that formal learning has served them well, and are mistrustful of it. The French sociologist Bourdieu claims that, just as some social groups lack economic capital in which to invest for the future, so others lack the 'cultural capital'

which can be used to take advantage of learning opportunities which they can pass on to the next generation (Bourdieu and Passeron 1970). The challenge for you, as facilitator, is to provide a motivation and will to learn in order to influence this cycle.

It is increasingly common to talk about 'communities of practice'. According to the work of the French sociologist Foucault (1975), knowledge is embedded in the activities, social relations and expertise of specific communities, whether these are scientific, political, geographical or virtual. On this view, knowing is inseparable from action and environment, and is also inseparable from issues of access and empowerment. Recent experiments in the use of 'collaborative environments' using new technologies have led to the empowerment of learners at quite different levels. For example, children have been involved in data collection with university researchers on environmental projects and are properly acknowledged in the resulting publications.

This view raises questions about your role as a representative of the academic community including that of gatekeeper of knowledge, enforcer of values and monitor of community participation and practice.

These are complicated ideas but they suggest the need for situated learning where knowledge is placed not just in the real world but, in specific practices and social relations. As a member of a community of practice you are expected to seek out opportunities for students to solve real problems in realistic situations as exemplified in problem-based learning.

**Tab. 8:** Implications of Social Constructivism for Practice

- Encourage team working and collaboration
- Promote discussion - even in lectures
- Involve students in project work
- Set up study groups for peer learning
- Allocate a small proportion of grades to peer assessment and train students in the process and criteria
- Show students models of good practice in essay writing and project work
- Be aware of your own role as a model of 'the way things are done around here'
- Know your students as people, develop relationships and build trust
- Be emotionally aware and intelligent
- Be explicit about your professional values and the ethical dimensions of your subject

*Source:* Authors

## Conclusion

In this chapter we have provided some reasons why a knowledge of learning theory is important, and how it could apply to your practice.

We have briefly outlined two philosophical approaches before going into detail about the three major theories which influence current principles and practice. As you can see, there has been a recent move away from the dominance of psychological theories which claim a scientific and objective explanation of the learning of the individual learner. There is now an increasing awareness of the role of philosophy and sociology in examining learning as a moral and a social activity which cannot be divorced from purpose, value and context.

We envisage the chapter as a resource that will inform the ideas and practices outlined in the other chapters. Finally, we hope that this chapter has stimulated your interest in theory and acts as an enrichment of your teaching.

## References

Ausubel, D. (1968). *Educational Psychology, A Cognitive View*. New York, Holt: Rinehart and Winston.

Barnett, R. (2004). Willing to Learn in Higher Education. In *Conference Paper, AISHE Inaugural Conference*, Dublin.

Bloom, B. et al. (1956). *Taxonomy of Educational Objectives: Handbooks 1 to 3: The Cognitive, Affective and Psychomotor Domain*. London: Longmans Green.

Bourdieu, P. and J. Passeron (1970). *Reproduction in Education, Society and Culture*. London: Sage.

Bruner, J. (1996). *Towards a Theory of Instruction*. Cambridge Mass.: Harvard University Press.

Burgess, A. (1962). *A Clockwork Orange*. London: Heinemann.

Buzan, T. (1974). *Use Your Head*. London: BBC.

Carlile, O., A. Jordan, and A. Stack (2004). *Learning by Design: Learning Theory for the Designer of Multimedia Educational Materials*. Waterford: WIT/ BBC Online.

Fleming, N. and C. Mills (1992). *Helping students understand how they learn*, Volume 7. The Teaching Professor.

Foucault, M. (1975). *Discipline and Punish: The Birth of the Prison*. London: Tavistock.

Gagné, R. and K. Medsker (1996). *The Conditions of Learning: Training Applications*. Forth Worth: Harcourt Brace.

Gardner, H. (1999). *Intelligence Reframed for the 21$^{st}$ Century*. New York: Basic Books.

Goleman, D. (1996). *Emotional Intelligence*. London: Bloomsbury Press.

Honey, P. and A. Mumford (1992). *The Learning Styles Questionnaire*. Maidenhead: Peter Honey Company.

Hyland, A. (2000). *Multiple Intelligences: Curriculum Assessment Project*. Cork: UCC. Final Report.

Jordan, A. (2003). *FinVoc MI Resource Book for Teachers: FinVoc Pilot Project on Multiple Intelligence*. Waterford: WIT.

Knowles, M. (1980). *The Modern Practice of Adult Education: From Pedagogy to Andragogy* (2 ed.). Chicago: Follett.

Kolb, D. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, New Jersey: Prentice-Hall.

Lewin, K. (1943). Forces behind food habits and methods of change. *Bulletin of the National Research Council 108*, 35–65.

Locke, J. (1690). *An Essay Concerning Human Understanding*. London: Penguin Classics.

Marton, F. and R. Saljo (1984). Approaches to learning. In F. Marton, D. Hounsell, and N. Entwistle (Eds.), *The Experience of Learning*. Edinburgh: Scottish Academic Press.

Miller, G. A. (1956). *The magic number seven, plus or minus two: Some limits on our capacity for processing information*, Volume 63. Psychological Review.

Myers-Briggs, I. (1980). *Gifts Differing*. Palo Alto, CA: Consulting Psychologists Press.

Piaget, J. and B. Inhelder (1990). *The Psychology of the Child*. New York: Basic Books.

Royce, W. (1970, August). Managing the development of large software systems. In *Proceedings of IEEE*, West Con.

Smith, D. and D. Kolb (1986). *The User's Guide for the Learning-Style Inventory: A Manual for Teachers and Trainers*. Boston, MA.: McBer & Company.

Tyler, R. (1949). *Basic Principles of Curriculum and Instruction*. Chicago: University Press Chicago.

Vygotsky, L. (1934). *Thought and Language*. Cambridge Mass: MIT Press.

Webb, J. (1996). Why theory matters. In J. Webb and C. Maughan (Eds.), *Teaching Lawyers Skills*. London: Butterworth.

**Tab. 9:** Useful Websites

| | |
|---|---|
| **Author/Topic** | Bruner, Jerome, (Main Concepts) |
| **Address** | `http://mercury.sfsu.edu/~ching/personal/Learning/theorists/Bruner.html` |
| **Accessed** | 2004 |
| **Description** | An overview of Bruners theory of discovery learning with a home link to many other relevant theorists and their studies along with a section of quizzes to test your own knowledge and understanding |
| | |
| **Author/Topic** | Gagné, Robert, M. (Conditions of Learning) |
| **Address** | `http://www.educationau.edu.au/archives/cp/04d.htm` |
| **Accessed** | 2004 |
| **Description** | An overview of Gagnés conditions of learning theory and how it relates to the process of instructional design |
| | |
| **Author/Topic** | Kelly, Curtis (David Kolb: The Theory of Experiential Learning) |
| **Address** | `http://reviewing.co.uk/research/experiential.learning.htm` |
| **Accessed** | 2004 |
| **Description** | A critique of Kolb's experiential learning style model, making reference to other experiential learning models along with many other relevant references |
| | |
| **Author/Topic** | Mayer, John, Salovey, Peter (The Intelligence of Emotional Intelligence) |
| **Address** | `http://trochim.human.cornell.edu/gallery/young/emotion.htm` |
| **Accessed** | 2002 |
| **Description** | Details on emotional intelligence with many links to other related websites on brain theory and neuroscience. |

*Source:* Jordan (2003:96–100) (adapted)

# STUDENT–CENTRED LEARNING: WHAT DOES IT MEAN FOR STUDENTS AND LECTURERS?

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## Introduction

The term student–centred learning (SCL) is widely used in the teaching and learning literature. Many terms have been linked with student–centred learning, such as *flexible learning* (Taylor 2000), *experiential learning* (Burnard 1999), *self-directed learning* and therefore the slightly overused term 'student–centred learning' can mean different things to different people. In addition, in practice it is also described by a range of terms and this has led to confusion surrounding its implementation.

The concept of student–centred learning has been credited as early as 1905 to Hayward and in 1956 to Dewey's work (O'Sullivan 2003). Carl Rogers, the father of client–centred counseling, is associated with expanding this approach into a general theory of education (Burnard 1999; Rogoff 1999). The term student–centred learning was also associated with the work of Piaget and more recently with Malcolm Knowles (Burnard 1999). Rogers (1983a:25), in his book 'Freedom to Learn for the 80s', describes the shift in power from the expert teacher to the student learner, driven by a need for a change in the traditional environment where in this 'so-called *educational* atmosphere, students become passive, apathetic and bored'. In the School system, the concept of child–centred education has been derived, in particular, from the work of Froebel and the idea that the teacher should not '*interfere with this process of maturation, but act as a guide*' (Simon 1999). Simon highlighted that this was linked with the process of development or 'readiness', i.e. the child will learn when he/she is ready (1999).

The paradigm shift away from teaching to an emphasis on learning has encouraged power to be moved from the teacher to the student (Barr and Tagg 1995). The teacher–focused/transmission of information formats, such as lecturing, have begun to be increasingly criticised and this has paved the way for a widespread growth of 'student–centred learning' as an alternative approach. However, despite widespread use of the term, Lea et al. (2003) maintain that one of the issues with student–centred learning is the fact that '*many institutions or educators claim to be putting student–centred learning into practice, but in reality they are not'* (2003:322).

This chapter aims to:

- Give an overview of the various ways student–centred learning is defined,
- Suggest some ways that student–centred learning can be used as the organising principle of teaching and assessment practices,
- Explore the effectiveness of student–centred learning and
- Present some critiques to it as an approach.

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

## What is student–centred learning?

Kember (1997) described two broad orientations in teaching: the teacher centred/content oriented conception and the student centred/learning oriented conceptions. In a very useful breakdown of these orientations he supports many other authors views in relation to student–centred view including: that knowledge is constructed by students and that the lecturer is a facilitator of learning rather than a presenter of information. Rogers (1983b:188) identified the important precondition for student–centred learning as the need for: '*... a leader or person who is perceived as an authority figure in the situation, is sufficiently secure within herself (himself) and in her (his) relationship to others that she (he) experiences an essential trust in the capacity of others to think for themselves, to learn for themselves'*.

Choice in the area of the learning is emphasised by Burnard, as he interprets Rogers' ideas of student–centredness as '*students might not only choose what to study, but how and why that topic might be an interesting one to study*' (1999:244). He also emphasises Rogers' belief that students' perceptions of the world were important, that they were relevant and appropriate. This definition therefore emphasises the concept of students having 'choice' in their learning.

Harden and Crosby (2000:335) describe teacher–centred learning strategies as the focus on the teacher transmitting knowledge, from the expert to the novice. In contrast, they describe student–centred learning as focusing on the students' learning and '*what students do to achieve this, rather than what the teacher does*'. This definition emphasises the concept of the student 'doing'.

Other authors articulate broader, more comprehensive definitions. Lea et al. (2003:322) summarises some of the literature on student–centred learning to include the followings tenets:

1. '*the reliance on active rather than passive learning,*
2. *an emphasis on deep learning and understanding,*
3. *increased responsibility and accountability on the part of the student,*
4. *an increased sense of autonomy in the learner*
5. *an interdependence between teacher and learner,*
6. *mutual respect within the learner teacher relationship,*
7. *and a reflexive approach to the teaching and learning process on the part of both teacher and learner.'*

Gibbs (1995) draws on similar concepts when he describes student–centred courses as those that emphasise: learner activity rather than passivity; students' experience on the course outside the institution and prior to the course; process and competence, rather than content; where the key decisions about learning are made by the student through negotiation with the teacher. Gibbs elaborates in more detail on these key decisions to include: '*What is to be learnt, how and when it is to be learnt, with what outcome, what criteria and standards are to be used, how the judgements are made and by whom these judgements are made*' (1995:1). In a similar vein in earlier literature, the student–teacher relationship is particularly elaborated upon by Brandes and Ginnis (1986). In their book for use in second level education (post–primary), entitled 'A Guide to Student–Centred Learning', they present the main principles of student–centred learning as:

- The learner has full responsibility for her/his learning
- Involvement and participation are necessary for learning
- The relationship between learners is more equal, promoting growth, development
- The teacher becomes a facilitator and resource person
- The learner experiences confluence in his education (affective and cognitive domains flow together)

- The learner sees himself differently as a result of the learning experience.

The theoretical standing of student–centred learning is often surprisingly absent in the literature. However, it appears to relate primarily to the constructivist view of learning in the importance it places on activity, discovery and independent learning (Carlile and Jordan 2005). Cognitive theory also highlights activity but in a different form than that supported by the constructivists (Cobb 1999). The cognitive view supports the idea that the activity of learning is computed in the head, or as often described 'in the mind'. The constructivist view of activity is related more to performing physical activities, for example, projects, practicals. Student–centred learning has some connections with the social constructivist view, which emphasises activity and the importance of communities of practice/others in the learning process. However, the definitions of SCL do not necessarily highlight the importance of peers in learning (Cobb 1999; Bredo 1999).

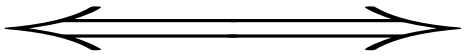
In summary, it appears from the literature that some view student–centred learning as: the concept of the student's **choice** in their education; others see it as the being about the student **doing** more than the lecturer (active versus passive learning); while others have a much broader definition which includes both of these concepts but, in addition, describes the shift in the **power relationship** between the student and the teacher.

## How can you implement student–centred learning?

Learning is often presented in this dualism of either student–centred learning or teacher–centred learning. In the reality of practice the situation is less black and white. A more useful presentation of student–centred learning is to see these terms as either end of a continuum, using the three concepts regularly used to describe student–centred learning (See Table 1).

**Tab. 1:** Student–centred and teacher–centred continuum

| **Teacher–centred Learning** | **Student–centred Learning** |
|---|---|
| Low level of student choice | High level of student choice |
| Student passive | Student active |
| Power is primarily with teacher | Power primarily with the student |



In examining how you might look at this in practice, it is worth thinking how far up the continuum you are able to move within the contextual barriers in your teaching situation. The next sections will present some ideas for your practice to aid you in making that progression.

## Implications for curriculum design

In relation to curriculum design, student–centredness includes the idea that students have choice in what to study, how to study. However, to what extent can this be carried out in the structures of today's Universities? Modularisation, which will be expected in all European undergraduate courses by 2006, provides a structure that allows students an element of choice in what modules they study. Donnelly and Fitzmaurice (2005) in their chapter in this collection on 'Designing Modules for Learning' highlight the importance of attempting to focus on the needs of the students at the early stage of curriculum design. Choice in the curriculum is not without its difficulties and Edwards argues about the dangers of individuality in the concept of the social learner and how this can in a seemingly contradictory way lead to disempowerment (2001).

One student–centred approach to curriculum design, Problem–Based Learning (PBL), allows for some choice within a programme of areas that students may study. It allows students to set some of their own learning objectives/outcomes, dependent on prior knowledge. Problem-Based Learning, through the use of problems/issues/triggers, encourages the students to develop their own learning goals, thereby filling in the gaps in their knowledge or understanding (Boud and Feletti 1997). This element of choice or control is referred to in many of the definitions of student–centred learning. This aspect of responsibility aligns with the Lea et al. (2003) view that student–centred learning involves '*increased responsibility and accountability on the part of the student'*. Problem–based learning is higher up the student **choice** aspect of the SCL continuum in Table 1, than the usual problem–solving or problem–oriented exercises performed in a lecture/tutorial. These approaches are more controlled by the teacher in their presentation and outcome (Davis and Harden 1999). However, they are useful in addressing the **active learning** aspect of student–centred learning. Other approaches to curriculum design also support the idea of student choice and activity in learning, for example, the systems–based approach, resource–based learning, and experiential/ personal relevance approach (Toohey 2000).

A growing practice in course design internationally is the writing of learning outcomes/objectives focusing on what the student will be able to do, rather than on the content being covered by the teacher (UCD Centre for Teaching and Learning 2005). This practice is an example of the move towards student–centred learning in the curriculum and helps to shift the emphasis on the learner as opposed to a coverage model by the teacher. Donnelly and Fitzmaurice (2005) re-iterate the importance of this shift in emphasis. This is also reflected in Gibbs' (1995) definition, i.e. an emphasis on the process and competence, rather than content. Table 2 presents some examples of student–centred learning outcomes.

**Tab. 2:** Learning Outcomes and Student–centred Learning

| **Student–centred Learning Outcomes: Some examples** | **Traditional Learning Outcomes/Objectives** |
|---|---|
| *By the end of this modules: **you** (the student) will be able to:* | *The course will cover:* |
| Recognise the structures of the heart | The anatomy of the heart |
| Critique one of Yeats' poems | A selection of Yeats poems |

## Implications for teaching/learning methods

The University of Glasgow (2004) identified four main strategies in a study on student–centred learning practices in their University. The first strategy was to make the student more active in acquiring knowledge and skills and might include exercises in class, fieldwork, use of CAL (computer assisted learning) packages etc. The second strategy was to make the student more aware of what they are doing and why they are doing it. A third strategy is a focus on interaction, such as the use of tutorials and other discussion groups. The final strategy is the focus on transferable skills. This last strategy is not mentioned in other definitions of the student–centred learning but does look beyond the immediate course requirements to other benefits to the student in later employment. Table 3 highlights a sample of student–centred learning/teaching methods and includes some ideas for lecturers both within (more teacher–centred) and outside of the lecture format. You may consider, however, in striving to reduce the amount of lecture contact hours for more student–centred formats, where possible.

## Implications for assessment practices

**Tab. 3:** Examples of student centred learning/teaching methods

| **Outside of the lecture format** | **In the Lecture** |
|---|---|
| Independent projects | Buzz groups (short discussion in twos) |
| Group discussion | Pyramids/snowballing (Buzz groups continuing the discussion into larger groups) |
| Peer mentoring of other students | Cross-overs (mixing students into groups by letter/number allocations) |
| Debates | Rounds (giving turns to individual students to talk) |
| Field-trips | Quizes |
| Practicals | Writing reflections on learning (3/4 minutes) |
| Reflective diaries, learning journals | Student class presentations |
| Computer assisted learning | Role play |
| Choice in subjects for study/projects | Poster presentations |
| Writing newspaper article | Students producing mind maps in class |
| Portfolio development | |

Black (1999) summarised some of the difficulties highlighted in the literature in the area of assessment, for example, a) that the giving of marks and grades are over emphasised, while the giving of advice and the learning function are under emphasised, b) pupils are compared with one another which highlights competition rather than personal improvement. He also explains the concept of self-assessment as essential activity to help students '*take responsibility for their own learning*', an important aspect of SCL (Benett 1999; Black 1999:126). Foucault argued that the examination was a technique of power, where a student is *'controlled through a system 'micro-penalties', the constant giving of marks which constitutes a whole field of surveillance'* (cited in Broadfoot 1999:88). The use of the written examination is still a strong practice in today's Universities and is primarily a summative assessment, i.e. an assessment for judgement or accreditation. The addition of more formative assessment, which emphasises feedback to students on their learning, would 'enhance their (student) learning' (Brown et al. 1997; Light and Cox 2001:170). By developing more formative assessment in your courses you can provide a focus for the student by highlighting their learning gaps and areas that they can develop. Examples of formative assessment include feedback on essays, written comments on assignments, grades during the year that do not add to end of year mark and multiple-choice questions/answers for feedback only. The addition of more formative assessment encourages a more student–centred approach.

Table 4 presents practical examples of student–centred assessments as presented by Gibbs (1995). Further details of some of these assessments can be seen on the UCD Centre for Teaching and Learning website (`http://www.ucd.ie/teaching`).

Peer and self-assessment both give some control and responsibility back to the student, emphasising *' an increased sense of autonomy in the learner'* as noted in Lea et al.'s definition of student–centred learning (2003). Learning contracts/negotiated contracts are goals set by the student, depending on their learning gaps, which are in turn negotiated with the lecturer (Knight 2002). The contract can also highlight the manner in which the student would like to be assessed in order to demonstrate that they have reached the goals. This can add choice in what to study and, in addition, choice in how the student will be assessed. Choice is one of the key terms in relation

**Tab. 4:** Examples of student–centred assessments (Gibbs 1995)

| | |
|---|---|
| • Diaries, logs and journals<br>• Portfolios<br>• Peer/self assessment<br>• Learning contracts and negotiated assessment | • Projects<br>• Group work<br>• Profiles<br>• Skills and competencies |

to student–centred learning. The concept of negotiation of learning also addresses the unique change in relationship between lecturer and student noted by Lea et al. (2003) in their definition of student–centred learning.

Gibbs (1995:1), as mentioned earlier, describes the range of choices available to students in relation to assessment as: *'. . . . . , what criteria and standards are to be used, how the judgements are made and by whom these judgements are made'*. In practice, how do we give students some autonomy and decision-making in an area such as assessment? Brown et al. (1994) highlight a range of suggestions on how lecturers can involve students in the assessment process: (Table 5).

**Tab. 5:** Assessment process and student–centred learning

| | |
|---|---|
| Involving students at the stage when the task is set: | • Choosing the assessment task<br>• Setting the assessment task<br>• Discussion the assessment criteria<br>• Setting the assessment criteria |
| Involving students at the stage after the task is completed: | • Making self-assessment comments<br>• Making peer-assessment feedback comments<br>• Suggesting self-assessment grades/marks<br>• Negotiating self-assessment grades/marks<br>• Assigning self-assessment grades/marks<br>• Assigning peer-assessment grades/marks |

(Brown, Rust, and Gibbs 1994)

The suggestions in Table 5 above may seem a large jump from your current practices, therefore, you might consider moving your assessment practice slightly up the teacher/student–centred continuum. An example of a small but significant change is to provide a choice of essay topics and exam questions as a manageable starting point.

## The effectiveness and critiques of student–centred learning

The use of student–centred learning appears to be reflective of today's society where choice and democracy are important concepts, however is it an effective approach to learning? Lea et al. (2003) reviewed several studies on student–centred learning and found that overall it was an effective approach. A six-year study in Helsinki, which compared traditional and activating instruction, found that the activating group developed better study skills and understanding, but were slower in their study initially (Lonka and Ahola 1995). Equally, Hall and Saunders found that students had increased participation, motivation and grades in a first year information technology course (1997). In addition, 94% of the students would recommend it to others over the more conventional approach (Hall and Saunders 1997). Students in a UK University elaborated on the impact of student–centred learning on them, i.e. they felt there was more respect for the student in this approach, that it was more interesting, exciting, and it boosted their confidence (Lea et al. 2003).

Student–centred learning, despite its popularity, is not without its critics. The main critique of student–centred learning is its focus on the individual learner. In addition, there are some difficulties in its implementation, i.e. the resources needed to implement it, the belief system of the students and staff, and students' lack of familiarity with the term.

Simon (1999) describes that student–centred learning, in the School system, can be in danger of focusing completely on the **individual learner** and taken to its extreme does not take into account the needs of the whole class. Simon highlights the point that '*if each child is unique, and each requires a specific pedagogical approach appropriate to him or her and to no other, the construction of an all embracing pedagogy or general principles of teaching become an impossibility*' (Simon 1999:42). Edwards (2001:42) also highlights the dangers associated with student–centredness in adult education where in empowering an individual there is a potential danger of *'a person's physical isolation from other learners'*. The importance of the social context of learning and the value of interaction with peers is emphasised in the socio-cultural view of learning (Bredo 1999). The concept of being an independent learner choosing his/her own route of learning, may in fact drive some of the sociability out of the learning process if care is not taken to emphasise the importance of peers. In relation to this individuality, Lea et al.'s study on psychology students highlighted their concern over being abandoned or isolated from other supports in a student–centred learning approach (2003).

O'Sullivan (2003) described student–centred learning as a Western approach to learning and may not necessarily transfer to the developing countries, such as Namibia, where there are limited **resources** and different learning cultures. It can be equally hard at times to see how the approach can be economical in the large classes associated with many current University undergraduate courses. A comprehensive study was conducted in 2004, by the University of Glasgow, on the use of student–centred learning with full-time undergraduate students (2004). In this study they found that student–centred learning (SCL) was more prevalent in the later years of the student degrees, and this they believe is often down to class sizes.

Another concern regarding student centred learning is the **belief** that students hold in relation to their learning. Students who value or have experienced more teacher–focused approaches, may reject the student–centred approach as frightening or indeed not within their remit. Prosser and Trigwell's work in higher education emphasises the different belief systems held by staff and students (2002). They found that lecturers with a teacher–centred approach to teaching held views that students should accommodate information rather than developing and changing their conceptions and understanding. The reverse was true for those with more student–centred approaches to their teaching. Perry's work on the development of University students highlights how students move from a dualistic view that knowledge is right or wrong to a relativist view that all answers are equally valid (Perry 1970). This study highlights that even during the University years, students can change their view on learning and as they move through the years so to may their views on student–centred learning change. In support of Perry's work, Stevenson and Sander (2002) highlighted that $1^{st}$ year medical students were suspicious of the value of student–centred learning methods.

Finally, **students' familiarity with the term** can be poor. Lea et al. (2003) conducted a study on 48 psychology students in the University of Plymouth on students' attitudes to student–centred learning. They found that, despite a University student–centred policy, 60% of the students had not heard of the term.

## Summary

The changing demographics of the student population and the more consumer/client–centred culture in today's society have provided a climate where the use of student–centred learning is thriving. The interpretation of the term 'student–centred learning' appears to vary between authors as some equate it with 'active learning', while others take a more comprehensive definition including: active learning, choice in learning, and the shift of power in the teacher–student relationship. It is used very commonly in the literature and in University policy statements, but this has not necessarily transferred into practice.

Student–centred learning is not without some criticism but in general it has been seen to be a positive experience, for example, Edwards (2001) emphasises the value of student–centred learning: *'Placing learners at the heart of the learning process and meeting their needs, is taken to a progressive step in which learner–centred approaches mean that persons are able to learn what is relevant for them in ways that are appropriate. Waste in human and educational resources is reduced as it suggested learners no longer have to learn what they already know or can do, nor what they are uninterested in'*. (Edwards 2001:37).

Although recognizing that it is not necessarily an easy task, it is hoped that this chapter has gone some way to providing evidence and ideas to move you higher up the continuum towards a more student–centred practice.

## References

Barr, R. B. and J. Tagg (1995, Nov/Dec). From teaching to learning – A new paradigm for undergraduate education. *Change*, 13–25.

Benett, Y. (1999). The validity and reliability of assessments and self-assessments of Work Based Learning. In P. Murphy (Ed.), *Learners, Learning and Assessment*. London: Open University Press.

Black, P. (1999). Assessment, learning theories and testing systems. In P. Murphy (Ed.), *Learners, Learning and Assessment*. London: Open University Press.

Boud, D. and G. Feletti (1997). *The Challenge of Problem Based Learning*. London: Kogan Page.

Brandes, D. and P. Ginnis (1986). *A Guide to Student Centred Learning*. Oxford: Blackwell.

Bredo, E. (1999). Reconstructing educational psychology. In P. Murphy (Ed.), *Learners, Learning and Assessment*. London: Open University Press.

Broadfoot, P. (1999). Assessment and the emergence of modern society. In B. Moon and P. Murphy (Eds.), *Curriculum in Context*. London: Sage Publications.

Brown, G., J. Bull, and M. Pendlebury (1997). What is assessment? In *Assessing Student Learning in Higher Education*. London: Routledge.

Brown, S., C. Rust, and G. Gibbs (1994). Involving students in assessment. In *Strategies for Diversifying Assessment in Higher Education*. Oxford: The Oxford Centre for Staff Development.

Burnard, P. (1999). Carl Rogers and postmodernism: Challenged in nursing and health sciences. *Nursing and Health Sciences 1*, 241–247.

Carlile, O. and A. Jordan (2005). It works in practice but will it work in theory? The theoretical underpinnings of pedagogy. In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

Cobb, P. (1999). Where is the Mind? In P. Murphy (Ed.), *Learners, Learning and Assessment*. London: Open University Press.

Davis, M. H. and R. M. Harden (1999). AMEE Medical Education Guide No. 15: Problem-based learning: A practical guide. *Medical Teacher 21*(2), 130–140.

Donnelly, R. and M. Fitzmaurice (2005). Designing Modules for Learning. In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

Edwards, R. (2001). Meeting individual learner needs: power, subject, subjection. In C. Paechter, M. Preedy, D. Scott, and J. Soler (Eds.), *Knowledge, Power and Learning*. London: SAGE.

Gibbs, G. (1995). *Assessing Student Centred Courses*. Oxford: Oxford Centre for Staff Learning and Development.

Hall, J. and P. Saunders (1997). Adopting a student-centred approach to management of learning. In C. Bell, M. Bowden, and A. Trott (Eds.), *Implementing Flexible Learning*. London: Kogan Page.

Harden, R. M. and J. Crosby (2000). AMEE Guide No 20: The good teacher is more than a lecturer-the twelve roles of the teacher. *Medical Teacher 22*(4), 334–347.

Kember, D. (1997). A reconceptualisation of the research into university academics conceptions of teaching. *Learning and Instruction 7*(3), 255–275.

Knight, P. (2002). Learning Contracts. In *Assessment for Learning in Higher Education*. Birmingham: SEDA series.

Lea, S. J., D. Stephenson, and J. Troy (2003). Higher Education Students' Attitudes to Student Centred Learning: Beyond 'educational bulimia'. *Studies in Higher Education 28*(3), 321–334.

Light, G. and R. Cox (2001). Assessing: student assessment. In *Learning and Teaching in Higher Education: The Reflective Practitioner*. London: Paul Chapman Publishing.

Lonka, K. and K. Ahola (1995). Activating instruction: How to foster study and thinking skills in Higher Education. *European Journal of Psychology of Education 10*, 351–368.

O'Sullivan, M. (2003). The reconceptualisation of learner-centred approaches: A Nambian case study. *International Journal of Educational Development*. In Press.

Perry, W. G. (1970). *Forms of Intellectual and Ethical Development in the College Years*. New York: Holt, Rinehart and Winston.

Prosser, K. and M. Trigwell (2002). Experiences of teaching in Higher Education. In *Understanding Learning and Teaching: The Experience of Higher Education*. Buckingham: SRHE and Open University Press.

Rogers, C. R. (1983a). As a teacher, can I be myself? In *Freedom to Learn for the 80's*. Ohio: Charles E. Merrill Publishing Company.

Rogers, C. R. (1983b). The politics of education. In *Freedom to Learn for the 80's*. Ohio: Charles E. Merrill Publishing Company.

Rogoff, B. (1999). Cognitive development through social interaction: Vgotsky and Piaget. In P. Murphy (Ed.), *Learners, Learning and Assessment*. London: Open University Press.

Simon, B. (1999). Why no pedagogy in England? In J. Leach and B. Moon (Eds.), *Learners and Pedagogy*. London: Sage Publications.

Stevenson, K. and P. Sander (2002). Medical students are from Mars-business and psychology students are from Venus-University teachers are from Pluto? *Medical Teacher 24*(1), 27–31.

Taylor, P. G. (2000). Changing Expectations: Preparing students for Flexible Learning. *The International Journal of Academic Development 5*(2), 107–115.

Toohey, S. (2000). *Designing Courses for Higher Education*. Buckingham: SRHE and Open University Press.

UCD Centre for Teaching and Learning (2005). Course Design. `http://www.ucd.ie/teaching/good/cou3.htm`

University of Glasgow (2004). Student Centred Learning. `http://www.gla.ac.uk/Otherdepts/TLS/Project/Reports`

# ACTIVE LEARNING — FROM LECTURE THEATRE TO FIELD-WORK

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## Introduction

Much of the literature (Bligh 1998; Gibbs and Jenkins 1992; Ramsden 1992) on active and deep learning – as opposed to passive and surface approaches to learning – suggests that most students do not internalise and cannot understand nor apply learning, unless they are actively involved in it. In the traditional approach to lectures, learning is seen as unproblematic: the lecturer's role is that of expert, the student's that of passive note-taker. The authors find that fieldwork can be an equally passive experience. Activity does not necessarily equate to learning. Fieldwork can simply be a 'lecture in the field'.

The lecture format is highly favoured by institutions. One lecturer teaches many students, and this is seen as cost effective. From analysis of 91 studies by various investigators, Bligh (1998) concludes that the lecture format is appropriate for information dissemination. Butler (1992) accepts that the perceived efficiency of the lecture will result in the continuation of this mode of study, but argues that educationalists must change their use of the lecture time in order to improve student learning, and achieve learning objectives. The lecture must be used in conjunction with other methods and techniques.

Occasionally a great speaker can expound, with very little class interaction, and we can all be motivated and inspired. Although this is teacher-focused transmission (Approach A of Trigwell et al. (1994)), great speakers may be student-focused in the sense that they are aware of passing on enthusiasm – they want to motivate and inspire. In this situation students may be motivated to read and reflect on the subject outside of class. Is this active learning, or 'incitement' to active learning?

Taking mathematical education as an example, Bligh (1998) concludes that the function of the lecture should be to guide students as to how to explore the problems later in private study. Copying equations from the board, two lines behind the lecturer, apart from introducing errors, causes students to experience lack of confidence and despondency. This teacher-focused transmission of information is still commonplace. Students can memorise the symbols of an equation without too much difficulty, but this is not understanding. To understand such an equation you have to read it with a flow of other words and symbols, as part of a whole framework of ideas. This is active learning.

Research in the cognitive sciences indicates that knowledge gained through activity is more useful than knowledge gained through memorisation (Moran 1997). Although teachers are aware of this, teaching methods still encourage and reward rote-learning and algorithmic performance. Why? Teachers may be constructivists at heart, but in the reality of the teaching session they

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act like behaviourists. Practicalities mean that transmission is the most effective way of getting through course content, and the reality of higher education is that many teachers have undeveloped or unexplored theories of teaching and learning.

Behaviourists view the mind as a static receptacle with its limits stamped on from conception. The student listens and should 'get it' if they are good enough. This view, known as eugenics, is very different from the theory of mind being developed by Greenfield (2000). Greenfield has studied the functioning of the brain, and introduces the notion of neuronal plasticity. The important point to note is that Greenfield's work suggests there is an intervening mental process between the stimulus and response. To learn, connections between neurons are made. This raises one dilemma. 'Passive learner' is a contradiction in terms. By definition, learning is an active process, with the student playing a key role. The concern should be about the *level* of activity that takes place. Greenfield says we do not receive signals passively as neuronal connections intercept what is relayed, and 'we see the world in terms of what we have already seen'. So a key implication of Greenfield's work is that 'the understanding of the world will be different for each individual'. Constructivist theories of learning, based on the belief that knowledge is built by the learner, and is not transmitted from the teacher to the student, are supported by Greenfield's work.

Our own view is that we are all born with high learning potential. Some of that potential is developed through experience and stimuli. Much is not developed. We agree with Brown (1997) whose work has provided evidence that problems in children's learning are not related to a mental capacity, but rather to children's inability to make use of what capacity they have. Interestingly Greenfield says 'the more ramifying and multiple the associations, the more meaning or relevance an object will have'. With more associations we can begin to see patterns, and themes, to relate these things into ideas. So as teachers we must help students' 'capacity to learn'. This may involve students learning *how* to learn (Hodson 1998). This suggests that teachers have a role in metacognition, that is, helping the students to understand their own learning.

What do the students think of the lecture format? Given 5 different formats for teaching sessions the students in Butler's experiment decided that the didactic lecture was the least effective. Other formats included students being set tasks and reporting back. In a study by Ross in 1989 (in Bligh 1998) clarity, organisation and student involvement emerged as important stylistic factors for students. However, these studies included only student *perceptions* of what was effective, and student understanding was not assessed. The introduction of performances of understanding (Wiske 1998) would enhance such studies.

In experiments carried out in UCC a short experiential task, introduced towards the end of the lecture is used to encourage communication between pairs or small groups. Natural 'buzz-groups' seem to form. The exercises are designed to encourage active review of notes just taken, and to build concepts. In these experiments the students can ask the teacher any questions they consider relevant. Work has to be handed in before the student leaves the class. Informed by this work, the teacher holds a debriefing of the exercise at the beginning of the next session. Students will usually have appropriate answers, but sometimes all members of a group will demonstrate a misconception. For example, in one session I described sediment as poorly sorted, and later discovered students had written 'pearly-sorted' in their notes. Students relate new information to what they already know, and generate new meaning. What meaning were they constructing in their minds to fit this description? Students may be influenced (or not) in intended or unintended ways. However, students learn through the course not to take the word of someone in the group but to think for themselves. They learn to question their peers, and eventually to produce counter arguments. This is active learning, and leads from peer to independent mode of study and articulation of ideas. This is important for student development. Interestingly this teaching strategy has encouraged greater attendance at lectures, since contributions from non-attendees are not accepted. This teaching method is similar to Bonwell and Eisson (1991) for improving active learning within the lecture format.

We would agree with Butler's conclusions that the traditional didactic lecture can be transformed into an exciting mechanism for fulfilling the objectives of higher education. Butler stresses that it is our duty as facilitators to make the lecture inspiring, exciting, provoking, and an effective

learning mechanism. The benefits of the enhanced lecture as a teaching method are now recognised. Teachers are encouraged to employ a range of teaching methods within the 'lecture'. This provides a greater equality of learning opportunity. Carrying out learning style questionnaires in UCC, and revealing the findings to the students, helps them to be more aware of their own learning, and broaden their strategies. Multiple Intelligences theory (Gardner 1999b;a)is potent in highlighting that students learn in different ways.

In science education a lecture may be linked to some practical activity, and act as a briefing, so that the time for 'activity' focuses on what is important for conceptual development. Procedural skills can be rehearsed so that they do not present a problem to distract from the understanding taking place in, for example, the fieldwork learning time. Claims abound from staff and students, regarding the learning that does take place in practical fieldwork (Sanders 2004). But is this always true? Students enjoy the social dimension of fieldwork but is the learning effective? Questioning students after a day in the field can indicate that their understanding of what they have seen is not high. This often does not match with the claims of the teacher. Field trip leaders often enjoy telling the story! They may pay little attention to what the students know at the end of the session...except that they can tell the same story. The transmission model is certainly alive and well in the geological field trip. We can transfer the learning site, but not necessarily the mindset (Zilbersztain and Gilbert 1981). Undoubtedly some learning takes place, but what is it? How can we release more of the learning potential of practical fieldwork? This natural laboratory should maximise active learning, encouraging communities of learners and creating a collaborative culture (Brown 1997). How can we achieve this?

In a study, one lecturer reported 'Reflection on my own experiences in higher education led me to realise that I learned because I had questions I wanted answered. My curiosity was heightened during some practical activities, but not all. As a first year geology student, on my first field trip, the teacher spoke 'over my head'. I tried to write down everything he said. Only when I was asked to do something did I become an active learner. Key to my learning was small group work, and an assistant teacher who I could communicate with on my level. Now, I recognise the above characteristics in my own students'.

Social constructivists, and socio-culturists believe that we learn by social and communal activities. All agree that learning is an active process of construction of meaning. Meaning is shaped, and knowledge constructed, through discussion with peers and teachers, and through reflection. This social constructivism is observed in groups of mature students, in UCC, who continuously interact with each other as they learn. This demonstrates a link between the constructivist view of learning, and the way we should teach. Teachers must be concerned with knowledge construction, and have well designed activities that appropriately challenge, and draw upon, student's prior learning. Allowing students to develop the narrative, as advocated by Bruner (1996), guided by an expert, is a way of teaching, and appears to work well. The teacher has responsibility for guiding students' development of shared meaning. Vygotsky (1978) introduced the term 'Zone of Proximal Development' to define the gap between the individual's unaided achievement and their potential achievement with the help of a skilled partner. For successful scaffolding, directing students to significant and timely aspects of the task, teachers need to know when to give support and when to withdraw it.

Teachers can engage with students in simple ways initially, taking account of students' existing views and making the subject relevant to encourage engagement. They can introduce new structures into the personal engagement as the need arises (Driver et al. 1994), and have on-going performances of understanding, to find out what the student's know and understand. An interplay of social and personal experience should be fostered in the process of learning. Social interaction and discourse can give effective feedback. This is feedback that learners can give to each other as well as to the teacher.

A diverse group of mature students talked of a lecturer who was 'very good in the field'. In 2001 I had the opportunity to assist in one of his field classes. The lecturer talked for two hours, telling the students the geological history of the area. He pointed out some features, not all of

which were correct. There was no opportunity for the students to question him. However, the students were entertained, impressed with his knowledge, and had enjoyed the experience.

So, what learning went on in this activity? The lecturer did not demonstrate how a question should be formulated in the field, or how he would go about answering it. Acceptance of information by students, without argument, can contribute to learning helplessness. A more inclusive session would have provided students with time to discover evidence and discuss this in groups. This would allow students to pose questions, and to answer some of their own questions. Tobin (2004) calls this a 'co-participation model'. What is the role of the teacher in this situation? Tobin (2004) believes students must be primed to look for certain types of evidence before they will see it for themselves. Students can be shown a plant fossil in sandstone, but must be allowed to discover examples for themselves. Tobin found that when students worked in groups, prior knowledge was shared. Those who understood were able to explain to those that did not. He observed that peer teaching was occurring and 'all students had chances to co-participate in the learning activities'. Increased inclusivity resulted.

During this field class, two experienced teaching assistants were available, but not called on by the leader. Kuhn (1993 in Tobin 2004) sees science as a form of argument. When field assistants are used well, students are able to listen to the discourse between teachers and assistants. If assistants remain silent and are not invited to join in, opportunities to hear the discourse of science are missed.

Practical fieldwork can help students to consolidate knowledge gained during the year in the classroom. It can be used to feel how it is to be a scientist in the real world, and help to develop practical and procedural understanding. In the work place accurate following of procedures are necessary, so for authentic science procedural understanding is important (McGlinn and Roth 1999). This contradicts Hodson (1998) who would like students to have total 'freedom' to be individuals in their investigations. We agree with Hodson that students appear to value cognitive challenge, combined with a handover of control from teacher to student. Practical fieldwork can, if correctly designed, offer these challenges and opportunities for learning, and lead to a deeper understanding –as opposed to shallow learning. It can be an authentic experience. Real scientists observe, discuss, persuade, negotiate, argue, disagree, and agree.

The context of learning is important. In fieldwork there is a unique opportunity to design activities that communicate the nature of science itself. In the geosciences there is rarely only one viewpoint. This is real, authentic, evidence-based science. Getting the right answer should be a lesser goal, since very often the experts disagree, or the answer cannot be proved.

Students learn that science is about thinking, guessing, predicting, measuring, testing, describing, reporting, defending, in appropriate scientific language. Science does not always work, or turn out as you expected. 'Conjuring' is unlikely to take place during fieldwork. It is difficult to rig the investigation. Students feel the work is honest. They do not blame their lack of understanding on poor apparatus. What is there is what is there, and needs explanation. However 'talking your way out of it' (Hodson 1998) is frequently practiced, instead of saying 'how could we go about finding that out?'.

## An example of practice

A field course for first year undergraduate students.

The learning activities form one day of a three-day field course. A carefully sequenced programme of investigative activities has been constructed " the event by which the teacher assists students in learning science" (Leach and Scott 2000). The scientific story develops over the 3 days, with students creating much of the narrative.

***Student Learning Goals***

- *To carry out an investigation in the natural world.*
- *To view rocks as a 3-D physical entity, surface and subsurface.*

- *To increase knowledge and understanding of strategies for scientific inquiry.*
- *To understand the role and status of evidence in scientific knowledge building.*
- *To think, plan and reflect, and oversee own learning.*

***Teacher Learning Goals***

- *To address the learning demand*
- *To encourage student-student communication, as well as student-teacher communication.*
- *To motivate, arouse curiosity, pose questions, be a role model, get students to think about how to answer questions.*

***Learning outcomes:***

- *The student will be able to demonstrate geological understanding by drawing a vertical geological cross-section through the area investigated.*
- *The student will be able to observe and record geological evidence, and discuss and defend their interpretation of evidence.*
- *The student will have experience and understanding of different learning strategies.*

This activity is informed by observation of a previous class, where the transmission method was dominant. The structure of the subsurface was not emphasised. Students were assessed on the day's work, and asked to draw a vertical cross-section. None of the students showed understanding of what was happening beneath the surface, and so failed in this activity. The 'internalisation' concept of Vygotsky (1978) suggests there is a difference between making the story available, and having individual students make sense of the story.

Leach and Scott (2000) identify authoritative discourse (presenting ideas) and dialogic (making meaning) discourse. These can be used to make the story intelligible to the students.

However, to do this the leaders needs to be aware of the existing understanding the students are bringing with them, so that they can develop lines of argument to engage with their existing understanding.

So, the teaching method has been modified to address the perceived 'learning demand'. Learning goals are made explicit, and engaging in dialogue with students is encouraged, to identify areas of confusion. Authoritative discourse is reduced, and more guidance given. The opportunity for dialogic discourse is increased, to allow students to develop their own narrative, and to improve scientific literacy (McGlinn and Roth 1999).

> ***Activity (am)***.
>
> *The Fieldwork leader introduces the activity and briefly reminds students of the purpose and relevance of this activity.*
>
> *Groups: Work in 4s Resources: Expert learning facilitators are available*

An introduction to important aspects of the task requires authoritative discourse. The way the teacher approaches an investigation in the field is part of the authoritative discourse. A balance with dialogic discourse must be achieved.

> ***Instructions to students***
>
> *From a vantage point, look at the rock outcrops on the foreshore. Note the layers of rock stacked one on top of the other. Note the direction of the boundaries between these layers of rock. Make an estimate of this direction, and indicate it on your map.*
>
> *Go down to the foreshore and look closely. Using a handlens, note colour, texture, thickness, and any special characteristics. Record this information systematically in your notebook. Measure dip. Mark this information on your map. Discuss with your group what you think happens to these rock layers beneath the ground, and make a 3-D sketch. (Essentially build a hypothesis you can test). Discuss the economic potential of these rocks?*

Here instructions are a guide, scaffolding, not a recipe to follow. Work is doable, but with some degree of independence. Challenge is at the core of motivational activities. If relevance to society is signposted, it enhances any routine procedural tasks. Asking students 'how would you extract the coal?' has students going through the same mental processes as 'construct a cross-section'.

> ***Activity (pm)***
>
> *Groups: Work in 4s. Resources available: expert learning facilitators.*
>
> ***Instructions to students***
>
> *Currently, in the literature, there are at least 2 differing views on what these rocks represent We want you to investigate and come up with your own view on what the evidence is suggesting. After 30 minutes the whole group will congregate; each group can report a piece of evidence they think is significant.*

The groups try to persuade each other of their case, creating a more authentic learning experience. Teachers act as facilitators of the discussion, guiding it if necessary. Students develop the narrative. This is authentic science.

> ***Activity (evening)***
>
> *Follow-up: Debriefing with students negotiating, defending, discussing, persuading.*

The resources available for this fieldwork are the whole group, the small working group, the teacher, and assistants. Brown (1997) quoting Bruner calls this ' the mix of human beings involved in teaching and learning', a rich resource, uniquely available almost 24 hours a day in the fieldwork environment! Students work in groups and are responsible for their own learning and that of the group. The group reports and defends their findings, citing evidence, to the whole class. Students develop their own narrative and share expertise with their classmates, so that they may all have access to the entire topic. Their investigations lead to performances of consequential tasks, such as debating and defending. This metacognitive environment encourages 'do I understand?' and 'that doesn't make sense!'. In this way Hodson (1998) says 'conceptual understanding is necessarily articulated, tested and challenged', encouraging robust learning. Reflection and discussion are essential and through time become the 'norm' for the group. Over time it becomes second nature to appreciate good questions and to critically evaluate answers that are themselves partially correct and in need of revision. What is important is that the students have good reasons for their interpretations, and can establish a chain of arguments from their current understanding to the interpretation (McNairy 1985; Hodson 1998). Teachers should be open, and willing to accept a student's point of view. Entirely authoritative discourse is not the most effective for learning (Brown 1997). Teachers can then lead the class in setting new learning goals. As the work progresses, the teacher can hand over control, in recognition of the student's increased capabilities for unassisted performance.

A key skill in fieldwork is observation, but the demarcation between objective observation and theoretical inference depends on prior experience. Hodson (1998) points out that 'where particular individuals 'draw the line' depends on their knowledge, level of experience, and familiarity with the phenomena or events being studied.' For example using terms such as bedding, cleavage, and joints all carry with them some prior theoretical framework. We need to be aware (and the students need to be made aware) of the ways in which there own observational skills change and develop as their theoretical understanding becomes more sophisticated. At the end of a field course, a shift in the language employed since the start can be pointed out to students to demonstrate their progress. Hodson (1998) calls this 'the conceptual-linguistic shift that can be readily demonstrated'. Shuell (1990) says 'meaningful, cognitive, learning is an active constructive and cumulative process that occurs gradually over a period of time'. On the residential field course it is possible to introduce key topics 'in a drip-feed fashion' over several days.

We must avoid tasks that promote performance orientation, where maximum marks are gained by reproducing material in exactly the form in which the teacher presented it. These tasks do not

require the student to think very deeply about the material, or to re-order or re-structure any ideas. We see this learning helplessness in the field. If a student does not realise how superficial his/her understanding is, he/she will not take steps to improve it. Positive attitude/inclination of students must be encouraged. Tasks should be a challenge not a threat.

Teachers who promote good habits assist students to become learning orientated. These students will use feedback to progress their understanding and re-double their efforts. Without this attitude students may believe they are unable to surmount negative outcomes. They view failure as predictive of their own potential, and discount any successes ('I'm no good at sketching what I see; I could never imagine structures in 3D'). Can we get the student beyond this conditioned belief system? This can be done by judicious design and selection of learning activities to maximise intrinsic motivation. Learning orientated students who do take steps to restructure in order to personalise their understanding should be rewarded for having done so. Design of field course assessment should take this into account. Self- directed effort should not be wasted as far as tangible reward is concerned?

## Conclusions

In this brief discussion we have questioned the traditional roles of teacher and learner in undergraduate education. We, like others, have concluded that new models of teaching and learning are needed to avoid didactic lectures and passive approaches to learning. All activity does not equate to learning. Undeveloped and unexplored theories of learning in higher education must be addressed so that the potential of the learning environment can be maximised. For the teacher in UCC it can be unsettling to give up the 'power' of the lecturer, and become the facilitator. For the students it can be uncomfortable to take responsibility and control of their own learning. These are still relatively new roles, and constructivism is present more in discourse than in practice. However, experiments in UCC are helping teachers to find ways to transform the lecture theatre into an active learning environment, and analysis of the 'field lecture' indicates that by giving up some 'control' the teacher can facilitate a movement from activity to active learning.

## References

Bligh, D. A. (1998). *What's the use of lectures?* (5 ed.). Exeter: Intellect.

Bonwell, C. C. and J. A. Eisson (1991). *Active learning: creating excitement in the classroom*. ERIC noED340272.

Brown, A. (1997). Transforming Schools into Communities of thinking and learning about serious matters. *American Psychologist 52*(4), 399–413.

Bruner, J. (1996). The Culture of Education. In *Narratives of Science*. Cambridge, Massachusetts: Harvard University Press.

Butler, J. A. (1992). Use of teaching methods within the lecture format. *Medical teaching 14*(1).

Driver, R., H. Asoko, J. Leach, E. Mortimer, and P. Scott (1994). Constructing scientific knowledge in the classroom. *Educational Researcher 23*(7), 5–12.

Gardner, H. (1999a). *Intelligence reframed: multiple intelligences for the 21$^{st}$ century*. New York: Basic Books.

Gardner, H. (1999b). *The disciplined mind: what all students should understand*. New York: Basic Books.

Gibbs, G. and A. Jenkins (1992). *Teaching large classes in Higher Education: how to maintain quality with reduced resources*. London: Kogan Page.

Greenfield, S. (2000). The Child. In *The Private Life of the Brain*. John Wiley and Sons.

Hodson, D. (1998). *Teaching and Learning Science: Towards a personalised approach*. Buckingham: Open University Press.

Leach, J. and P. Scott (2000). Designing and evaluating Science teaching sequences: an approach drawing upon the concept of learning demand and a social constructivist perspective on learning. *Studies in Science Education 38*(115–142).

McGlinn, M. K. and M. W. Roth (1999). Preparing students for competent scientific practice: implications of recent research in science and technology studies. *Educational Researcher 28*(3), 14–24.

McNairy, M. R. (1985). Sciencing: science education for early childhood. *School Science and Mathematics 85*, 383–93.

Moran, A. (1997). *Managing your own learning at University. A practical guide*. University College Dublin Press.

Ramsden, P. (1992). *Learning to teach in Higher Education*. Routledge.

Sanders, M. (2004). Engaging with e-learning in Geography, Earth and Environmental Sciences. *Exchange* (6), 19.

Shuell, T. J. (1990). Phases of meaningful learning. *Review of educational research* (60), 531–547.

Tobin, K. (2004). Cultural perspectives on the teaching and learning of science. In E. Scanlon, P. Murphy, J. Thomas, and E. Whitelegg (Eds.), *Reconsidering Science Learning*, pp. 176–194. London: Routledge.

Trigwell, K., M. Prosser, and P. Taylor (1994). *Qualitative differences in approaches to teaching first year University Science*, Volume 27. Higher Education.

Vygotsky, L. S. (1978). *Mind in Society: The development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

Wiske, M. S. (1998). *Teaching for Understanding : Linking research and practice*. San Francisco: Jossey Bass Publishers.

Zilbersztain, A. and J. Gilbert (1981). Does practice in the laboratory fit the spirit? *Australian Science Teachers Journal 27*, 39–44.

# TEACHING AND LEARNING ACTIVITIES: EXPANDING THE REPERTOIRE TO SUPPORT STUDENT LEARNING

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## Introduction

This chapter reports on the use of a practical exercise to help lecturers to consider expanding the repertoire of activities that they use in their teaching. It sets the discussion within the framework of a particular set of assumptions about the nature of higher education and the characteristics of teaching in a higher education context. It outlines the instrument and the exercises used with participants in the workshops for academic staff from three higher education campuses. It includes observations about the processes that occurred. The chapter concludes by outlining the value of the exercise, suggesting practical ways it can be used at individual and group level, both by lecturers and staff developers, and offering suggestions for further work.

## Context and background

In setting out the rationale for this chapter a number of basic assumptions that create the framework in which it is situated must be stated. The first is to declare some definitions. I declare these as premises. They relate to a definition of teaching, a theoretical paradigm and a view on the nature of the higher education endeavour. This is important to the individual teacher because we work out of our theoretical paradigms, values and definitions, whether they are explicit or implicit.

## A definition of teaching

Ramsden says (Ramsden 1992:5) that "The aim of teaching is simple: it is to make student learning possible." For the purposes of this paper teaching is taken to mean a set of activities that makes learning possible in students. While the aim is simple, the activity is complex because it involves an array of understandings from discipline perspectives to which students are being introduced and in which they are invited to operate. It is not a value free activity but is undertaken within one or more possible paradigms or world views. This paradigm, defined as "an internally consistent orientation from which a conceptual and operational approach to functioning in the world is constructed" (Pearse 1983:158) influences the way it is conducted. Making explicit ones own definitions and paradigm(s) can illuminate the choices made in teaching.

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## A theoretical paradigm

Two such paradigms of teaching are identified and discussed by Kolitch and Dean in their critique of student ratings of instruction in the context of North American higher education (Kolitch and Dean 1999). They describe a "transmission model of teaching" and an "engaged critical model of teaching". They acknowledge that the use of paradigms "to capture the complexity of teaching and learning is widespread" and draw parallels with similar dichotomies in other writings (Barr & Tagg 1995; Trigwell & Prosser, 1996; Kember and Gow, 1994).

The **transmission model** characterizes the activity of teaching as the imparting of knowledge and the activity of learning as the absorbing of knowledge and, writing in 1999, Kolitch and Dean considered that this remained the dominant model in classrooms in North America.

The ***engaged critical model of teaching***, on the other hand, sees teaching and learning more in terms of a dialogue. Students, each with a unique life experience, and the teacher, also with a unique life experience, engage in a mutual and creative dialogue.

While a critical engaged model is often thought of in terms of a social change model of education, one of its defining attributes is its focus on the work of learning, the need for the student to engage with the object of study in order to achieve understanding and create knowledge.

This paper is written from the standpoint of the latter model. It rejects the transmission model as a candidate for dominant paradigm of teaching in higher education but respects it as a tool, among other tools, that can be brought into service when needed. The reasons will be apparent from the assumptions about the nature of higher education set out below.

One of the key benefits of the learning pyramid exercise discussed below is that is allows teachers, to access the models and definitions they are operating through dialogue about very practical teaching and learning activities. This awareness can, in turn, assist them in seeing the value of alternative paradigms as well as broader repertoires of methods and activities.

## The idea of higher education

In a book entitled *The Idea of Higher Education,* Barnett endeavours to outline a theory of higher education (Barnett 1990). He searches thinkers from Plato through Newman to Jaspers finding some important points of continuity in the evolving understanding of higher education and establishes what he describes as "the minimal educational conditions for an educational process to justify the title 'higher education'". These, he says, are logically necessary conditions an institution must fulfil in order to be an institution of higher education. For our purposes they are what define the teaching process in higher education. He says Higher educational processes promote:

1. A deep understanding by the student of some knowledge claims.
2. A radical critique by the same student of those knowledge claims.
3. A developing competence to conduct that critique in the company of others.
4. The student's involvement in determining the shape and direction of that critique (i.e. some form of independent inquiry).
5. The student's self-reflection, with the student developing the capacity critically to evaluate his or her own achievements, knowledge claims and performance.
6. The opportunity for the student to engage in that inquiry in a process of open dialogue and cooperation (freed from unnecessary direction).

While Barnett argues that such a conception of higher education is being undermined from various angles, it remains a working model for thinking about teaching and learning in higher education and investigating ways of enhancing it.

In respect of the transmission model of teaching, it alone would seem inadequate to the challenge of bringing students to the later levels of learning required by Barnett's concepts of higher education, while the engaged critical model may well allow that possibility.

## Teaching and Learning

The first section of the chapter set out the framework and assumptions. Working within this framework of Barnett's criteria, and on the basis that the goal of teaching is to promote student knowledge this section explores the role of teaching in promoting learning. In the context of a discussion about possible links between research and teaching, Lewis Elton offers some helpful insights He distinguishes between learning (verb) and learning (noun) (Elton 2001) and goes on to elaborate on how learning (noun) can be achieved.

> Now, there is a very basic point of learning theory, namely that learning with understanding, so-called 'deep' learning, requires learners to integrate new knowledge with existing knowledge ... . For this to happen, students must be actively involved in the learning process and come – at least in part – to own it. (Elton 2001:19)

Knowledge is achieved through learning (verb), and involves information or content, reflection and dialogue. Teaching is effective if it facilitates learning.

In an interesting paper on professional development in the use of ICT, Littlejohn makes two interesting observations that are applicable more widely than in the ICT context in which they are made (Littlejohn 2002).

The first observation is the identification of three levels at which online learning may operate. These are transmitting information, encouraging reflection and finally dialogue. The parallel is clear; in direct teaching too we need to ensure that these three levels are encompassed. The second insight is that it is a mistake to decide on the medium before we have thought of the message. If the messages are varied, it may be that the media need to be varied too.

While it is not clear that a varied repertoire of teaching methods is a reliable indicator of teaching quality (Coffey and Gibbs 2002), it is probably safe to suggest that different activities are appropriate to different objectives and to different learning styles. In a teaching development context it is certainly worth offering colleagues an opportunity to reflect on the activities they most often incorporate into their teaching and consider their effectiveness for the purposes for which they employ them.

## A wide array of activities

The array of possible teaching and learning activities and methods is extensive. Whether in handbooks on teaching and learning in higher education, in courses, long and short, certificated and otherwise, a wealth of advice is available to the beginning teacher and the experienced practitioner seeking renewal. The volume of material is in itself a problem.

Educational developers often find that simple tools that provide a stimulus for reflection on experience are valuable in helping colleagues to explore their approaches to teaching in order to enhance their practice.

The remainder of the chapter describes a tool for reflection on some of the activities that are included within the term 'learning and teaching activities'. It reports on an exercise used in workshops for staff seeking to improve their teaching. While other activities were included in the workshops, the Learning Pyramid provided a useful image of a comprehensive range of activities and offered a good basis for a practical exercise with groups.

## What is the Learning Pyramid?

The learning pyramid is an image that maps a range of teaching methods and learning activities onto a triangular image in proportion to their effectiveness in promoting student retention of the material taught.

The research base for the pyramid is difficult to establish conclusively. It was developed and used by the National Teaching Laboratory Institute at their Bethel, Maine campus in the early

nineteen sixties, when that organization was part of the National Education Association's Adult Education Division. NTL believes it to be accurate but says that it can no longer trace the original research that supports the numbers. NTL acknowledges that in 1954 a similar pyramid, with slightly different numbers appeared on p. 43 of a book called *Audio-Visual Methods in Teaching*, by the Edgar Dale. The Learning Pyramid seems to have been modified but has always been attributed to NTL Institute. NTL allows free use of the Pyramid and asks for it to be cited as developed by NTL Institute for Applied Behavioral Science, 300 N. Lee Street, Suite 300, Alexandria, VA 22314. 1-800-777-5227.

While there remains a level of discomfort around the use of an instrument with such a tenuous research base, NTL is a reputable organization and is happy to have its name – and reputation – associated with the pyramid. Moreover, it is used as a stimulus for reflection only. In the context of our workshops, its purpose was to promote discussion and analysis, which it did with great success.

The methods included in the pyramid are:

- Lecture
- Demonstration
- Group Discussion
- Practical activity by students
- Use of Audio-Visual aids
- Student Reading
- Student presentations
- Peer tutoring by students

In addition to the research base issue, thought was given to the clarity of the terms used. Coffey and Gibbs have reported difficulty in regard to misinterpretation of terms in the context of their repertoire of teaching methods (Coffey and Gibbs 2002). In the context of a practical exercise in a workshop setting, the clarity issue seemed unlikely to cause problems. Indeed, the generic nature of the items was likely to promote discussion and sharing of experience, a positive benefit in the context.

Finally, in preparing to use the pyramid, there is an issue to be considered in relation to a counter intuitive nature of its layout. We tend to see the pinnacle or apex as the most important. As the pyramid places at the apex the method it holds to be least effective, the reader may experience a certain conceptual dissonance. This proved useful in the workshops because it provoked thought. It looked right according to the transmission paradigm, until the figures were displayed.

Ultimately, in spite of these concerns, the pyramid proved extremely useful as a stimulus for reflection and discussion of teaching methods, their uses and relative effectiveness, when used in teaching development workshops with experienced staff and beginning teachers in higher education institutions in Ireland. It was used in a series of workshops with staff in three institutions in Ireland in the course of 2003 and this report is based on these workshops. The groups brought together staff with varying lengths of experience, from different disciplines, including Humanities, Computer Science and Nursing.

## The Exercise

The exercise was designed for use in developmental workshops and involved three stages. Following an opportunity to reflect individually, participants working in small groups were asked to discuss the relative values of the teaching methods. Prepared cards of equal sizes were used as stimuli. On each card, one item from the pyramid was written, and through their discussion

participants were asked to arrive at a consensus as to the order in which the pyramid should be reconstructed. The groups then shared the reasons for their particular weighting and finally compared whole group consensus with the pyramid as set out in Appendix 1

The primary purpose of the exercise was to support individual reflection on a range of activities that might contribute to their students learning and to consider the effectiveness of these methods in relation to the single dimension of how effectively it might promote retention by learners of the material concerned The group negotiation in the exercise aimed at promoting a discussion of the reasons behind the ranking of particular activities, thus accessing theoretical positions and value judgements which contributed to the deliberations. The theoretical aspect was not cued or signalled in any way at the outset but arose naturally from the work of ranking the items.

## Observations on the exercise

The following observations are of a qualitative nature, reflections on the process of the exercise and a sharing of the experience of the workshops. They are offered as insights from a staff developer's viewpoint that may assist in colleagues own reflection on their teaching and learning support activities and on the theoretical or value positions that underpin their choices.

In each of the groups the exercise was undertaken enthusiastically and the participants debated energetically the relative value of each activity. Through the iterative process moving from individual, through small group to larger group debate, consensus generally moved closer to the model. More important however, was the quality of engagement in the discussions and the openness of participants to learn from the experiences of their colleagues as that experience led to insights into why one method might have more impact than others.

The relative weightings given in the model are set out in Table 1 below.

**Tab. 1:** Relative weightings given to activities in the learning pyramid

| **Activity** | **Average Retention Rate** |
|---|---|
| Lecture | 5 |
| Reading | 10 |
| Audio-Visual | 20 |
| Demonstration | 30 |
| Discussion Group | 50 |
| Practice by doing | 75 |
| Teach others / Immedate use of learning | 90 |

In general, participants rated lecturing as more highly effective than the pyramid, although not as highly as one might expect, given the dominance of the lecture in higher education. Colleagues were well aware of difficulties related to large numbers, attention span and problems with interactivity. An important benefit came from the participants sharing ways of solving these difficulties based on their own practice. Especially fruitful was the interaction of staff with different levels of experience and from extremely diverse disciplines. The experienced participants had practical solutions to contribute and alternative prespectives from diverse subject areas supplied keys to issues for participants.

Unsurprisingly, reading was consistently rated as more highly effective by the participants than in the pyramid. Discussions centred on whether reading was an active learning method, and as such more effective than other methods. The placing of this item felt like an ambush. It may be that in terms of learning styles, academic groups tend to favour the read/write dimension and so were unaware that this preference is not universal. The centrality of the reading list is already being challenged by internet resources, though this material is often text based and so it remains in the reading domain. This appears to be an extremely important issue, especially in the

context of widening participation and diversity of students. It is beyond the scope of this chapter to investigate the issue but it would certainly merit further exploration.

There was also considerable debate about the ordering of 'teaching others ' and 'practice by doing'. Generally, by the conclusion of exercise the consensus was that order given in the pyramid model was correct. An appreciation of the clarity of understanding needed to teach material, the interactivity and feedback from learners, were identified as important factors in arriving at this view. This suggests that teachers need to think about providing opportunities for students to undertake peer tutoring or to give presentations to their peers with greater frequency than is currently the norm.

Participants felt it was an interesting exercise that helped them to reflect on their approaches to teaching and consider whether they might broaden the range of activities they included in the student learning experience. The visual image acted as an important stimulus, with participants seeming to plot their experience onto it as onto a map and then finding ways of extending their territory. Although the activities listed were practical, and the introduction to the exercise offered no cue to a more theoretical discussion, the act of ranking the items as a group led the participants into the areas of values and theory.

The practical nature of the exercise, where participants could physically move the items, discuss the order and change the placement was helpful. It was possible to try things out, see how it looked without committing irrevocably to an answer. The physical movement also played a role as the group members walked round their space and repositioning the cards until consensus was achieved.

The workshop evaluations were extremely positive and participants clearly enjoyed the experience and felt they benefited from it. Benefits included the opportunity to share with colleagues and hear practical suggestions for dealing with specific issues. The creation of networks was also considered helpful as a focus for an ongoing dialogue and mutual support. While these might be true of any developmental workshop, the specific benefit of the learning pyramid exercise was that participants shared knowledge about actual teaching and learning activities in specific contexts. Thus it moved teaching more into the public domain and away from the privacy, often isolation, that can affect teachers and it did this in a manner that linked theory with practice. Perhaps this, above all is what made it so important.

## Conclusions

This chapter is premised on the view that higher education needs to fulfil a particular set of criteria. These criteria have appeared in many guises as institutions adapted to their societal contexts: the version used here – Barnett's – reflects many earlier iterations. These particular criteria centre around knowledge. Teaching in all its diversity serves to promote knowledge in those who learn. In helping students to learn, to inform themselves, to integrate their new knowledge, to engage in critical reflection, evaluation and dialogue, teachers in higher education need to draw on a diversity of activities and methods.

The chapter reports on the use of the learning pyramid in a practical exercise with groups of staff and considers what benefits it offered to participants in understanding their teaching and in expanding their repertoires. In passing, it is probably worth noting that the pyramid exercise itself occupies the three base categories of the structure. Reflecting on observations of the exercise and the in-depth and creative dialogue engaged in by participants, a number of general conclusions are possible.

- Clearly the experience confirms that it is useful to reflect on practice and consider how broad a range of activities are routinely included in the teaching repertoire.
- The practical stimulus offered a useful and safe opportunity to reflect on the potential of various activities in teaching and on opportunities to move beyond a narrow segment of those activities

- The exercise seemed particularly beneficial for experienced staff whose reflection on that experience was helpful both for their own development and for less experienced colleagues.
- It worked well with groups that mixed staff with experience and those with less experience; this situation can often present a challenge to educational developers and so the exercise is particularly useful in these contexts.
- It worked well with groups that mixed staff from backgrounds as diverse as Computer Science, Nursing and Outdoor Pursuits and allowed a creative interchange of ideas. Although not all the elements were relevant to all, the selection was sufficiently comprehensive to facilitate dialogue.
- The terms used in the pyramid were generic, but at the same time sufficiently precise to be recognizable across a wide range of subject specialisms.
- The access the pyramid provided to a grounded dialogue around values, aims and theoretical issues represents a major benefit

Given the positive response of participants to the exercise and the benefits that have been identified, it is worth considering what further work might be undertaken. These include applications to practice and additional investigations that could be undertaken.

In considering implications for individual practice a number of practical applications suggest themselves:

- The pyramid can be used as a stimulus for individual reflection and internal dialogue about teaching and learning. The repertoire of activities can be plotted onto the image, offering an opportunity to assess the strength of that repertoire
- The pyramid can act as a stimulus to reflection on theoretical paradigms, and allow consideration of links between these and practice
- The results of an individual reflection can be written up for a teaching portfolio, and it may be especially useful in this context because of its capacity to link theory and practice – often a difficult issue for practitioners.
- Students may find the analysis interesting: it might well provide an added incentive to students to participate in discussions, presentations and peer tutoring schemes.
- Colleagues working in course teams or on departmental planning groups may find it useful as a support for implementing a varied diet of learning activities for students, especially in more traditional environments.

As regards further investigations, activities to increase our knowledge of the impact of the exercises offer one possibility. In future iterations with other staff groups a more structured approach to the responses of participants would support verification of the findings here. An investigation of impact in the longer term with those groups of staff who engaged in the workshop offers another possibility. A wider study of the range of activities in use among academic staff, based of the pyramid categories is a further possibility. Finally, the role of reading in student learning is undoubtedly an area for investigation.

This chapter has set out with a view about what teaching in higher education seeks to achieve. It has argued that theoretical paradigms, assumptions about, and definitions of teaching influence our practice and the outcomes we, and our students, achieve. It has offered a practical way for individuals and groups to explore their practice and the theoretical models that underpin it so that they can make choices about changing, extending or refocusing their teaching repertoire to achieve their educational aims and support students in achieving their potential.

## References

Barnett, R. (1990). *The Idea of Higher Education*. Buckingham: SRHE and Open University Press.

Coffey, M. and G. Gibbs (2002). Measuring Teachers' Repertoire of Teaching Methods. *Assessment and Evaluation in Higher Education 27*(4), 383–390.

Elton, L. (2001). Teaching in Higher Education: conditions for a positive link [1]. *Teaching in Higher Education 6*(1), 43–56.

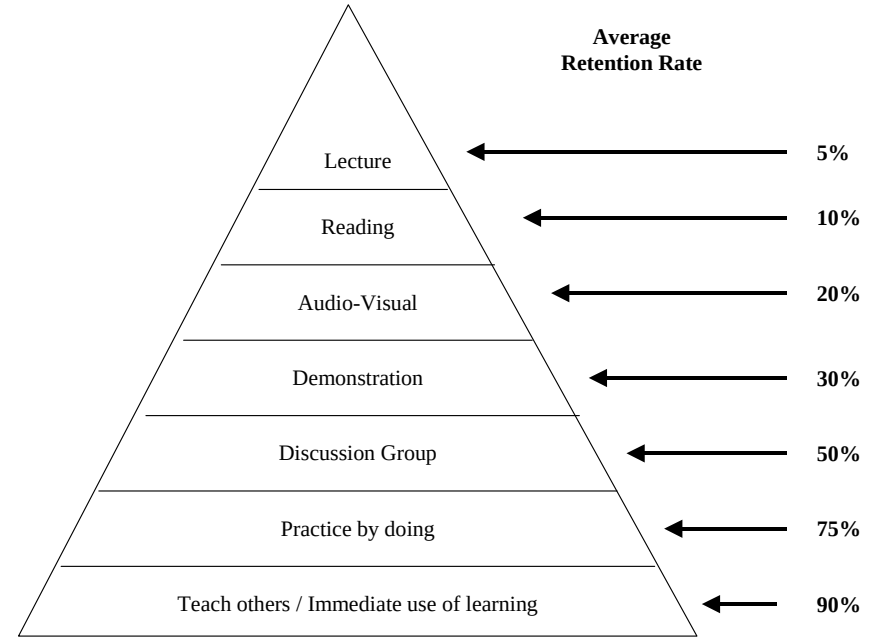
Kolitch, E. and A. V. Dean (1999). Student Ratings of Instruction in the USA: Hidden assumptions and missing conceptions about 'good' teaching. *Studies in Higher Education 24*(1), 27–42.

Littlejohn, A. (2002). Improving continuing professional development in the ise of ICT. *Journal of Computer Assisted Learning 18*, 166–174.

Pearse, H. (1983). Brother can you spare a paradigm? The theory beneath the practice. *Studies in Art Education 24*, 158–163.

Ramsden, P. (1992). *Learning to teach in Higher Education*. Routledge.

## The Learning Pyramid?

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# WHAT IS PROBLEM–BASED LEARNING?

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Problem–based learning has been the one of the most important recent developments in the university education of the professions (Boud and Feletti 1977). It started with medical education in North America and has spread across the globe and across most disciplines. Its potential to develop student learning has not been exploited in higher education (Savin-Baden 2000). Students report that problem–based learning is fun (The Irish Times 2002). So, what is problem–based learning?

This introduction to problem–based learning will give an overview of problem–based learning by answering some of the questions, which I am often asked when facilitating PBL staff development initiatives. It aims to encourage you to explore the idea of using or not using PBL in your teaching. It highlights areas of research you may be interested in considering.

I was course co-ordinator of the Postgraduate Diploma in Third Level Learning and Teaching at the Dublin Institute of Technology. This course was a problem–based learning course. The lecturers became problem–based learners for the year. I have worked as an education developer in a number of universities facilitating academics to plan and implement PBL initiatives. I have worked with staff across a range of disciplines including physics, computer science and speech and language therapy.

Based on my experience as a PBL curriculum designer, programme leader, tutor, education developer, consultant and researcher I will give a brief overview of some questions about PBL.

The following diagram gives you a visual overview of the structure of the chapter

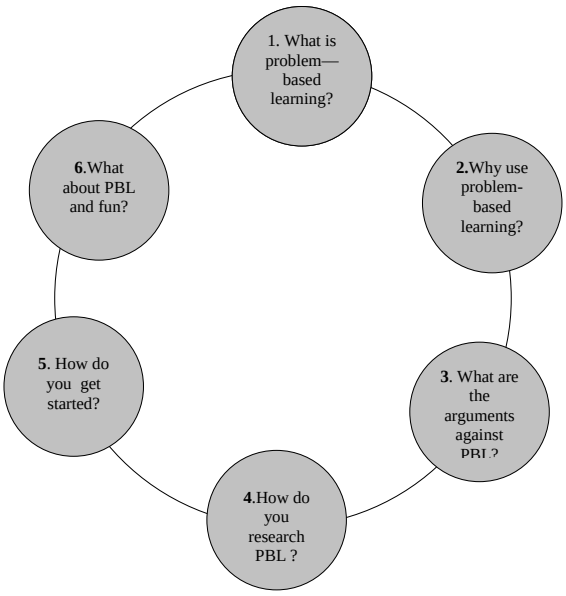


**Fig. 1:** Questions about PBL that will be addressed in this chapter

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

## What is problem–based learning? and What is not problem–based learning?

Barrows defines it as follows:

> The learning that results from the process of working towards the understanding of a resolution of a problem. The problem is encountered ***first*** in the learning process (Barrows and Tamblyn 1980:1 my emphasis)

An operational definition of problem–based learning is as follows:

1. First students are presented with a problem
2. Students discuss the problem in a small group PBL tutorial. They clarify the facts of the case. They define what the problem is. They brainstorm ideas based on the prior knowledge. They identify what they need to learn to work on the problem, what they do not know (learning issues). They reason through the problem. They specify an action plan for working on the problem.
3. Students engage in independent study on their learning issues outside the tutorial. The information sources they draw on include: library, databases, the web and resource people
4. They come back to the PBL tutorial (s) sharing information, peer teaching and working together on the problem
5. They present and discuss their solution to the problem
6. They review what they have learnt from working on the problem. All who participated in the process engage in self, peer and tutor review of the PBL process and each person's contribution to that process.

Problem–based learning is **"Problem".....”based" .....”learning"**. Let us look at each of these words. A **problem** is something that is problematic to the student; something that cannot be resolved with the current level of knowledge and/or way of thinking about the issues. The nature of effective problems in problem–based learning is that they are ill-structured as opposed to well structured. The characteristics of PBL ill-structured problems are that they are real-life and authentic not teacher's exercises, messy not tidy, incomplete in the sense of lacking information needed for their resolution and iterative in the way that they produce further ideas,/hypotheses and learning issues (Barrows 1989; Stephen and Pyke 1977; Margeston 2001). It is vital that the problems are engaging, that they "smell real", are interesting and challenging to students. This engagement stimulates further learning and requires research, elaboration, further analysis and synthesis together with decisions and action plans.

The word "problem" in problem based learning needs to be interrogated. Problems are not always about something that is in difficulty that needs to be sorted out. An ill-structured design brief for an artist or an architect can be a problem. A dilemma for a doctor or a challenge for an engineer can be a problem. Problems are not always how to do something immediately practical in professional practice. Problems can also be about how to understand something. Problems can be presented to students in a variety of formats including: scenarios, puzzles, diagrams, dialogues, quotations, cartoons, e-mails, posters, poems, physical objects, and video-clips

One of the most important points about problems in problem–based learning is that it is not a question that first the students receive inputs of knowledge e.g. lectures, practicals, handouts etc. and then "apply" this knowledge to a problem they are presented with later in the learning process. This type of a situation is nor problem–based learning it is problem solving (Savin-Baden 2000). It is like making a cake when you have already been given the recipe and all the ingredients. One of the defining characteristics of the use of problems in problem–based learning is is that students are deliberately presented with the problem at the start of the learning process.

This is like getting the challenge of preparing a celebratory meal for a special occasion where no recipes or ingredients are given.

Margeston argues that the view of traditional higher education where "bodies of knowledge" have primacy over problems is flawed. He highlights the centrality of **problems** in knowledge acquisition. He asserts that:

1. Students need not only to acquire knowledge- that is the solution to problems- but also understand what the problems are that give rise to the knowledge in question:
2. Students need to gain knowledge, understanding, and experience of how knowledge is gained -essentially, that is the process through which problems are resolved:
3. Problems should be problematic for students, even though for many others (such as teachers, lecturers, researchers, and scholars) who will already have the knowledge constituting solutions to the problems these problems will no longer be problematic.
4. The process of learning itself must model crucial aspects of (1), (2), and (3): effectively, this means that students must pursue their study in a way which requires that they gain a realistic sense of why certain problems are or can be, seen as sufficiently important to justify inquiry into them, of how this enquiry proceeds, and of how to evaluate the knowledge gained through inquiry (Margeston 2001:9)

Starting with problems can be very motivating for students who may not see why they should be interested in inputs of bodies of knowledge but may become very engaged in researching these bodies of knowledge to address the learning issue they have identified themselves from working on the problem. Problem–based learning forces students to name what they need to learn to work on the problem. Some forms of lecturing in contrast have been referred to as the process of answering questions students never asked in the first place.

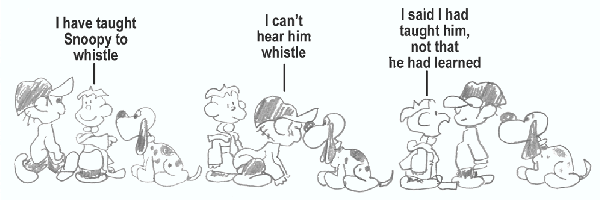


**Fig. 2:** I said that I taught him not that he had learned

Problem–based learning is problem–based **learning** not problem–based teaching. It fits into the learning paradigm not the teaching paradigm and is part of a set of student–centred approaches which are discussed in another chapter. A lecturer using a PBL approach is not concerned with what and how they are teaching. Rather they are observing, looking, listening, stimulating and provoking student learning. The learning of the students is their focus not the teaching of the teacher.

Problem–based learning is **based** on problems, which are discussed in **PBL tutorials** The PBL tutorial is the pivotal discursive site for students working through problems. Research (Barrett 2004c) into the lived experience of students in PBL tutorials suggests that the PBL tutorial as a genre contrasts with traditional committee meetings in that PBL tutorials are more democratic, less hierarchical and having less social distance between participants.

PBL tutorials also contrast with individual research. Individual research was seen in terms of my knowledge and control, whereas the PBL tutorial was seen in terms of our knowledge and control. Two PBL students discuss this issue:

> Philip: Well, my opinion on the idea of the PBL working in groups, if I was working independently I couldn't have been as creative as this group has been. And the number of ideas that were thrown around and developed by the group is very, very, I think it creates a whole new dynamic. Whereas if I work independently I am sure for everyone here, independently, they wouldn't have felt it was as creative a process or as interesting a process, I think.
>
> Betty: I think what that question is more addressing is control as opposed to the standard. As an individual you have control over the start and finish of a product whereas you need to give this up as this is group knowledge and it's a group process, you don't have control over it, what the finished piece is. That is different, .... (Barrett 2004a)

The nature of the dialogue in PBL tutorials is a process by which people together create and recreate knowledge as "true dialogue unites subjects together in the cognition of the object that mediates between them" (Freire 1985:49). Problem–based learning is an active process of accessing prior knowledge, making connections between old and new concepts and using the elaboration of relationships to engage in theory construction (Schmidt 2004). The PBL tutorial is the main discursive site for this elaboration. In PBL the learners are constructing their own knowledge together. PBL thus has a constructivist view of learning as "it suggests that learning results from a learner's actions and instruction plays a role only to the extent that it enables and fosters constructivist activities" (Gijselaers 1966:13). Constructivism is explored further in the chapter on learning theories in this book.

Problem–based learning is **based** on the problem that is reasoned through in the PBL tutorial. However this does not mean that there are not other elements to the curricula, than the PBL tutorial where a team of students are working on a problem. The tutorial is the heart of the PBL around which other curriculum elements (practicals, information seeking skills workshops, etc.) are based and timetabled. It doesn't mean necessarily that there are no lectures in PBL curricula, but they usually take a different format. The fixed resource session is a popular format, which happens after the teams have been working on the problem for a while. Here if the resource person gives a presentation it is short. Most of the time is spent with students asking questions relevant to the problem they are working on and the general subject area with the resource person answering questions. All discuss the emerging issues. Some people use a wrap up lecture at the end of a series of problems to explore the links between different concepts. Research seminars on related topics are integrated into some curricula. Curricula where there is PBL and substantial traditional lectures are referred to as "hybrid".

Problem–based learning is not a mere technique or fashionable fad. It is a total approach to higher education. It involves designing a curriculum whose core is a set of problems. The PBL tutorial is the heart of the process where students and a tutor reason through a problem. Assessment drives learning and therefore it is vital to design assessments that will drive the desired learning, be compatible with the PBL process and match learning outcomes. If you are preoccupied with the spray of the wave you fail to realise its underlying swell, which in the case of PBL is the philosophy of problem–based learning. Discussing the philosophy of PBL encourages us to revisit what we mean be the concepts of "learning " and "teaching " in "higher education ". It bring us back to basic questions like "What is PBL?", "Why are we using PBL?" It provokes us into reviewing the roles of lecturer, PBL tutor, student and librarian, where there is a focus on learning not teaching. There are many ways to explore the philosophy of PBL including reflecting on your practice as a PBL tutor, observing PBL in action in another institution and going to PBL conferences. Interrogating writings on the philosophy of PBL e.g. Margeston (2001), Barrett (2001) can help us to understand more deeply what problem–based learning is and is not. I would also assert that research is a key element in PBL. Curriculum designers and tutors can base their work on the evidence of research. Students can develop research skills through working on problems. Curricula can improve through local evaluation and national/international research

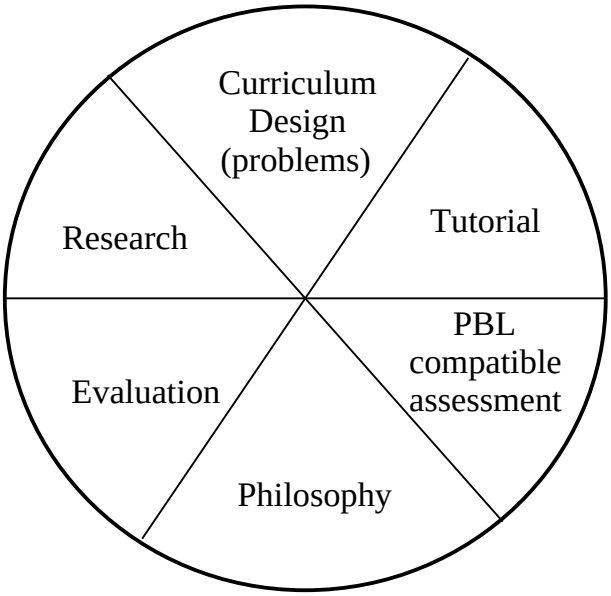


**Fig. 3:** Problem–based learning a total approach to learning: Turning the wheel of PBL

projects. Academics (and students!) can publish not only on specific research topics in their discipline but also on emerging issues of facilitating PBL in their discipline.

The following definition of PBL draws together the points about PBL in the most comprehensive definition of PBL I have come across:

> PBL is both a curriculum and a process. The curriculum consists of carefully selected and designed problems that demand from the learner acquisition of critical knowledge, problem-solving proficiency, self –directed learning strategies and team participation skills. The process replicates the commonly used systematic approach to resolving problems or meeting challenges that are encountered in life and career.
>
> (Maricopa Community College, Center for Learning and Instruction
> `http://www.mcli.dist.maricopa.edu/pbl/info.html`)

However it would be a contradiction in terms not to treat problem–based learning itself as a problem. We all need to continually ask ourselves what is problem–based learning in our contexts, in relation to our students, our disciplines, our cultures, our philosophies and our creativity. Problems and PBL tutorials are essential characteristic of PBL so what are they like in practice?

The exploration of what problem–based learning is will continue by discussing what PBL is in practice. If problems are so important in PBL what does a PBL problem look like? Here is a sample problem This problem was used in a management of sales module in a masters course in marketing

> **The Job of My Dreams**
>
> Mary had been feeling somewhat plateau-ed in her current job as National Accounts Manager in the Irish drinks industry. With an honours B.Sc. in Business Studies, Graduateship of the Marketing Institute of Ireland, and seven years sales experience rising to her present position, she is anxious to prove her worth and potential in next weeks final interview for the post of Marketing and Sales Manager in an existing successful business which intends to move in to the healthcare market.
>
> Specifically the successful applicant is to be responsible for:
>
> - The refinement and execution of the marketing and sales strategy

- The identification, appointment and management of a network of distribution partners for the preventative foot care line in Ireland
- Building, leading and motivating a marketing and sales team as the health care business grows.

(Laura Cuddihy Senior Lecturer, Dublin Institute of Technology)

To see examples of other PBL problems link to www.udel.edu/pbl/problems One of the key roles for academics in PBL is writing high quality problems. Research has shown that the quality of problems affects the interest in the subject matter, the time spent in independent study and the functioning of the tutorial group (Schmidt and Moust 2000). Problem-writing and tutor facilitation are two important roles for academics in PBL curricula. So what does a PBL tutorial look like?

Problem based learning is the learning that takes place when a small group of students (usually 5-8) work together in a PBL tutorial on a real life ill-structured problem. There is usually a student chairperson, scribe and reader of the problem. The role of the PBL tutor is not to teach or give information but rather to facilitate students reasoning through the problem. If the students are using Barrows's model (1989) they may have two shared whiteboards in the room. On one whiteboard they will record a summary of their discussion under the following headings:

| Ideas/ Hypotheses | Facts | Learning issues | Action Plan |
|---|---|---|---|
| | | | |

**Fig. 4:** The shared learning environment of the whiteboard in problem–based learning

Students use another whiteboard/flipchart to record other work on the problem e.g. diagrams or flowcharts. Having given an overview of what problem–based learning is the next issue to explore is the rationale for using problem–based learning

## Why use problem–based learning?

Problem–based learning is introduced and continued for many reasons including:

1. Acquiring subject matter knowledge
2. Motivating students to learn
3. Helping student retention
4. Developing students thinking skills
5. Developing students key skills relevant to employment e.g. interpersonal communication skills, information seeking skills and presentation skills
6. Fostering professional competence and confidence together with professional identity
7. Mirroring the interdisciplinary team process graduates will be using in work and research
8. Facilitating students learning how to learn
9. Encouraging students to integrate knowledge from different subjects, disciplines and sources
10. Linking theory and practice
11. Having a sense of belonging and friendship

12. Having fun
13. Expressing in operational form a philosophy of learning that is student-centred and problem-focused
14. Responding to research evidence on the benefits of PBL
15. Increasing competitiveness in the higher education market
16. Producing graduates that can hit the floor running at work after graduation

These are some of the positive reasons for using PBL but a balanced view must also look at the arguments against PBL.

## What about the arguments against PBL?

A meta-analysis of medical students in PBL curricula and traditional curricula (Norman and Schmidt 1993) indicates that the retention of knowledge over a long period was increased and the transfer of concepts into clinical situations was enhanced for the PBL students. In addition self-directed study skills improved for the PBL students. However in the same study traditional methods of education produced higher scores on knowledge of basic sciences than problem–based learning methods. So there are some things that PBL is more effective for and other things that traditional methods are more effective for.

Another argument against PBL is that it can be very difficult to change to PBL when some or most of the students and /or staff are products of didactic teaching methods (Walton and Mathews 1989). Trigger and Prosser (1996) compared approaches to teaching and conceptions of teaching in their 24 teachers of courses in first year chemistry and physics. They found that teachers who had a particular conception of teaching tended to adopt a commensurate approach to teaching. The teachers with a student centred and learning oriented conception of teaching tended to adopt a commensurate approach to teaching. So the argument is that if you want teachers to adopt a student-focused approach to teaching such as PBL, you need to ensure that they have a commensurate conception of teaching. If this is not already present a short staff development programme will not be sufficient, but substantial appropriate staff development is needed to work at this level of attitudes, not just at the level of hints and tips about PBL. Also an effective student induction programme needs to be designed to introduce students to PBL. For any school of a university changing to PBL is a major change management initiative. Jarvis et al. (2001:118) stresses that this is not to be underestimated:

> Such an approach makes demands of the organisation of educational institutions and on curriculum planning. Within universities, colleges and schools for instance, authority must shift away from disciplines toward inter-disciplinary or multi-disciplinary groupings of staff. But curricula still need to be designed, and students' educational progression monitored. Structures (committees, working groups and the like) are necessary for this.

For problem–based learning to be successful you need some enthusiastic lecturers,, management support and an effective working group. Sometimes this can prove to be difficult and hard work. Having considered some of the arguments for and against PBL you can engage in your own research about PBL.

## How do you research PBL?

For getting introductory information about PBL generally and your discipline in particular, I would recommend three websites; www.adelaide.edu.au/ltdu/leap, www.udel.edu/pbl/, and www.hss.coventry.ac.uk/pbl/ . In terms of books I would suggest the following two for an

overview; Boud and Feletti (1977) *The Challenge of Problem–based Learning* and Savin-Baden (2003) *Facilitating Problem–based Learning: Illuminative perspectives*. If you are doing a search for research papers about specific aspects of PBL or about PBL in your discipline the following three databases PBL Clearinghouse, Academic Search Premier and Eric are among the many useful ones. An interesting collection of research papers on PBL can be found in Savin-Baden and Wilkie (2004) *Challenging Research into Problem–based Learning*. If you want to discuss PBL with others JISC PBL Mailing List[1] is useful.

When I was talking to Helen Fallon about her chapter I highlighted that two of the most useful resources I have found were other people and bibliographies of PBL. The people that really helped were other academics who are implementing and/or researching PBL, international contacts, PBL consultants, librarians, and PBL students who are refreshingly honest about their experiences of PBL. Getting information about PBL is part of the process of starting a PBL initiative. For further information see the chapter in this book entitled "Finding information for your teaching and research work in teaching and learning".

## How do you get started?

In addition to gathering information, strategies academics have found effective include attending staff development workshops in their own institution or at a major PBL university such as Maastericht or MacMaster, visiting a university that is implementing PBL in a particular discipline and working with an internal/external PBL consultant to plan, implement and evaluate a specific PBL initiative. When starting a PBL initiative it is very important to be aware of the success factors that are well documented in the literature and to make plans using this awareness.

Implementing PBL is introducing major curriculum change. Research indicates that the success factors in PBL include:

- An understanding of the philosophy of PBL
- A commitment to the philosophy of PBL
- High quality problems
- A major acceptance of the role change
- An ability to model process skills
- Assessment compatible with PBL
- Substantial appropriate staff development
- A pragmatic and realistic approach
- Institutional and management support

(Little in Boud and Feletti 1977; Murray and Savin-Baden 2000; Schmidt and Moust 2000).

Whether a PBL initiative is starting with one module or a whole course it is important to be mindful of these success factors. The opposite factors are barriers to implementing PBL. That sounds like a lot of work and it is in the first years. However there is fun in PBL too!

## What about PBL and fun?

As effective PBL problems are personally and socially engaging, PBL can be fun for students and tutors. The following is a quote about a PBL first year physics course at the Dublin Institute of Technology: "The students have already judged PBL: "It's not so boring. It's fun. It's easier to

[1] `http://www.jiscmail.ac.uk/lists/pbl.html`

learn." (The Irish Times 2002) Who said learning couldn't be fun? Who said learning has to be always heavy?

I view PBL as "**hard fun"** (Papert 1996). I would argue that the fun in PBL is not a superficial or frivolous fun or a gimmicky by-product of doing PBL. Rather PBL is **fun because it is hard** as it presents students with a problem that they cannot solve with their current level of knowledge and/or way of thinking.

Play can be viewed, not as something separate from work and learning but as a media for both. Kane (2004) explains that play is about engagement and that the Indo-European root behind the old English *plegian* is found in Celtic, German, Slavic *dtegh* meaning to engage oneself. If PBL problems are well written to be engaging for students they will enjoy playing with them. I agree with Feyerabend (1999) about the importance of initial playful activity with ideas in moving towards understanding.

## Concluding comments

Some academics adopt PBL because it corresponds to their own philosophical and epistemological stances. For others, adopting PBL has meant a shift in their beliefs about how we learn. I would like to finish with a poem that a team of lecturers who became problem–based learners for a PBL staff development module wrote, which was part of a paper about lecturers as problem–based learners (Barrett 2004b). They are talking about how their thinking about learning has changed. Each student wrote one or more verses. There was great laughter, energy and fun when they did a team presentation of this poem. I hope you enjoy it!

**I used to believe . . . and then I learned some more**

I used to believe
that I was the lead, and what the students need was to follow
and then I learned some more.

I used to believe
that my teaching style gave cause to smile
and I enjoyed my delivery style
and then I learned some more

I used to believe that students learned according to my notes
would give me cause to gloat
and then I learned some more.

I used to believe
that students will always be bright and white
and all would be enabled and not disabled
and then I learned some more.

I used to believe
that the knowledge learnt in college
gave lifelong sources for my courses
and then I learned some more

I used to believe with all my might and height [she is short]
I could shelter students from the mess of real life
and .then I learned some more.

I used to believe
that I'd be beholden

to the curriculum of olden
and then I learned some more

I used to believe
that there were new learning and teaching methodology
and they were a load of codology
and then I learned some more.

I used to believe
that talk of process
was all hocus-pocus
and then I learned some more.

I used to believe
that their workload was vicious
and that their assessment was not pernicious
and then I learned some more.

I used to believe that education of the visceral should be peripheral
and stirring emotion would cause commotion
and then I learned some more.

I used to believe
that the role of assessor was not an oppressor
that lecturers grades need not to be explained
and then I learned some more

I used to believe
that you can start new courses
with promises of resources
and then I learned some more

I used to believe
that Heads where there to fear
I'd better watch out and steer well clear
and then I learned some more.

Now we are going to ask for ear
Its time we got everything out in the clear.

I argue that problem–based learning puts problems, challenges, creativity and fun into learning. It provokes us in to revisiting our conceptions of both learning and teaching in higher education. But what about you, what are the questions you are now asking about PBL? What are your learning issues, the questions you want to know more about?

## Online resources

## Websites

Coventry website. Very good list of resources including: web resources, books, research papers , PBL consultants and PBL conferences. `http://www.hss.coventry.ac.uk/pbl/`

McMaster University where PBL began. `http://www-fhs.mcmaster.ca/mhsi/problem-.htm`

PBL Clearinghouse. http://www.mis4.udel.edu/Pbl/index.jsp

University of Adelaide's Advisory Centre for University Education: hosts the 'Leap into PBL' website. http://www.adelaide.edu.au/ltdu/leap This is a very informative site and is a good staring point for lecturers who are new to PBL and are considering implementing it.

University of Delaware site on PBL: Comprehensive introduction to PBL with lots of sample problems. http://www.udel.edu/pbl/

University of Maastricht: A European Centre for PBL. http://www.unimaas.nl/pbl/mission/mission001.htm Runs staff development workshops and producing a range of resources including videos.

## Discussion List

JISC PBL Mailing List. New members can join by visiting the following website: http://www.jiscmail.ac.uk/cgi-bin/wa.exe?SUBED1=pbl&A=1

## Databases (available on subscription in libraries)

Academic Services Premier. ERIC.

## Recommended Books

Boud, D. and G. Feletti (1977). *The Challenge of Problem-based learning*. London: Kogan Page.

Savin-Baden, M. (2003). *Facilitating Problem-based Learning: Illuminative perspectives*. Buckingham: Open University Press.

Savin-Baden, M. and K. Wilkie (2004). *Challenging Research into Problem-based learning*. Buckingham: Open University Press.

## Other References

Barrett, T. (2001). Philosophical Principles for Problem-based Learning: Freire's concepts of personal development and social empowerment. In L. P. and K. P. (Eds.), *The Power of Problem-based Learning. Refereed proceedings of the 3$^{rd}$ Asia Pacific Conference on PBl*, 9–12 December, Callaghan, Australia. PROBLARC.

Barrett, T. (2004a). My knowledge and my control versus Our knowledge and Our control: Lecturers as problem-based learners talking about the PBL tutorial. In *Problem-Based Learning 2004: A Quality experience?* 15–17 September The University of Salford.

Barrett, T. (2004b). Poetry and Fun; The Discourse of Learning in a PBL staff development module. In *Mapping the Landscape of Higher Education in Ireland. AISHE Inaugural Conference*. 2$^{nd}$ and 3$^{rd}$ September Trinity College Dublin.

Barrett, T. (2004c). Researching the dialogue of PBL tutorials: a critical discourse analysis approach. In M. Savin-Baden and K. Wilkie (Eds.), *Challenging Research into Problem-based learning*. Buckingham: Open University Press.

Barrows, H. (1989). *The Tutorial Process*. Springfield, Illinois: Southern Illinois University School of Medicine.

Barrows, H. and R. Tamblyn (1980). *Problem-based Learning: An Approach to Medical Education*. New York, NY: Springer Pub Co.

Boud, D. and G. Feletti (1977). Changing-problem learning. Introduction to the Second Edition. In D. Boud and G. Feletti (Eds.), *The Challenge of Problem-based learning*. London: Kogan Page.

Feyerabend, P. (1999). *The Conquest of Abundance: A tale of Abstraction versus the Richness of Being*. Chicago: The University of Chicago Press.

Freire, P. (1985). *The Politics of Education*. London: MacMillan Publishers Ltd.

Gijselaers, W. (1966). Connecting Problem-based Practices with Educational Theory. *New Directions for Teaching and Learning* (68 Winter), 13–21.

Jarvis, P., J. Holford, and C. Griffin (2001). *The Theory and Practice of Learning*. London: Kogan Page.

Kane, P. (2004). *The Play Ethic : A Manifesto for a Different Way of Living*. London: Macmillan.

Margeston, D. (2001, 29 September). Can all education be problem-based: can it afford not to be? Problem-based Learning Forum, Hong Kong Centre for Problem-Based Learning.

Murray, I. and M. Savin-Baden (2000). Staff Development in Problem–based learning. *Teaching in Higher Education 5*(1), 107–126.

Norman, G. and H. Schmidt (1993). Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine* (68), 557–565.

Papert, S. (1996). *The Connected Family : Bridging the digital generation gap*. Atlanta, Georgia: Longstreet Press.

Savin-Baden, M. (2000). *Problem-based Learning in Higher Education: Untold Stories*. Buckingham: SRHE and Open University.

Schmidt, H. (2004, 15-17 September). The Current State of Problem-based Learning. Problem-Based Learning 2004: A Quality experience? The University of Salford.

Schmidt, H. and J. Moust (2000). Factors Affecting Small-Group Tutorial Learning : A Review of Research. In *Problem-based Learning : a Research Perspective on Learning Interactions*. London: Lawrence Erlbaum Associates Publishers.

Stephen, W. and S. Pyke (1977). Designing Problem-based Learning Units. *Journal for the Education of the Gifted 20*(4), 380–400.

The Irish Times (2002, April 23rd). Education and Living. 15.

Trigger, K. and M. Prosser (1996). Congruence between intention and strategy in university science teachers' approaches to teaching. *Higher Education 32*, 77–87.

Walton, H. and M. Mathews (1989). Essentials of problem-based learning. *Medical Education 23*, 542–558.

# PUTTING THE LEARNING BACK INTO LEARNING TECHNOLOGY

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## Abstract

The story of technology and teaching in higher education has generally been one of successive false dawns. Each major technological advance has been ritually hailed as heralding a revolution in either the quality or cost of education (or both). Large sums of money have been expended on foot of such predictions - but, in each case, the long term impact has been found to be, at best, modest (at worst, actually negative). The application of Internet technologies in education has followed this pattern quite consistently - from hyperbolic claim, through commitment of sometimes extraordinary amounts of resource (admittedly, in this case, at the irrational height of "dot.com" fever), to both public and not-so-public failure to deliver any recognisable revolution ("no significant difference" - again). So what might we learn from this? A common factor, already recognised in earlier iterations, seems to be preoccupation with technology per se, and neglect of pedagogical theory. Indeed, many recent innovations, though technologically dazzling, seem to have been premised on the most naive and primitive theories of knowledge and learning. Yet beneath the technological hype and dazzle, the Internet may yet have something genuinely profound to bring to education. From a social constructionist view of learning (and teaching) there are signs of a slower, quieter - and much cheaper - Internet revolution, under such unlikely rallying cries as "open content", "wikiwiki", "blogging" and "moodling". In this paper we will review these developments, relate them to each other and to theoretical foundations, and finally risk some continuing optimism about the ultimate role of the Internet in enhancing higher education.

## Introduction

Over the past half century or more, there have been repeated claims that a new technological innovation will dramatically alter and enhance the learning process. By turns, radio, television, video tape, interactive video disk, computer based training, and no doubt many others, have all been ritually hailed as revolutionary contributions which will radically transform the practice and *effectiveness* of teaching and learning. By 1992, Ramsden was ready to summarise the resultant experiences, briefly but accurately:

> Computers and video in higher education have so far rarely lived up to the promises made for them ... No medium, however useful, can solve fundamental educational problems. (Ramsden 1992:159–161)

Then came the Internet and World Wide Web. "eLearning" became the next great thing, and technology was poised, again, to radically change the way people learn. Governments, companies, educational institutions (both ancient and modern) were all equally dazzled by the promise

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

of vast new revenues - and the threat that somebody else might get them first! Partnerships formed, projects were launched, veritable armies of programmers, "content designers", "subject experts" were all put to work.

Of course, it couldn't last. The Internet "boom" turned out to be an Internet "bubble" - and duly burst.

Though eLearning was not, after all, a panacea, it has nonetheless shaken things up. Ramsden was right in observing that technology in inself is unlikely to solve "fundamental educational problems", but it might still allow us to see them in a new light.

My fundamental premise is that there has been at least one consistent and repeated motif in the (so far) failed promises of successive waves of learning technologies: namely that they have been driven by technology rather than by learning. I start with a general statement of pedagogical commitment: to the view that learning, especially "higher order" learning, is at once personal, social and constructivist. Knowledge cannot be "transmitted" (electronically or otherwise!), but must be constructed anew. Yet this constructive process can be greatly facilitated, especially by social interaction - with teachers and with other learners. This is the pedagogy of *social constructivism* . I will not elaborate the theory itself here - it is treated extensively elsewhere in this collection, and especially in Carlile and Jordan (2005) and Higgs and McCarthy (2005). My task here assumes this theory as a starting point, and uses it as a "searchlight" on the technological landscape.

My contribution will then be the modest one of presenting a selection of just four recent technological innovations which, it seems to me, have significant potential to support and enhance social constructivist learning. The first three are generic, and not specifically designed for educational use, but I suggest that they can nonetheless be effectively co-opted for this purpose. The last (moodle) serves, in part, to do just that - to package and tailor generic innovations and place them easily in the hands of teachers and learners; but it also goes further in its own right, as we shall see.

In conclusion, I will take the risk of once again being optimistic about the potential of technology to enhance learning: not in itself, but as an instrument of pedagogical change.

## Open Content/Free Culture?

### What is it?

One of earliest Internet facilities was the development of so-called "anonymous ftp servers" - the precursors of modern Web sites - where electronic documents could be made available for download to any computer with an Internet connection. These were quickly adopted as a mechanism for academics (then the primary users of the Internet) to share their scholarly work. In some ways, this was merely a new form of a long-standing academic tradition - namely, the free exchange of "preprints" and "offprints". Yet it also marked a radical change, in that access was now much faster (reduced from weeks to minutes), and a much wider diversity of materials became readily available to anyone with an interest.

The World Wide Web was originally born as an enhanced version of this facility (Berners-Lee 1996)[1], and was still largely directed at the same specific purpose of facilitating exchange of scholarly work. It introduced several new features, but, perhaps most critically, the idea of "hypertext" linkage - direct electronic links between networked documents. At one level this was merely a more efficient version of the traditional academic devices of cross-referencing and citation. But, at another level, it permitted the spontaneous, bottom-up, emergence of a global network of densely interconnected digital resources, which was easily and freely browsable, indexable and searchable.

Of course, the Web rapidly transcended these beginnings in academic practice. It is now a primary medium for public discourse, for trading of goods and services, for government and political activism, and for a myriad of other new forms of human communication and interaction.

[1] `http://www.w3.org/People/Berners-Lee/1996/ppf.html`

But it is worth emphasizing here that this dramatic innovation, which appears overtly *technological*, has been parasitic upon a much older *cultural* innovation, namely the tradition of "open" content and the "free" exchange of human ideas. The Web, as we now know it, simply could not have arisen in what Lawrence Lessig has called a "permission culture"[2]: a culture in which, before accessing any particular knowledge or idea, one would have to somehow negotiate, individually and repeatedly, specific terms - rights, permissions, charges - to enable that access.

## What has this got to do with *learning*?

At a basic level, it is clear that learning - in the sense of academic, reflective, "higher order" learning - absolutely requires access to learning "resources", such as books, journals, abstracts, commentaries, annotations etc. Indeed, a traditional mark of the quality or stature of a university institution was precisely the size and scope of its "learning object repository" - that is to say, its *library* . The web has radically altered this by making it possible, in principle at least, for students anywhere to access a shared global repository of learning resources - a repository which *could* far exceed the holdings of any traditional library. But the realization of this potential depends, in turn, on:

- the original *creation* of such content;
- its (open) *publication* on the web;
- and its *location* or *identification* by relevant learners.

I have already noted that the very origin of the Web was as a device for the sharing of original scholarly content. Even as the Web has exploded and diversified into popular or mainsteam culture, this original usage has still been steadily, if more quietly, thriving. Many academics continue to use personal web sites to informally publish preprints (or, indeed, much larger bodies of work)[3], but there has also been a sustained growth in more systematic and larger scale initiatives. This includes the now global network of scholarly "eprint archives" which are indexed and searchable through the Open Archives initiative[4], and the emergence of peer-reviewed, but open access, online electronic journals, such as First Monday[5], BioMed Central[6] and others. Moreover, a large number of "classic" texts (where copyright has expired) have been republished on the Web (e.g. Project Gutenberg[7]); and it is progressively becoming normal practice for all "public sector" documents, reports and resources to be freely published through the web ( e.g., all new, and much historical, Irish legislation is now available online[8]).

These resources are certainly of some educational value, but they are generally what would be traditionally described as "primary sources"—which are not regarded as most suitable or effective for the purposes of *learners* . Rather, at least for "established" domains of knowledge, one generally expects learners to engage first with "secondary" treatments, which have been specifically organized, designed and distilled to facilitate learning. It is useful here to distinguish at least two categories of such overtly "educational" resource:

- lecture notes/commentary/critique;
- textbooks (and/or its digital equivalent, known as "courseware").

Roughly speaking, "lecture notes" and similar materials, are relatively informal resources, specifically tailored to suit some local need - one specific course or class - and usually authored

[2] http://free-culture.org/
[3] http://www.williamcalvin.com/
[4] http://www.openarchives.org/
[5] http://www.firstmonday.org/
[6] http://www.biomedcentral.com/
[7] http://www.gutenberg.org/
[8] http://www.irishstatutebook.ie/

by the individual academic/teacher responsible for that class. They might typically select, summarize, and critique a range of more comprehensive or generic resources - primary sources, textbooks, etc. The provision of such resources is a long standing academic practice; but the Web has also brought significant changes and new opportunities:

- From the early days of the Web, individual teachers have used personal web sites (and, latterly, "virtual learning environments") as a convenient mechanism for disseminating these resources. This has rather modest (if any) pedagogical significance in itself; but to the extent that it streamlines or reduces the administrative burden on teachers, it correspondingly increases their ability to invest more effort in teaching.

- Much more significantly, the growing availability of pedagogically useful and relevant resources on the Web, means that "lecture notes" can increasingly be structured in the form of *hypertext commentary* or annotation. This can be particularly efficient to create, and allows for highly selective and targeted linkage to primary sources, with immediate and seamless access by learners. This was much more difficult, in not impossible, in traditional media. A local library was unlikely to stock the necessary range or quantity of holdings. This was commonly compensated for by the practice of aggregating selected extracts in "reading packs" for students; but the burden of evaluating and/or clearing copyright for such packs has become progressively much more onerous. Of course, the Web based alternative therefore *relies* on referencing Web content which is either public domain or explicitly licenced for open use (e.g., via Creative Commons[9] or Free for Education[10] licences); but, as already described, there is a growing body of at least *primary* resources, in many domains, which are indeed free to use in this way.

Of course, if lecture notes are structured as hypertext overlay on primary sources, they must themselves be authored and disseminated in a suitable online format; this is potentially a significant technological barrier, to which I will return in subsequent sections.

In any case, between primary sources on the one hand, and lecture notes on the other, fall the traditional educational resources of textbooks and courseware. These still exist, of course; but have not generally migrated into online, *open access,* forms. Traditional publishers are still experimenting with effective "business models" for online publishing. The Internet has raised difficult and complex issues here, which extend far beyond textbook publishing, raising fundamental questions about the nature of "intellectual property" in the digital age. Exploring these further is beyond my scope here, but I shall suggest avenues for further exploration in the conclusion.

## wikiwiki, wikipedia

## What is it?

"Wiki" (from the Hawawian "wikiwiki" meaning "quickly") is a generic name for a family of Web based collaborative authoring systems. Wiki based web pages are usually immediately recognizable by the appearance of a button or link labelled "edit this page". For many users, when they first encounter it, this seems disconcerting, if not unbelievable, as it is so different from the typical "read only" or "consumption" model of using the web. Nonetheless, it is a serious and meaningful invitation for readers to immediately and freely modify the content - deleting, revising, annotating or augmenting, as they see fit.

Of course, some controls are necessary. The details vary between implementations. While some wiki systems are completely public, even permitting page editing by unidentified or "anonymous" users, others require at least some form of user registration before editing, and others again may be limited to closed groups of pre-authorized users. Perhaps more importantly, wikis now

[9] `http://creativecommons.org/`
[10] `http://www.aesharenet.com.au/FfE/`

generally have facilities to record and track modifications and - if necessary - allow them to be easily reversed. If appropriate, specific modifications can also be associated with the particular person who carries them out; this can be useful *even* in systems allowing anonymous editing, where those users who *want* to be identified (or credited!) with a particular contribution can still do so. Mechanisms are also necessary for reconciling or resolving conflicting "concurrent" modifications of the same page by different users. A final, and critical, feature is that wikis incorporate "notification" or "alert" facilities, whereby users can elect to receive (by email or otherwise) automatic reports when certain kinds of change are made (e.g., when certain articles are modified, or when new articles are created in certain topic areas etc.). This allows users to very efficiently monitor, and respond to, each other's interventions - which is of the essence of effective collaboration.

At face value, it may seem like a wiki is simply a form of Web-based "Content Management System" (CMS). Yet, although there is much conceptual overlap, wikis are quite distinctive, both technologically and culturally (and the two are intertwined).

Technologically, wikis are much more lightweight compared to typical CMS systems. Firstly, they make absolutely minimal demands on the user or "client side" computer system. The user is not required to install any special software or plugin: a quite basic Web browser (which, virtually by definition, any prospective user already has available) is all that is required. Secondly, all users of a given wiki are *required* to rely on "plain text" editing, within simple browser forms; but where this "plain text" is enriched with a very simple and intuitive "mark up" to indicate common textual structures such as emphasis, headings, lists, and most importantly, hypertext links. This is in contrast to systems which either require all users to install (and master) some more or less complex new authoring tools; *or* permit users to rely on their own idiosyncratic tools, but then somehow have to reconcile the resulting zoo of incompatible and conflicting document formats. Finally - and implicit in the above - wikis are specifically tailored and optimized for authoring *Web-based* materials, where the primary usage mode is reading from screen; whereas CMS systems are still typically oriented to authoring "typeset" materials whose primary usage mode is reading from paper. The two are subtly, but significantly, different.

These technological characteristics of wikis then give rise to a distinctive culture of usage. The "barriers" to entry are extremely low. Almost any web browser will work. One needs to familiarize oneself with the wiki "mark up" (which may vary somewhat from one wiki to another), but because this is kept simple and intuitive, most users can begin editing wiki pages within 5-10 minutes of first being introduced to them. The consequence is that a user's focus and effort is quickly applied to the editing or authoring task, rather than to overcoming technological obstacles or learning complex new tools.

## An example: the strange case of the *wikipedia* ...

Perhaps the best known example of a public wiki is the wikipedia[11]. This is, in effect, a collaboratively authored, Web-based, encylopedia. By definition, it is dynamic, and continuously changing; but in the space of only four years since its inception, and relying entirely on voluntary effort in contributing (and, of course, revising) its content, it has already grown to have over 470,000 articles, covering a very wide variety of subject areas. In contrast to a conventional, centrally edited and directed, encylopedia, the development of wikipedia is organic and driven by the diverse interests and skills of whoever happens to contribute to it. This means that both breadth and depth of coverage is highly variable; but that is not *necessarily* a disadvantage, as it allows a very flexible and adaptive development process.

For example, the original, English language, version of wikipedia has already diversified to support translations into a wide, and growing, variety of other languages. Uniquely, these include minority languages, such as Irish. It would be almost unthinkable that a "mainstream" encylopedia would be translated into Irish, as it would imply an impractical commitment both to be complete and to be maintained up-to-date. By contrast, the wikipedia - because of its dynamic

[11] `http://www.wikipedia.org/`

and flexible (or chaotic?) development model, implies no automatic commitments either to completeness or currency; which therefore permits incremental and continuous improvement. No doubt, the Irish version of wikipedia will never be as complete or current as the English version; but for those users who need it, it will be much better than having no Irish language encylopedia at all! Moreover, the Irish wikipedia will probably evolve to contain the primary or definitive versions of articles in certain specific topic areas. Of course, *mutatis mutandis*, similar comments could be made for other language versions of wikipedia.

A common reaction of many people, on first encountering wikipedia, is to respond that surely, if there is an editing "free for all", the *quality* of the articles must therefore be completely unreliable; whereas the very notion of a traditional "encyclopedia" is that it should be *authoritative*. This is a very interesting critique, and probably deserves an entire article in its own right.[12] In brief, however, there are both theoretical reasons, and sound empirical evidence, that the wikipedia model can and does yield very high quality materials - no matter how counter-intuitive this may seem. The theoretical basis is essentially the core academic premise of *peer review*; wiki technology, combined with potentially global communities of peers, allows the most extreme and immediate form of such review. The empirical evidence is an experiment in which a number of wikipedia articles were deliberated corrupted, introducing a variety of errors, ranging from gross to subtle[13]. In all cases these were corrected "... within a couple of hours", revealing an extraordinary capacity for self-repair – which no conventional, centrally controlled, encyclopedia can possibly deliver.

## What has this got to do with *learning*?

The emergence of wiki technology has one obvious potential for use in education. Collaboratively authored, open access, projects such as wikipedia clearly give rise to materials that teachers may exploit. This can be at the immediate and simple level of including links to such materials in tailored, hypertext linked, course notes. Of course, in this simple respect, wiki materials are no different from any other public web resource. But wikis also introduce a quite new and distinctive additional possibility. Suppose a teacher locates a wiki-based page (say in the wikipedia) that is very relevant to a course, but yet is not quite exactly what is wanted. This is a very common scenario. A traditional response might be to provide a separate annotation, or clarification. But in the wikipedia the teacher can literally reach in and edit the original. Of course, this would still need to be done with an eye to the generic audience (otherwise the change will probably be quickly revoked!), but this is often still perfectly compatible with better meeting the needs of one's own particular class; and can be a good deal simpler and faster, both for a teacher to write and a learner to read. Further, that enhancement now represents an additional contribution to a globally shared resource, rather than only ever being available to one isolated class group. Even very small individual enhancements can, if aggregated on a global basis, give rise to large scale developments. Thus the contributions of individuals can mutually support and re-inforce each other in a "virtuous circle".

However, that said, even this is not the most important potential for wiki technology in learning. The much more profound opportunity is to invite *learners* to participate in collaboratively building resources through a wiki themselves. An essential part of relective, constructivist, learning is that learners should be invited to reflect on their knowledge and make it explicit. This, of course, is the role of the traditional essay, worked problem, project report etc. However, the wiki allows this reflection and progressive articulation to be done *collaboratively* – moving us to a fully *social* constructivist mode of learning. In theory, of course, this can be achieved without the technological support of a wiki; students have long been required to (sometimes) work in groups, and (sometimes) review or critique each others' work. But the practical difficulties and barriers are significant, to the extent that this tends to be an exceptional rather than typical mode of learning. By contrast, wikis, with their very low technological barriers, yet very rich and flexible function-

[12] `http://www.techcentralstation.com/111504A.html`
[13] `http://alex.halavais.net/news/index.php?p=794`

ality, offer the opportunity to embed collaborative, constructive, learning much more extensively in our educational environments.

## bloggers and blogging

### What is it?

Though "blogging" has become one of the most visible (and hyped) phenomena of the online world in recent years, there is no single definition of what constitutes a "blog" (or "web-log"). In general, the term refers to something like an online journal or diary, but with a number of distinctive new characteristics arising from the Web medium:

- A blog is most usually published by a single person, with, perhaps, occasional "guest" bloggers;
- It consists of a series of individual "postings" issued frequently, and fairly regularly. To properly deserve the name blog, the frequency should probably be no less than one post every two or three days - and might be as high as nine or ten in a single day.
- Postings rely heavily on hypertext linkage; these can be links to arbitrary Web resources, but links to other blog postings are especially common.
- Arising from the heavy use of linkage, individual postings are typically brief - perhaps one to three paragraphs of text (but sometimes as short as a single - hyperlinked - phrase!).
- Blogs may be simply browsed on the web, in the manner of normal web pages. However, because they are relatively dynamic, this imposes a burden on a reader to regularly check for new postings. To overcome this, blogs usually also offer a "syndication" service. This means a reader can use a tool called an "aggregator" to "subscribe" to one or more blogs - and will then automatically receive new postings to those blogs as they are generated.
- Blogs usually provide for readers to post reactions or commentary, attached to an original blog post and archived along with it.
- The technology for blog publishing - as with wikis - presents very low barriers to entry. Again, a user normally needs no tools beyond a basic browser, and can quickly master the requisite simple, plain text, authoring format. (Indeed, in some cases, one can use very similar or identical authoring formats for both blog and wiki publishing.)
- Consequently ... blog content is highly variable, idiosyncratic, and personal to the particular blogger. Bloggers are somewhat reminiscent of the traditional newspaper or magazine columnist - yet also very different. *Anybody* can start a blog, open to the world. Given the wide availability of free and low-cost blog servers, a novice blogger can begin publishing to a global audience in as little as 10-15 minutes!

### What has this got to do with *learning* ?

Public blogging has an obvious and immediate application in any education for "public writing" - journalism, communications, etc. It provides an immediate opportunity for such students to engage in *authentic* publishing from the earliest stages of their studies. Of course, there is no guarantee that they will garner an authentic readership; but the very act of exposing their writing to an unconstrained, public, audience will certainly feel much more meaningful (and challenging) than merely writing for their teacher or classmates, as would more traditionally have been the case. And, of course, because of the vast scale, and dense interconnection, of the so-called "blogosphere", they *may* attract at least some interested readers, from whom they will surely learn valuable lessons.

These are opportunities that simply did not exist before the infrastructure of the Internet and the Web, and more recent arrival of the low barrier publishing tools of modern blogging servers.

But there are much more general opportunities for the use of blog-like technologies, outside of these specific domains. In particular, while blogs *can* be completely public, they *need* not be, and this opens up a variety of other possibilities.

Thus, blogs might be shared among a single class group, or even small groups within a class. In the same manner as a wiki, this then allows very dynamic and flexible social interaction in constructing and responding to each others' postings. Yet, in contrast to the wiki mechanism, in blogging, the individual postings clearly remain the property of their *individual* authors, and are - deliberately - frozen once posted, rather than continuously re-edited. At its simplest level, blogging is therefore immediately useful for students of any discipline to develop their personal writing skills - in a social, yet still private, space. But it also opens up potential for much deeper peer-to-peer, and teacher-mediated, critique and discourse. Of course, other Internet technologies, such as shared mailing lists and Web discussion forums, might also be employed in this way; but the particular architecture of personal ownership in blogging provides a distinctively structured and nuanced discussion framework.

Taking this to its extreme form, essentially the same technology can support classic "learning diaries" - where individual students are invited to regularly reflect upon and document their own learning experiences - but these are private to each individual student and the teacher. Of course, the idea of a learning diary is not new in itself; but the technology of the blog can make it much more practical to implement. With minimal administrative or bureacratic overhead, both learner and teacher can then efficiently concentrate on substantive learning issues.

## moodling through

### What is it?

From moodle.org:

> Moodle is a software package for producing internet-based courses and web sites. It's an ongoing development project designed to support a social constructionist framework of education. Moodle is provided freely as Open Source[14] software (under the GNU Public License[15]).

On one level, moodle is simply an example of (yet another) "Virtual Learning Environment" (VLE), in the same genre as the more widely known Blackboard[16] and WebCT[17] systems. That is, it comprises a web based platform supporting a more or less integrated suite of tools to support "online learning". At its most basic level, it offers easy "transmission" of electronic resources to (only) the authorised and authenticated members of each class group. It also implements a variety of other typical VLE functionalities such as class-based threaded discussion forums, online assignment submission and simple online "quizzes". Of course, seen in this way, it is hardly particularly distinctive.

But the quotation above signals two much more radical aspects of the moodle project:

- It is explicitly inspired by, and committed to, a particular pedagogical framework, namely *social constructivism*.
- It is distributed under an "open source" software licence.

First then, although moodle does support a naive "transmission" oriented pedagogy, it is *primarily* designed to facilitate and encourage social interaction and collaborative construction of

[14] `http://www.opensource.org/docs/definition_plain.html`
[15] `http://www.gnu.org/copyleft/gpl.html`
[16] `http://www.blackboard.com/`
[17] `http://www.webct.com/`

knowledge. To this end, it already incorporates a number of the distinct facilities already described in previous sections, and provides additional variations or enhancements:

- Option of "open content". A typical VLE is specifically designed to prevent uncontrolled access to the resources provided within. Moodle *can* operate in that mode; but it can equally operate in a mode where such resources are browsable, indexable and searchable without special permission or authentication. This is very flexible, can be set at the discretion of individual teachers, and, in any case, still protects the privacy of individual participant interactions and communications. Alternatively, teachers can export fully designed and packaged course materials through moodle.org; this is a feasible and practical way of sharing course content precisely because the required supporting software - moodle itself - is available without any licencing cost barrier.

- wiki activity. A wiki activity is integrated within moodle, making it easy to create wikis for individual courses, class groups, or even smaller groups or projects within a class or course.

- blog activity. Moodle forums can be configured in the generic threaded discussion format; but can also be flexibly configured to function as individual learning journals (private to a teacher and student) or as blogs (private to a class group, or public to the world).

- Survey instruments, such as COLLES[18], specifically designed to facilitate and promote social constructivist learning, have been built in to moodle. Use of such instruments serves both to inform and sensitize students to their learning styles and approches and to inform teachers as to the effectiveness of the particular learning activities they are facilitating.

The second distinctive feature of moodle is its "open source" licencing. I have already mentioned an immediate implication of this - the manner in which this open availability of the software platform facilitates open availability of content or resources to use with this platform. But the open source licence has a deeper significance: it means that - in principle at least - individual teachers, and even learners, can directly participate in and contribute to the ongoing development of this learning platform. It is early days, and it remains to be seen what the full implications of this may be. However, one immediate effect is that - as in the case of the wikipedia - this open content model has facilitated very early adaption and localization of the system for different language users (including minority languages, such as Irish). It is very difficult to see how this rapid adaptation could be practically achieved using any closed licencing approach.

## Conclusion: Where to next?

The focus of this chapter has been on presenting a number of recent technological and cultural innovations, and attempting to relate these to challenges of improving learning in higher education. Clearly, all of these technologies overlap and interact, but I have suggested that, together, they offer a powerful set of tools for social reflection, collaboration, and construction of knowledge.

The discussion here has necessarily been brief. Hopefully, you have already noted the embedded opportunities for wider exploration (hyperlinked, of course, in the online version!). I close with some final, overarching, pointers to more comprehensive resources:

- Dougiamas (1998) concisely reviews the overall history and development of constructivism, and includes an excellent bibliography. This can also be read as the intellectual foundation for the design of moodle.

- The issues of intellectual property and copyright in the digital world are excellently analysed by Lessig (2004), including a concrete suggestion of one possible, radically new, digital publishing paradigm. Appropriately, the book itself is used as an exemplar: it has been made

[18] `http://surveylearning.com/colles/`

available as a traditional, commercially published, "rights reserved", hardcopy book, but also as an open access, online work, with a licence specifically permitting independent production of derivative works (provided these carry attribution, are "non-commerical", and are released on the same terms). Among the interesting effects of this has been the rapid, spontaneous, appearance of alternative online versions, of independent translations into different languages, and of transpositions into other media (audio books).

- Downes (2004) provides a comprehensive, and constructively critical, review of the history, nature, and future prospects for the use of blogging in education. Alternatively, Ferdig and Trammell (2004) is a gentle introductory discussion, including some specific strategies for using blogs in the classroom.
- moodle.org is, of course, the primary source for information on moodle. It is also host to an extremely active and diverse community of moodle users from around the world.

## References

Berners-Lee, T. (1996). The World Wide Web: Past, Present and Future. `http://www.w3.org/People/Berners-Lee/1996/ppf.html`

Carlile, O. and A. Jordan (2005). It Works in Practice But Will it Work in Theory? In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

Dougiamas, M. (1998). A Journey into Constructivism. `http://dougiamas.com/writing/constructivism.html`

Downes, S. (2004, September/October). Educational Blogging. *EDUCAUSE Review 39*(5), 14–26. `http://www.educause.edu/pub/er/erm04/erm0450.asp`

Ferdig, R. E. and K. D. Trammell (2004). Content Delivery in the 'Blogosphere'. *T.H.E. Journal (Technological Horizons in Education)*. `http://www.thejournal.com/magazine/vault/A4677A.cfm`

Higgs, B. and M. McCarthy (2005). Active Learning — from Lecture Theatre to Field-work. In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

Lessig, L. (2004). *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*. New York: The Penguin Press.

Ramsden, P. (1992). *Learning to Teach in Higher Education*. London: Routledge.

# DO YOU KNOW WHAT YOUR STUDENTS ARE LEARNING? (AND DO YOU CARE?)

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## Introduction

In higher education we sometimes pause at the end of a lecture and ask "Any questions?" or "Is everything clear?" Usually there are no responses, and as students leave we are satisfied that we did allow students the opportunity to ask questions. As there were no questions, they must have understood, or so we think. However, how do we really know what students are actually learning when they are in the process of learning something new for the first time? As lecturers we are not mind readers. We need to check in with our students to find out what they are learning and what they don't understand fully.

Lecturers who care about what students are actually learning have often found informal ways to ask students what they have learned. However, by systematically and thoughtfully asking students about their learning as a normal integrated part of a lecture, we can gain valuable feedback about any gaps in their understanding of a particular topic. The goal for lecturers is to gain an understanding of what students know (and don't know) in order to make responsive changes in teaching and learning (Boston 2002). This is a very specific set of strategies which use the principles of student-centred learning as described in a previous chapter.

This chapter will provide strategies that will help lecturers to determine what students have learned in any in-class situation: lecture, lab, tutorial, etc. Using these in-class strategies, lecturers can monitor the learning progress of a group of students and address or review difficult topics.

In this process, students become more skilled at evaluating their own learning progress, an essential skill for lifelong learning. Lecturers learn whether or not the teaching and learning strategies are actually helping students to learn. This can stimulate greater creativity in teaching and greater responsiveness to learners as lecturers seek to find new ways to help students understand particularly challenging concepts.

This chapter will provide background on the use of strategies to check on student learning in higher education, examples of six practical ways to implement these strategies in teaching, and a discussion of how student feedback on their learning can help lecturers to improve their teaching.

## Background

## Terminology

These strategies to check on student learning have been called "Classroom Assessment Techniques" (CATs) in the literature of North American higher education. However, this name might be interpreted differently by those in Irish universities. "Assessment" in this case does not mean graded exams, but rather a set of teaching strategies aimed at improving the quality of student learning. And "Classroom" does not refer to secondary school but rather to in-class sessions (lectures, labs, tutorials) in higher education.

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

The literature of assessment includes distinctions between "summative" and "formative" assessments. "Summative" assessments include any assessments occurring after the learning has taken place, such as end of year exams or projects that are graded to make a judgement about the extent and quality of learning that is demonstrated. "Formative" assessments generally involve providing feedback to students on work in progress, such as an essay or a project, after students have learned enough about a topic to work on an essay or project. Although usually not graded, the formative feedback from the lecturer or from peers (other students) is usually a critique of the work which is advisory or evaluative.

In contrast, Classroom Assessment Techniques (CATs) are used at a very early stage in the learning process, when students are first learning about a new topic. The CATs are anonymous and non-graded, and mainly aimed at gathering feedback from a group of students about what they have learned and what they find confusing about a topic. You can use them to help students in the process of learning a new subject.

## Research

The origins of "Classroom Assessment Techniques" were in the late 1980s in two well-respected American universities: Harvard University (Mosteller 1989; Light 1990; Roueche, S. (ed.) 1993) and University of California at Berkeley (Cross 1987; Cross and Angelo 1988; 1993a; Cross and Steadman 1996; Davis 1999). Since the beginning, "Classroom Research" has been done in the way that K. Patricia Cross originally envisioned (1987): lecturers use "Classroom Assessment Techniques" to systematically find out what and how well their students are learning and then use the results to improve their teaching practice. This fits with the notion of "The Scholarship of Teaching" (Boyer 1990) in encouraging lecturers in higher education to research the teaching and learning of their subjects.

More comprehensive research studies have examined the larger effects of CATs on student learning (Ang 1991; 1998; Kelly 1991; 1993; Cross and Steadman 1996). Results of these studies indicate that overall, Classroom Assessment Techniques have a positive impact on student learning, including deeper learning and greater involvement in the learning process. However, the impact of these strategies would probably be greater if used in a cohort group in which students travelled through a programme together and all lecturers on the course were using CATs routinely (Kelly 1991; 1993).

The use of CATs has also had a strong positive impact on the professional development of lecturers as teachers Kelly (1991; 1993). There is no question that Classroom Assessment has helped many lecturers to re-think how they teach their classes (Cross and Steadman 1996; Kelly 1991; 1993; College of Marin 1990). This can result in rejuvenation among long-term lecturers and more confidence among new lecturers.

## Learning Theory

The notion of checking on student learning using CATs supports Constructivist theory, Adult Learning Theories, Experiential Learning, and Deep Learning. CATs encourage students to think about what and how they are learning, construct their own knowledge, link their learning with their experiences, and move toward a more self-directed approach to learning. As Jarvis et al. points out (1998), learning is regarded as constructed by the learner rather than received from the teacher. When learning something new, students try to understand the new information as it relates to other things they already know. For this reason, the individual learner's role is central. By asking students about what they have learned in the very early stages, they have the opportunity to reflect upon their understanding of the new thing they have just learned. It's possible that misunderstandings can occur or there might be some confusion in the minds of the learners because what they have just learn doesn't "fit" with their prior experience. Using CATs, a lecturer can quickly see how students have interpreted what they have learned and can take any needed corrective action to help students to learn.

Students go through developmental stages as they become more confident as learners in the subject area. As students gain confidence they should be less dependent on the lecturer and more dependent on their own abilities as learners, so that ultimately they become self-directed lifelong learners. One of the purposes of using CATs is to help students to develop their ability to self-assess their own learning, monitoring their learning progress. They also actively construct their own learning in their responses to the CATs and in the discussion of feedback from the lecturer. As a result, it is not surprising that research into the use of CATs has indicated that these strategies help students to become more reflective and confident as learners (Cross and Steadman 1996; Angelo 1999).

## "Best Practice" in Teaching and Learning

In the 1980's a research project was set up by the American Association for Higher Education (AAHE) to summarize best practices in teaching and learning in higher education. The results of that research project were summarised into "Seven Principles of Good Practice in Undergraduate Education" (Chickering and Gamson 1987). This publication was based on results from many research projects into teaching and learning in higher education. Several years later, the AAHE Assessment Forum developed "Nine Principles of Good Practice for the Assessment of Student Learning" (Astin et al. 1995). More recently, the Higher Education Academy Generic Centre in the UK has published the following seven principles for good feedback practice:

1. Facilitates the development of self-assessment (reflection) in learning.
2. Encourages teacher and peer dialogue around learning.
3. Helps clarify what good performance is (goals, criteria, standards expected).
4. Provides opportunities to close the gap between current and desired performance.
5. Delivers high quality information to students about their learning.
6. Encourages positive motivational beliefs and self-esteem.
7. Provides information to teachers that can be used to help shape the teaching.

(Juwah et al. 2004)

## Professional Development

Most lecturers start using CATs because they want to find out what their students are learning. However, most continue to use these strategies because it stimulates greater creativity in teaching and helps them to find ways to improve their own teaching. The feedback from students often provides lecturers with a stimulus to try new teaching methods aimed at enhancing student learning. These strategies provide valuable input to all lecturers about what is working and what needs to be changed in their teaching in order to enhance student learning.

## Implementing classroom assessment techniques

Classroom Assessment Techniques (CATs) are systematic on-going strategies for collecting student feedback about their learning which answer these questions:

1. What are students actually learning in my lecture/lab/tutorial?
2. How are the students progressing toward the learning objectives?
3. Where are they having difficulties in learning?

CATs allow lecturers to determine the learning progress of a group of students through anonymous written responses to questions posed by the lecturer. The emphasis is on what students are learning rather than on feedback about the lecturer. Some lecturers gather feedback by using student surveys at the end of the year. Although this may be helpful in planning next year's class, it does not directly benefit those who are currently in the course. However, using CATs the lecturer may obtain feedback from the students as often as every session, or at critical points in the term. In this way, it is immediately apparent if students are having problems understanding a concept or if they have missed an important point. It is possible to take corrective action at the next class session rather than waiting for an exam to find out what students did not understand. These strategies help lecturers to focus on student learning rather than on their own teaching. By finding out what students have learned and what is unclear, lecturers can focus the class more effectively to meet the learning needs of that group. This may mean reviewing some areas, or spending less time in other areas.

Before starting to use Classroom Assessment Techniques, it is important for lecturers to clarify their own teaching goals, using the Teaching Goals Inventory (Cross and Angelo 1993b). Learning objectives will flow from the teaching goals, and should be clearly communicated to students (Sadler 1989).

## Examples of Classroom Assessment Techniques

CATs may be used in any type of class session: traditional lectures, laboratories, tutorials, seminars, etc. Some CATs are for individual students, others are for use in small groups. Some are designed to check students' immediate understanding, others are for application and critical thinking. The following are several examples of CATs that may be used to enhance student learning (Cross and Angelo 1993a).

### The Minute Paper

This is often used at the end of a lecture to give students the opportunity to reflect upon what they had learned. Their anonymous responses provide valuable feedback to the lecturer that may be used in planning the next class session. There are six main steps for a lecturer:

Step 1: About five minutes before the end of a lecture, lab or tutorial, hand out small cards or half-sheets of paper to students and explain that you would like some anonymous feedback about what they have learned today so you may help them with their learning.

Step 2: On one side of the card, ask them to answer a question about the session, such as, "What was the most important thing you learned today about _____?" or "List three new things you learned today about _____." A specific content-centred question is most effective to provide a focus for students.

Step 3: On the other side of the card, ask them to write any new questions they have as a result of the lecture/tutorial, or write questions about any areas they didn't understand fully.

Step 4: Keep silent for at least two or three minutes while students are writing, allowing them time to think and formulate their responses. Then collect the cards.

Step 5: Tally and analyse the responses. This usually takes about 30 seconds per card. The cards may be arranged into categories by types of answers. In very large lectures it is possible to get a good sense of the group by sampling rather than reading every response.

Step 6: Plan to spend about five minutes at the beginning of the next session briefly summarising the feedback, and address the areas which were not fully understood.

The Minute Paper may also be used at the beginning of a class session to ask students questions about a reading assignment or a project they are working on. Minute Papers have also been

used in the middle of a lecture to encourage students to reflect on a particular point that has been raised, or to check on their comprehension of a new concept. In these cases it may be more expedient to get immediate feedback by combining the Minute Paper with a "Think-Pair-Share" activity in which students first write briefly, then they pair up and share what they have written for about two or three minutes, and then the lecturer calls on a few students to get a variety of responses to the Minute Paper. The lecturer may also choose to collect the cards for review after class. This is an efficient way to gather quick feedback from students, even in very large lectures.

### Background Knowledge Probe

The "Background Knowledge Probe" allows lecturers to learn about students' prior knowledge or experience in the subject. It may sometimes take the form of a survey at the beginning of the course, but could also be used as new topics are introduced. This strategy is useful for the lecturer to know the variation in background of that particular group of students. The responses may also be used in measuring the overall learning progress of the group at a later stage in the course. A Background Knowledge Probe is usually in the form of a survey which might include the following areas:

- Educational or work-related background experience in the subject
- Motivations/reasons for studying the subject
- Expectations for this subject – what they hope to learn, and how it will help them to be successful in the course or programme.
- Concerns or apprehensions about studying this subject (eg: memorization, exam anxiety, essay writing, previous negative experiences in this subject, etc.)

Although asking about apprehensions may appear to be negative, in reality, addressing these fears from the beginning is actually helpful to students (Kelly 1993), particularly when they find out they are not the only one with this concern. This also lets students know that the lecturer wants to help students to overcome these fears.

### Focused Listing

A Focused Listing exercise may be used at any time to ask students to recall a set of terms, facts, or concepts that they should know. Although this strategy might appear to be at the lowest level of Bloom's Taxonomy (1956), it can be used to check on recall as well as understanding of terms if they are particularly important for the topic of a lecture. Some lecturers have used a focused listing exercise at the beginning of a class session to measure students' recall of a reading assignment, and again at the end of the class session to see the extent to which their recall and understanding of terms has improved.

### Directed Paraphrase

This strategy is particularly useful in measuring students' level of understanding of a particular set of procedures or methods to be followed, although it can also be used to check for students understanding of a complex concept or theory. This assessment may be given as an assignment to be completed outside of class, or it may be done during a class session individually, in pairs or in small groups. Students are asked to write an explanation of a concept or a set of instructions in their own words as if writing for someone who is not on the course. This paraphrase provides a way for the student and the lecturer to assess the degree to which students have understood an important concept or procedure and if there are any gaps in their understanding.

### Memory Matrix

The Memory Matrix is particularly helpful if students will be asked to compare and contrast various items for a higher level analysis. A listing of items is provided by the lecturer down the left side of the matrix, and several key characteristics are listed across the top of the matrix. The students then fill in the blank boxes with their understanding of how the items are different. This method could be used to help improve students' analysis of different types of cells in biology, different types of government structures, different types of economic theories, or different authors of a particular literary genre. It helps students to construct their own knowledge for a deeper level of understanding. The following Memory Matrix shows how students might use this CAT to analyze the writing styles of several different authors of short stories.

| Authors | characters | plot | perspective | setting |
|---|---|---|---|---|
| author 1 | | | | |
| author 2 | | | | |
| author 3 | | | | |
| author 4 | | | | |

### Process Self-Analysis

Students are asked to write down all of the actual steps they take in carrying out an assignment or project, and the length of time it takes them to complete each part of the project. They then analyze how they have done the work, and which areas they found most difficult or most time consuming. This helps students to pinpoint the areas in which they may need more work to develop the skills needed to improve the process of completing this type of project. Process Self-Analysis could be used with any type of assignment, including project work, individual essay writing, or research work.

## Common Questions about implementation

Lecturers who want to begin using Classroom Assessments often have questions regarding the details of implementation. Concerns are expressed in the following areas:

### How much time does it take?

The most common barrier to the implementation of these strategies is the perception among lecturers that they will take too much time (Juwah et al. 2004; Cross and Angelo 1993a). Lecture sessions are short, and lecturers are concerned that it is already difficult to find sufficient time to "cover the content" without adding Classroom Assessments. However, those who have used CATs find that they actually save time in lectures by focusing the lecture on areas of greatest importance for student understanding. In addition, students take on more responsibility for their own self-assessment of learning which also saves time (Boud 1986). By linking the learning objectives to what students are actually learning, it is possible to direct the teaching sessions to the areas in which students need more help rather than attempting to "cover the content." Different CATs take differing amounts of time during a lecture, from very few minutes at the beginning and ending of a class session for the "Minute Paper" to perhaps 15 or 20 minutes for a complex CAT such as the Memory Matrix. Some CATs, such as Process Self-Analysis are more effective if they are done outside of the class session and discussed in the next session. The most important thing to remember in using these strategies is that they are actually integrated into the learning process rather than an "add-on" activity.

### Why use these strategies at all? Is this "hand-holding" necessary in higher education?

Classroom Assessment Techniques provide opportunities to check on student learning before a critical stage: before the final exam, before a major project, or before a transition to a new subject upon which knowledge of a prior topic is crucial. Some lecturers might consider this "hand-holding." However, as Jarvis points out, "Involving the student in judging what he or she has learnt encourages a more positive attitude to learning and increases the degree of student direction of the learning process." (Jarvis et al. 1998:144) In other words, these strategies for checking on student learning are actually more rigorous for students because they put greater responsibility on the students for monitoring and constructing their own learning.

### How do lecturers convince students that checking on their learning is worthwhile?

Lecturers have found that in the beginning students may be sceptical or may not take these strategies seriously because they are not graded. For this reason it is important to explain what you are doing and why you are doing it: their responses to the CATs will allow you to help them to learn. If a significant number of the students clearly did not understand a key concept, the fact that the lecturer spends more time on it or approaches it in a different way will convince students that the CATs are important and will help them to do well later on the graded assessments.

Students also appreciate having opportunities to provide anonymous feedback to lecturers about what they are learning and what is confusing. Often students are hesitant to ask questions during a lecture. Studies on the use of Classroom Assessment Techniques (Kelly 1993; Cross and Steadman 1996) indicate that students feel that the teacher "really cares" about whether or not they are actually learning. This often makes them more motivated to learn. Students also believe that the CATs made them more involved in learning because they were forced to think about what they had learned. In addition, CATs encourage students to reflect on their learning, taking a deep (rather than a surface) approach to their learning during lectures.

### Is it necessary to always give feedback to students about their responses to the CATs?

It is essential! Closing the feedback loop with students as quickly as possible is the most important part of the process. When students get feedback from the lecturer, they know that the lecturer is paying attention to their responses. As the lecturer reviews the student feedback, usually at the beginning of the next lecture, students often find that others had similar questions. This can be comforting and can raise self-confidence among students who are having difficulties. Some lecturers base the entire next class session on the feedback to the students. This works particularly well for review/revision sessions. However, even taking five minutes at the beginning of a class session is beneficial to the learning process. The most important thing is to ensure that students understand the feedback from the lecturer, and that they know what to do with it (Sadler 1989).

### How often should these strategies be used?

Some lecturers ask students to respond to a question at the end of every class session, and others use CATs at the most critical points in the course or before a major exam or project. Most lecturers integrate the CATs as regular class activities. Others use these strategies to evaluate the effectiveness of class activities or tests. And some use CATs to encourage students to evaluate their own learning progress. The frequency and type of Classroom Assessment Techniques depends upon the group of students, the lecturer, the subject, the learning objectives, and the reasons for asking students about their learning.

### Do the student responses have to be anonymous?

Anonymous feedback results in responses that are more candid. However, if the assessments are used in the form of homework assignments or small group activities within the class, anonymity

is not possible, and may not be necessary. Research on the use of these strategies (Kelly 1993) indicates that students generally feel more comfortable if their responses are anonymous.

#### What kind of questions should I ask?

It is best to ask students learner-centred questions ("What have you learned?") rather than teacher-centred questions ("How do you like my teaching?"). The learner-centred questions will show clearly whether or not the teaching is effective. Thoughtful, reflective questions are better than simple, factual ones. Questions should be asked only if you really want to know the answer and are willing to respond to the feedback to meet student needs.

#### Is it necessary to undertake professional development before using these strategies?

Many lecturers have started using Classroom Assessment Techniques on their own by reading the Cross and Angelo handbook (1993a) and selecting and adapting a few CATs for their lectures. However, CATs are even more effective for students if they are undertaken by a department or a course team. In this way, students have opportunities to respond to questions about their learning as they go through different lectures, seminars, tutorials, and labs. Lecturers working together to integrate CATs into the curriculum find it very rewarding to share their experiences and work collaboratively as a group to improve teaching and learning. The "Teaching Goals Inventory" is a particularly useful exercise for a group of lecturers who plan to implement CATs (Cross and Angelo 1993b). This inventory helps to clarify teaching goals and learning objectives for individual lecturers or a group of lecturers working together in a department or course team. It can be an advantage to undergo some professional development as a group to learn about the various forms of CATs and which ones might be most appropriate and most useful to enhance learning in the course.

## Conclusion

Using Classroom Assessment Techniques has benefits for both the students and the lecturers. Students appreciate being asked what they are learning and what they don't understand. Using these strategies demonstrates to students that we care about their learning and want to help to facilitate their learning. However, lecturers using CATs also experience clear benefits. It is easy to begin using these strategies in a small way, starting with a simple "Minute Paper" at the end of a lecture. By asking students about their learning, lecturers find out about their own teaching and become more interested in the teaching and learning process in their own subject. This often leads to more discourse and enthusiasm about teaching and learning in departments and course teams and can ultimately result in enhanced teaching and learning.

## References

(1991). Classroom Research: Early Lessons from Success. In T. Angelo (Ed.), *New Directions for Teaching and Learning*, Number 46. San Francisco: Jossey-Bass Publishers.

(1998). Classroom Assessment and Research: An Update on Uses, Approaches, and Research Findings. In T. Angelo (Ed.), *New Directions for Teaching and Learning*, Number 75. San Francisco: Jossey-Bass Publishers.

Angelo, T. (1999, May). Doing Assessment as if Learning Matters Most. *AAHE Bulletin*.

Astin, A. et al. (1995). Nine Principles of Good Practice for Assessing Student Learning. *Assessment Forum*, American Association of Higher Education (AAHE). `http://www.aahe.org/assessment/principl.htm`

Bloom, D. (Ed.) (1956). *Taxonomy of Educational Objectives — Book 1, the Cognitive Domain*. London: Longman.

Boston, C. (2002). The Concept of Formative Assessment, ERIC Digest. College Park, Maryland: ERIC Clearinghouse on Assessment and Evaluation. (ED 470 206). http://www.ericfacility.net/databases/ERIC_Digests/ed470206.html

Boud, D. (1986). Implementing Student Self-Assessment. Higher Education Research and Development Society of Australia (HERSDA), Kensington, New South Wales.

Boyer, E. (1990). *Scholarship Reconsidered: Priorities of the Professoriate*. Princeton, New Jersey: Carnegie Foundation for the Advancement of Teaching.

Chickering, A. and Z. Gamson (1987, March). Seven Principles of Good Practice in Undergraduate Education. *AAHE Bulletin* (39), 3–7. Washington D.C.: American Association of Higher Education (AAHE), http://aahebulletin.com/public/archive/sevenprinciples1987.asp

College of Marin (1990). Teacher Directed Classroom Research. (Videotape) College of Marin, California.

Cross, K. P. (1987). The Need for Classroom Research. In J. K. Kurfiss (Ed.), *To Improve the Academy*. Stillwater, OK: POD Network in Higher Education and New Forums Press Inc.

Cross, K. P. and T. Angelo (1988). *Classroom Assessment Techniques: A Handbook for Faculty*. Ann Arbor: National Center for Research to Improve Postsecondary Teaching and Learning. University of Michigan.

Cross, K. P. and T. Angelo (1993a). *Classroom Assessment Techniques: A Handbook for College Teachers* (second ed.). San Francisco: Jossey-Bass Publishers.

Cross, K. P. and T. Angelo (1993b). Teaching Goals Inventory. Available online at University of Iowa, Teaching Center. http://www.uiowa.edu/~centeach/tgi/index.html

Cross, K. P. and M. Steadman (1996). *Classroom Research*. San Francisco: Jossey Bass Publishers.

Davis, B. (1999). Fast Feedback. In *Tools for Teaching*. Berkeley, California: University of California, Berkeley.

Jarvis, P., J. Holford, and C. Griffin (1998). *The Theory and Practice of Learning*. London: Kogan Page.

Juwah, C., D. Macfarlane-Dick, B. Matthew, D. Nicol, D. Ross, and B. Smith (2004). *Enhancing Student Learning through Effective Formative Feedback*. U.K.: The Higher Education Academy Generic Centre.

Kelly, D. K. (1991). *The Effects of Classroom Research by Part-time Faculty upon the Retention of Adult Learners*. Saratoga Springs, N.Y.: National Center on Adult Learning, Empire State College, SUNY.

Kelly, D. K. (1993). Classroom Research and Interactive Learning: Assessing the Impact on Adult Learners and Faculty. Unpublished doctoral dissertation, The Claremont Graduate University.

Light, R. (1990). *The Harvard Assessment Seminars, First Report*. Cambridge, Massachusetts: Harvard University Graduate School of Education and Kennedy School of Government.

Mosteller, F. (1989). The "Muddiest Point in the Lecture" as a Feedback Device. *On Teaching and Learning 3*. Cambridge, Massachusetts: Harvard University, Derek Bok Center for Teaching and Learning, http://bokcenter.fas.harvard.edu/docs/mosteller.html

Roueche, S. (ed.) (1993). What I learned about quality in the classroom from a Harvard Business School professor and a group of freshman students. *Innovation Abstracts XV*(22). Austin, Texas: National Institute for Staff and Organizational Development (NISOD), College of Education, The University of Texas at Austin.

Sadler, D. (1989). Formative assessment and the design of instructional systems. *Instructional Science 18*, 119–144.

### Websites on Classroom Assessment Techniques

American Association of Higher Education (AAHE) Assessment Forum]
`http://www.aahe.org/assessment/assess_links.htm`

National Teaching & Learning Forum (NTLF)
`http://www.ntlf.com/html/lib/bib/assess.htm`

Technology applied to Classroom Assessments
`http://www.ntlf.com/html/sf/vc75.htm`

Classroom Assessment Techniques designed for Technology
`http://www.mtsu.edu/~itconf/Proceed99/Martin.htm`

### University websites on Classroom Assessment Techniques

Southern Illinois University
`http://www.siue.edu/~deder/assess/catmain.html`

Hawaii Community College
`http://www.hcc.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/assess-1.htm`
`http://www.hcc.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/assess-2.htm`

Indiana University
`http://www.iub.edu/~teaching/feedback.html#sfcats`

Iowa State University
`http://www.cte.iastate.edu/tips/cat.html`

Pennsylvania State University
`http://www.psu.edu/celt/CATs.html`

Portland State University
`http://www.fd.pdx.edu/workshops/cat/examples.html`

Syracuse University
`http://cstl.syr.edu/cstl/t-l/cls_asmt.htm`

University of New Orleans
`http://ss.uno.edu/ss/TeachDevel/Asses/AssemTechMenu.html`

University of Washington
`http://depts.washington.edu/cidrweb/CATools.htm`

# COLLABORATIVE PROJECT–BASED LEARNING AND PROBLEM–BASED LEARNING IN HIGHER EDUCATION: A CONSIDERATION OF TUTOR AND STUDENT ROLES IN LEARNER-FOCUSED STRATEGIES

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**KEYWORDS:** Collaborative Project–based Learning, Problem–based Learning, Facilitation.

## Introduction

The aim of this chapter is twofold. Firstly to support academic staff from a variety of subject disciplines in higher education in the clarification between two different learner focused strategies, namely collaborative project-based (CPBL) and problem-based learning (PBL). Secondly, to provide practical advice to them to assist in the making of informed decisions as to when which strategy is most appropriate to use to support learning. These decisions will be based on a sound understanding of each strategy and a consideration of when each is most appropriate to use in enhancing the learning of their students.

Section One explores what is meant by group learning. Students have knowledge, views and experiences to share that are valuable and worthy of consideration. Opening up our classes to the voices of our students is sending a very powerful message to them as it is through dialogue with others, articulation of viewpoints and identification of concerns that students are enabled to make sense of new information.

Definitions of the two learner-focused strategies will be provided in specific contexts within higher education. Collaborative project-based Learning will consider the learning afforded by the involvement of students in a collaborative group project. Problem-based learning will explore the importance of placing students in control of their own learning.

Section Two details each strategy under the key headings: the role of tutor and students.

## Group Learning

Lecturing is without doubt effective for transmitting information but if we wish to develop thinking skills, problem solving abilities and lifelong learning skills a more student-centered approach

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http://www.aishe.org/readings/2005-1/

must be taken. This involves a change in the role of the lecturer from presenting information to students to facilitating and guiding learning. Palmer (1998) talks about preparing a learning space so that students can learn with and from each other and the there can be no doubting the potential of the group to learn from each other. According to Race (2001) *'learning from other people is the most instinctive and natural of all the learning contexts we experience'*. Group discussion allows students to attend more clearly to meaning as they interact with the language of the discipline and put into their own words the issues arising from a particular topic. It also gives students an opportunity to direct and take responsibility for their own learning. It has been argued that in higher education today students must be supported to develop specific expertise and knowledge in their chosen discipline and also facilitated to develop *'the skills necessary for employment and for life as a responsibility citizen'* (Fallows and Steve 2000). In a group learning context students are facilitated to develop key skills such as communication and teamwork. Students can only become proficient in a skill by practicing it and in a group learning context the students have to learn how to work within a group and listen and negotiate with others in order to resolve dilemmas or conflicts. These are important skills for students to develop as research indicates that employers worldwide want graduates who have well developed communication, teamwork and problem solving skills. The realization of this type of learning environment depends to a large extent on the skill of the tutor to lead and facilitate group discussion but many tutors find this task *'difficult to perform satisfactorily and too readily fall back in frustration on their reserve position of authority, expert and prime talker'* (Jaques 2000). Also, many students will want to be given the solutions to problems rather than taking responsibility for finding information and discussing it together and so there is a need for induction and tutor training and support; this will be discussed in more detail later in the chapter. There is a real potential to promote a deeper engagement with the subject matter and enhance the student experience by creating opportunities for group learning but this does require the tutor to focus more on the design and development of the learning experience and less on transmission of content. In further sections, we will look more closely at the role of tutor and students in project-based and problem-based learning. Firstly, we will define the terms, as each are each used to describe a range of instructional strategies. The breadth of their respective definitions, their conceptual similarity, and the use of the shorthand term PBL result in has previously resulted in some confusion in the literature.

## Definitions

Project-Based Learning is an individual or group activity that goes on over a period of time, resulting in a product, presentation, or performance. It typically has a time line and milestones, and other aspects of formative evaluation as the project proceeds. For the purposes of this chapter, we are considering the group activity involved in collaborative project-based learning.

Problem-based learning is both a curriculum and a process. The curriculum consists of carefully selected and designed problems that demand from the learner acquisition of critical knowledge, problem solving proficiency, self-directed learning strategies, and team participation skills. The process replicates the commonly used systemic approach to resolving problems or meeting challenges that are encountered in life and career.

As defined in the literature, project-based learning and problem-based learning share several characteristics. Both are instructional strategies that are intended to engage students in authentic, "real world" tasks to enhance learning. Students are given open-ended projects or problems with more than one approach or answer, intended to simulate professional situations. Both learning approaches are defined as student-centered, and include the teacher in the role of facilitator or coach. Students engaged in project- or problem-based learning generally work in cooperative groups for extended periods of time, and are encouraged to seek out multiple sources of information. Often these approaches include an emphasis on authentic, performance-based assessment.

Despite these many similarities, project- and problem-based learning are not identical approaches. Project-based learning tends to be associated with engineering and science instruction.

Problem-based learning is also used in these disciplines, but has its origins in medical training and other professional preparation practices (Ryan and Koschmann 1994).

In practice, it is likely that the line between project- and problem-based learning is frequently blurred and that the two are used in combination and play complementary roles. Fundamentally, problem- and project-based learning have the same orientation: both are authentic, constructivist approaches to learning. The differences between the two approaches may lie in the subtle variations. There are at least two possible continua of variation in these type of learning approaches. One is the extent to which the end product is the organizing center of the project. On one end of this continuum, end products are elaborate and shape the production process, such as a CAD engineering piece which requires extensive planning and effort. On the other end, end products are simpler and more summative, such as a group's report on their research findings. The former example is best described as project-based learning, where the end product drives the planning, production, and evaluation process. The latter example, where the inquiry and research (rather than the end product) is the primary focus of the learning process, is a better example of problem-based learning.

A second continuum of variation is the extent to which a problem is the organizing centre of the project. On one end of this continuum are projects in which it is implicitly assumed that any number of problems will arise and students will require problem-solving skills to overcome them. On the other end of this continuum are projects that begin with a clearly stated problem or problems and require a set of conclusions or a solution in direct response, where the problematic situation is the organizing centre for the curriculum. Here again, the former example typifies project-based learning, where the latter is best described as problem-based learning.

## Clarification Between Strategies

Project-based learning typically begins with an end product or "artifact" in mind, the production of which requires specific content knowledge or skills and typically raises one or more problems which students must solve together. Projects vary widely in scope and time frame, and end products vary widely in level of technology used and sophistication. The collaborative project-based learning approach uses a production model: first, students define the purpose for creating the end product and identify their audience. They research their topic, design their product, and create a plan for project management. Students then begin the project, resolve problems and issues that arise in production, and finish their product. Students may use or present the product they have created, and ideally are given time to reflect on and evaluate their work (Blumenfeld et al. 1991). The entire process is meant to be authentic, mirroring real world production activities and utilizing students' own ideas and approaches to accomplish the tasks at hand. Though the end product is the driving force in collaborative project-based learning, it is the content knowledge and skills acquired during the production process that are important to the success of the approach.

Collaborative project-based learning adopts a multidisciplinary, project-based approach using real world problems to bringing together knowledge and skills. Designing the appropriate course materials provide the flexibility for a move away from transmission teaching in large lecture halls to a more student-centred teaching and learning environment. The term learning environment can be used to distinguish it from approaches based primarily on a sequence of questions, answers and feedback. A learning environment places greater emphasis on problem solving situations and mechanisms to assist the learner in their tasks and monitor learning.

Problem-based learning, as the name implies, begins with a problem for students to solve or learn more about. Often these problems are framed in a scenario or case study format. Problems are designed to be "ill-structured" and to imitate the complexity of real life cases. As with project-based learning, problem-based learning assignments vary widely in scope and sophistication. The approach uses an inquiry model: students are presented with a problem and they begin by organizing any previous knowledge on the subject, posing any additional questions, and identifying areas they need more information.

In acknowledgement of this existing blurring between the strategies, and in seeking clarification, we find it helpful to look at each strategy in terms of the role of the tutor and students.

## Role of the Tutor in CPBL

Collaborative project-based work is well established as a component of many courses in Arts, Social Sciences, Science, and Technology in higher education. The argument for the strategy principally rests upon the assumption that it is a means of developing a more active and motivated student-centred approach to learning.

A reason for introducing this form of learner-focus strategy is that students may have relatively little understanding of the real world examples that lecturers use in illustrating concepts in lectures.

In conventional face-to-face teaching, the introduction of project-based methods entails recognizing that there will be less tutor control over the learning processes, that students must accept more responsibility for organizing their own learning experience, and that assessment is more complex because the piece of work that results from each student project will be unique. This variety is usually accommodated within the "conventional" learning framework by laying greater emphasis on providing opportunities for tutor supervision and guidance at appropriate stages during the course of the project. In a traditional setting of face-to-face teaching, frequent tutor/student contact means that adjusting the balance of supervision and guidance is a relatively flexible process. Knowledge of the project, built up by that tutor/student contact, can make assessment of it easier.

Biggs (1999:93) outlines the features of rich teaching and learning environments and emphasises that *'knowledge is constructed through learner activity and interaction'*. He goes on to point out that this kind of environment is created through a variety of teaching and learning activities directed by teachers, learners and peers because these each serve different purposes.

Collaborative project work often goes on for a considerable length of time, though the time span may range from a single afternoon to several years. Advantages of project-based learning include the encouragement of student initiative, self-directiveness, inventiveness, and independence. However, a project-based course demands from students a heightened level of self-confidence, motivation, and ability to organize their own work plans. A number of the issues are also present for the tutor: related to project time allocation, project scope delineation, and tutorial responsibility.

There may be extra involvement and time commitment that collaborative project-based work entails for tutors. This emerges from extra workload, on the extra resources that may need to be allocated to compensate for it, and on the more complex task of project assessment.

The tutor's role is very important at the design stage:

- Strong guidance is needed on how to tackle project work at the outset in order to reduce the likelihood of students attempting to undertake overly ambitious projects;
- Project specifications should be more detailed than they would be in "face-to-face" teaching;
- Careful piloting and testing of proposed projects should be undertaken in advance of the first presentation of the relevant course in order to establish reasonable estimates of time required for successful student completion;
- Sample projects should be provided to indicate to students the scope of project expected, in order to help students form a realistic picture of what they are expected to achieve;
- Course teams should be aware of the importance of a Project Guide (a document containing guidelines for undertaking the relevant project) and strive to make it as clear and as helpful as possible;
- It should be recognized that extra demands are made upon tutors both in terms of personal involvement and of time commitment in evaluating or assessing projects.

Collaborative project-based methods also imply more tutor involvement in terms of reassurance and guidance. Assessment will also be more demanding, and more resources may need to be allocated for assessment than would be required on "teacher-directed" courses (Crooks et al. 1976). They also need guidance on the extent to which they should allow students to follow an independent path and at which point they should intervene if a student's chosen direction seems to be going badly off-course. The flexibility of tutorial contact makes it easier to remedy the problem of students taking a "wrong" direction.

From an academic point of view, tutors also need to be clear about the rewards and penalties that students may incur by pursuing an unconventional solution to their project problem. They need to know the balance that the course aims to achieve between encouraging students to produce unique solutions and rewarding a successful arrival at the "end goal."

## The Role of the Student in CPBL

This is a student centred learning strategy and as such the role of the student must be considered. In the section which follows, we will outline and develop the important issues for students who are undertaking a project in higher education.

Throughout your studies at college you will be given a variety of opportunities to develop your skills as an independent learner and doing a project is a real example of this. A project takes you beyond what you already know about a topic and therefore requires research from a variety of sources including books, research papers and the world wide web. What you include in your project and how you present it will vary according to your discipline and the specific purpose of the project. However doing a collaborative project will require you to put into practice a range of important skills such as searching literature, collecting information from a wide variety of sources, analysing data and working as part of team. In addition skills of communication and time management will be important.

## Managing the Project

Doing a collaborative project requires that you identify key learning issues and take assume responsibility for your own learning as you undertake an extended piece of work and time management is a key area. Begin the project as soon as possible once you have the brief and plan your time to ensure that you make steady progress and build in regular project team meetings.

## Producing a successful project

A project brief can be daunting but it can help greatly if the task is broken down into a series of stages and then the group can logically work through each stage until your task is completed. A diagram of the main stages involved in doing a project is presented in Figure 1 below.

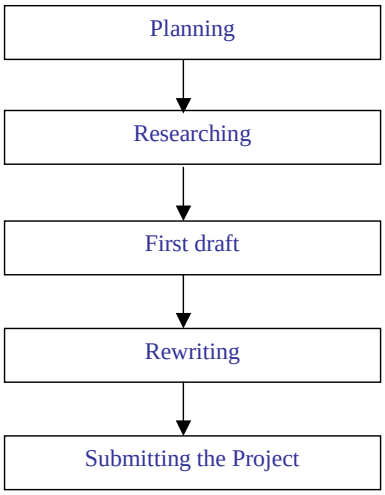


**Fig. 1:**

## Stage 1 — Planning

At this stage it is essential to make sure that you understand what the project requires. Read the brief carefully several times and write down initial thoughts and any questions that you might have. Then, at this stage, it will be essential to discuss the project brief with other students in your group but if you are unsure it is very important that you arrange to meet with the academic tutor involved with the project to avoid completing a task only to realise you misunderstood it. Once you have clarified the project brief you are now ready to begin researching.

## Stage 2 — Researching

This stage involves the group deciding on areas of responsibility for each individual. Then it will be necessary to locate relevant literature taking into account your aims and purposes, so that the information you gather is relevant. The amount of research will depend on the nature and length of the project and the time available to complete the work.

A large amount of information is available electronically and you will need to be able to use the library catalogues, databases and internet search engines. It is best to start with a visit to the library and librarians will give advice and guidance. It is very easy at this point to branch off in a variety of directions and spend a lot of time researching literature that is not directly relevant. In order to avoid this possibility it is good practice to keep in front of you the project title and this will support you to search through the literature using key words and thereby locate relevant material. Having located the literature it is important to take notes and record the main ideas gleamed from the text and think about how these relate to what you already know. It will be necessary to think critically and form conclusions based on a systematic evaluation of the available evidence.

Also take care to record your references sources correctly as failure to do this will mean that at a later stage you have to revisit all the literature consulted in order to check references and this can be very time consuming. It is expected in academic work that sources are correctly referenced and always avoid plagiarism, which is presenting somebody's work as your own without acknowledging it.

## Stage 3 — First Draft

Having located and evaluated the relevant information you can now move logically to the next stage, which is to write a first draft of your section of the project. All good writers produce a

draft, which they revise and edit to produce a final version. Once you begin to write you will find that you will begin to clarify your thinking. Try to get all your ideas down on paper first and you can reorganise later to ensure that there is logic to the draft and that your writing is clear and coherent and meets academic expectations. You must be very careful to reference the work of other people so as there is no plagiarism in the finished work. In producing a collaborative project, there will be a need to decide as a group how best to synthesise the individual elements into a coherent whole. A number of approaches can be taken to this but it will be essential that the final document is logical and consistent.

There is a common formula for writing an assignment at college level that may appear simplistic but does provide a good structure for a project:

- Introduction: Provide the reader with a clear outline of what you are going to do in the project and relate it to the project title.
- Main Body: Draw on relevant material and present your arguments in a structured way.
- Conclusion: Bring everything together so that there is a sense of completion. This involves summarising the main points, making recommendations and highlighting issues for further investigation.

## Stage 4 — Rewriting

It is important to understand that all writing involves rewriting and that even the most gifted writers will revisit work and edit and revise. Pay attention to the following as you make annotations and amendments:

- The document clearly adheres to the project brief
- The objectives are achieved and there are no gaps in the work
- There is a logical flow to the document
- Formal academic language is used
- The conclusions are clear to the reader
- The document is clear and well presented and adheres to the conventions laid down in the assignment brief.

## Role of the Tutor in PBL

As the amount of direct instruction is reduced in problem based learning, students assume greater responsibility for their own learning (Bridges and Hallinger 1991). The tutor's role becomes one of subject matter expert, resource guide, and facilitator of learning in the group. This arrangement promotes group processing of information rather than an imparting of information by tutors (Vernon and Blake 1993). The tutor's role is to encourage student participation, provide appropriate information to keep students on track, avoid negative feedback, and assume the role of fellow learner (Aspy et al. 1993). In essence, tutors should be more concerned with the process of learning of students than with the content of their learning. To do this properly requires many skills from the tutor, most of them in the field of social-pedagogy.

Fundamentally, the tutor is an educator who leads a task-oriented group to successfully achieve the outcomes of a teaching programme. In doing this, the tutor has to fulfil several responsibilities and is accountable to the teaching programme for the satisfactory completion of them. These responsibilities require abilities and skills relevant to the principles and practice of problem-based learning, group dynamics, the assessment of student learning, the use of learning resources and managerial skills.

The role of the tutor is very different from the usual teacher's role. Rather than being a "content expert" who provides the facts, the tutor is a facilitator, responsible for guiding students to identify the key issues in each problem and to find ways to learn those areas in appropriate breadth and depth. Tutors in a problem based learning curriculum need to alter their traditional teaching methods of lectures, discussions, and asking students to memorize materials for tests. As such, tutors focus their attention on questioning student logic and beliefs, providing hints to correct erroneous student reasoning, providing resources for student research, and keeping students on task. Because this role will be new to some teachers, they may have concern moving away from their past practice.

Considerable debate has occurred in higher education about the merits and demerits of tutors being selected for their content expertise. The early literature on PBL tutoring, exemplified by Barrows (1988), has emphasized the need for tutors to possess "*facilitatory teaching skills during a small group learning process*", these skills being the major determinant of the quality of the PBL learning process.

Other studies of tutor roles and behaviours by Schmidt et al. (1993), Schmidt and Moust (1995), have found that subject matter expertise of tutors enhanced both student learning and the learning process. With respect to tutor behaviours, Schmidt et al. (1993) found that subject matter expert tutors were able to employ more effective process facilitative behaviours such as asking stimulating questions, offering counter examples or seeking clarification, and that these behaviours were related to achievement, the latter referring to written test scores. Schmidt and Moust conclude that to be effective, tutors must possess both facilitatory teaching skills and content expertise, with content expertise a pre-condition to effectively perform the behaviours suggested by Barrows (1988).

Although students have much more responsibility in PBL than in most conventional approaches to teaching, the tutor is not just a passive observer. He or she must be active and directive about the learning process to assure that the group stays on target and makes reasonable choices on what issues are key to study. Teachers also have considerable influence on what is learned by selecting the problems in the first place, and by creating tutor guides and specific outcomes for each phase of the curriculum.

## Role of Students in PBL

As problem-based learning is a student-centred process, it is the responsibility of the individual student to participate fully, not only for his or her own learning, but also to aid the learning of others in the group. Although a significant proportion of time is spent alone in the library or at the computer, the full benefits of PBL cannot be realized in isolation.

In PBL, students devise a plan for gathering more information, then do the necessary research and reconvene to share and summarize their new knowledge in the group. Students may present their conclusions, and there may or may not be an end product. Again, students ideally have adequate time for reflection and self-evaluation (Duch 1995; Delisle 1997; Hoffman and Ritchie 1997; Stepien and Gallagher 1993). All problem-based learning approaches rely on a problem as their driving forces, but may focus on the solution to varying degrees. Some problem-based approaches intend for students to clearly define the problem, develop hypotheses, gather information, and arrive at clearly stated solutions (Allen 1998). Others design the problems as learning-embedded cases which may have no solution but are meant to engage students in learning and information gathering (Wang 1998).

An unanticipated issue with problem based learning is the traditional assumptions of the student. Most students have spent their previous years assuming their teacher was the main disseminator of knowledge. Due to this orientation towards the subject-matter expertise of their tutor and the traditional memorization of facts required of students, many students appear to have lost the ability to "simply wonder about something" (Reithlingshoefer 1992). This is especially seen in first year students who often express difficulties with self directed learning (Schmidt et al. 1992).

Although students generally prefer problem based learning courses, and their ability to solve real-life problems appears to increase over traditional instruction, there are issues to be aware of in moving towards this type of learning. Contributing to this divergence is the time requirement placed upon academic staff to assess student learning (Delafuente et al. 1994), prepare course materials, and allow students to complete the reduction in coverage of course material.

Students all seek approval from their tutors. They need guidance and role models whom they can respect and trust. It is essential for tutors to be honest with students. Even though effective tutors avoid the 'expert' role, they can have a powerful impact on students. Figure 2 depicts the possible levels of independence that students can achieve in a PBL group, where the tutor adopts differing roles.

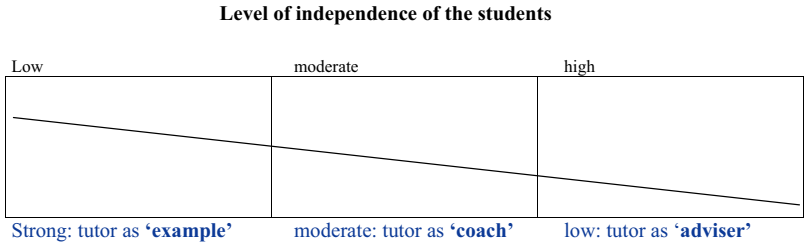


**Fig. 2:**

## Induction Process

Arguably, induction to both strategies is very important for both students and staff. Student induction must have a group work session, and include more support for those without group work experience. Through a series of team-building and problem-solving group activities, students need to become exposed to the problem-based and project-based way of thinking in an enjoyable way.

Considering problem-based learning, before students go into the curriculum proper, a PBL Orientation is essential to prepare students for PBL and enables them to make full use of the PBL process for life-long learning. Such an orientation can cover the following:

- Knowing and using PBL;
- Guest speakers from graduates on their views of PBL;
- Guest speakers from clients/employers on their views of the type of employees that they are looking for and their experience with students who learnt via PBL approach;
- Coping with change;
- PBL Small Group Tutorial Process;
- Assessment for PBL;
- Concept mapping.

Within the orientation, a specific focus on teamwork is vital, in particular, it can include problem-challenging and self-esteem games alongside how effective feedback in group situations is going to be constructed and conveyed.

## Academic achievement

Few academics doubt the ability of students prepared in problem based learning to exhibit strong reasoning and team building skills. Concern has been raised, however, over the breadth of content covered. As the focus of problem based learning centres on a specific problem, academic achievement scores often favour traditional teaching methods when standardized tests are used, but favour neither method when non-standardized forms of assessment are employed (Vernon and Blake 1993). These measures include problem-solving ability, interpersonal skills, peer-tutor relationships, the ability to reason, and self-motivated learning. In contrast, traditional instruction is judged better in the coverage of science content areas (Albanese and Mitchell 1993; Vernon and Blake 1993) and in evaluating students' knowledge content. Although problem based learning tends to reduce initial levels of learning, it can improve long-term retention (Farnsworth 1994).

## Resources

A continuing challenge for CPBL and PBL groups is "How much detail is enough?" Students should be encouraged to bring books and previous class notes and use them in the tutorial, if necessary, to clarify concepts and terminology. To obtain additional information, the tutor may direct students to a specific resource (journal article, book, expert, web site etc.). It is important for students to avoid wasting time tracking down an obscure reference. However, on the other hand, it is important for them to develop skill in finding good information and taking responsibility for the self-evaluation and development of personal study skills.

Generally, there is not a specific list of references developed for each problem considered. Part of the overall learning experience implicit in CPBL and PBL is the development of skills that will facilitate access to learning resources throughout students' future professional career.

Tutors should encourage students to discuss matters of interest pertaining to specific problems with their peers and with more senior students. Similarly, by virtue of the multidisciplinary nature of many of the learning issues that will evolve from individual problems, it is important to guide them towards discussions with professionals in the field.

In CPBL and PBL, resources need to be allocated to take specific factors into account. More generous tutorial support needs to be allocated than is provided for "traditional" courses. Additional tutor time needed to assess a final project report and for double marking of that report needs also to be included.

## Conclusion

It could be argued that the skill of the twenty first century graduate will be to articulate the right questions and to understand where and how they can search for knowledge, not remember the answers. Thus the importance for lecturers in higher education to adopt teaching strategies which cultivate and develop in students the processes of thinking, learning how to learn, problem solving and team-working, within a context of self-directed learning. We believe that well designed collaborative project-based and problem-based learning strategies have the potential to support the development of academic knowledge and skills and combine these in a way that enhances the student learning experience.

## References

Albanese, M. and S. Mitchell (1993). Problem-based learning: A review of the literature on its outcomes and implementation issues. *Academic Medicine 68*(1), 52–81.

Allen, D. (1998). Bringing Problem–Based Learning to the Introductory Biology Classroom. In A. McNeal and C. D'Avanzo (Eds.), *Student Active Science*. Available: `http://www.saunderscollege.com/lifesci/studact/chapters/ch15.html`

Aspy, D. N., C. B. Aspy, and P. M. Quimby (1993). What doctors can teach teachers about problem-based learning. *Educational Leadership 50*(7), 22–24.

Barrows, H. S. (1988). *The Tutorial Process*. Springfield, Illinois: Southern Illinois University School of Medicine.

Biggs, J. (1999). *Teaching for quality learning*. Buckingham: Society for Research into Higher Education and Open University Press.

Blumenfeld, P., E. Soloway, R. W. Marx, J. S. Krajcik, M. Guzdial, and A. Palincsar (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist 26*, 369–398.

Bridges, E. M. and P. Hallinger (1991, September). Problem-based learning in medical and managerial education. In *Paper presented for the Cognition and School Leadership Conference of the National Center for Educational Leadership and the Ontario Institute for Studies in Education*, Nashville, TN.

Crooks, B., J. Henry, and A. Morgan (1976). *Project memo 7: Assessment procedures in project courses (Project memo series)*. Milton Keynes, UK: Open University, Institute of Educational Technology.

Delafuente, J. C., T. O. Munyer, D. M. Angaran, and P. L. Doering (1994). A problem solving active learning course in pharmacotherapy. *American Journal of Pharmaceutical Education 58*(1), 61–64.

Delisle, R. (1997). *How to Use Problem-Based Learning in the Classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.

Duch, B. (Ed.) (1995, January). *What is Problem–Based Learning? In ABOUT TEACHING: A Newsletter of the Center for Teaching Effectiveness*, Volume 47. Available: `http://www.udel.edu/pbl/cte/jan95-what.html`

Fallows, S. and C. Steve (2000). *Integrating key skills in higher education: employability, transferable skills and learning for life*. London: Kogan Page.

Farnsworth, C. C. (1994). Using computer simulations in problem-based learning. In M. Orey (Ed.), *Proceedings of the Thirty-fifth ADCIS Conference*, Nashville, TN, pp. 137–140. Omni Press.

Hoffman, B. and D. Ritchie (1997, March). Using Multimedia to Overcome the Problems with Problem Based Learning. *Instructional Science 25*(2), 97–115.

Jaques, D. (2000). *Learning in Groups* ($3^{rd}$ ed.). London: Kogan Page.

Palmer, J. (1998). *The Courage To Teach*. California: Jossey–Bass Inc. Publishers.

Race, P. (2001). *The Lecturer's Toolkit: a practical guide to learning, teaching and assessment* ($2^{nd}$ ed.). London: Kogan Page.

Reithlingshoefer, S. J. (Ed.) (1992). *The future of Nontraditional/Interdisciplinary Programs: Margin or mainstream?*, Virginia Beach, VA. Selected Papers from the Tenth Annual Conference on Nontraditional and Interdisciplinary Programs.

Ryan, C. and T. Koschmann (1994). The Collaborative Learning Laboratory: A Technology-Enriched Environment to Support Problem-Based Learning.

Schmidt, H. G., P. A. Henny, and M. de Vries (1992). Comparing problem-based with conventional education: A review of the University of Limburg medical school experiment. *Annals of Community-Oriented Education* (5), 193–198.

Schmidt, H. G. and J. H. Moust (1995). What makes a tutor effective? A structural-equations modeling approach to learning in problem-based curricula. *Academic Medicine 70*(8), 708–714.

Schmidt, H. G., A. van der Arend, J. H. Moust, I. Kokx, and L. Boon (1993). Influence of tutors' subject-matter expertise on student effort and achievement in problem-based learning. *Academic Medicine 68*, 784–791.

Stepien, W. and S. Gallagher (1993). Problem-based Learning: As Authentic as it Gets. *Educational Leadership 50*(7), 25–28.

Vernon, D. T. and R. L. Blake (1993). Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine 68*(7), 550–563.

Wang, H. (1998, August 8). Research Associate. CCMB-USC. On AERA listserve on-line discussion.

# DESIGNING MODULES FOR LEARNING

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## Introduction

During the past fifty years third level education has expanded and diversified and the demands and expectations being placed on Higher Education Institutions are now formidable, with changes in the student body and increased pressure from government on costs, procedures and results. For academic staff, there are increased pressures through increased teaching loads, growing reporting and administrative requirements and pressure to develop and strengthen their research profile. Amongst academic staff surveys consistently report that teaching is a source of reward but staff say that they are working longer hours and dealing with a more diverse student group (McInnis 2000). At the same time, they still wish to improve and innovate their practice by designing and delivering effective courses and modules. The increased size and diversity of the student group has impacted on the process of course design. Biggs (1999) offers valuable suggestions for course design strategies in the context of a growing student population and Knight (2002) argues for courses in higher education to be designed in order to maximize the chance that learners will experience coherence, progression and deep learning.

Barnett et al. (2004) argue that the curriculum receives scant regard in current debates about teaching and learning in higher education but suggest that this may change in the context of quality assurance mechanisms and benchmarking. Knight (2002) points out that material on design work for teachers planning programmes in higher education is insubstantial. He suggests that there is a need for advice on programme design and argues for texts to be developed to target specific national markets. Thus, this chapter has been written to guide teachers in higher education who are currently involved in module design and would benefit from a practical manual that will steer them through the process of designing a module for the first time. It will also be of benefit to teachers who are redesigning existing modules, and wish to bring an awareness of current thinking to the task.

The focus of this chapter is the design of modules which form part of programmes in higher education. In the context of this chapter, we are taking a module to be a self contained, formally structured learning experience with a coherent and explicit set of learning outcomes and assessment.

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

Modules are not developed in isolation, but within a course or programme structure, and the process is informed by the external national qualifications framework and where relevant, professional body requirements. Thus, internal and external factors must be taken into account at the planning stage. In terms of designing modules, we would argue that there is a need for a planned integrated approach to the process with the focus on the learning of the student. We would suggest that academic staff can begin the process not by focusing on the content of the module and how they intend to teach it, rather by focusing on the quality of learning that can be achieved by their students.

The aim of the chapter is to support the reader in becoming a logical module planner, aware of the important decisions to be made, and the variety of possibilities available. Planning a module is a process that requires time, commitment and a thoughtful, systematic approach. We guide you through the process of structuring learning into modules and by working through the chapter, you will be facilitated to design a module that supports your students' learning. We would intend that the material presented would be adapted and modified to suit your professional context.

The chapter will bridge theory and practice in module design and deepen your understanding of the process, regardless of subject matter or institutional setting. The focus is on higher education, although much of what is suggested has application in other areas of education. Key issues in the process of module design will be explored and the relationship between educational philosophy, learner needs and the module design process itself will be analysed to ensure that they work in harmony and maximize the learning.

The chapter is structured in a number of sections, each including a practical activity entitled 'Action Trigger' for you to complete. The aim of these activities is to provide you with a hands-on opportunity to work through the design of your module of choice and to ensure that the time you invest will be productive in terms of the process and product.

## Context

The traditional curriculum focused on the teacher rather than the learner. However, in recent years there has been a paradigm shift taking place, moving the emphasis from teaching to learning and a more student-centred curriculum. This change has impacted on the curriculum design process with a greater emphasis on the learning in terms of knowledge, skills and competencies within courses and modules. The focus is on how learners learn and the design of effective learning environments. Alongside this change in pedagogy, the Bologna Agreement has emphasized the need for reform to modernise European higher education.

This chapter recognizes that many countries have national qualifications frameworks and that each institution has its own realities of quality assurance procedures with which to engage. However, we will outline a generic model of module design that academic staff can take and adapt within the realities of their own institutional and national contexts.

The standpoint is taken that although modularity is 'a good thing', it does not come without problems and whilst being cognizant of these, the focus of this work is to help teachers to gain educationally sound ideas and strategies for improving learning, teaching and assessment in a modularised context.

## The module design process

There are a variety of models for the design of courses in higher education (Toohey 1999; Biggs 1999) and many of the same issues are relevant in the context of designing modules. In the process of devising a module, the key is to forge educationally sound and logical links between learner needs, aims, learning outcomes, resources, learning and teaching strategies, assessment criteria and evaluation.

## Framework towards Designing Modules for Learning

In Figure 1 a Framework for Module Design and Development is outlined. This provides an overview of the process, highlighting the important variables in module design and illustrating the relationships between them; however it is important to stress that it is not a linear process.

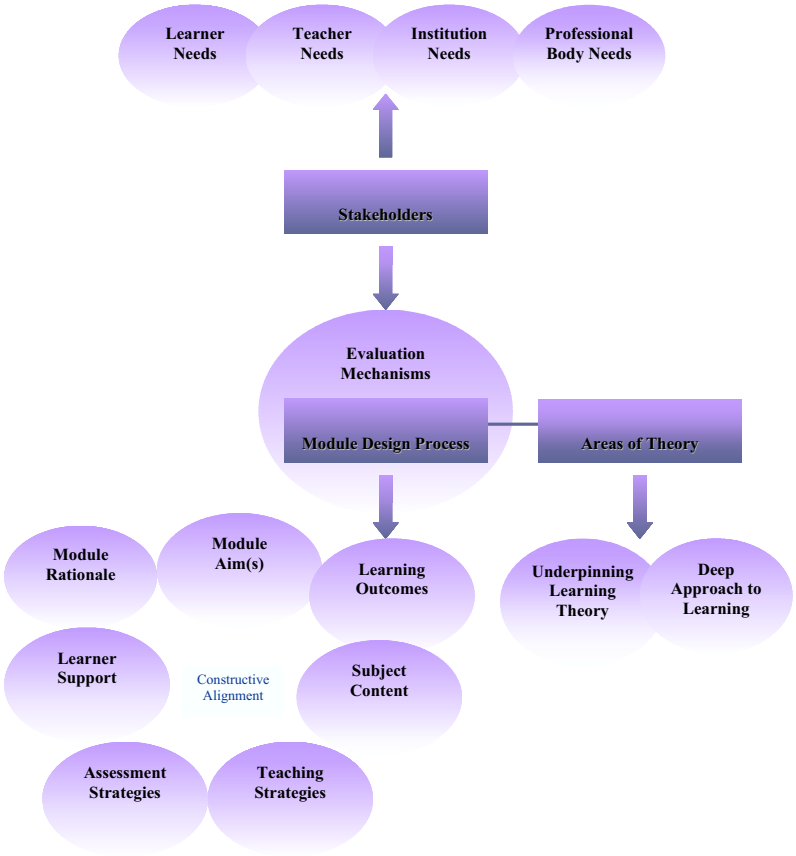


**Fig. 1:** Framework for Module Design and Development

## A place to start

Any systematic approach to module design must be considered within the context of a theoretical framework.

## Applying Relevant Theory

The question remains when designing modules for learning, why is it important to be aware of the theories that underpin learning? We would argue that a theory should make explicit the underlying psychological dynamics of events related to learning. Each one is based on different assumptions about the nature of learning and we are suggesting that you identify your own theory of learning because the strategies one might use to enhance learning will direct follow from one's orientation.

It could be argued that teachers bring to the classroom or lecture theatre an inbuilt informal theory of teaching. This theory, which may be either consciously stated or implicit in what the teachers do, has implications for the way in which students learn. It is outside the scope of this

chapter to go into depth on learning theories. Further discussion of these theories can be found in Carlile and Jordan (2005).

In addition to taking cognizance of different learning theories, it is also important o take into account that there is no universal way of learning. Brown and Atkins (1991) state that differing students will use different strategies on different tasks. They stress the importance of 'learning-for-understanding' and 'learning-for-knowledge' orientations, with learning being a continuous process of development back and forth between the two.

When designing modules, we would argue that it is important for teachers to be aware of concepts of deep and surface approaches to learning. Much research has previously been conducted on the relationship between courses and the approach students take to learning (Marton and Saljo 1976; Entwistle 1981; Gibbs 1992; Ramsden 1992; Biggs 1999). Arising from these studies, there are implications in terms of module design. Seeking to incorporate the following to your module design can offer a greater likelihood of fostering a deep approach to learning:

- sustained interaction with content and others;
- relating new ideas to previous knowledge;
- providing explicit explanations and a clear knowledge base to students;
- structuring in a reasonable student workload;
- providing opportunities for students to pursue topics in depth so that they can understand the material for themselves;
- ensuring an appropriate formative and summative assessment strategy.

These ideas resonate with teachers in today's higher education environment and have implications both for our choice of learning and teaching strategies and how we assess learning. An awareness of these approaches to learning is fundamental to the entire module design process.

## Constructive Alignment: the Importance of Coherence

Constructive alignment is an approach to curriculum design that maximises the conditions for quality learning by ensuring alignment throughout the process, from the forming of learning outcomes, to the choice of teaching methods to assessment.

> *"The fundamental principle of constructive alignment is that a good teaching system aligns teaching method and assessment to the learning activities stated in the objectives so that all aspects of this system are in accord in supporting appropriate student learning."*
>
> (Biggs 1999:25)

There are three elements involved in the process of constructively aligning your module:

1. Defining the learning outcomes;
2. Choosing the learning and teaching methods that can lead to attainment of outcomes;
3. Assessing student learning outcomes.

This is a design for learning which is most likely to encourage deep engagement from students but setting up an aligned system requires time and some thought on the part of the academic. However, we argue that a well designed module depends for its success on the interrelationship between these elements and should inform your thinking at all stages as you work through the process.

We now begin by identifying the areas that need to be addressed as this gives a clear focus to the design activity. We are not suggesting an approach in which each step needs to be completed

before the next is begun. Rather, one can move back and forth as required. It is often easier to think productively about abstract topics such as values only after thinking about more concrete issues such as curriculum content and learning and teaching strategies. A series of steps are now outlined to take you through the module design process and in the forthcoming sections of the chapter, each will be dealt with in some detail.

- Thinking through a rationale for your module
- Deciding on aims and learning outcomes for the module
- Thinking about the module content
- Exploring learning and teaching strategies and the appropriate learner support
- Focusing on assessment
- Considering learner support
- Planning a module evaluation strategy

## Developing a Module Rationale

The purpose of a rationale is to serve as a broad value system for the learning in your module. However, seldom will a module be designed in isolation but rather it is more likely to form part of a programme of study and it is important to give consideration to the underlying values and beliefs about the purposes of education. The opportunity to think through and discuss such issues through the process of module design can support teachers to highlight the values that they hold as educators. We would content that your module should do more than add information to students' stock of knowledge but should be seeking to encourage a deep approach to learning.

The activity below can assist you in developing a coherent rationale statement for your module.

**Action Trigger**

- What are the educational goals for your module?
- What conceptions do you have of your learners?
- Why is the subject matter important?
- What are your beliefs and values about learning and teaching?

## Aims and Learning Outcomes

The aim of your module indicates the general direction or orientation of a module in terms of its content and sometimes its context within a programme. An aim tends to be written in terms of the teaching intentions:

- The aim of the module is to provide an introduction to the application of statistical theory in general insurance.
- The module aims to provide an effective and common grounding in written and interpersonal skills.

The traditional way of describing modules and programmes in Higher Education has been to write in terms of the content with academics defining courses in terms of what is taught. However, recent development have encouraged a move to an outcomes based approach to course design with learning being defined in terms of what the students can do at the end of a module or programme. There is continuing debate in the literature about the value of defining learning in terms of outcomes and the effect that this may have on student learning but it is not the purpose of this chapter to enter into the debate. Although many academics have misgivings about the outcomes based approach, many of us are now required to define modules and courses in these terms. The use of learning outcomes is a means of describing the contents of a module or course in terms of the learning that is intended to happen.

A learning outcome is a statement of what the learner is expected to know, understand and / or be able to do at the end of a period of learning. Learning outcomes focus on learning rather than teaching and are not about what the teacher can provide but what the learner can demonstrate at the end of a module or course. Learning outcomes should be written taking into account level descriptors relevant to the level of study, and if relevant professional body requirements. They can support students to better understand what they can expect to know and be able to do at the end of a module. Some examples of learning outcomes follow:

On completion of the module the learner will be expected to able to:
explain the role of accounting information in organisations

Successful students will typically be able to:
identify and critically evaluate the strategic options available to enterprises

The phrases used to start the sentence lead to the use of action verbs and to a focus on how students will demonstrate their learning. You need to think about how you will ask your students to demonstrate their understanding. When they are being assessed students may be asked to discuss a concept, analyse a situation, describe a process or evaluate some data. These are the tasks the student actually does in order to demonstrate understanding and so these terms can be used to express the learning outcome. Bloom's Taxonomy developed in 1956 still remains one of the best aids to writing good learning outcomes There are no rules on how many outcomes per module or course but some guidelines have been given on the literature in learning outcomes in the U.K. It has been suggested that a module should have between four and eight learning outcomes and an entire programme should have up to twenty five (Moon 2002).

## Teaching for Learning

In this section, we are going to explore a range of teaching methods and will focus on the methods and combinations of methods that can best realize the sort of constructive engagement with learning activities that leads to understanding (Ramsden 1992). Even the best designed modules, with very worthwhile defined learning outcomes, can fail if the teaching strategies employed are inappropriate to encourage and support the learners towards meeting the desired learning outcomes. It is useful to reflect on what we mean by a teaching strategy? Toohey (1999:152) offers the following definition:

> *"A teaching strategy is … a plan for someone else's learning, and it encompasses the presentations which the teacher might make, the exercises and activities designed for students, materials which will be supplied or suggested for students to work with, and ways in which evidence of their growing understanding and capability will be collected."*

This definition is very helpful as it emphasizes that a teaching strategy is fundamentally about supporting your student's learning. In giving consideration to how, as academics, we can teach in order to ensure that our students are engaging with the learning process, it is necessary to focus on the type of teaching strategies we can employ to achieve this end.

The following approach will help you to think through and decide on appropriate teaching strategies for your module. First, take time to read over your module aims, learning outcomes and content material. Then, focus on how best you can involve students in making sense of the material through active engagement and application.

**Action Trigger**

- Who are your learners? E.g. undergraduate, postgraduate, adult, international students
- What kinds of learning are you trying to achieve? E.g. knowledge, skills, attitudes.
- How are you going to deliver the content? E.g. lectures, tutorials, seminars, practicals
- What learning activities can be organized to meet the learning outcomes? E.g case studies, problem-solving, role play, group discussions
- What resources are available to you? E.g. handouts, worksheets, OHPs, visuals
- Does your teaching strategy support the learner to meet the desired learning outcomes? The matrix in Table 1 provides an opportunity for you to review a range of popular teaching strategies in higher education and the type of learning which each strategy best supports.

**Tab. 1:**

| Learning Outcomes | | Teaching Strategy | Learner Activity | Assessing for Learning |
|---|---|---|---|---|
| Knowledge | Transmit / Inform | Lecture<br>Reading<br><br>Tutorial<br>Researching | Reproduce learning<br>Linking to theory<br><br>Clarify and expand<br>Self-directed learning | Essay exam<br>Assignment; Open Book exam<br>Reflective Journal<br>Assignment |
| ↕<br><br>Skills | Engage | Discussion<br><br>Question & Answer<br>Peer Teaching & Learning<br><br>Web-based Teaching | Interpreting knowledge<br>Clarify knowledge<br>Providing multiple perspectives; self insight<br>Exploring learning; Providing multiple perspectives; | Interview; Presentation; Viva<br>Quiz<br>Self and peer assessment; Portfolio; Project<br>Computer Assisted Assessment |
| ↕ | Practice | Seminar<br>Class Presentation<br>Field Trip | Clarify knowledge<br>Presentation skills<br>Experiential | Presentation; Project<br>Presentation<br>Project |
| ↕ | Application | Laboratory<br><br>Demonstration<br><br>Games<br>Problem solving<br><br>Case Study<br><br>Group work | Apply theory to practice<br>Deepen understanding<br>Exploring learning<br>Transform knowledge<br>Appraising; synthesing<br>Transform knowledge | Practical Assessment; Lab Reports<br><br>Practical Assessment<br><br><br>Set problems in Exam<br><br>Case Study Assessment<br><br>Group Project |

The table above is not a comprehensive summary of all possible teaching strategies and more detail can be found in Higgs and McCarthy (2005). The reality is that there is no shortage of teaching strategies. However, the key issue for module designers is selecting the strategies that are most likely to support the achievement of learning outcomes and are suitable for use in your teaching context taking into account the resources available to you.

## Assessing your Learners

In relation to assessment, we would suggest that the fundamental principles are that the assessment methods should be in accord with the learning outcomes of the module and should foster a deep approach to learning.

Assessment is generally considered in terms of either being Formative and/or Summative. Formative assessment is used to inform both student and teacher as to how the learner is progressing. Integral to this process is the feedback that students receive from the teacher and this should be used to improve both the learning of students and the teaching practice. Summative assessment is used to grade students at the end of a module or to accredit them at the end of a programme.

Formative assessment may be used to contribute to continuous assessment but we would argue that in order for students to have the maximum opportunities to learn in a module, then there must be some option for a formative assessment which does not contribute to the final grade. Students can then obtain feedback which will allow them to address any gaps in their knowledge or skills.

**Action Trigger**

- What knowledge do you want to assess? Refer to your learning outcomes.
- What skills do you want to test?
- Have you built in provision for formative and summative assessment?
- What weighting do you want to give to the final exam and other forms of continuous assessment?

Despite the fact that there are a variety of assessment methods available, Brown (1999:8) notes 'that the range of ways that students are assessed is extremely limited with around 80% of assessments being in the form of exams, essays and reports of some kind.' We would encourage you to give consideration to a wide range of possible assessment methods.

Table 2 will outline a range of assessment methods to assist you in choosing an appropriate assessment taking into account the link between learning outcomes and assessment, within the context of modularity.

**Tab. 2:**

| Learning Outcomes | | Teaching Strategy | Learner Activity | Assessing for Learning |
|---|---|---|---|---|
| Knowledge<br>  <br>Skills<br>  | Transmit / Inform | Lecture<br>Reading<br><br>Tutorial<br>Researching | Reproduce learning<br>Linking to theory<br><br>Clarify and expand<br>Self-directed learning | Essay exam<br>Assignment; Open Book exam<br>Reflective Journal<br>Assignment |
| | Engage | Discussion<br><br>Question & Answer<br>Peer Teaching & Learning<br><br>Web-based Teaching | Interpreting knowledge<br>Clarify knowledge<br>Providing multiple perspectives; self insight<br>Exploring learning; Providing multiple perspectives; | Interview; Presentation; Viva<br>Quiz<br>Self and peer assessment; Portfolio; Project<br>Computer Assisted Assessment |
| | Practice | Seminar<br>Class Presentation<br>Field Trip | Clarify knowledge<br>Presentation skills<br>Experiential | Presentation; Project<br>Presentation<br>Project |
| | Application | Laboratory<br><br>Demonstration<br><br>Games<br>Problem solving<br><br>Case Study<br><br>Group work | Apply theory to practice<br>Deepen understanding<br>Exploring learning<br>Transform knowledge<br>Appraising; synthesing<br>Transform knowledge | Practical Assessment; Lab Reports<br><br>Practical Assessment<br><br><br>Set problems in Exam<br><br>Case Study Assessment<br><br>Group Project |

Assessment should be given serious consideration and reflection and the choice of assessment methods should clearly relate to the learning outcomes. There will rarely be one method of assessment which satisfies all learning outcomes for a module and we would recommend that in devising your assessment strategy, a variety of methods is included.

It is also important for module designers to think about how modularity may impact upon assessment practices and give consideration to some of the pitfalls associated with assessment within modular structures. In designing or redesigning modules, it is vital to bear in mind which parameters of assessment do you need to agree on as a group, and which can be left to individual teachers or subject coordinators. In a modular system, it is important to guard against over-assessing students based on the unit of study. Also there is a tendency in a modular curriculum to crowd the assessments with the result that students are handing in multiple assessments at the mid way point and at the end. This is an unacceptable burden for students and it is therefore vitally important that within a programme of study, the timetable of assessment is planned thoroughly in advance so the students do not face this problem.

## Supporting your Learners

In designing modules consideration should be given to the type of learner support which will be required for the achievement of the learning outcomes. There are administrative issues around module design: scheduling of teachers, students, teaching activities, assessment time and module resources. Many modules are over ambitious and require more time on the part of students for their completion than is reasonable. Modules depend for their success on the careful allocation of resources, whether this is teaching rooms, laboratories, library facilities and equipment.

Whether you are teaching a module alone, or are adopting a team-teaching approach, you will find a need for support, whether it be technically subject-specific, audio-visual, information skills or information technology, and it is important to think through the issues around support.

**Action Trigger**

- Have you considered the implications of the likely background, qualifications and
  experience of students?
- Have you considered a learner support policy?
- Have you ideas for producing a student guide for the module?

## Evaluation Mechanisms

Module design and development is an ongoing process and this section will look at the kind of evaluation mechanisms that might be used to elicit meaningful information to assist you in reviewing and improving your module. This should be based upon criteria that are co-operatively developed and concerned with gathering information about the quality and effectiveness of the module. Evaluation is not just a retrospective process, but can be an integral part of the module development, informing you before, during and after the process.

When designing your evaluation strategy it is important to consider the following:

**Action Trigger**

- Are you designing into the module opportunities for feedback and evaluation?
- Are you using feedback and evaluative processes throughout the year not just as part of annual monitoring and review?
- Who is the evaluation for?
- Why are you carrying out the evaluation?
- What will your evaluation do?
- What kind of information do you want to collect?
- What do you plan to do with the information once collected?

Before selecting your evaluation methods within the strategy, the key thing to consider is your evaluation question i.e. what do you want to know? Your selection of methods will be determined by considering, for example, who the evaluation is for, the scale of your evaluation, the necessity for authenticity within the data collection and levels of resources available to you. A range of methods can be employed and further reading is available (Neary 2002; Posner and Rudnitsky 2001).

When designing your evaluation strategy it is important to consider when you will collect your data and how you will select your student and/or stakeholder sample. It is also recommended that something is done with any data collected and if students have been involved in the data collection, try and feedback any data and make changes as appropriate.

## Conclusion

This chapter has demonstrated that the creation of a constructive learning environment requires thoughtful planning at module level. The purpose of the chapter has been to enable teachers to explore the factors that impact on the curriculum design process and to use learning outcomes as an organizing principle for module design. The focus of the chapter has been on developing coherence in the curriculum through the use of learning outcomes, teaching methods, materials and activities, and assessment. The main question to be asked is what do students need to learn and how best can they be facilitated to learn it.

We hope that you have found working through this chapter has helped to clarify the module design process and has provided you with a useful starting point to begin this journey. This brings to an end the design and plan of your module, but in a sense there is never a close, but rather it is a continuing process of reflection and review.

## References

Barnett, R., G. Parry, and K. Coate (2004). Conceptualising Curriculum Change. In M. Tight (Ed.), *The RoutledgeFalmer Reader in Higher Education*. RoutledgeFalmer.

Biggs, J. (1999). *Teaching for Quality Learning at University*. Buckingham: SRHE/OU Press.

Brown, G. and M. Atkins (1991). *Effective Teaching in Higher Education*. London: Routledge.

Brown, S. (1999). Institutional Strategies for Assessment. In S. Brown and A. Glasner (Eds.), *Assessment Matters in Higher Education*. Buckingham: SRHE and OU Press.

Carlile, O. and A. Jordan (2005). It works in practice but will it work in theory? The theoretical underpinnings of pedagogy. In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

Entwistle, N. (1981). *Styles of Teaching and Learning*. Chistester: Wiley.

Gibbs, G. (1992). *Improving the Quality of Student Learning*. Bristol: Oxford Centre for Staff Development.

Higgs, B. and M. McCarthy (2005). Active Learning — from Lecture Theatre to Field-work. In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

Knight, P. T. (2002). *Being a Teacher in Higher Education*. Buckingham: SRHE/OU Press.

Marton, F. and R. Saljo (1976). On Qualitative Differences in Learning – I: Outcome and Process. *British Journal of Educational Psychology 46*, 4–11.

McInnis, C. (2000). Changing academic work roles: the everyday realities challenging quality in teaching. *Quality in Higher Education 6*(2), 143–52.

Moon, J. (2002). *The Module and Programme Development Handbook*. London: Kogan Page Ltd.

Neary, M. (2002). *Curriculum Studies in Post-Compulsory and Adult Education*. Cheltenham: Nelson Thornes Ltd.

Posner, G. J. and A. N. Rudnitsky (2001). *Course Design: A Guide to Curriculum Development for Teachers*. New York: Longman.

Ramsden, P. (1992). *Learning to Teach in Higher Education*. London: Routledge.

Toohey, S. (1999). *Designing Courses for Higher Education*. Buckingham: SRHE and OU Press.

# NEW TRENDS IN ACADEMIC STAFF DEVELOPMENT : REFLECTIVE JOURNALS, TEACHING PORTFOLIOS, ACCREDITATION AND PROFESSIONAL DEVELOPMENT.

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## Introduction

A renewed professionalism has taken seed in higher education in Ireland and elsewhere, with a long overdue acceptance of the need to provide teaching staff with frameworks for professional development in the area of teaching practice. The *professional scholar*, *but amateur teacher* model of the past is increasingly untenable in an era of widening diversity, greater public accountability and technological and institutional transformation. In this chapter, we will explore a range of relatively recent developments (in Irish terms) in the field of academic staff development, surveying the current landscape and reflecting on evolving international trends. We will explore the concept of the *reflective practitioner*, which is increasingly emerging as the dominant paradigm in many professional development programmes in higher education, through discussion of reflective writing and *teaching portofolios*. In addition, the new trend towards the provision of accredited, post-graduate level qualifications will be discussed through comparison between the UK and Ireland.

## Teaching Portfolios

Boyer's concept of the "scholarships of higher education" (Boyer 1990), which sought a new approach to the traditional research *vs* teaching debate, has been strongly influential in the US and has made gradual progress elsewhere. Coupled with Schön's work on reflective practice (Schön 1983; 1987), it has helped fuel the acceptance of *teaching portfolios* as a means of documenting teaching practice and encouraging critical self-reflection. As Shulman states:

> My argument is that until we find ways of publicly displaying, examining, archiving, and referencing teaching as a form of scholarship and investigation, our pedagogical knowledge and know-how will never serve us as scholars in the ways our research does. The archival functions of research scaffold our frailties of memory, and we need something comparable for the scholarship of teaching
>
> (Shulman (1998) as quoted in Lyons et al. (2002))

Teaching portfolios have thus emerged as the dominant form of such "archiving" and are now very well established, with over 2,000 colleges and universities in the US currently supporting or developing teaching portfolio schemes, as discussed in Seldin (2004) review - which also provides large numbers of example portfolios from across a range of disciplines and institutions.

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

The use of Teaching Portfolios in Irish universities was pioneered at UCC (University College, Cork), driven at Vice-Presidential level and nurtured by links with US expertise, primarily by supporting a distinguished visiting scholar. In this particular model, teaching portfolios have been explicitly linked with the promotion of the "scholarship of teaching." A pilot portfolio scheme was structured around a seminar series, with participation by staff from a range of academic disciplines (Lyons et al. 2002). The emphasis, as can clearly be seen in this publication, has been strongly placed on the development of a statement of personal, individual teaching philosophy (e.g. McCarthy 2002). In many ways, it is this aspect of portfolio writing that poses the greatest challenge, highlighting the lack of tradition and familiarity both with reflective writing itself and in discussion of teaching-related issues from an academic perspective. The UCC model is commendable in establishing a local community of practice and a network for peer-support amongst at least the first cohort of portfolio writers. Now that portfolios are becoming required "artefacts" in evidence of teaching excellence for promotion applications, however, this model may face some challenges. One would suspect, that a new cohort of participants with this more explicit, more instrumental focus, may prove less tolerant of wide ranging, open discussion on philosophical matters and keener to relate to a more standardised portfolio format.

Indeed, if one compares the examples presented in Lyons *et al.*, with those included in Seldin's recent volume (and many other examples, which are increasingly available on the internet) a distinction becomes apparent between two groupings of portfolio types. The first is those which, as in the UCC experience, have emerged from a mutual, collaborative exploration of fundamental issues and principles in teaching and learning (e.g. McCarthy 2002). Such writing documents a process of conceptual change or a transformation of perspective. The second grouping, is rather more "pragmatic" in style and provides some minimal level of critical reflection, including a rather brief statement of teaching philosophy (e.g. Mues and Sorcinelli 2000). It is this second type, however, that appears dominant, driven, no doubt, by its primary use as evidence in support of a case for promotion (or tenure), but also by its relative ease of construction (3–7 Mues and Sorcinelli 2000).

Indeed, the acceptance of portfolios by university administration as a legitimate (and in some cases, compulsory) means of evidencing "excellence" in teaching, has arguably been the primary factor in boosting portfolio uptake (e.g. Hyland 2002). Within Ireland, this approach has also taken hold, and while to be welcomed by the advocates of "the scholarship of teaching", there should be no delusions about the instrumentalist rationale and the consequent limitations of such documents. The issue now, for academic staff developers, becomes one of taking existing portfolios, produced for promotion applications, and turning these into *living documents* that play a key role in informing and transforming day-to-day teaching practice.

It is not sufficient in such a context to simply require the inclusion of "evidence of reflection". The question of review, comparison and ultimately, of grading portfolios is of key importance. Promotions panels, awards committees and other potential recipients of portfolio submissions need to be adequately trained and experienced in recognising what makes an effective portfolio. If evidence of reflective practice is sought, then clear examples and explanations require to be offered in such training and this can prove difficult. But these are the same problems faced by academic staff that seek to encourage their students to be more reflective and demonstrate critical thinking. How is it possible to measure reflection? What are the hallmarks of reflective writing and how can one measure the "depth" of any discussion or critique?

## Reflective Writing in Journals and Portfolios

A number of approaches to examining reflective writing are discussed in detail in Moon's work (1999; 2000). One such approach, which we have used in a major study on the continuing professional development of high school teachers (Susilowati et al. 2004; Mac Labhrainn et al. 2004) is to build on van Mannen's (1995) "levels of reflection." A simple scheme identifying 4 or 5 apparent levels of reflective analysis, or depth of critique, has been shown to have strong inter-grader relia-

bility and to provide a close relationship with levels of performance, particularly at postgraduate level. These levels and their characteristics are described in table 1.

**Tab. 1:** A coding scheme for reflective journals based on van Mannen's levels of reflection.

| Level | Description | Indicators |
|---|---|---|
| 0 | Non reflective. | The entry in the learning journal/reflective portfolio is either irrelevant to the question or no entry is written for the question. |
| 1 | Everyday thinking and acting | The entry states common sense thinking and acting which was derived from habitual or routine action. It is intuitive and pre-reflective. No further reasoning or explanation is given to the entry. |
| 2 | Reflection on incidental and a limited way on practical experiences in everyday life. | Further reasoning or explanation is given to the entry. The reasoning or explanation given shows limited insight related to practical principles, "dos and don'ts" or rules of thumb. |
| 3 | More systematic reflection on own experience and that of others. | The reasoning or explanation given is more structured, based on existing theories or others' accepted perspectives and experiences. The entry shows indication of theoretical understanding or critical insight into the matter. |
| 4 | Reflect on the way we reflect on the form of our theorising. | The entry demonstrates a more self-reflective grasp of the nature of the knowledge, how knowledge functions in action and how it can be applied to the active understanding of the practical action. It could also show the transformation of the writer's thinking or belief. |

*Sources:* Van Mannen (1995); Susilowati et al. (2004)

Indeed, in this and related work, the concept of a reflective learning journal structured around guiding questions and peer discussion, has proven highly effective. This reflective journal can be used as a means of developing an individual narrative through the content of a professional level course and tackling directly higher order intended learning outcomes. In essence, such journals form a mediated dialogue between writer and tutor/mentor.

Laurillard (2002) has argued that such a dialogue or "conversational framework" is a characteristic hallmark of academic learning. Although much of her writing has focussed on the potential roles of technology in contemporary higher education, this seminal volume takes a far wider brief and explores a number of possible theoretical groundings for higher education studies, raising interesting questions about the extent to which critical thinking and active learner engagement is taking place in mainstream higher education degree programmes, not just those supported by technology. The theoretical and ideological context in which portfolio assessment is situated is also something which has received only fairly limited attention to date. Moon (2000), of course, provides an excellent overview and a critique of many of the standpoints regarding the act of reflection itself. Johnston (2003), highlights the issue of developing approaches to assessment and

measuring outcomes and how these relate to a number of possible different theoretical/cultural positions.

One of the difficulties of simple self-reflection, is the danger that it becomes too introspective, unchallenged, ego-centric and self-limiting (Bleakley 2000; Land 2003; Moon 2000). In the case of the teaching philosophy statements found in all teaching portfolios, for example, there is the distinct possibility that such statements are essentially constructed as *post-hoc* justifications for the teaching methods used, which were most probably adopted through custom and tradition, rather than through a process of critical investigation or through a desire for "constructive alignment" (Biggs 2003). The role of a mentor, tutor or "critical friend" able to challenge statements and question assumptions therefore becomes central to any attempt to shift from the instrumental approach to a scholarship orientation.

## Professional Qualifications in Teaching & Learning

Whilst Teaching Portfolios have served as the principal means of promoting the idea of the scholarship of teaching and laying the foundations for a more formalised basis for the continuing professional development of academic staff (or "faculty") in US universities, the situation elsewhere is somewhat different. In the UK, for example, the major focus of attention has been on the development and delivery of postgraduate level qualifications in teaching and learning. It is now compulsory in most UK institutions for new academic staff to complete at least a postgraduate certificate in this field. Opportunities also exist in many cases to pursue such studies to postgraduate diploma or masters' levels. However, certificate level programmes are the most "popular."

The timescale over which such programmes have moved from piloting to compulsory, probationary requirements has been remarkably short, driven strongly by government focus on quality issues in higher education, and triggered by the report of the National Committee of Inquiry into Higher Education (NCIHE 1997). This rapid development has not been without criticism and dispute, but should not be portrayed as simply a struggle between the forces of change and traditional vested interests. There have been serious, legitimate concerns about the nature of higher education and the appropriateness of the proposed frameworks. Indeed, the theoretical underpinnings of many such programmes have also been challenged. For example, Schön's reflective practice (Schön 1983) approach is particularly popular, but in truth, whilst there are many examples of small scale studies in specific academic subject areas, there are as of yet no major, robust studies indicating that reflective practitioners actually make "better teachers." Of course, how one interprets or measures good teaching is itself problematic. But, combined with internal contradictions in some of Schön's writings (see Moon 2000:46–53, for a detailed discussion) about specific aspects of the processes of reflection, the issue is worth further research.

Gibbs and Coffey (2004) have investigated the effectiveness of formal training programmes for university teachers in twenty-two institutions (in eight countries). This study is of particular value because it examined the impact of the training on the approaches to learning adopted by students in the classes of the participating teachers. They concluded that there was indeed some evidence that students were less likely to adopt surface learning approaches as a result of staff undertaking year long training programmes.

Haggis (2003) has drawn attention to the almost unchallenged assumptions upon which much of the 'standard texts' in this field are based, in particular the dominant "deep/surface" learning model. Through probing interviews with students she reveals some of the limitations and dangers of interpreting such research in over-simplistic terms and raises a number of interesting questions.

The current picture in the UK, then, is one where there are large numbers of postgraduate certificate programmes for academic staff (almost as many as there are institutions). Most, if not all, however, have been accredited by the *Institute for Learning & Teaching in Higher Education* (ILTHE), now the *Higher Education Academy*. This accreditation process (Brown 2000), whilst conferring official recognition and approval, does not require the adoption of a standard, national curriculum, but rather, requires programmes to explore commonly identified key areas. There is,

consequently, a wide range of programmes available, from formal classroom based taught modules with a range of assessment instruments, to more flexible portfolio-oriented programmes.

However, the history of the ILTHE's growth and development has revealed tensions within the community, its relationship with other long standing organisations, such as SEDA (Staff and Educational Developer's Association) and the university unions (most notably, the AUT), its accelerated membership programme (based on a very abbreviated "portfolio of evidence") and the extent to which it has been accepted (or not) by management and academic communities in old and new universities have all helped generate a (healthy) debate over the past several years. Now in a merger with other, hitherto autonomous, organisations and projects (e.g. the LTSN – *Learning & Teaching Support Network*) it has been recast as the HEA (resulting in an interesting acronym conflict with Ireland's Higher Education Authority!) which has been viewed with suspicion by some as being far more an instrument of government control. Although this point is contested by virtue of its retention of "mass" membership and elements of democratic/representative governance, there is no doubt that it is an instrument through which government higher education priorities can be pursued. Interestingly, particularly given the devolution settlement of recent years, the new Academy is closely allied with the *Higher Education Funding Council for England* and there seems at least an incomplete appreciation, amongst some members at any rate, that higher education policy is now devolved to the Scottish Parliament and Welsh Assembly.

## The Irish Context

For Ireland, as a near (and conjoined) neighbour, these developments are important, given attempts to strengthen links between institutions in the North and the Republic (for example through AISHE – the *All Ireland Society for Higher Education*, and *Universities Ireland*). The ILTHE, as was, attempted to open its membership to academic staff in the Republic, with some limited success, but was still viewed very much as UK – centric. Accreditation of courses offered by universities in the Republic, however, has not been pursued since there is a view that, not only is there not a requirement for such accreditation nor any perception of conferred advantage, but that there is value in maintaining a distinctively Irish quality to the programmes on offer.

Outwith the UK, such programmes are not as developed or firmly embedded in preparation for higher education teaching careers (especially at university level in those countries where the "binary divide" has been maintained), although a number of European countries have long established schemes more akin to "apprenticeship", but also which include, increasingly, formalised certificated courses. There are significant cultural variations across Europe, but these issues are being explored through a variety of projects and organisations (for example the EUA). Given moves towards greater European harmonisation through, for example, the Bologna process (see, for example, Reichert and Tauch 2003), it is likely that the issue of staff training and development will become increasingly prominent in the next few years.

In Ireland, such courses are (at the time of writing) available to academic staff in DIT, UCC, NUI Galway and UCD, with indications that others are ready either to develop their own or to share those of partner institutions. Issues currently being debated are similar to those in the UK, and also focus on the value of Masters and Diploma courses as opposed to Certificate level. The latter, of course, are likely to receive a higher uptake, but the challenge is in encouraging longer term, *continuing professional development* and opportunities may exist through modular structures and incorporating wider areas of "academic practice", such as postgraduate student supervision, research strategy, etc.

## Conclusions

These are exciting times in academic staff development. We are witnessing a renewed interest at the highest levels in issues relating to teaching practice, career progression and the role of the sector in the wider society. Teaching itself is beginning to develop a greater legitimacy within the academy (see for example Becher and Trowler (2001) for the definitive study of these cultural

aspects): acquiring the attributes of scholarly activity, building a research literature and growing international communities of practice. This is only, however, the beginning of the journey and a great number of challenges lie ahead, not least of which is the extent to which developments are driven by government policy or the academic community themselves.

The initiatives in Teaching Portfolios and formal postgraduate, professional certificate programmes are becoming increasingly important as a demonstration of the community's desire to professionalise the teaching role. An issue which still requires to be explored in some depth, however, is the cultural, political, ethical and institutional context in which such programmes are offered. Prosser and Trigwell (1997) have demonstrated that the context in which teachers teach shapes their approach to teaching, mirroring the contextual influences on students' approaches to learning. However, a similar argument could be made that the context in which these professional teaching programmes and portfolio initiatives are developed and delivered is likely to have a strong influence on their content, format, impact and value (Trowler and Cooper 2002; O'Neill and Mac Labhrainn 2004).

It is also, for example, no use denying that developing a strong research profile is still of central importance for a career plan in most universities and the positioning of teaching vis-à-vis research is still problematic, even given the widespread adoption of courses and, increasingly, portfolios. There is considerable opportunity for seeking synergy between these two roles, not just in following Boyer's scholarship approach, but also more overtly in directly linking aspects of the two as central, defining attributes of a modern academic.

Indeed, it is to be hoped that looking from this perspective there might also be a greater realisation of the need to widen our view of the role of higher education in society, breaking out of the somewhat sterile contemporary discussions around the "knowledge economy" and acknowledging the political, economic, cultural and sociological reality in which we are all daily immersed.

## References

Becher, T. and P. R. Trowler (2001). *Academic Tribes and Territories* ($2^{nd}$ ed.). Buckingham, UK: SRHE and Open University Press.

Biggs, J. (2003). *Teaching for Quality Learning at University* ($2^{nd}$ ed.). Buckingham, UK: SRHE and Open University Press.

Bleakley, A. (2000). Writing with invisible ink: narrative, confessionalism and reflective practice. *Reflective Practice 1*(1), 11–24.

Boyer, E. (1990). *Scholarship Reconsidered*. Princeton, NJ: The Carnegie Foundation for the Advancement of Teaching.

Brown, S. (2000). The Institute for Learning and Teaching and UK approaches to accrediting teaching: looking to the future. *Medical Teacher 22*(5), 513–516.

Gibbs, G. and M. Coffey (2004). The impact of training of university teachers on their teachin skills, their approach to teaching and the approach to learning of their students. *Active Learning in Higher Education 5*, 87–100.

Haggis, T. (2003). Constructing images of ourselves? A critical investigation into 'approaches to learning' research in higher education. *British Journal of Educational Psychology 29*, 143–169.

Hyland, A. (2002). Recognising and Rewarding Teaching Within a University: The University College Cork Experience. In N. Lyons, A. Hyland, and N. Ryan (Eds.), *Advancing the Scholarship of Teaching and Learning Through a Reflective Portfolio Process*. UCC, Cork.

Johnston, B. (2003). Summative assessment of portfolios: an examination of different approaches to agreement over outcomes. *Studies in Higher Education 29*(3), 395–412.

Land, R. (2003). Orientations to Academic Development. In H. Eggins and R. Macdonald (Eds.), *The Scholarship of Academic Development*. Buckingham, UK: SRHE, Open University Press.

Laurillard, D. (2002). *Rethinking University Teaching: a conversational framework for the effective use of learning technologies* ($2^{nd}$ ed.). London: Routledge Falmer.

Lyons, N., A. Hyland, and N. Ryan (2002). *Advancing the Scholarship of Teaching and Learning Through a Reflective Portfolio Process: The University College Cork Experience*. UCC, Cork.

Mac Labhrainn, I., K. Susilowati, and E. Boyle (2004, $14^{th}$-$16^{th}$ September). CPD by e-Learning: the challenge of Reflective Practice and Assessment. In *Association for Learning Technology Conference*, Exeter, UK.

McCarthy, M. (2002). Where Finbarr Taught, Let Munster Learn. In N. Lyons, A. Hyland, and N. Ryan (Eds.), *Advancing the Scholarship of Teaching and Learning Through a Reflective Portfolio Process: The University College Cork Experience*. UCC, Cork.

Moon, J. (1999). *Learning Journals: A Handbook for Academics, Students and Professional Development*. London: Kogan Page.

Moon, J. (2000). *Reflection in Learning & Professional Development: Theory and Practice*. London: Kogan Page.

Mues, F. and M. D. Sorcinelli (2000). *Preparing a Teaching Portfolio*. Amherst: Center for Teaching, University of Massachusetts.

NCIHE (1997). Higher Education in the learning society. Technical report, National Committee of Inquiry into Higher Education, Norwich: The Stationery Office.

O'Neill, G. and I. Mac Labhrainn (2004, September $2^{nd}$-$3^{rd}$). Frameworks for qualifications in teaching and learning in higher education. In *paper presented at the Inaugural Conference of the All Ireland Society for Higher Education*, Dublin. [Available online at `http://www.aishe.org/conf2004/proceedings/paper35.doc`].

Prosser, M. and K. Trigwell (1997). Perceptions of the teaching environment and its relationship to approaches to teaching. *British Journal of Educational Psychology 1*(67), 25–35.

Reichert, S. and R. Tauch (2003). *Trends 2003: Progress towards the European Higher Education Area*. Brussels: European University Association.

Schön, D. (1983). *The Reflective Practitioner*. San Francisco: Jossey-Bass.

Schön, D. (1987). *Educating The Reflective Practitioner*. San Francisco: Jossey-Bass.

Seldin, P. (2004). *The Teaching Portfolio* ($3^{rd}$ ed.). Bolton, MA: Anker Publishing.

Shulman, L. (1998). Course anatomy: The dissection and analysis of knowledge through teaching. In P. Hutchings (Ed.), *The Course Portfolio*. Washington, DC: The American Association for Higher Education.

Susilowati, K., E. Boyle, and I. Mac Labhrainn (2004, September $14^{th}$-$16^{th}$). An Investigation into Students' Reflective Thinking in Online Discussion Fora. In *Association for Learning Technology Conference*, Exeter, UK.

Trowler, P. and A. Cooper (2002). Teaching and Learning Regimes: Implicit theories and recurrent practices in the enhancement of teaching and learning through educational development programmes. *Higher Education Research and Development 21*(3), 221–240.

Van Mannen, M. (1995). On the Epistemology of Reflective Practice. *Teachers and Teaching: Theory and Practice 1*(1), 33–50.

# WHAT INSTITUTIONAL RESEARCH CAN DO TO SUPPORT THE INDIVIDUAL ACADEMIC

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**KEYWORDS:** Institutional Research, Quantitative Approaches, Educational Development, Higher Education, Ireland, Academic Teaching

## Introduction

All academic practitioners need information to help them decide what to do next from time to time. Information sources vary according to the issue at hand. In terms of learning development, reflective practitioners have numerous potential resources available to help them to understand the factors affecting student learning. Many qualitative methods exist to evaluate the learning process and experience (e.g. Light and Cox 2001). While qualitative approaches provide an excellent and rich resource, it is important to consider all resources, including those often dismissively referred to as 'bean counting', or more accurately, quantitative methods.

Quantitative methods are a central plank of the practice of Institutional Research and provide information that can speed up assessment of an issue while also providing context. Starting off with quantitative analysis can support the speedy identification of the existence, or otherwise, of patterns; leaving more resources and time available to explore and understand phenomena. While quantitative methods may not always support detailed insight into the working of new learning methodologies, they can shed light on the impact they have on students, and the intersecting impact of other factors operating to influence the experience of a given cohort.

## What is Institutional Research?

Institutional Research is the practice whereby an institution assesses itself, its activities and its position within a given milieu. Higher Education Institutional Research facilities, where they exist, conduct these assessments with the objective of serving 'as a comprehensive resource for information about the institution' (University of Florida, Office of Institutional Research, Mission Statement). The data resources employed usually comprise information derived from surveys, student record and other internal record systems, sectoral and national databases and reports and published research. The actual assessments, analyses and hypotheses tested cover issues requiring ongoing monitoring as well as the exploration of emerging issues to inform an institution's decision-making with regard to its own development.

Institutional Research is a relatively new concept in the Irish context in particular, and development of the practice is so far limited and very uneven. The type of work done by Institutional Research Units in other countries is, in Ireland, generally done across a number of disparate units and services. Some elements of Institutional Research are not currently undertaken, or are not easily available, in most Irish institutions.

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http://www.aishe.org/readings/2005-1/

## Institutional Research and Formal Evaluation in Higher Education

The term "Institutional Research" may be more familiar to academics and education professionals in North America and Australia than it is to those in Ireland and some parts of Europe. Where Institutional Research is well-developed, and even in Ireland where the practice is only now emerging in a recognisable form, common databases and comparative analyses based on shared methodologies allow institutions to compare themselves, or benchmark, against other institutions and agreed standards (e.g. US Common Data Set; UK Higher Education Statistics Agency (HESA), Irish Higher Education Authority (HEA)).

A good starting point for developing an understanding of the scope of Institutional Research is the US based Association for Institutional Research (AIR). AIR hosts a website (`http://www.airweb.org`) which reflects a vibrant and creative network of Institutional Researchers. The association has been incorporated since 1965 and has over 3,000 US based members as well as international affiliated associations including:

- Southern African Association for Institutional Research (SAAIR)
- South East Asia Association for Institutional Research (SEAAIR)
- Australasian Association for Institutional Research (AAIR)
- European Higher Education Society (EAIR)
- Canadian Institutional Researchers and Planners Association (CIRPA)

The Centre for the Study of Higher Education (CSHE) at The University of Melbourne, while not restricted to Institutional Research, is an invaluable resource for the tools and principles available for use in the study of Higher Education, be that within an institution or on a much broader basis. Operating now for 35 years the CSHE undertakes work within the University of Melbourne as well as nationally and internationally. The Centre's website (`http://www.cshe.unimelb.edu.au/`) includes a section on academic development outlining services 'available on request to assist departments in the evaluation, review and planning of strategies to improve the quality of teaching and learning' which form an excellent basis on which to develop a local strategy for evaluation and development.

In recent years the international drive to improve quality and assess quality improvements in a manner supporting transparent comparison and benchmarking across national Higher Education sectors has been one trigger for improved Institutional Research. The old paradigm whereby it was believed that Universities were the only bodies capable of assessing University activities has undergone a seismic shift in recent decades. Now, Higher Education institutions all over the world, including Universities, are required to open themselves to performance evaluation. Like the UK in the 1980s (Johnes and Taylor 1990b) Ireland, particularly since the implementation of the Universities Act 1997, and in line with an increased demand for accountability in all publicly funded bodies, is moving towards a situation similar to the UK's 'evaluative state' (Henkel 1991).

While Irish quality review systems are based on peer review of a self-assessment, and formal league tables have been avoided thus far, external review is becoming more common with the EUA review of Irish Universities and the recently published OECD report (OECD 2004) while the print media in particular are moving towards the generation of informal league tables such as the Sunday Times University of the Year Award. The Irish Higher Education Authority has also published numerous reports on various aspects of the University system in particular (e.g. Morgan et al. 2001; Skilbeck 2001) in addition to regular reporting on First Destinations and Annual Reports in paper and electronic formats.

## Institutional Research and the individual academic

Our focus here is local information, what the Institutional Research resource or it's equivalent in your institution, can provide in terms of data and analyses to support your teaching and development. Institutional Research offices do not always exist, in some cases there is no such resource,

in others there is a full or partial resource which can be located within a variety of structures including the student records section or its equivalent, the President's Office, Registry or Learning Development facility in centralised institutional structures. In Dublin City University's case the 'Institutional Analysis Office' (`http://www.dcu.ie/registry/emao/index.shtml`) is currently located within the Registry's Awards' Team, although it has developed through numerous identities and continues to do so, reflecting the early evolutionary nature of this activity at present.

Analyses of data drawn from electronic student records systems and surveying, while not comprising the entire gamut of Institutional Research resources and techniques, are the most obviously applicable to the needs of academics seeking to better understand student learning. Individual academics, as well as departments, have always carried out analyses using available data to assess student performance. The differences with the current situation; with the growing interest in Institutional Research, the advent of integrated computerised records systems and the emphasis on reliable data production methods for quality review in particular, are:

- The huge expansion in the breadth of data available providing the critical mass necessary for effective statistical analyses
- The improved quality of the data available
- The increasing availability of sufficient data for longitudinal analyses, and
- The greater availability of dedicated staff within HE structures with the skills, tools and expertise to undertake meaningful and reliable analyses.

This piece does not recommend or promote reliance on empirical statistical analyses alone to inform understanding and promote learning development. Rather, it suggests that the considerable body of data and analyses developed for Institutional Research purposes represent an invaluable resource for academic practitioners seeking context and information to support individual understanding and decision-making.

Institutional Research; based as it is on expert knowledge of available data, the skills to manipulate that data for targeted analyses and the use of student record data in particular, can provide insights on visible and invisible characteristics in increasingly large and diverse student cohorts without the need to carry out surveys to test hypotheses. In essence, from the individual academic's perspective, Institutional Research can often provide a shortcut to a level of initial understanding, releasing time and resources for well-founded qualitative investigation.

## Institutional Research and You

## Introduction

This section outlines the types of questions Institutional Research facilities can address to support the individual academic as well as providing an example of an Institutional Research project and examples of the queries often made to the Institutional Analysis Office in Dublin City University.

The most commonly requested analyses in DCU, where a substantial number of staff have engaged with Institutional Research as an additional tool available to support their decision-making, include:

- Marks ranges applied in particular subjects over time and correlation with changing characteristics in student cohorts with regard to prior attainment
- The impact of separate components (e.g. modules) on overall award classifications over time
- The effect of the size of continuous assessment components on overall marks awarded
- The entry standard below which students have a substantially increased risk of failure

- The importance of mathematical ability in overall performance in Science and Engineering
- Application, acceptance, registration and withdrawal figures for programmes reflecting demand, perception and experience.

Many of these types of queries subsequently lead to requests for comparative information. In general, once the internal situation is understood there is a desire to deepen understanding by comparing local activities with practice elsewhere within the institution, or in a similar discipline externally. In Ireland in particular, self-assessment and external assessment have become more widespread. Benchmarking, however, has not.

## Questions Institutional Research May Help You to Answer

From the academic's perspective, one of the greatest benefits of an Institutional Research facility is knowledge of the information available and knowledge of other analyses underway. Having a central resource means that individual academics do not need to 'reinvent the wheel' when an issue requiring investigation arises. Those in the Institutional Research facility will probably have done a similar analysis in the past and be in a position to undertake the desired piece of research quickly and efficiently. Knowing what information is available is equally as important as the ability to manipulate it. Johnes and Taylor (1990a) found, when developing an indicator for standard of degrees awarded across institutions, that the indicator had to be tempered with explanatory variables, some of which related to student characteristics. These explanatory variables, which were used to develop an expected value against which the actual value could be rated, included A level scores and the proportion of the student cohort living at home as well as library expenditure among the six items used. While library expenditure is not a student related variable, it is also not one that each individual academic might be expected to include in an assessment aimed at explaining why the standard of awards made in their own institution differ to those made to students in the same discipline elsewhere. The same is true for the impact of the proportion of a student cohort living at home.

The following questions and possible analyses illustrate two sample queries likely to benefit from the support of Institutional Research:

| ***Question:*** Failure rates have risen dramatically in one of my modules, but I have not changed my methods and I can't see why this has happened. |
|---|
| ***Possible analyses and items for correlation with performance in the module:*** |
| • Changes in entry requirements<br>• Changes in actual pre-entry educational attainment (e.g. CAO points (ROI), A Level score (UK)) of the cohort.<br>• Standards achieved pre-entry in core subjects such as mathematics.<br>• Changes in size of class group<br>• Changes in origins of class group (are all native speakers of the language of delivery?)<br>• Gender, Age, Educational and Social characteristics, Entry route and attendance type profiles[1]<br>• Range of marks used over time in assessing the module |

| ***Question:*** Student retention in my field is poor, I understand some of the reasons why but I want to address the problem and need a comprehensive picture of what is happening. |
|---|
| ***Possible analyses and items for correlation with performance in the subject:*** |
| • What is the student profile now, how has it changed and how is it likely to change in the future?<br>• What are the particular programme elements contributing most consistently to non-completion.<br>• What do the students think?<br>• Are student expectations of the programme realistic prior to entry?<br>• Do entry requirements need to be recalibrated based on changes in standards or curricula outside the Institution?<br>• Would a change in programme content, providing extra support in problem areas, help students to progress? |

[1] Note: this type of analysis would be aimed at identifying if the pedagogical approach is appropriate to the students' prior experience. For example, it might indicate that the cohort profile has shifted towards older learners to whom the existing pedagogical approach may not be appropriate.

This second example, relating to factors that may affect student retention, is of key importance and an excellent example of how different data resources can be readily drawn together by Institutional Researchers in a manner that may be very difficult for individual academics.

Undertaking a project to assess factors affecting student retention is a daunting task, not least because of the breadth of factors that may or may not be included in the research. The first task is to get a general understanding of the institution, the subject area and the departmental and broader environments in which students are operating. The following case study illustrates just such a project and how it might work, based on a current Institutional Research project in DCU.

### Case Study/Sample Project: Attitudes, experiences and characteristics influencing student progression – A DCU pilot for assessing the impact of diverse factors through the first year of study

This project is a good example of how the combined skills and resources of a dedicated Institutional Research facility, working with other experts in the institution, can contribute to an understanding of the dynamics affecting student progression and completion. While initially aimed at the institutional level, the methods as well as the results can be applied and employed according to the needs of the individual academic. Jointly run by the Institutional Analysis Officer and the First Year Student Support Facilitator in DCU, the project draws together information held on the central student record system and information derived from a series of three student surveys.

The surveys, run at the beginning, mid-point and end of the academic year, are not anonymous. This is made clear to the students at the point when they agree to participate in the study and sign an agreement in line with the Data Protection Acts 1988 and 2003 having been furnished with an outline of the project. The surveys track changing attitudes as well as academic progress through the first year. In addition to identifying key factors impacting on progression, the study is intended to weed out factors that do not actually have any significant effect on student progression so that remedies and initiatives can be focussed on the most significant influencing factors.

The study, while not focussed on a specific programme, has the input of a number of academics and is intended to provide guidelines for identifying and addressing emerging retention problems within programmes of study.

The aims of the project, in brief, are as follows:

1. To explore a wide range of aspects of the experience of undergraduate students with the specific purpose of identifying factors that may influence programme completion.
2. To ascertain the factors and relationships determining the qualitative nature of the student experience while in DCU.
3. To explore the interrelationship between pre-entry expectations and experienced reality of the university experience.
4. To refine understanding of the relevance of different factors affecting student retention, with a view to focussing efforts and resources on the most potent influencing factors.

(O'Flanagan and Crehan 2004)

#### Data Used for the Study:

The first survey, taken at point of registration includes the following core elements:

1. Biographical Detail,
2. Self evaluation of personal characteristics; including tenacity, mathematical and writing ability, ambition, academic ability and self-confidence,
3. Factors affecting the decision to study at University,

4. Level of prior understanding of the programme,
5. Anticipated time spent on specified work, study and social activities,
6. Difficulties anticipated,
7. Perceived locus of responsibility for learning and the role of the lecturer,
8. Priorities while at University, academic ambitions and career goals,
9. Family educational background,
10. Financial concerns,
11. Perception of the experience of studying at Higher level in practical terms, and
12. The anticipated best and worst elements of the experience of study at University.

The second survey reviews issues assessed in the first including:

1. Self evaluation of characteristics,
2. Level of prior understanding of the programme,
3. Actual time spent on specific activities,
4. Difficulties encountered,
5. Perceived locus of responsibility for learning and the role of the lecturer,
6. Priorities while at University, academic ambitions and career goals,
7. Financial concerns, and
8. The best and worst elements of the experience thus far.

New issues covered in the second survey include:

1. Self identified changes in perception of study at Higher level having spent six months in the University,
2. Support services accessed, and
3. Integration into campus life/sense of belonging.

The final survey revisits the items covered in the second survey and includes a sub-module addressed to those who have chosen to change programmes, defer or withdraw from the institution.

A key element of the study is the combination of the data gathered through the surveys with information stored on the student record system. In addition to aggregate completion rates, individual level data elements are taken from the official record and include:

1. Academic history including second level results (Leaving Certificate (ROI), A-Levels (UK) or other national equivalents), institution attended, and level of preference for the course onto which participants were accepted,
2. Entry route (central clearing house (Central Applications Office in ROI) or direct entry on the basis of age or other specified characteristics),
3. Modular exam results achieved through the year, including continuous assessment marks,
4. End-of year results,
5. Other official items of record including withdrawal and reasons for withdrawal, changes in optional programme elements and transfer, and
6. Completion rates at the institutional and discipline level.

### Approach and Outcomes

Using a paper based OMR readable questionnaire in the first instance, followed up with online surveys, the data were collected and stored in an SPSS database. Using the student number provided by respondents, records drawn from the University's student records database (MIS) were linked and matched to these records to create a master file combining both datasets. The MIS data in this master file were updated throughout the year following registration and examinations.

The files in which the data are stored and linked are maintained only on a single hard drive and are not accessible via the University's networks. The data collected in the surveys cannot be accessed by anyone other than the researcher and cannot be linked back into the University's MIS.

Based on the responses to the survey in the first pilot year, the study is being repeated in 2004/05 using new versions of the questionnaires based on the responses, and analysis of same, in the first year. The objective, based on the implementation phase as well as analysis of the available data, is to refine the tool down to a shorter questionnaire and database tool that can be used to quickly approach and assess factors affecting emerging student retention.

So far, the data have been analysed at Institution, Faculty and Programme levels where there was sufficient information to do so and the results communicated, in summary form, to the relevant managers. Further analysis was made available on request, including the use of additional data from the MIS if testing of additional hypotheses was warranted.

## Conclusions

## Using Institutional Research

Evaluation based on statistical techniques can be daunting at first and, when unfamiliar, even frightening. Quantitative analysis has languished in the cold, to some extent, because it has been seen to be 'incomplete' and lacking in perspective. There is no doubt that statistics need to be interpreted, however, in an increasingly evaluative culture, as is the case in Ireland at present, avoiding quantitative approaches is not only blinkered, but also counter-productive as it means losing out on high quality support tools that can contribute greatly to reflection, understanding and development.

There are a host of analyses that can be done using modern databases, computerised techniques and skilled researchers that were unavailable to academics in the past, or at least much more difficult to undertake or access. Before embarking on any form of quantitative analysis it is important to consider the origin and quality of the data to be used. If you have an Institutional Research facility available to you, or a student records or comparable office, it is worth exploring with colleagues in those services exactly what data are available, where the data came from, what legal restrictions or implications may pertain to use of the data, what comparable analyses are available for benchmarking purposes should you require that and what level of reliability testing may be required. If benchmarking, it is important to ensure that data from external sources is of the same standards of quality and accuracy as the data sourced within your institution.

Reports produced internally, for internal or external purposes, are a good starting point when familiarising yourself with your institutional research function, if your institution has developed one already, and will generally suggest analyses available according to the types of data included in the reports. In the case of DCU, the provision of such reports generally results in further, more detailed, queries specific to individual programmes, modules or student cohorts. This is where the value of Institutional Research to the individual academic comes into it own.

## References

Henkel, M. (1991). *Government, Evaluation and Change*. London: Jessica Kingsley.

Johnes, J. and J. Taylor (1990a). Degree Results: Differences between Universities. *Performance Indicators in Higher Education*, 109–118.

Johnes, J. and J. Taylor (1990b). The clamour for performance indicators. *Performance Indicators in Higher Education*, 1.

Light, G. and R. Cox (2001). Evaluating: Teaching and course evaluation. *Learning and teaching in Higher Education: The reflective professional*, 195–216. Mission statement, Office of Institutional Research, University of Florida.

Morgan, M., R. Flanagan, and T. Kellaghan (2001). A Study of Non-Completion in Undergraduate University Courses. Higher Education Authority, Dublin.

OECD (2004). Review of Higher Education in Ireland.

O'Flanagan, M. and M. Crehan (2004). Attitudes, experiences and characteristics influencing student progression – A DCU pilot for assessing the impact of diverse factors through the first year of study. In S. Moore (Ed.), *Proceedings of the Irish Retention Network Colloquium*, Ireland, pp. 1. forthcoming.

Skilbeck, M. (2001). The University Challenged - A Review of International Trends and Issues with particular reference to Ireland. Higher Education Authority, Dublin.

# FINDING INFORMATION FOR YOUR TEACHING AND RESEARCH WORK IN TEACHING AND LEARNING

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## Introduction

While most academics will be aware of the key people and information sources in their specific discipline they may be unaware of the people who are writing about teaching and learning in these disciplines. This chapter is aimed at those involved in exploring the topic of teaching and learning in various disciplines. Librarians will also find it useful in identifying key resources for collection development.

The chapter is divided into three sections.

Section *"Planning a literature search"* describes the process of doing a literature search. There are common steps in executing a literature search across disciplines. However, researching the literature of teaching and learning may necessitate a review of a much broader range of literature than that which academics are familiar with in their own discipline. It can be argued that teaching and learning is in itself a discipline. A body of research relating to teaching and learning has grown up and much of the applications and findings can be applied across disciplines. For example articles in the *"Journal of Chemical Education"*, may be relevant for research in other science or indeed in the social sciences or humanities.

Section *"Directory of Resources"* is a directory of resources. This gives details of resources, including books, journals, websites, conference papers and databases in the area of learning and teaching. The directory is selective rather than exhaustive and draws on a survey of the information needs of education developers carried out by the author in Summer 2004. It is aimed primarily at education developers, new academic staff and experienced academic staff who wish to develop their teaching and learning.

Section *"Publishing your findings/research on your teaching"* gives brief guidelines on publishing your research are included in this section.

The chapter emphasises the vital link between the new lecturer, the experienced lecturer who wants to improve his/her teaching practice and the Librarian.

## Planning a literature search

The points may by summarised as follows:

1. Clarify the purpose of your research
2. Define the topic
3. Discuss with your subject librarian and identify information sources of potential use
4. Break your topic into keywords

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

5. Consider alternative spelling
6. Identify key people in the area
7. Identify key journals
8. Begin searching

The following case study illustrates a structured approach to finding information. The reader might like to parallel this when sourcing information.

The author – a librarian – engaged in detailed discussion with an education developer who wanted information on the topic of student-centered learning.

## Clarifying purpose

The purpose of your research will significantly influence the range and type of information sources used. The range of information consulted for a PhD thesis will greatly exceed that needed for a book chapter.

## Define the topic

After establishing the purpose begin to define the topic. It can be useful, when you are defining your topic, to write it as a question.

## Discuss with a Subject Librarian and identify information sources of potential use.

While there are increasing moves towards consortium purchasing particularly in the area of journal databases, different libraries have different resources. It is useful to discuss your topic with a Librarian in order to identify:

1. what resources are available in your library
2. what resources you can access via other libraries and through other methods e.g. inter-library loans

## Break your topic into keywords

Keywords are concepts which describe topics and are sometimes assigned by the authors of articles, or in the case of large databases, there may be a thesaurus of terms using for indexing articles.

While academics will have built up an expertise in the keywords of their particular research area, the keywords and vocabulary of teaching and learning may be new. Generally, if you can find one very useful article it is useful to look at the keywords assigned to it as this can lead to further articles.

While the process of defining search terms as keywords may take some thought and time, the investment of time defining very specifically what you are looking for, will save time in the long run.

When selecting keywords consider alternative spelling and whether the term might be hyphenated e.g.,

Student-cen**ter**ed learning

Student-cen**tre**d learning

Student centered learning

Student centred learning

Databases and library catalogues have variant indexing practices. The term might or might not be hyphenated.

A library catalogue will always list a book under the exact title as it appears on the title page of the book. Each book in the catalogue is assigned subject headings. Most Irish university libraries use the U.S. Library of Congress subject headings. Therefore, a keyword or subject search under student centred learning would only yield those books which had these words, with this spelling, in the title. Some library catalogues offer "see also" links which are useful.

To have gone with only one of these options for example the first which is British spelling, would exclude useful articles which used American spelling.

## Consider alternative terms

In addition to considering if there are alternative spellings consider if there are alternative terms by which a topic may be known. For example student-centered learning is sometimes referred to as client-centered learning and learner-centered learning.

## Key people

If you know of a key person working in a particular area, in addition to being able to identify papers by this person, you can also check who is citing the work of this person. Much of the philosophical base of student-centered learning came from the 1970s work of the psychologist Carl Rogers. Using the "Social Science Citation Index" it is possible to check who cited the work of Carl Rogers in subsequent articles and this may be useful in identifying current perspectives on Carl Rogers' work.

## Key journals

A list of journals in the area of teaching and learning is given in the resource guide. In addition to this, journals in other subject disciplines may carry articles on applying the principles of student-centered learning in those disciplines. A search across a large multidisciplinary database such as the Web of Science, which encompasses the social sciences, the sciences and arts and humanities, will retrieve journal articles relating to teaching and learning in different disciplines."

## Where to begin

Start by discussing your topic with a librarian.

The nature of the topic being researched will to a large extent, influence where you begin your search. If you want a few current articles on thinking in a particular area, a search of a database such as "Web of Science" by keyword may rapidly yield some useful results. A search by keyword on a major search engine such as Google may also yield useful current information and identify places where research on the topic is being carried out.

For more detailed in-depth research on a topic the library catalogue is generally a useful starting point.

## Information Sources

Books

Journals and journal articles

Databases

Websites

Conference Papers

### Finding books

Books as information sources, were identified as slightly more important than journals, in the questionnaire survey I carried out earlier in the year. This is in keeping with trends across the social sciences. In the sciences, journals are rated as more important than books.

Check the library catalogue using the various keywords you have identified.

Student-centered learning

Student-centred learning

Student centered learning

Student centred learning

When you retrieve a useful record check if the record includes the subject headings assigned to the book. Entries in library catalogues are assigned broad subject headings. Keyword searches only search the subject headings and the details given such as title and author. At present, catalogue records generally do not have a breakdown of individual chapters. Thus a book on new methods of teaching and learning might well have a chapter on student-centred learning but might not have added this as a subject heading. If the term were not in the body of the catalogue record i.e. the title of the book, it would not be retrieved.

Going to the Library and looking at the contents pages and indexes of books on education methodologies is a useful way of identifying relevant chapters in books. Within the Dewey Decimal Classification system (used by most Irish and UK university libraries) 378 is the Dewey number for higher education. Within that 378.17 is the number for methods of instruction and study. This number is further lengthened to reflect individual methodologies, for example discussion as a method of instruction and study is classified at 378.1795. Most automated library catalogues allow searching by classification number, so it is possible to select the classification search option, enter 371.17 and get a listing of books at that number in the Library. Doing this on the UCD catalogue, I retrieved 47 titles. Interestingly the title "Teaching students to Learn: a student-centered approach" by Graham Gibbs was retrieved in this way, while it had not been retrieved using a keyword search using the keywords "student-centred learning" or "student-centered learning." Going back and using the keyword "student-centred approach" retrieved one more book that had not been identified earlier.

While knowing the classification number for a subject area is useful, particularly if you want to browse the shelves, it is important you know that books on related topics are often scattered through the library collection and the application of classification numbers can vary between libraries.

Information on how to identify books not held in the Library is given in the directory section of this chapter.

### Finding journal articles

While no university library will carry all the journal titles any researcher would like, those involved in the study of teaching and learning may face additional challenges in that most libraries allocate funding for journals to departments or faculties. Many education developers may be attached to a centre rather than a faculty or department and this centre may not be allocated a budget for the purchase of books and journals. Because of the recurrent nature of journal purchasing i.e. subscriptions must be maintained and paid annually, getting relevant journals may prove to be particularly challenging.

Individual journal titles are listed in the library catalogue. It is well worth going to the shelves and browsing through titles.

The key journal publishers in the area of innovations and developments in teaching and learning are Carfax, who are part of the Taylor and Francis publishing group.

A list of key titles with details is given in section II.

Tables of contents - generally with abstracts – for all Taylor & Francis titles are available online free of charge from their website at `www.taylorandfrancisgroup.com`

It is possible to buy individual articles and to subscribe to a free contents alerting service, SARA (Scholarly Articles Research Alerting) via the website. The requestor indicates the keywords he/she wants searched. As new issues of Taylor & Francis journals are produced, they are searched for occurrences of these words in the title or abstract of articles. Bibliographic details of the articles are then e-mailed to the person who signed up for the alert. If the fulltext of the article is not available in print or electronic form in the Library, it can be obtained via inter-library loan or ordered – via credit card payment - from the Taylor and Francis website.

### Databases of journal articles

While institutions may take out subscriptions to individual electronic versions of journals, titles are also increasingly becoming available as part of larger packages of fulltext electronic journals known as databases. Databases generally contain either the abstract or fulltext of journal articles. Individual databases such as "Academic Search Premier," may offer access to thousands of journals. Databases are expensive and generally libraries or groups of libraries take out annual subscriptions to particular databases. To ensure libraries do not cancel their subscriptions to individual print titles, there is often an embargo or time restriction placed on when the database can release the fulltext of an article. While many of the Carfax titles are available in fulltext via the database "Academic Search Premier" most of these do not have the fulltext posted until six months to a year after publication. The contents of most of the Carfax journals are available fulltext from 1990 forward with a six to twelve month embargo. This is a very useful way of doing a retrospective search. The ability to search individual journal titles by subject over a ten or more year period in a single search is extremely useful.

Details of a number of databases of potential use to education developers, are given in the directory section. These include "Academic Search Premier" "ERIC," "Research into Higher Education Abstracts," "Professional Development Collection," and "Education Complete."

In addition to these databases, for information relating to teaching and learning in specific disciplines, the databases and journals of that discipline should be consulted and the multidisciplinary Web of Science which includes science, social sciences and arts and humanities.

The above databases are available on subscription (generally via libraries because of the costs involved).

### Websites

A number of very useful websites dealing with teaching and learning have been created by education developers and their associations. These generally provide notification of forthcoming conferences, address issues of concern to education developers, including integrating information technology tools into teaching and managing educational organisations, promote innovation and best practice, give useful contacts and provide links to additional web resources.

A listing of useful websites is provided in the directory.

### Conference Papers

Websites, meetings, and electronic discussion lists are useful sources of information on forthcoming conferences. Details of past conference papers are available via the database Institute for Scientific Information (ISI) Proceedings. See the directory for further details.

## Directory of Resources

The material listed here has been identified in consultation with education developers.

The directory is selective rather than exhaustive. Individual libraries have different collections and have access to different resources electronically. It is best to discuss your information needs with your local librarian, who may suggest additional resources.

## Books

The books listed below are a mixture of types reflecting different traditions and different concerns.

- Bates, A. & Poole, G (2003) *Effective Teaching with Technology in Higher Education.* Jossey-Bass

  Considers the appropriate use of technology within the curriculum and examines the differences between face-to-face teaching and teaching through technology from a pedagogical perspective.

- Biggs, J. (2003) *Teaching for Quality Learning at University.* Maidenhead: Open University. $2^{nd}$ edition.

  This revised edition of *Teaching for Quality Learning at University: What the Student does* includes a variety of new material including a chapter on how electronic technology can be used to enhance learning.

- Brown, G., Pendlebury, M. & Bull, J (1997) *Assessing Student Learning in Higher Education*. London: Routledge.

  Provides background information on different aspects of assessment including methods and strategies, assessing oral communication and issues relating to quality and standards.

- Brown, G. & Atkins, M (1990) *Effective Teaching and Learning in Higher Education.* London: Routledge.

- Laurillard, D. (2002) *Rethinking University Teaching: A conversational framework for the effective use of learning technologies.* New York: (Routledge) Falmer. $2^{nd}$ ed.

  Includes information on traditional and technological learning methods.

- Newble, D. & Cannon, R (2000) *A Handbook for teachers in universities and colleges: A guide to improving teaching methods.* London: Kogan Page. $4^{th}$ ed.

  Covers a variety of topics including group teaching, curriculum planning, assessment, problem based learning and preparing class material.

- Race, P. (2001) *The Lecturer's Toolkit: a Practical Guide to Learning, Teaching & Assessment.* London: Kogan Page. $2^{nd}$ ed.

  Offers practical suggestions and guidelines on issues such as using handouts, working with small groups and self-care and management.

- Ramsden, P. (2003) *Learning to Teach in Higher Education.* New York: Routledge Falmer. $2^{nd}$ ed.

  Reflects the changing education environment and addresses issues such as quality and professional development. It includes case studies.

- Sue Habeshaw & Graham Gibbs have written a number of practical books

- The Staff and Educational Development (SEDA) Association has a useful series of publications. Details are available from its website at `http://www.seda.ac.uk`. Click on *publications*.

Ways to identify more books:

- Publishers catalogues and websites (including Taylor & Francis, Kogan Page, Routledge Falmer, Kluwer)
- Library catalogues including merged catalogues (union catalogues) COPAC (catalogues of 24 major university libraries, includes TCD, plus the British Library and the National Library of Scotland) `http://www.copac.ac.uk`
- IRIS (project to develop a combined catalogue of Irish university library catalogues) `http://www.iris.ie`
- Library of Congress Online Catalog (12 million records)

  `http://catalog.loc.gov`

Most academic libraries in Ireland and the UK have joined SCONUL Research Extra which allows access with borrowing to the collections of participating libraries. For further information and to get a list of participating libraries consult `http://www.sconul.ac.uk/use_lib/srx/`

The above library catalogues are available free of charge via the Internet. Major libraries will also subscribe to commercial databases of book in print. These include "Libweb" which gives publication details of English-language books in print. Resources such as "Libweb" can be useful for checking information for ordering books and verifying the latest edition of a book. However, they give no indication of the quality of a title.

## Journals

As mentioned in Section I, the tables of contents with abstracts, for journals in the Taylor & Francis Group, are available free of charge from the Taylor & Francis website at `http://www.taylorandfrancisgroup.com`

It possible to buy individual articles and to subscribe to a free contents alerting service.

It should be noted that many journal publishers are now making their titles available electronically and more will in the coming years. Therefore it is worth checking if your Library has access to electronic versions of these journals on a periodic basis.

- Active Learning in Higher Education, 2000-, 3 times a year

  Sage
- Assessment & Evaluation in Higher Education, 1976-, Bimonthly

  Carfax

  Available fulltext from 1991 (with a six month embargo) from "Academic Search Premier" database.
- British Journal of Educational Technology, 1970-, Quarterly

  Blackwell
- Higher Education: the international journal of higher education and educational planning, 1971-, 8 times a year

  Kluwer
- Higher Education Quarterly 1946-, Quarterly

  Blackwell
- Higher Education Review 1968-, 3 times a year

  Tyrrell Burgess Associates

- International Journal for Academic Development (IJAD) 1996-, Semi-annually

  Routledge

- Innovations in Education & Teaching International, 1964-, Quarterly

  Routledge

  Fulltext available from 1998 to present, with a twelve month embargo, from "Academic Search Premier" database

- Reflective Practice, 2000-, 3 times a year

  Carfax

  Available fulltext from 2000 (with a twelve month embargo) from "Academic Search Premier" database

- Studies in Higher Education, 1976-, Bimonthly

  Carfax

  Available fulltext from1990 (with a six month embargo) from from "Academic Search Premier" database

- Teaching in Higher Education

  Carfax

  Available fulltext from1996 (with a six month embargo) from from "Academic Search Premier" database

Discipline specific journals include

- Journal of Chemical Education, 1924-, Monthly

  American Chemical Society

- European Journal of Engineering Education, 1975, Quarterly

  Taylor & Francis

Finding out about more journal titles
Websites (see below) & publishers catalogues

- Ulrich's International Periodicals Directory (subscription based, enquire from your librarian)

## Databases

Check with your library to find out if they have a subscription to any of the following databases.

- Academic Search Premier (EBSCO)

  Fulltext of a wide range of titles of interest to education developers.

- ERIC (Education Resources Information Center)

  Produced by the US Department of Education, this database abstracts journal and non-journal education literature from 1966 forward.

- Research into Higher Education Abstracts (Carfax)

- Professional Development Collection (EBSCO)

  Designed for professional educators, this database gives the fulltext of 500

  peer-reviewed journals

- Education Complete (Proquest)

  Contains more than 500 journals on education, including primary, secondary and university. 300 of the titles are fulltext.

- Web of Science (Institute for Scientific Information)

  Provides abstracts of articles across all disciplines

- ISI Proceedings (Institute for Scientific Information)

  Gives abstracts of conference papers and publication details.

## Websites

- All Ireland Society for Higher Education

  http://www.aishe.org

  Promotes the professional recognition and enhancement of teaching and learning in Higher Education through a range of activities including seminars, conferences, publications, and provision of online community forums and services.

- ESCalate (Education Subject Centre: Advancing Learning and Teaching in Education)

  http://www.escalate.ac.uk

  ESCalate is a for staff working in Higher Education and Further Education who teach Education and Continuing Education. It is involved in a wide range of staff development activities related to promoting high quality learning and teaching in Higher Education.

- The Higher Education Academy

  http://www.heacademy.ac.uk

  Formed from a merger of the Institute for Learning and Teaching in Higher Education (ILTHE), the Learning and Teaching Support Network (LTSN), and the TQEF National Coordination Team (NCT), the Higher Education Academy is a UK-wide organisation, set up to support quality enhancement in teaching and the student experience in higher education.

  Provides a large range of useful information including subject centres.

- Horizon

  http://horizon.unc.edu

  Grew out of a 1992 publication *On the Horizon* which informed educational leaders of the implications of change and made recommendations on how to address these changes. It provides notification of forthcoming conferences, online workshops and seminars. It produces *Innovate*, an online peer-reviewed journal that focuses on the creative use of information tools to enhance active learning and *The Technology Source,* a peer-reviewed bimonthly periodical that gives full text of articles that aim to help address the issue of integrating information technology tools into teaching and managing educational organisations.

- Learning and Teaching Support Network

  http://www.ltsn.ac.uk/home.asp

- Staff and Educational Development Association

  http://www.seda.ac.uk

  Professional association for staff and educational developers in the UK which promotes innovation and good practice in higher education.

  Catalogue of SEDA publications, links to a range of education-related organisations

- UCD Centre for Teaching and Learning

  http://www.ucd.ie/teaching

  Provides information on good practices in teaching and learning, teaching portfolio practices, teaching and course evaluations, teaching and learning research methodologies.

## Publishing your findings/research on your teaching

Presenting papers at conferences is a useful method of getting feedback on your research and can be a useful precursor to publishing a journal article. Consider targeting papers at conferences outside the ones you normally attend. Consider presenting a paper on teaching and learning at your discipline based conference.

Consider collaborating with a colleague from an education development unit or centre when writing a journal article. They will know the literature of teaching and learning.

When considering a journal for possible submission of a manuscript, study the style of the journal in some detail. What is the average length of article? Are articles generally descriptive, evidence-based or reviews?

Consider two journals in some depth as possible outlets for your research. Study a recent issue. Examine back-issues and see if your topic has been covered recently. If it has, is there new information in your article which will add to the knowledge on the topic? If it has not been covered is there a particular reason, for example, is it something which would not fit into the scope of the journal.

Submission guidelines are given in the inside front cover of most journals and on the journal website, study these guidelines before submitting.

Two journals you might consider are

- British Journal of Educational Technology
- Active Learning in Higher Education

These have short papers and do not require a rigorous evidence base.

Before submitting a paper to a journal, it is useful to send a query e-mail.

Murray (2004) suggests the following in relation to query e-mails.

> This enquiry should be short, should state what you are researching
> "I am writing a paper about…"
>
> It should give some indication of your approach
> "I'm making a case that…"
>
> It should state why you think it should appear in this particular journal.
> "I think readers of [journal name] would be interested in this topic because…
>
> It should ask if the editor is interested in seeing a copy of the article.

If the editor expresses interest, after you submit the article it will be passed to referees just as would be the case in your own discipline. They are likely to suggest changes. Make these changes as quickly as possible and resubmit the article.

## Conclusion

The range of information available in both print and electronic formats may seem quite daunting. The availability of these sources vary from institution to institution. It is best to use the resources listed in this chapter in conjunction with discussions with a Librarian who will be able to advise you as to their availability and also help you identify additional sources.

## References

Murray, R. (2004). *Writing for Academic Journals*. Maidenhead: Open University Press/McGraw Hill.

# A PUNITIVE BUREAUCRATIC TOOL OR A VALUABLE RESOURCE? USING STUDENT EVALUATIONS TO ENHANCE YOUR TEACHING

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## Abstract

This chapter will explore specific ways in which academic faculty can participate in, use and interpret student evaluations of their teaching. It begins with a critical review of the literature on student evaluations of teaching (SET's), and it uses evidence based data to demonstrate that there are different categories of typical reactions to both positive and negative student evaluations, some (but not all) of which have a helpful effect on subsequent teaching activity and orientations. It explores Johnson's (2000) important censure of SET's exploring to what extent and under what circumstances such systems play into the hands of a bureaucratic, mechanistic climate for which higher educational contexts have been increasingly criticised. It also demonstrates Perry's (1988) observations that different worlds can exist within the same classroom setting and shows how SET's can be used to explore and to understand these different worlds in more meaningful ways.

The following discussion explores some of the natural defence mechanisms that operate when we review our students' evaluations of our teaching. Based on extensive experience with the design, development and implementation of a student evaluation of teaching system, it highlights optimum criteria for using SET's in order to produce positive teaching and learning outcomes. The chapter concludes with a range of practical strategies that academics can adopt in order to use SET's as a valuable professional development resource.

## Introduction

In the educational literature, thousands of research papers have focused on the value and nature of student evaluations of teaching (e.g. Cashin 1988) (e.g. Cashin 1988; Feldman, 1990). In the light of this it is extraordinary that very few of these studies have examined the nature of teacher reaction to such feedback, least of all the impact of such reaction on subsequent efforts to improve the teaching and learning environment in higher educational contexts. With all of the controversy surrounding the application of SET systems in university settings, it seems that the dialogue has been excessively focused on the nature and validity of student feedback without looking at the equally important impact that faculty reaction to that feedback has on subsequent teaching and learning contexts (e.g. Marsh 2000).

This chapter presents a theoretical framework of faculty reaction to student evaluations of teaching. It argues that understanding the range of possible reactions to which SET's may give rise, can equip institutions and individuals with important perspectives allowing them to use SET-based feedback more effectively than might otherwise be the case. The following discussion presents a brief overview of the SET controversy, outlines a feedback reaction matrix proposed by

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

Moore and Kuol (2005) and sets out a range of pragmatic and research based recommendations associated with the effective, appropriate and culturally sensitive use of SET systems in university settings. The following discussion aims to ensure that institutions and faculty that avail of SET systems within their own work contexts will ensure that they do so with a view to improving the teaching component of their professional lives, notwithstanding the fact that such systems rarely if ever give rise to perfect (or indeed easily interpreted) data.

## The SET controversy in academic settings

Whether SET's give rise to any enhancement of teaching and learning within higher educational settings is a highly contested question. In the context of an environment in which independent action and academic freedom is fiercely protected, the perceived value and validity of student evaluations of teaching (SETs) is at least mixed, and has been the focus of much divisive debate within the last three decades.

Notwithstanding the criticisms and debates surrounding SET's, the developing focus on quality, accountability and the importance of 'reflective practice' in university teaching have driven the increased use of student surveys to evaluate or provide feedback on teacher performance. SET's are an established part of university feedback systems in the USA, UK, Australia and many European countries. In the Irish context, implementation of this form of feedback has been slower than elsewhere. Most Irish universities either do not have formal, centralised systems for student evaluation of teaching or have only recently introduced them. However, the pressure to establish and mainstream such systems is increasing. This pressure comes from emerging legislative, policy and quality oriented perspectives, and also from some individual and groups of faculty members, many of who have requested or are seeking more structured and objective feedback from their students. This is consistent with the observations that Ashford and Cummings (1983) and others have made about the tendency in many organisational settings for people to seek out performance information from sources other than their immediate superiors.

Given that other countries have been engaged in efforts to moderate or improve SET systems, the analysis of their introduction in a setting in which they have not been previously part of established practice, may yield important and fresh insights that could give rise to better systems in a whole range of environments.

## The case against student evaluations of teaching

Some commentators argue that students are not an appropriate or effective source of teacher evaluation. Cashin (1988) proposed that such factors as student motivation and expected grades could bias student evaluations. Tomasco (1980) has argued that student evaluations of teaching are more likely to be 'personality contests' rather than valid measures of teaching effectiveness. Others have outlined that student evaluations of teaching can lead to 'grade inflation' and a lowering of standards. Calderon et al. (1996) and Green, Calderon, and Reider (1998) highlight that some SET's require students to respond to performance issues that are beyond or outside their own knowledge and experience bases. For example, asking students to rate their teachers' level of knowledge will yield only impressions of expertise that may be inaccurate and likely to be moderated by stereotypical associations often found to be linked to demographic features such as age, gender and physical appearance.

Some of the criticisms directed at SET's as a source of performance information is based then on the idea that students are simply not in a position to evaluate their teachers' performance. In addition, student perspectives and motivations may give rise to their evaluating lecturers on the basis of their own sense of comfort and satisfaction, thus implicitly encouraging the teaching of less challenging material and the avoidance by teachers of processes that may give rise to high level learning (Murphy 1999). Carey (1993) has presented evidence that points to the risks that SET's pose in terms of catalysing an increase in standard grading (grade inflation) along with a decrease in course demands (competence deflation). Some commentators have suggested that

the costs of introducing SET systems that are effective and efficient may outweigh the benefits to which they are said to give rise, while others suggest that they are only justifiable precisely because they provide low cost alternatives to other forms of evaluation and feedback (Greenwald and Gilmore 1997). But possibly the most serious attack on the use of SET's in higher educational environments comes from commentators such as Johnson (2000) and Wilson, Lizzo, and Ramsden (1997) who highlight that the motives for installing SET systems in educational contexts are neither educationally sound nor focused on the fulfilment of the goals of either teachers or students. Rather, as Johnson argues, they exist primarily to serve the needs of the bureaucracy in which the systematic reporting of feedback can be conducted on an organisation-wide basis in order to fulfil relatively shallow notions of what teaching quality represents.

Where SET's have been introduced, they are often rubbished as invalid or damaging, or at best accepted as a necessary evil (C. 1991). Where they have not been introduced, persistent efforts to avoid their introduction are often made (e.g. Whitworth, Price, and Randall 2002). What is clear is that student evaluations of teaching that have any influence on the subsequent rewards received by individual teachers represent a new source of authority that has changed the balance of power within academic institutions. This may indeed be the reason why so many arguments against their introduction have reached both public and scholarly arenas.

## The case for student evaluations of teaching

Despite the criticisms and concerns surrounding the implementation of SET's, student evaluations have also been welcomed and endorsed by a range of commentators. There is plenty of evidence to suggest that students can provide useful information about the effectiveness of teaching methods, equity in the evaluation/teaching process, faculty focus on the student, and faculty enthusiasm and interest in the content of the course or subject (e.g. Stockham and Amann 1994). Much of the debate under-emphasises the important developmental opportunities that student feedback can provide (Hand and Rowe 2001). Furthermore, it is possible that SETs can avoid the proliferation of unrepresentative information and feedback about teaching relying on hearsay and anecdote. Moreover, without a student evaluation of teaching system, feedback from informal, serendipitous sources is likely to be based on individual students' unequal abilities or opportunities to bring teaching-related issues to the attention of the system (see Murphy 1999). Student evaluation systems that avail of responses from a representative sample of students in a specific class setting, can help to identify the 'size' of teaching related problems or issues. And, particularly in large or diverse classroom settings, SET's that include key demographic information, can identify subsets of students who may be encountering certain difficulties.

Added to these factors are the more general benefits that having and using a teaching-related measurement instrument. SET's can bestow on the teaching dimension of an academic's professional role. Given that it is an almost universal phenomenon that research activity reaps more individual rewards than those associated with teaching, efforts to measure the teaching related dimensions of their performance, and to pay attention to those measures in the context of an individual's professional development helps to create more parity of esteem between the teaching and research components of the academic role. Such a measurement system can, by virtue of its existence, give rise to significant improvements in the undergraduate experience, something that has been the subject of explicit concern at both institutional and policy levels for over two decades (e.g. Radmacher and Martin 2001). Brookfield (1995) has helped to focus the debate by implying that good feedback systems should be formative rather than summative, should recognise that a 'perfect score' does not always reflect teaching quality or learning impact, and should be implemented in a context of trust and development rather than fear or censure. Many of these features could be more effectively introduced if we understood more about the nature and impact of faculty reaction to student feedback.

## The feedback reaction matrix

Previous research by these authors (see Moore and Kuol 2005) has provided a tentative framework for understanding the variety of orientations that evaluated faculty may adopt with respect to the feedback they receive from their students. Understanding different categories of feedback reaction can provide a useful picture about the likely impact of feedback on a group of participants in a SET system.

The proposed reaction matrix identified the extent to which there exists a match or a mismatch between a faculty members own subjective evaluation of their own teaching and that of the student feedback provided via a SET system. A positive subjective evaluation that is matched with broadly positive feedback from students can be hypothesised to lead to reactions characterised by endorsement and reinforcement with a possible risk of complacency in terms of future performance.

A subjectively negative emphasis combined with broadly positive objective feedback may indicate that individuals in this quadrant are committed to addressing specific aspects of underperformance. This orientation may also be accompanied by the risk that individuals will become 'fixated' on relatively unimportant problems, at the expense of otherwise good performance.

The match between a negative focus of both faculty and his/her students can be hypothesised to lead to reactions characterised by a realistic commitment to improvement, but which also risk being accompanied by dismay, dejection and withdrawal from a commitment to developing teaching effectiveness.

Finally, broadly negative student evaluations accompanied by a positive subjective focus on one's own teaching may provide important indicators about the different value positions adopted by teachers and students within the same classroom setting, invoking Perry's (1988) descriptions of different worlds at play in the same learning setting. Another possible explanation of negative feedback accompanied by a positive focus could indicate a form of denial. This may be the kind of reaction that is most difficult to address. Alternatively, this reaction may represent a functional strategy which can serve to protect an individual's self esteem in the face of student dissatisfaction over which the individual teacher perceives that he/she has little or no control.

**Tab. 1:** Theoretical orientations towards feedback based on the interactions between subjective and objective evaluative emphasis

| | Positive SETs | Negative SETs |
|---|---|---|
| Positive self-evaluation | *Quadrant 1*<br>Endorsement of performance. Reinforcement of current practice.<br><br>Risk: complacency and focus on other areas of professional development | *Quadrant 2*<br>Ego – protection<br>Maintenance of sense of efficacy<br>Identification of a difference of value position between teacher and students<br>Risk: Intransigent denial of real problems |
| Negative self-evaluation | *Quadrant 3*<br>Commitment to addressing minor problem areas<br><br>Risk: Excessive fixation on small teaching problems at the expense of other areas of established competence | *Quadrant 4*<br>Realistic analysis of and commitment to improvement and or repair strategy<br>Risk: Dismay, dejection, discouragement and possible withdrawal |

Thus, according to this empirically derived framework, student feedback of any kind can give rise to both positive and negative responses from faculty. These reactions may be contingent on the extent to which teachers' own self-evaluations match those of their students. Reactions of endorsement, ego-protection, problem solving and repair can all contribute to a more positive learning environment, but the risks that faculty will respond with complacency, denial, fixation or dismay are possibilities that haunt every academic setting, and ones that threaten to have a detrimental impact on a wide variety of teaching and learning experiences.

An institutional and individual awareness of the possible range of reactions to student feedback can empower those in educational settings to use SETs in more sensitive, appropriate and effective ways. Based on an analysis of the qualitative responses of SET participants and on a review of the current literature exploring the validity of SETs the second part of this chapter highlights the features of good SET systems. It proposes a range of individual guidelines that can help faculty members to manage their reactions in a way that will be more likely to give rise to genuine professional development.

**Individual strategies for analysing student feedback:**

1. *Control your defence mechanisms*. Ask yourself: **What kinds of reactions am I having to this feedback and what is it likely to make me do in future**? Make explicit the implicit emotions to which the feedback is giving rise.

2. *Analyse the source of your students' reactions in a way that sheds light on any issues and problems that have been identified*. Ask yourself: **What are the reasons behind both the positive and negative feedback provided by the students?** Whether or not you can answer these questions easily, try to pursue information via other methodologies (e.g. focus groups; one-to-one interviews, facilitated by objective information gatherers). Remember to focus just as assiduously on the reasons behind positive as well as negative feedback, keeping in mind that it can be just as professionally damaging not to know why students think you have done well, as it is not to know why they think you have done badly.

3. *Work hard not to under-react or over-react to information that you receive via SET feedback*. Ask yourself: **What are the changes that would enhance student learning, versus the ones that would have neutral or negative impact on learning?** Try to differentiate between the implications of different changes implied by the feedback.

4. *Divide the issues raised by students into actionable and non-actionable categories*. Ask yourself: **What aspects of this feedback can I do something about**? What aspects of this feedback require a wider institutional, administrative or resource based reaction? Integrate these categories into your teaching enhancement strategy. Simply put, it's important that you don't justify anything identified by your students that that is unjustifiable about your current teaching approaches, but equally that you don't allow yourself to become the scapegoat for issues that clearly need to be tackled at an institutional level.

5. *Communicate with students before and after their provision of feedback*. Ask yourself: **how can I use the SET system to improve communication and to create constructive dialogue with my students ?** Do not appear to ignore students' participation in the SET system. Register with them that you are aware of their impending participation in the feedback system and encourage them to take part as honestly and constructively as possible. And when the results come in, devote a short session of one of your lectures to presenting the summary data and explaining to your students what you will and will not be doing as a result of the feedback they have provided. Student satisfaction levels can be significantly increased via this kind of non- defensive, honest and reasonable communication. Ensure that they know that no negative or recriminatory outcomes will be associated with their participation.

6. *Do not make the simplistic assumption that all positive responses are related to good teaching and all negative responses are related to bad teaching*. Ask yourself: **What parts of this feedback most robustly indicate where my teaching strengths and weaknesses lie?** As outlined

earlier in this chapter, much of the literature on SET's cautions against the risk of giving rise to negative learning outcomes in the pursuit of positive ratings. Some negative student reactions to your teaching may be related to a vital part of their learning journey. This negative feedback can provide the basis for an enhanced dialogue to help secure higher levels of student motivation and commitment. Also be strict about assuming that positive ratings are always related to good teaching. As outlined earlier, the literature shows that there are moderators of student satisfaction that relate to other factors such as disciplinary background, class size, student demographics and timing of feedback.

7. *Remember that small changes can have big effects*. Ask yourself: **What initial small changes can I make based on the feedback that I have received that might have immediate and positive effects on my students' learning experiences in this learning setting?** While not all changes implied by the feedback will be easy or short term, it's a good idea to identify some 'low lying fruit'. Most participants in a SET system can identify one or two small changes that are relatively easy to effect and that can indicate to students that you have heard their voices and are registering their feedback through immediate action. This can create positive momentum for more fundamental or strategic changes to your teaching styles and approaches.

8. *Develop a teaching enhancement strategy that takes into account the SET feedback*. Ask yourself: **what are my long term teaching goals and how can this feedback help me to achieve them?** Within a short time of receiving the feedback, allocate a dedicated period of time in your schedule to develop a longer term teaching enhancement strategy. This strategy might include plans to receive more feedback later in the semester or year, specific professional development interventions that you'd like to avail of, more communication with other key members of your teaching network (heads of department, IT specialists, researchers in your field, librarians, student advisers, study skills experts and so on), and enhanced student assessment strategies.

## Institutional issues for the design of a student evaluation system

Individual teachers can achieve enormous advances in their own teaching strategies if they resolve to engage in a functional and positive way with the feedback that they receive through Student Evaluation of Teaching Systems. However, functional, healthy and emotionally intelligent responses to SET's can be significantly facilitated or prohibited by the institutional approach to managing a SET system. Based on an analysis of the literature that has been outlined earlier, and on gathering the opinions of participating students and teachers, we recommend that standardised SET systems should be characterised by the following important features:

SETs should be:

- Voluntary (both for teachers and students);
- Confidential and controlled (i.e. feedback information only made available to a limited group),
- Comparable with meaningful data (i.e. feedback should compared within discipline and class size, and take account of important student demographics);
- Supported by training, mentoring and other professional development help (that can be availed of in order to help construct and implement individual teaching enhancement strategies);
- Conducted in a high trust, non recriminatory setting (in order to ensure active and positive participation in the process, to secure positive responses to both negative and positive information and to minimise the risk of reactions that are characterised by complacency, denial, fixation or dismay);

- Part of a wider and integrated set of teaching quality interventions and supports (so that SET's are never the only source of information available about the nature and quality of teaching and learning);
- Centrally stored and objectively gathered using standard practices (so that the SET system is carried out in a way that maximises comparability with other similar courses and class sizes);
- Appropriately resourced (so that growing databases of student ratings can be subjected to effective and informed analysis, and so that resources are in place to help individuals and groups of faculty to derive continuous value from the data generated through the SET system).

## Conclusions

Too often, SET systems have been compulsory, publicly displayed, uncontextualised, unsupported, simplistic and interpreted in isolated ways, features which render SET's punitive bureaucratic tools rather than supportive mechanisms through which enhanced learning environments can be created and sustained. Furthermore these characteristics are particularly inappropriate in academic environments, the very contexts in which people are encouraged to adopt critical stances to one-dimensional or naive approaches to data gathering. In order for a SET system to become a positive, value added and effective mechanism, it must help teachers and learners to enhance the complex dynamics that occur in higher level educational settings. It should avoid unsophisticated, knee-jerk analysis and it should promote trust and positive dialogue between student and teacher in a way that gives rise to a better learning culture. This chapter has provided a set of recommendations that we hope will help to prevent SET's from acting as punitive, bureaucratic instruments of control but rather to ensure that they are more likely to act as a valuable resource for teachers and their students in the ongoing journey of professional development.

## References

Ashford, S. J. and L. L. Cummings (1983). Feedback as an individual resource: Personal strategies for creating information. *Organisational Behaviour and Human Performance 32*, 370–398.

Brookfield, S. (1995). *On becoming a critically reflective teacher*. San Francisco: Jossey-Bass.

C., O. J. (1991). Changes in evaluating teaching in higher education. *Theory into practice 30*(1), 30–36.

Calderon, T. G., Gabbin, A. L., and B. P. Green (1996). *Report of the committee on promoting and evaluating effective teaching*. Virginia, U.S.A.: James Madison University Press.

Carey, G. (1993). Thoughts on the lesser evil: student evaluations. *Perspectives on political science 22*(1), 17–20.

Cashin, W. E. (1988). Student ratings of teaching: a summary of the research. IDEA Paper No. 20. Manhatten: Kansas State University, Centre for Faculty Evaluation and Development.

Green, B. P., T. G. Calderon, and B. P. Reider (1998, February). A content analysis of teaching evaluation instruments used in accounting departments. *Issues in Accounting Education*, 15–30.

Greenwald, A. and G. Gilmore (1997). Grading leniency is a removable contaminant of student ratings. *American psychologist 52*(11), 1209–1217.

Hand, L. and M. Rowe (2001). Evaluation of student feedback. *Accounting Education 10*(2), 147–160.

Johnson, R. (2000). The authority of the student evaluation questionnaire. *Teaching in Higher Education 5*(4), 419–434.

Moore, S. and N. Kuol (2005). Students evaluating teachers: exploring the importance of faculty reaction to feedback on teaching. *Teaching in Higher Education 10*(1).

Murphy, A. (1999). Enhancing the motivation for good teaching with an improved system of evaluation. *Financial Practice and Education Fall/Winter*, 100–104.

Perry, W. G. (1988). Different worlds in the same classroom. In P. Ramsden (Ed.), *Improving learning: new perspectives*. New Jersey: Nichols.

Radmacher, S. A. and D. J. Martin (2001). Identifying significant predictors of student evaluations of faculty through hierarchical regression analysis. *The Journal of Psychology 135*(3), 259–268.

Stockham, S. L. and J. F. Amann (1994). Facilitated student feedback to improve teaching and learning. *Journal of Veterinary Medical Education 21*(2).

Tomasco, A. T. (1980). Student perceptions of instructional and personality characteristics of faculty: A canonical analysis. *Teaching of Psychology 7*, 79–82.

Whitworth, J. E., B. A. Price, and C. H. Randall (2002). Factors that affect business student opinion of teaching and learning. *Journal of Education for Business* (May/June), 282–289.

Wilson, K. L., A. Lizzo, and P. Ramsden (1997). The development, validation and application of the Course Experience Questionnaire. *Studies in Higher Education 22*(1), 33–54.

# THE WRITE APPROACH: INTEGRATING WRITING ACTIVITIES INTO YOUR TEACHING

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There is a belief among students that assessment of student writing ability takes place only in courses in the English department. However, as lecturers we expect our undergraduate students to write for assessment in most disciplines, most likely a research paper, report, or an examination essay. And no matter how bright their ideas, how well-researched their information or how analytic their thoughts, their grade will suffer if these thoughts aren't communicated in a clear, accessible, well-organised, and competently-written fashion. Academic writing is a skill that all disciplines demand so, at the very least, we need to offer our students strategies to help them deal with the challenges of writing effectively.

I studied English in university, eventually completing an MA and a PhD. Yet during all this time – and I was there many years – I was never, never once, offered a formal or indeed, informal, class on how to write academically. And never once was I asked do any writing activities in lectures or tutorials other than perfunctory note-taking, despite being expected to submit written assignments all the time.

As an academic, writing is a key skill I use every day; however, it is also a competency that many other professions value highly. Writing skills thus need to be actively cultivated in undergraduates across all disciplines, as not only will the ability to write clearly and persuasively stand to our students in their professional life, but the act of learning through writing will also help them become more effective critical thinkers. Since thinking is an essential component of meaning construction, classrooms that actively cultivate that construction of meaning through writing will produce not only better writers, but also better thinkers (Tierney and Shanahan 1991).

This chapter will argue that writing should form an integral part of teaching in all disciplines. While it is beyond its scope to fully elucidate the practices of writing across the curriculum, this chapter is more than just a reflection on the various principles of academic writing; underpinned by theory, its objective is to delineate realistic, feasible and immediate strategies to integrate writing activities into the classroom or lecture hall.

## Why should we care about writing in subjects outside of English?

As academics, most of us would react with some worry if we had to submit written assessments in order to apply for positions at third level. Indeed, often one of the greatest professional challenges we face as academics is our academic writing. For many of us the simple fact is, good quality academic writing is difficult. And though academia may be content-driven we are aware that, at the end of the day, no amount of intelligence or mastery of a particular discipline can guarantee good written communication skills.

According to the social constructivists, writing is always conditioned by social context (Bazerman 1981; Bizzell 1982; Myers 1985). In university, writing takes place within the context of an academic discipline and is the means by which our students can extend their thinking and explore

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

meaning. Writing brokers learning; it plays a crucial role in developing critical thinking skills and can help students amalgamate, evaluate and apply course content. By combining content instruction with writing activities, learners can achieve better reasoning and higher-level thinking than is normally achieved through either process alone (McGinley and Tierney 1989). Therefore, as is the case with reading, writing should be an integral part of all content disciplines, not just a means for students to express *what* they have been taught, but to demonstrate their responses to this knowledge, and ultimately to *apply* it.

Writing is also a lifelong skill, an essential tool for graduates across all disciplines to communicate effectively in the working world. This may seem like an obvious point, but it's one that often needs to be more suitably applied in our disciplines. How often do you get your students to write essays? And how often do you get them to write other forms of written communication that they may use in future discipline-related careers? My guess is that the prevailing way you assess content is through the essay – by far the most dominant form of writing within the academic context, but far less so (at least in its pure state) in life outside university.

Sometimes we need to be reminded that there are writing forms other than the traditional essay, so if your subject discipline requires your graduates to write prescriptions, reports, memos, emails, proposals, policy manuals, business analyses, plans, or strategies, to name but a few, then surely it's a good idea to get your students to practice writing these forms, and assess them accordingly? Similarly, by designing writing activities that allow room for students to incorporate their experiences into their writing, the level of clarity and depth in their writing will not only increase, but they will be more likely to engage in their work if they can connect it to the experience they bring to the classroom.

## But how can I teach something I've never been taught?

The very real concern for many lecturers is that if we ourselves have never been taught explicitly how to write academically, either within or outside our own curricular areas, then how can we be expected to teach writing? However, I am not suggesting that we teach our students *how* to write; rather that we teach content partially *through* writing.

What we must also remember is that, as lecturers, most of us have learnt to write academically primarily through years of academic-related reading, coupled with acquired knowledge of discipline-related spoken discourse which we learn to translate into text. In short we know what being critical or being analytic looks like as text in our field of study – and that's an awful lot more than most of our undergraduate students know when they first attend university.

A metaphor often applied to learning academic writing is that it is like being initiated into a conversation, before eventually finding a personal voice. As lecturers, we form part of a disciplinary community. We possess both content knowledge and discourse knowledge, having long since learnt our community's specialised language and conventions; and most of us have found a personal voice – though this is arguably an ongoing, dynamic process. Therefore, we are actually in a good position to pass on these skills to our students, to teach them the rules of discourse, both generic and content-specific, and to show them how to become a critical writer: to move from merely quoting experts to eventually using these experts' ideas as springboards from which to launch their own theories.

As an expert in your field, you are often in the best position to teach the particular rules of discourse within that discipline. Knowledge is encoded in the language and communication forum your community members use. Graduates need to learn the rules of discourse, not only to recognise and use appropriate linguistic communication conventions within this forum, but to decipher the expectations of the discipline underpinning the language. There are obvious pedagogical advantages to this approach when a specialist teacher is the immediate audience, or indeed emulates the immediate audience, for students' writing can be as technical as it needs to be without having to be translated into conventional lay language. Of course, the correlative disadvantage of this approach is when you allow your students slip into a language that is inappropriately jargon-filled, or that makes no attempt to speak outside the discourse community

when it should. As one critic notes, 'training those future professionals to write only in expository prose is training them to ignore their political and ethical responsibilities.' (Kinleavy 1983)

As academic writers, knowledge of writing practices outside our discipline is also essential if we want to communicate to and become part of a broader university community, and in so doing move from an isolated plura-versity to a linguistically unified uni-versity[1].

## Suggested Activity

To encourage writing activities that not only analyse our own discourse community, but that recognise other discourse communities also, divide students into small groups and give them an appropriate research article in their field. They must read the article and generate a list of discipline-specific discursive conventions (writing style, organization patterns, specialized terminologies etc). Next, ask them to generate a list of discourse conventions that could be transferred to other disciplines or to more generic writing.

Another version of this activity is to ask students to rewrite parts of the research article using a different voice, persona, or point of view, or indeed to rewrite any published piece in a new genre (eg. turn a lab report into a poem; turn a poem into an essay)

As educators, we need to become more aware of what constitutes 'good writing', as well as recognising that characteristics of 'good writing' vary from discipline to discipline. When McQueeney and Jones (1996) and Zerger and McQueeney (1998) asked university lecturers to describe 'good' writing, the spectrum ranged from *interesting* and *bold* at one end to *precise*, *succinct*, and *accurate in punctuation and grammar* at the other. Zerger and McQueeney's study (1998) confirmed the hypothesis that words used to describe good writing could be categorised by discipline. For example, humanities used the terms *eloquent*, *vivacious*, and *aesthetically satisfying*, whereas social scientists preferred *non-trivial*, *relevant*, and *plausible*. Arts favoured *creative*, *imaginative* and *persuasive*, whereas natural science used *theory-driven* and *analytic*[2].

## Suggested writing activity

This research only becomes relevant in this context if we can make our students aware of what constitutes good writing within a particular discipline/genre. One way to approach this is to create a table, such as the one below, and ask your students to circle the relevant adjectives to describe the sort of writing that is acceptable for your particular subject/discipline. They then have five minutes to choose which one they think is the most relevant and to write down why.

| | | | |
|---|---|---|---|
| Clever | Creative | Structured | Persuasive |
| Vivacious | Thoughtful | Insightful | Accurate |
| Eloquent | Bold | Well reasoned | Theory-driven |
| Clear | Imaginative | Reflective | Understandable |
| Precise | Succinct | Analytical | Inquiring |

A group/class discussion can then ensue where students have the opportunity to express their reasons for their choices, and you, as lecturer, have the opportunity to put forward the discipline's writing expectations to an active and hopefully engaged audience.

[1] For a further analysis of this idea see James L. Kinleavy's article, 'Writing Across the Curriculum', ADE Bulletin, 076 (winter 1983): 14-21

[2] However, despite the seeming differences in attitude to what constitutes 'good' writing, there were some generic words chosen by all disciplines, including *clear, precise and succinct, organized, accurate in punctuation and grammar, cohesive,* and *understandable.* These characteristics are generic to all good writing, and should not be forgotten when teaching writing in a discipline-specific context.

## Can't I send my students to the English Department for training?

Well perhaps, but that's assuming that writing is always transferable; in fact, though some of the principles remain the same, writing differs by discipline, so while it is important to learn the generic principles of writing and grammar, your students also need to learn to write as a chemist, or an engineer, or a literary critic, as the case may be.

Embedding writing activities within your discipline can not only initiate your students into your specific discourse community, but it can help them demystify and master what that community's particular conventions are. Charles Bazerman (1981) compared articles published in professional journals in the fields of biology, sociology, and literary criticism, and deduced that there exists a large difference in what constituted acceptable evidence: biologists favoured experimental results, sociologists trusted statistics and theoretic models, while literary critics cited evidence from texts. Likewise, the types of writing expected by students within a university will vary from discipline to discipline. For example, the term 'essay' is used broadly across disciplines, but there are differences between a literary analysis, a research paper, an evaluative essay, a term assignment, a literature review, a research report, or a book review. Further, writing in the sciences might favour lab reports, journal article critiques, or abstracts, and some of its particular characteristics might include clarity, objectivity and formality. Writing in the Arts, on the other hand, may favour essays, literary analysis or book reviews, and encourage secondary research, literary analysis, and eloquence of expression.

## Suggested writing activity

Students need to know what is expected of their writing within the discipline, that's obvious; but as their lecturer you also need to ensure that they understand what is expected of them. One way to do this is, for each assignment or task, is to give students a few minutes in class to freewrite what they understand by its genre, its methodology, or any other of its characteristics. Suggested writing prompts can be as broad or as specific as you want them to be. For example:

- What is the purpose of a lap report?
- What should an abstract set out to do?
- What does the word 'analyse' mean in this context?
- What should the title of a proposal indicate?
- What makes a good introduction to an essay?
- What are some of the dangers of email writing?
- What should a conclusion include and what should it not include?
- What are the differences between conclusions and recommendations?

After ten minutes writing, students will have formulated their thoughts, and some brief explanations by you to the group will act to reinforce or modify their approaches as appropriate. Not only will students be more confident starting their written task, but they are also likely to be motivated to actually begin writing it.

## How do I know what writing activities to use?

Luckily there is a wealth of resources specific to multi-discipline writing[3]. Just type in 'WAC' (Writing Across the Curriculum) to your search engine and you will be directed to numerous

[3] Purdue has one of the largest online writing laboratories, with many printable handouts on research and writing, categorised by subject. See `http://owl.english.ourdue.edu/handouts/index2.html`
See also The University of Guelph for advice on academic writing: `http://www.learningcommons.uoguelph.ca`

pedagogical practices in this area. A movement begun in the United States in the mid-1970s, WAC is premised on the theory that writing is a valuable learning tool. Many institutions began by offering workshops that showed faculty how to productively incorporate writing exercises into their courses, and it is now common to see college-led WAC programs both advocating and supporting third level adoption of writing as an important component of all courses in all disciplines[4]. Some universities have set up writing centres to offer training, consultations, workshops and other resources[5]. Here in Ireland, WAC centres or departments are not common but the methods, principles and pedagogy they espouse can be borrowed and adapted, both cognitively and rhetorically, in the lecture hall or classroom.

It's never to late to introduce activity writing into your classroom, but the earlier you get your students writing, the better the results will be. How about trying something like the following in your first lecture of the academic year:

## Suggested writing activity

Ask your students to write anonymously an answer to the following question: 'What concerns do you have about the essays you will have to write this year?'

After five minutes writing, collect your students' answers.

This activity works particularly well because students tend to focus on what they're going to be assessed on, and because their responses are anonymous, the variety of concerns is broad and honest. Previous responses to my employment of this activity have included:

- What exactly is a university essay?
- How will these essays differ to ones I had to write in school?
- What does my lecturer/tutor expect from my academic writing?
- What does critical reading/writing mean?
- How do I structure my writing?
- Are there any resources to help me out?
- How do I begin to write?
- If I fail, will I get the chance to re-write my essays?

I normally collect the sheets, take them away with me, and the following lecture spend ten minutes answering both some of the general, and some of the more specific concerns.

You can introduce writing into your course through a variety of means. You can use 'formal' writing assignments such as research papers, essay exams, lab reports etc. However, you can also assign more, 'informal' 'freewriting' assignments such as brief, in-class writing prompts, reflections, or journal entries, to name but a few. First introduced in Peter Elbow's *Writing Without Teachers* (1985), freewriting is where you write whatever comes into your head. Focused freewriting, on the other hand, is writing about a particular subject or question which has been posed. Here are some ideas for some informal in-class writing activities:

[4] The Writing Center at Colorado State University is a good starting point to explore a university that 'supports writers and teachers of writing inside and outside the CSU community'. See `http://writing.colostate.edu` Georgia State University

[5] For example, the WAC program at Georgia State University was established in direct response to one of the University's strategic plan's goals to '... emphasise the importance of writing skills in all disciplines, [and] initiate a Writing Across the Curriculum Program, in which all students will take at least one course designated as writing intensive in their major department.' See: `http://wac.gsu.edu` for their WAC website.

### Activity: What I know about. . .

Ask students write down what they know about a topic before you introduce it into your lecture or discussion. This will help focus them on the topic and since they will have something written in front of them before class begins, it should contribute to student participation.

### Activity: The Problem Statement

If you introduce a new concept into your course, ask students to write out a practical (or theoretical) problem that the concept just explained will help to solve. Students can work in pairs or alone, and can exchange problems and/or solutions as you wish.

Another version is for students to write a problem statement and pass it to the student beside them who must solve it. This works particularly well in large classes.

### Activity: Summary writing

Tell students they will have to write a brief summary at the end of the class. This technique will help students concentrate on the class/lecture, and if you collect the summaries you can ascertain what they remembered from class and if they identified the main issues covered.

### Activity: Focus questions

Compose specific questions for your students and get them to freewrite accordingly e.g.

Q: What points in the article you read for today's tutorial are the most (or least) convincing?

Q: Of what value is the knowledge you learned in today's lecture?

Q: How does what we studied today apply to the world around you?

### Activity: 'The center of gravity'

Ask students to compose a single sentence that summarizes the main point of the lecture/discussion. Collect or discuss to ensure that your students grasped the main points of the discussion/lecture.

Informal in-class writing activities like these can present more latitude than formal writing assignments. Because they are unedited and unrevised, they are generally best used to promote student reflection and engagement with the content, and can be a useful tool for generating ideas and discovering attitudes.

### But I just don't have the time!

From the lecturer's point of view, integrating writing into the classroom may sound reasonable and even desirable, but the concern is often a time-related one: how can one cover the curriculum and meet curriculum requirements within time if one adds another component to classroom instruction? However, proponents of WAC agree that when teachers incorporate regular writing activities into their classes, the need for revision and re-teaching after testing is significantly reduced (Hightshue et al 1988; Worsley and Mayer 1989).

Certainly, some writing activities can be formal, but critical thinking, organization/synthesis skills, summarizing and reflective skills (among others) can be equally taught through informal, formative, five-minute class exercises that are both feasible and effective. Diane Miller Miller, in her article, 'Begin Mathematics Class with Writing' (1991), gives many samples of succinct yet effective writing assignments. Two follow here:

## Activities for mathematics

- General mathematics: You have studied the commutative property for addition and multiplication of real numbers. Not all operators are commutative. If you were asked to explain to a friend why division is not commutative, what would you say?
- Algebra: Suppose a friend asks you to check your answers to some homework problems. Would you mark the following problem correct or incorrect. Explain why ...

$$(a + b)^2 = a^2 + b^2$$

Obviously, timely feedback is an important factor when setting writing tasks, especially those that are less 'reflective'[6], as one of the purposes of feedback is to ensure students have grasped what you are trying to teach them, and to enable them improve their performance. One way for both student and lecturer to assess the degree to which students have understood an important concept or procedure is by using 'directed paraphrasing', like the maths example above does, where students write an explanation of a concept or a set of instructions in their own words as if writing for someone who is not on the course[7].

As well as imparting such skills as focus, organization and support, asking students to work together can also be time efficient. For example, you could divide a lecture into small groups to revise a document that has already been written. Either have them sit down together cold in class, or to be more time efficient, get them to work individually on the document before class and then pool their suggested changes. By assigning a group writing project, you can cut back on the amount of papers you have to grade.

## Suggested activity:

Instructors in sociology, speech communication and political science might divide their classes into 5 or 6 groups in order to investigate local problems or issues. Some students do the background research while others conduct interviews or surveys. Each student prepares a draft of his or her results for the group. Then the group as a whole must synthesize the information, organize, and prepare a report for presentation to the entire class[8].

Using class time to promote writing activities, and offering feedback on them can be highly effective and efficient given the benefits it can bring. Writing in small groups promotes a classroom community; and if writing is emphasised correctly, a myriad of other skills and abilities are gained, such as the ability to think clearly, to pose worthwhile questions, to articulate a complex thought simply, to evaluate the adequacy of an argument, and to give and receive criticism.

## Will my students want to write in a lecture? It's not what they're used to.

A recent study found that student engagement with the subject matter being taught increased dramatically when students were frequently asked to write about that subject[9]. In-class writing activities can certainly pull students from their passivity. Had any of my lecturers regularly paused and asked us to write for five minutes on our reactions to key arguments, I for one would have not only leant more quickly how to formulate my own ideas, but would also have been roused from the type of concentration stupor I often fell into in the latter part of a lecture – and often sooner depending on the lecturer.

[6] Tools such as peer and self assessment can be effectively used to promote feedback, and though it is beyond the scope of this chapter to discuss these tools in any detail, a quick web search should guide you to the benefits of this kind of formative assessment.

[7] I would like to thank Dr. Diana Kelly for pointing me to this strategy.

[8] Activity quoted from the Center for Instruction Development and Research at University of Washington at Seattle, see the following website for more information: `http://writing2.richmond.edu/wac/grpwrite.html`

[9] Richard J. Light. 'Writing and Students' Engagement ' *Peer Review* 6.1 (Fall 2003): 28-31. Rpt. of 'The Most Effective Classes' in *Making the Most of College: Students Speak Their Minds* by Richard J. Light. Cambridge: Harvard University Press, 2001. 54-62.

In-class writing activities encourage active learning – after all one cannot write without thinking, and developing critical thinking is key to students being active rather than passive participants in their education. If you spend your hour's lecture trying to jam facts and figures into your student's heads, their learning will stagnate at lower level or 'surface' learning. However, if you encourage them to try a variety of thought processes in class, they will move to a 'deeper' learning, and develop critical thinking skills. As Bina Shah writes:

> Writing is just such a way to develop these critical thinking skills, because when you have to put your ideas down on paper and support them with evidence and argument, you sharpen your ability to reason, to extrapolate, and to draw conclusions from the information presented to you. Writing exercises challenge students to go beyond what is presented to them, and encourage them to come back with their own ideas and thoughts, which they will then develop into well thought out and well reasoned arguments.[10]

## Conclusion

Writing within an academic context is much more than an exclusive concern with correct grammar and should go beyond the technicalities of stylistic accuracy. This chapter has shown you how to help your students enter writing through content, and has delineated strategies to facilitate your learners developing their own writing voices within their particular academic discipline and context – voices that are certainly grammatically accurate and stylistically proficient, but also cogent, engaging and suitably analytic.

We have seen that writing and learning are inextricably linked, that writing is different in different disciplines and contexts, and that as lecturers we should guide the writing process, not merely judge the written product. Finally, by integrating writing into our teaching, we have seen how we can afford our learners not just generic writing skills, but also the tool to become higher level thinkers, a lifelong skill of indeterminable value.

## References

Bazerman, C. (1981). What written knowledge does: Three examples of academic discourse. *Philosophy of the Social Sciences 11*, 361–387.

Bizzell, P. (1982). Cognition, convention, and certainty: What we need to know about writing. *PreText 3*, 213–243.

Elbow, P. (1985). *Writing Without Teachers*. Oxford University Press.

Hightshue et al, D. (1988, June). Writing in Junior and Senior High Schools. *Phi Delta Kappan 69*(10), 725–728. EJ 379 988.

Kinleavy, J. L. (1983). Writing Across the Curriculum. *ADE Bulletin 076*, 14–21.

McGinley, W. and R. J. Tierney (1989). Traversing the topical landscape: Reading and writing as ways of knowing. *Written Communications 6*, 243–269.

McQueeney, P. and A. Jones (1996). *An academic writing glossary: A sampling of Terms used to assign writing at the University of Kansas*. Lawrence, KS: University of Kansas.

Miller, D. L. (1991, June). Begin Mathematics with Class Writing. *The Mathematics Teacher 85*, 129–136.

[10] Shah, Bina, 'The need for Writing Across the Curriculum', see website: `http://www.chowk.com/show_article.cgi?aid=00003629`

Myers, G. (1985). The social construction of two biologists' proposals. *Written Communication 2*, 219–245.

Tierney, R. J. and T. Shanahan (1991). Research on the Reading-Writing Relationship: Interactions, Transactions, and Outcomes. In R. Barr, M. L. Kamil, P. Mosenthal, and P. D. Pearson (Eds.), *Handbook of Reading Research*, Volume 2. New York: Longman.

Worsley, D. and B. Mayer (1989). *The Art of Science Writing*. New York: Teachers and Writers Collaborative. ED 304 702.

Zerger, S. and P. McQueeney (1998). This is chemistry, not English literature: Supporting writing across campus. In C. Shireen (Ed.), *Travels with the Midwest Writing Centers Association 1996-1997*. Conference Proceedings. Midwest Writing Centers Association.

# VIRTUALLY EFFECTIVE: THE MEASURE OF A LEARNING ENVIRONMENT

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## Introduction

This chapter examines the preliminary findings of a recent user survey of the staff use of the virtual learning environment (VLE) Blackboard™ in University College Dublin (UCD), Ireland. Many Higher Education Institutes (HEI) are in the early stages of adoption and implementation of such systems. The results from this small survey serve to reflect a portion of the current dilemmas facing the individual academic and institute.

One of the key aims of the UCD survey was to quantify the level of usage of Blackboard within faculty and to attempt to qualify its usage as a means to aiding student learning. Further issues considered what particular 'drivers', both institutional and personal were behind the uptake of e-learning, what types of teaching materials were being employed and how were these integrated within the traditional face to face teaching environment, also considered were the effects on organizational change that the presence of a VLE might bring to faculty.

The results of the user survey are the first part of an overall strategy aimed at evaluating the effectiveness of Blackboard within the university and to develop a means by which to offer an evaluation tool to our users so that they may measure and develop their own usage of the VLE.

This paper does not propose to evaluate the technological merits of a VLE but instead offers a means by which we may assess its impact and allow us to improve on our own interactions and methodologies of usage.

## What is a virtual learning environment?

> "VLE's are learning management software systems that synthesise the functionality of computer-mediated communications software and on-line methods of delivering course materials."[1]

They allow the academic (often referred to as the facilitator) and learner a means by which to participate in online interactions using an array of tools such as email, databases, discussion threads, web resources etc. Ideally they offer an all in one system where a single interface allows access to a range of learning materials and communication tools. The academic may use the system to provide enhanced resources (bibliographies with live links to electronic journals, simulations expanding practice) or initiate online collaborative projects to stimulate and develop ideas and theories beyond their face to face meetings A student may access these learning materials and engage in online interactions (via email or chat tools) with peers and facilitators at a time and location that suits their personal needs.

[1] JTAP Report -041 *A Framework for Pedagogical Evaluation of VLE'S*

*Emerging Issues in the Practice of University Learning and Teaching.* O'Neill, G., Moore, S., McMullin, B. (Eds). Dublin:AISHE, 2005. 
http://www.aishe.org/readings/2005-1/

From an administrative point of view a VLE offers the opportunity of integrating with a dedicated management information system (MIS) that may be responsible for student enrolment, registration and exams. Once again the idea of an all in one system allows for mass communications to be immediately effective and the possibility of tracking student progress and results.

The current market place for VLEs in HEIs is dominated by two products Blackboard™(`http://www.blackboard.com/`) and WebCT™ (`http://www.webct.com/`), each offering a variety of tools and functionality. Many other products are available and in wide use such as FirstClass™ (`http://www.firstclass.com/`) (the VLE of choice for the Open University) and LearnWise™ (`http://www.learnwise.com`). More recently the advent of open source has offered the academic community Moodle (`http://moodle.org/`). This VLE is fast superceding the proprietary products as being the most popular and easy to use system of choice (see McMullin 2005).

## Pedagogical Context:

One of the fundamental issues of engagement with any new educational technology is the need to place pedagogy first, using this as the catalyst and choosing the product/s that best suit individual requirements. Best practice indicates that this is key to establishing the effective integration of any technology into the core curriculum.

Current practice is trying to adapt and transform ready-made curricula to 'fit into' the VLEs that are being established throughout the academic world. In the traditional education system currently employed, students learn by a means of transmission (Ramsden 1992) 'interacting with and transforming received knowledge so as to own it and make it personally meaningful.' They do this '... by actively constructing or reconstructing information.' (Nicol et al. 2002). What a VLE can do is to encourage and place a greater emphasis on the active engagement of the material rather than the predominantly adoptive delivery approach. A VLE should act as a *facilitator* for both student and teacher, providing them with a set of tools to accommodate a wide range of learning styles and goals, to encourage collaborative, inclusive and student centred learning, and to act as a resource for shared experience.

The first step on engaging a VLE is to adopt an approach for course integration that will allow academics to present their current working practices sympathetically and inclusively. Each discipline will have to be handled subjectively as each will have its own distinctive pedagogies, involving characteristic learning activities, teaching and assessment methods. It follows that though there may well be a campus *'digital signature'*, as part of an ICT strategy, each faculty and department will still maintain its academic independence.

With current student numbers ever increasing, the labour intensive support once provided by academics has been greatly reduced. Through the use of a managed learning environment (MLE) [often seen as the combination of a VLE and MIS] a more flexible teaching and learning situation can be adopted to facilitate these student requirements, with both mentoring and tutoring services provided online.

All of this requires that a pedagogically sound model must be used to develop curricula for e-learning, a programme must activate and stimulate the cognitive and reflective component of the students psyche to promote a deeper research led path of learning. Furthermore academics should be encouraged to build research-based courses in an effort to facilitate the latter and to maintain their own field of excellence. This will fall in line with the mission statements of HEIs in '...achieving scholarly excellence through research, publication and excellence of teaching.' (UCD Staff Manual 2001)

## The Survey Design:

The Chickering and Gamson (1983) guiding principles for effective learning were integrated into the design of the survey as a means to consider if effective practice was taking place and being encouraged within the context of the VLE. These principles offer a premise from which to consider

ones own pedagogy in practice and may act as a check list that one can apply to any area of curriculum design. It was hoped to prove that the use of a VLE offers a means by which to reconsider and improve ones own fundamental pedagogical beliefs. The use of any educational technology often invites a close examination of how best one might choose to implement new methodologies into day to day practice. *Can the use of a VLE stir the need for pedagogical enlightenment?*

**Guiding Principles for Effective Learning:**

- Establish clear learning objectives and learning outcomes
- Provide learning grounded in effective, i.e. contextual, authentic, case-based examples
- Provide a manageable workload
- Emphasize time on task
- Encourage contact between students and faculty
- Develop reciprocity and cooperation among students
- Encourage active learning
- Encourage deep learning
- Make the assessment relevant to the task
- Reward critical thinking in the assessment process
- Provide prompt feedback
- Provide feedback commensurate with performance
- Respect and accommodate diverse ways of learning
- Communicate high expectations

## Background to the Survey:

Many institutes over the last number of years have chosen a proprietary VLE that has been licensed and released over their local area network (LAN) for use amongst the academic community. Training and various levels of support are available to those wishing to develop an online presence within the framework of this dedicated VLE. Most institutes are now in their third to forth year of such schemes and a great deal of feedback has already come to light in relation to initial best practice and implementation (Browne and Jenkins 2003; Tearle and Prosse 2004).

Blackboard™ has been in use at UCD for over two years replacing the former online environment of TopClass™ and more recently the Online Classes system. UCD currently has two live Blackboard servers in production running version 5 (and one test server for staff training). Version 6 of Blackboard will be released campus wide in September 2005. The primary server is housed by Computing Services and is open to all faculty, this currently holds in the region of 400 courses run by c.300 instructors. Another production server dedicated to the Michael Smurfit Graduate School of Business is also in operation.

The user survey was jointly developed by the Centre For Teaching and Learning (CTL) and the Computing Services Department. The Centre is responsible for the promotion of excellence and innovation in teaching and learning within UCD. The Computing Services Department is

responsible for the IT infrastructure of the entire college and also manages and administers the Blackboard system.

New users of Blackboard are provided with a half day induction to familiarize them with the main functionality and to set them up on the test server so that they may engage with the system in their own time. All staff are recommended to take part in a two day induction course which is jointly run by the Audio Visual Centre, the Centre For Teaching and Learning, Computing Services and the Library and provided through the system itself. This course covers a breadth of material including basic HTML and image manipulation, promoting active and deep learning, key tools in Blackboard and copyright issues. The majority of current Blackboard users would have undertaken both these courses.

## Results from the Survey:

The key cohort of c.300 registered instructors were notified by means of an internal ListServe and by notices published in the University's E-Learning Forum and within Blackboard itself shortly after the 2004 summer exam period. A 15% response rate was achieved, an open forum will follow and individual interviews have yet to take place.

Those that responded were across the breadth of user experience, representing both the novice and advanced adopter. From this small cohort of users who replied it is important to note the number of issues and concerns raised that are mirrored in many other HEI.

A broad range of usage occurs throughout faculty with a core element residing in the Sciences (19%) and Medicine (37%). The types of courses in place are primarily undergraduate and range from Archaeology and Accountancy to Veterinarian Pathology.

In relation to who is using the system the majority are academic members of staff (76%) but a key cohort of administrative members (16%) are being drawn in to maintain courses, post notices and in one department act as a 'gate-keeper' to all content postings. Thereby providing a consistent and harmonious structure to both the design and layout in the content and communications.

Part of the survey asked 'why' individuals decided to engage with Blackboard to ascertain what personal or institutional drivers may be at play. Fundamental to this question was the 'perception' of what the VLE was and therefore how it might be used. Was it a seen as a content delivery mechanism (acting as a resource for student notes, bibliographies etc.). Or was it recognized as a multi functional tool with which to offer an array of opportunities to both learner and teacher?

A sizable cohort (28%) are utilizing the VLE as a means for providing supplemental materials to face to face (f2f) sessions. This is integrated with the day-to-day activities by providing learning materials (such as slides) prior to and after traditional lectures, practicals and tutorials. This is often seen as a first step in the use of a VLE, allowing individuals a means with which to distribute content effectively. What is not noted is that a subtle change may occur in the interactions at the f2f level. For example by providing content online prior to a session the learner may be more likely to move beyond the didactic intake to a deeper level of learning by engaging more in discussion and reflection.

A number of responses (23%) cited that the reason why they engaged with the VLE was to offer the opportunity for student centred learning (see O'Neill and McMahon 2005). This shows an awareness of the potential laid out by the many tools within the VLE. By using these, one may offer the learner the choice of how it is they engage with the content, and allow them to self direct their own learning.

The promotion of scholarly intent and development of teaching portfolios within HEI acts as a driver for many individual academics who continuously strive to develop their own teaching. The use of educational technology such as a VLE, offers the opportunity to develop new methodologies and practices. It is rewarding to note that many (23%) engaged with the VLE as way to improve their teaching and be personally innovative.

Within UCD the use of Blackboard has been offered as means by which to utilize e-learning methodology within the traditional curriculum, although integrated in the ICT strategy, it is not a

fundamental requirement. 15% of the users however have a departmental or faculty policy with which to promote the use of the VLE within their teaching.

Other reasons cited for using the VLE included the need to place student notices, to enhance the use of existing websites and one reason in particular found resonance '. . . no other choice was provided by the academic institution'. We will return to this later.

An interesting by product noted by the survey occured when users were asked what further training they might like to undertake. As expected there were a number of requests for developing quizzes and multiple choice questionnaires (MCQs) not a strong feature of the Blackboard VLE and a series of requests for management style themed training. These consisted of general site management, project management and online time management skills – all of which are being developed in response to this.

What was particularly interesting was the amount of requests for fundamental training in the area of Blackboard itself, particular reference was made to the tools such as the group functions, communications, surveys, the electric blackboard etc. One of the key reasons UCD acquired Blackboard was for its ease of use and yet here we have a cohort of users, some familiar enough with Blackboard to be running courses for over two years, that are unable to use some of its basic functions.

Why is this? Basic training has been provided through the induction courses. Perhaps an underlying reason for this is quite simple. Although these tools appear easy to use, the way in which they are designed is often un-necessarily complicated. This makes it harder for the novice user to structure and plan how it might best be integrated into their day to day practice.

Other training requests included courses to aid in the development of interactive resources, such as Flash animations, digital video clips, audio files etc.

In UCD, although training and basic support are provided pro grata there is no specific e–learning support team provided to those who wish to develop e–learning materials (e.g. digital video, Flash, MCQs etc). Such resources can only be developed with additional finance (e.g. Teaching Grants and Awards), departmental initiatives and the release of time enabling the end user to develop the framework upon which such content will sit.

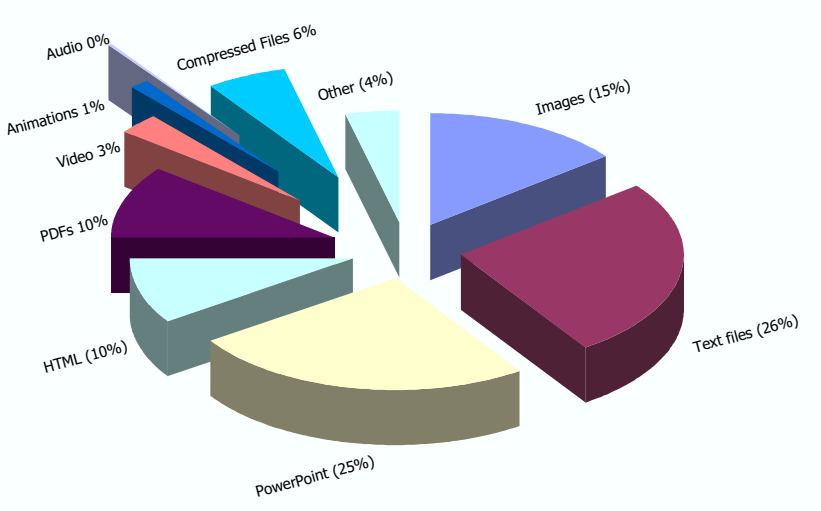


**Fig. 1:** Current 'File Type' usage within Blackboard.

Analysing the material content within the VLE (see fig. 1) one was immediately presented with the dominance of the use of Microsoft (MS) Office tools. This was noted in the majority of text files used online. Further analysis found that these are almost all Microsoft Word Documents, and despite guidelines very few have been saved in either Rich Text Format (.rtf) or plain text (.txt). Although MS Office is almost ubiquitous in its use in HEI one must realize that the

end user, the learner, may not be able to afford such an application and be looking towards low cost or open source examples such as Star Office (`http//:www.staroffice.com`). Although MS Office files may be opened in alternate packages, formatting and layout often goes astray. Furthermore assistive technologies may encounter difficulties with reading the additional coding often placed in MS Word .html files.

It has been noted that there is a wide divergence of the ICT skills base within the UCD Blackboard community, a certain cohort are akin to web and Flash designers and the majority are at an introductionary level of providing supplemental materials online. This case of extremes needs to be remedied. The presence of champions (those who have pioneered and/or developed methodologies and content of an exceptional or innovative nature) offers an insight into how the VLE may best be used, but unless their endeavours are transferable and scalable across the whole community it may represent to the novice user a stark reminder of the burgeoning gap in their own VLE usage. It is interesting to note that where collaboration occurred in developing course materials particular technological innovations were often required. Thus it is here that a 'champion' might best share their expertise and experience.

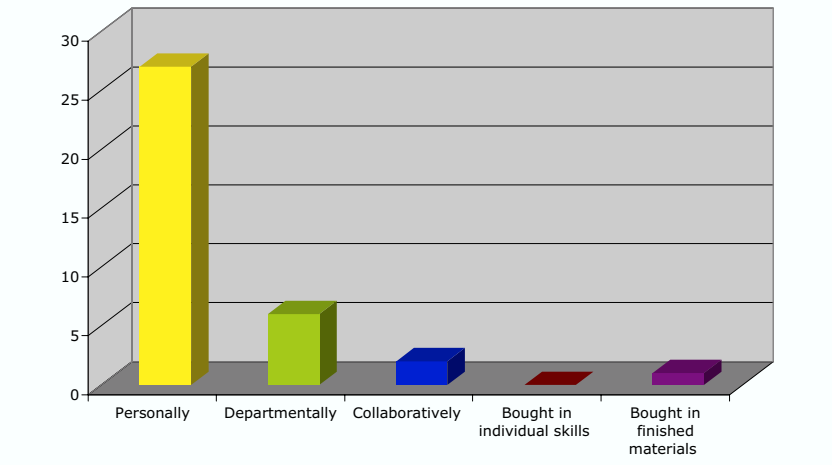


**Fig. 2:** How materials/content was developed for implementation into Blackboard

## Analysis:

HEFCE (Higher Education Funding Council for England) has required all HEI in the UK to have a Teaching and Learning closely aligned with an Information Strategy demonstrably in place, together these attempt to ensure that the use of ICT is appropriately embedded in an institution's core running.

The Dearing Report (NCIHE 1997) has amongst its recommendations some key areas that HEI needs to address in the implementation of ICT strategies for the immediate future. A key element is to ensure that staff and students receive appropriate training and support to enable them to realise the full potential of any ICT initiatives[2]. The change in future student interactions recognises the need for all students to have access to their own portable computers.[3]

A major barrier in instigating e-learning has been the lack of coherent institute wide strategies. This has been compounded, where strategies exist, by the conspicuous absence of support at management level in attaining this end goal. A recent report (Studies in the Context of the E-learning Initiative: Virtual Models of European Universities, (2004)) identified a cluster approach to the integration of e-learning in European universities. Four clusters prevail with the first cluster 'The Front-Runners' far in advance of the other groupings providing a fully integrated approach,

[2] Recommendation 9
[3] Recommendation 46

self-financed, with an explicit ICT strategy, and a leader in co-operative development across the community. A worrying trend occurs that can be seen repeating itself at the academic level. Although cluster two 'The Co-operating Universities' are not that far removed in many areas, full integration of e-learning in the university itself does not exist. The lack of an internal strategy suggests that it will not be possible to catch up with the front runners in the near future.

The student perception of online learning is often problematic. In a traditional face to face environment there may well be a misinterpretation of its purpose if not appropriately delivered, the students may see the online content as a mere collection of revision aids. Laurillard (1993) offers a series of guidelines for the effective use of the internet that apply equally to the VLE concept.

> Is it clear to the students why they are using this new way of learning?
>
> Is any prerequisite knowledge needed to use the material?
>
> Is there sufficient support (eg hardware and software; training; access to experts)?
>
> Has the assessment for the course being redesigned in the light of the introduction of Internet-based materials?
>
> Have the students been made fully aware of the importance of the course: eg is it essential, important, or simple optional?"

*Source:* (Laurillard 1993)

These questions provide a valuable prompt with which to begin the consideration of implementing an elearning initiative. If complied with they should ensure that an appropriate structure is in place to allow for student engagement with the content of a VLE course.

## The Evaluation Tool

A key element of the survey was to present an opportunity for the CTL and Computing Services to gain an insight into how users were engaging with Blackboard and to provide them with a way in which to assess and develop their own methodologies and interactions with the system.

A basic premise has been developed for an evaluation tool that allows the user to create a systematic development plan that will enhance the use of Blackboard from both the learners point of view and the academic (or administrative) facilitator who wishes to increase and promote the active engagement with the online content.

The evaluation tool will be developed for use within Blackboard and will utilize the 'Survey Tool' function. This will allow all users access to the tool and the ability to apply it to their own particular courses.

A three step approach has been taken in an attempt to capture a snapshot at key phases in the life cycle of an online course (Mason 1998) and to lay down milestones that will act as a guide and point to resources for future growth.

The first Phase will concentrate on the students point of view and ascertain what their level of experience is with ILTs and ICTs in general. It will then enquire as to what the learners expectation of the online course may be.

Phase two focuses on highlighting what additions to the online environment may be added during the lifetime of a course, akin to a Mid-Term Evaluation this model offers an insight into when and how best one might attempt to increase the online activity and enhance the learning experience.

The final phase is to assess the course on the merit of its achieved learning outcomes and ascertain if these may have been better served by further student interactions and the promotion of active and deeper levels of learning.

*Evaluation Model:*

- Formative Phase
  - Used prior to a course to establish levels of learner expectation and experience
- Diagnostic Phase
  - Used during the course to ascertain necessary developmental changes
- Summative
  - Used after course to measure effectiveness (on learning outcomes and interaction) and prepare for future developments/revisements

## Discussion

The use of ICT to support teaching and learning has increased dramatically over the last decade (Conole 2002; Browne and Jenkins 2003). This use has been seen as a catalyst to revisit fundamental teaching and learning issues. With a wealth of technological resources at hand one is prompted to question how best these tools may add to the learning experience. Is it possible to enhance particular elements of the curriculum by the use of ICTs or can we develop the social and communications skills of our learners. Has ICT enabled us to once again look at the prospect of HEI offering a genuine holistic development for our learners?

The title of this chapter hoped to capture the virtual element of learning environments and assess their true effectiveness but on reflection it appears a pun has been created. Is the VLE Blackboard proving to be virtually (almost) effective rather than wholly effective?

It is apparent that the majority of Blackboard users in UCD are only just beginning to tap into the potential on offer, and are using the system as an effective means of delivering and managing an array of multimedia content. Our VLE has become a CMS (Course Management System). As time goes on users will become more familiar with the tools and attempt to blend them into the day to day process of teaching and learning. However, those that are already familiar have begun to look elsewhere to enhance the environment by including outside sources of interactivity in the guise of digital video or Flash files (Thakore and McMahon 2004). This anomaly only further raises the question of the true effectiveness of the VLE in being the answer to all our e-learning needs. It is clear that there is no overarching solution, and more often than not new technologies on the world wide web (www) fast supercede what any company can produce and develop under strict market requirements.

## Concluding Statement

Tim Berniers-Lee (considered by many as the father of the www) considered that the basic concept of the Web was "...that it is an information space through which people can communicate... communicate by sharing their knowledge in a pool... The idea was that everybody would be putting their ideas in, as well as taking them out." (`http://www.w3.org/People/Berners-Lee`) This evocative statement provides hope for a new dawn in the use of ICT in education. What fast became a consumer market place has only now just begun to offer a way to claim back the www for what it was originally intended – to share information (particularly with the advent of tools such as VLEs and innovative collaborative tools such as wikis and bloggs (see McMullin 2005)). We as academics have a wonderful opportunity to bring this to fruition. Tempered with the foresight to heighten our pedagogic needs we can begin to use the VLE as yet another tool among many in forwarding teaching and learning.

## Acknowledgements

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## References

Browne, T. and M. Jenkins (2003). VLE Surveys, A Longitudinal Perspective between March 2001 and March 2003 for Higher Education in the United Kingdom. UCISA, http://www.ucisa.ac.uk/group/tlig/vle/vle2003.pdf

Chickering, A. W. and Z. F. Gamson (1983). Seven Principles for Good Practice in Undergraduate Education. http://www.hcc.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/7princip.htm.

Conole, G. (2002). Review of JTAP Projects: Perspectives on teaching and learning. University of Southhampton.

Laurillard, D. (1993). *Rethinking University Teaching: a framework for the effective use of educational technology*. London: Routledge.

Mason, R. (1998). Models of Online Courses. *ALN Magazine 2*(2). Accessed 09.03 http://www.aln.org/publications/magazine/v2n2/mason.asp

McMullin, B. (2005). Putting the learning back into learning technology. In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

NCIHE (1997). National Committee of Inquiry into Higher Edication - the Dearing Report. Higher Education in the Learning Society, HMSO/NCIHE.

Nicol, D., N. Kay, G. Gordon, and M. Coen (2002). INSIGHT: A Model for Evaluation the Costs and Benefits of ICT in Teaching and Learning. University of Strathclyde.

O'Neill, G. and T. McMahon (2005). Student-Centred Learning: What does it mean for students and lecturers? In S. Moore, G. O'Neill, and B. McMullin (Eds.), *Emerging Issues in the Practice of University Learning and Teaching*. Dublin: AISHE.

PLS RAMBOLL Management A/S (2004). Studies in the Context of the E-learning Initiative: Virtual Models of European Universities (Lot 1). Draft Final Report to the EU Commission, DG Education & Culture.

Ramsden, P. (1992). *Learning to teach in Higher Education*. Routledge.

Tearle, P. and D. Prosse (2004). Use of Virtual Learning Environments for teaching and learning in higher education: Pedagogic models. Paper at ALT-C 2004, Exeter University.

Thakore, H. and T. McMahon (2004, 6–8 September). Developing a Pilot Web-based Interactive Tutorial System for Medical Students. *Association for Medical Education in Europe Annual Conference*.

UCD Staff Manual (2001). Mission and Vision Statement. http://www.ucd.ie/personl/html/manual/index_acc.htm

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Collaborative Techniques in Teaching Online
E-Moderating

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Roisin has been working for the past 5 years in the Learning and Teaching Centre in DIT, where she has been involved from the outset in designing, co-ordinating and delivering the Postgraduate Certificate, Diploma and Masters (MA) in Third Level Learning and Teaching. She has also been involved in design and delivery of E-Learning Pedagogy training and consultations for Academic Staff Development in DIT. In 2003, Roisin became a full member of the professional body

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Terry Barrett is an education development consultant. She is currently finishing writing up her doctoral thesis which is entitled " Lecturers as problem–based learners: a critical discourse analysis of the dialogue of a PBL staff development module. "

She was Programme Leader of the Postgraduate Programme in Third Level Learning and Teaching at the Dublin Institute of Technology. Previous to this she was a lecturer at the School of Education Studies, Dublin City University. She has published in the areas of community development, guidance counselling, academic development and problem–based learning. She currently works as an education development consultant and her specialisms include curriculum design and problem–based learning.

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