Case Studies of Good Practices in Assessment of Student Learning in Higher Education

Geraldine O'Neill
Sylvia Huntley-Moore
Phil Race (Editors)

UNIVERSITY COLLEGE DUBLIN (UCD)
UNIVERSITY OF DUBLIN, TRINITY COLLEGE (TCD)
DUBLIN CITY UNIVERSITY (DCU)

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[1] http://www.hea.ie/
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[4] http://www.dcu.ie/
[5] http://www.aishe.org/

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Foreword

Authors	Dr. Geraldine O'Neill	Ms. Sylvia-Huntley Moore
Email	geraldine.m.oneill@ucd.ie	shuntley@tcd.ie
Telephone	+353-1-716-2839	+353-1-896-3704
Affiliation	Centre for Teaching and Learning, School of Education and Lifelong Learning, University College Dublin, Ireland.	Director, Staff Education and Development, School of Nursing and Midwifery, Trinity College Dublin, Ireland.

Context of the assessment project

> There is a high, hard ground where practitioners can make effective use of research-based theory and technique, and there is a swampy lowland where situations are confusing "messes" incapable of technical solution. . . . There are those who choose the swampy lowlands. They deliberately involve themselves in messy but crucially important problems and, when asked to describe their methods of inquiry, they speak of experience, trial and error, intuition and muddling through. . .
>
> —Schön (1983, pp. 42–43)

The practice of assessment in higher education can feel at times like Schön's swampy lowlands. Lecturers and tutors may find themselves teaching in complex and sometimes under-resourced learning environments, in which approaches to assessment are often influenced more by tradition than by the research literature. However, recent drivers for the enhancement of teaching and learning in higher education, including: the growth of academic development units, institutional awards for excellence in teaching and teaching development grants, have encouraged lecturers to consult the literature on assessment when implementing change. This literature has included authors such as, Biggs (2004), Brown *et al.* (1997), Heywood (2000), Lea *et al.* (2003) and Race (2005). External drivers have forced some changes in assessment practices but many staff have tried out new and challenging assessment methods based simply on their desire to enhance the student learning experience.

This collection of case studies is the result of the editors' shared belief in the fundamental importance of assessment to student learning. It is a snap-shot of the diversity of assessment methods currently in use—primarily in Ireland but also including international examples. The editors cannot claim that the idea, of disseminating case

studies in this format, is original. The project was strongly influenced by an earlier Australian book by Nightingale *et al.* (1996). The collection is the result of a call for contributions for case studies of assessment in use in higher education, made through Irish* and International** networks. This approach, it was hoped, would focus not only on the swampy lowlands of complex assessment practices but also on the literature that supports these practices.

The cases are presented by the contributors using their own terminology. The cases represent assessments used in practice in 2005/6. We have asked the contributors to reflect on the strengths and the weaknesses of their approaches to assessment in their own contexts. We hope that this will help the readers of this collection to, in turn, reflect on the aspects of the assessment which may or may not work for their own student groups.

The organisation of the case studies

In contrast to the approach used by Nightingale *et al.* (1996), we decided not to use an over-arching framework to organise the cases. We believed it would be equally interesting to see what emerged: to allow the collection to reflect what contributors believed to be key assessment trends and methods in this snap-shot of time. Therefore, some forms of assessment are not represented while some are well represented (e.g., reflective journals). We included multiple examples of some methods as they were applied in different contexts and in different ways. Equally, we did not judge any one method as more valuable than any other and have therefore ordered the cases randomly.

We hope readers will explore the full range of cases. However, we have provided two cross-reference tables as follows:

- Appendix A: Range of assessment methods used
- Appendix B: Disciplines and countries represented in the cases

We would encourage you to read cases drawn from both inside and outside your discipline, as there is much to be discovered from assessment practices used in other areas.

The first chapter, *Introduction: Assessment in Crisis?* (Phil Race), by Professor Phil Race, describes many of the current assessment issues and the terminology used, such as, *'reliability'*, *'validity'*, *'formative assessment'* and *'authentic assessment'*.

We hope to add further examples of cases studies to the AISHE* website to keep abreast of developments in assessment in practice, but in the mean-time we hope you enjoy reading these cases which have been so generously shared by your colleagues.

Networks

- *__AISHE__[10]: the All Ireland Society for Higher Education, is a professional society whose goal is to bring together and support those people who are concerned to advance higher education in the island of Ireland. It 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.
- **__HERDSA__[11]: The Higher Education and Research Development Society of Australasia Inc.
- **__SEDA__[12]: The Staff and Educational Development Association (UK).

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[10] http://www.aishe.org/
[11] http://www.herdsa.org.au/
[12] http://www.seda.ac.uk/

Appendix A: Range of assessment methods used

Assessment methods used	Case numbers
Observation	1, 12
Oral presentation	12
Clinical assessment	1
Peer assessment	13, 23
Oral examination (viva voce)	1
Reflective/Creative Portfolio	15
Discussion/contributions on-line	2, 6, 17
On-line tasks	17
Reflective research journal	3
E-portfolio	1
Examination	4, 23
Group poster	1
Essay	5
Triple jump assessment	19
Essay plan	5
Peer assessment of group presentation	20
Technical report	24
Peer assessment of individual presentation	23
Submit sample of notes	5
Open book/notes examination	21
Submit examination questions	5
On-line problem solving exercise	21
Learning journals	7, 16
On-line quizzes	21
Writing computer programs	8
Language Portfolio	22
Multiple class tests	9
Research proposal	23
Teaching Portfolio	10
Self assessment	13, 24
Work-based assessment	11
Research report	12, 23
Reflective writing	11, 14

Appendix B: Disciplines and countries represented in the cases

Discipline	Country	Case
Clinical Speech and Language Studies	Ireland, Dublin	1
Business: Study Skills	Ireland, Dublin	5
Business Mathematics and Statistics	Ireland, Tralee	21
Computer Science and Informatics	Ireland and China	2
Computer Science and Informatics	Ireland, Dublin	8
Economics	Ireland, Maynooth	16
Education (Higher)	Ireland, Dublin	10
Education (Adult/Vocational)	Ireland, Dublin	11
Electronic Engineering	Ireland, Maynooth	9
Environmental Science	Australia, N.S.W.	23
Health Sciences	Northern Ireland, Belfast	14
Health Sciences Education	UK, Suffolk	15
Health Sciences	Ireland, Dublin	18
Health Sciences	Ireland, Dublin	19
Health Sciences	Australia, N.S.W.	24
Humanities	Ireland, Dublin	17
Information and Library Studies	Ireland, Dublin	3
Information and Library Studies	Ireland, Dublin	12
Information Systems Management	Ireland, Tralee	21
Information Technology	Ireland, Dublin	6
Information Technology	Ireland, Dublin	17
Languages: Spanish	Ireland, Dublin	13
Languages: English	Hong Kong, Hung Hom	22
Law	Australia, Queensland	4
Mathematics	Ireland, Waterford	7
Natural Resources	Australia, N.S.W.	23
Social work and social policy	Ireland, Dublin	20
Science	Australia, N.S.W.	23

Introduction: Assessment in Crisis?

Author	Professor Phil Race
Email	p.race@leedsmet.ac.uk
Telephone	+44-7711-885-804
Affiliation	Assessment, Learning and Teaching Visiting Professor, Leeds Metropolitan University (September 2006).

This volume contains a wealth of experience, and collects together the wisdom and talent of a wide range of practitioners who are trying to make assessment work better for their students. For most students, assessment is a principal driver of their learning. If there weren't any assessment, perhaps not much learning would take place. However, there is a lot of dissatisfaction and frustration among staff internationally concerning assessment. We're overburdened with it—and so are our students. Perhaps a good starting place for our efforts to improve assessment is to look at what we could do to make assessment a better driver for learning.

At the Northumbria Assessment Conference (very much an international event, with participants from round the globe), on 31st August 2006, as part of a symposium about 'Changing hearts regarding assessment', I asked participants to write on post-its their heartfelt completions of the starter: "Assessment would be better at making learning happen with my students if only . . . ". With their permission, I quote (in Table 1) all of their thoughts about what we need to do (and what students need to do) to make assessment a better driver for learning. There is, of course, some overlap, but it is interesting to see where the overlaps lie—signposting the most serious of the problems we face in trying to make assessment fit for purpose.

Table 1: Quotes from Assessment Symposium: *Assessment would be better at making learning happen with my students if only . . .*

I had more time to spend having individual assessments that truly met their personal learning requirements.
We could forget percentage marks and leave just feedback and pass/fail/merit instead.
I could spend more time on assessment and less on delivery.
We did not have grades at final level undergraduate study.

Table 1: (continued) *Assessment would be better at making learning happen with my students if only . . .*

They realised the importance of the process to their future development.
There were less dilemmas and constraints in the assessment process.
They didn't wait till the last minute to do any work.
They knew what is expected and they could steer themselves there with some guidance from me.
I had more time with individuals or groups rather than 200 at a time.
I spent more time on working with others on preparing them for assessment.
I could talk through drafts with them as part of the learning process, in a detailed manner.
My students became involved (immersed in) assessment—in collaboration with me and each other—right from the outset of the module.
We introduced a systematic regime of formative assessment.
They found a self-fulfillment value in the assessment.
The university would not impose dead criteria based on what is easy to measure rather than what we want students to do.
The assessment criteria were transparent and understandable.
They would recognise that I am not assessing them, their worth, but their ideas.
It was more person centred (individual, applicable) to the students.
We took into account their individual learning needs.
Both the students and myself could negotiate and discuss what matters in their learning.
Students themselves were more involved in the design of the assessment.
Feed-forward was more constructive across the board.
Assessment processes sequentially built students' 'process' skills at levels 1, 2 and 3, enabling them to develop antecedent skills for self-assessment, peer-assessment, group assessment processes, etc.
It was a true reflection of their work.
We got the students to evaluate the success and impact of the chosen assessment process on their learning.
They were less anxious about it.
All colleagues would take the time to think more about learning and assessment.
They were aware of how and why it is done.
It involved self-assessment.
The feedback could be oral and one-to-one (for hundreds of students!).
I was free to choose the most appropriate assessment.
There weren't so many students!

Table 1: (continued) *Assessment would be better at making learning happen with my students if only . . .*

The overall module design allowed feedback to influence future learning.
All lecturers adopted similar principles relating to support and feed-forward—especially in the early stages.
It were more fun and more enjoyable.
My students understood the value of it in affecting their learning.
Course texts were more accessible in terms of language difficulty.
The system was more flexible—we are chained to percentages.
Then learning outcomes were transparent to the students.
I would make the purpose clear and give clear instruction to the students about what they ought to do.
They truly valued the process and afforded the optimum amount of time needed for it.
It valued the students' active involvement in the process—peer and self-assessment is known to have benefits, but not used enough!
I really knew what I was doing—and they really knew what they were doing.

Perhaps the last of these quotations sums it up? (. . . *if only . . . I really knew what I was doing—and they really knew what they were doing*). But there are some notable trends in the responses of these delegates, including:

- Many feel constrained by the systems in which they are implementing assessment, not least the requirement to use percentage scores.
- Colleagues often feel that they are 'out on a limb' in their approaches to assessment, and wish that other colleagues viewed assessment in similar ways.
- Many practitioners see value in using self- and peer-assessment, and wish that students were more often involved in the design and implementation of assessment.

It should also be borne in mind that the participants at this particular conference were largely a self-selecting group of practitioners who know already a great deal about assessment, and care a lot about making it work well—and are often fighting battles in their own institutions to improve assessment processes, practices and instruments. In other words, they are in a position to be expert witnesses regarding the problems encountered in the context of assessment.

Therefore, it is particularly useful that this volume has collected not just the 'if only' problems, but a rich collection of what is being done to address these problems. After reading the 'if only' statements reproduced above, there is no doubt that there are major problems to overcome in designing and implementing assessment. In other words, we know all too well *why* we need to change assessment, but we still need to learn *how* to do it. The case studies in this book provide welcome reassurance that there are indeed ways of going about this task.

The terminology of assessment

A lot has been written about assessment, and a vocabulary of specific terms has grown up around the subject. I suggest that it is useful to preface the collection of case studies in this book with a short digest of some of the terminology, hopefully in straightforward language. Assessment should be *valid*, *reliable*, *transparent* and *authentic*. Easily said, but harder to achieve! What do these four words actually mean in practice? I've abridged the discussion which follows from my own latest thinking about assessment, presented in 'Making Learning Happen' (Race, 2005).

Validity

Valid assessment is about measuring that which we should be trying to measure. But still too often, we don't succeed in this intention. We measure what we can. We measure echoes of what we're trying to measure. We measure ghosts of the manifestation of the achievement of learning outcomes by students. Whenever we're just ending up measuring what they *write* about what they *remembe*r about what they once *thought* (or what we once *said* to them in our classes) we're measuring ghosts. Now if we were measuring what they could now *do* with what they'd *processed* from what they thought, it would be better.

"But we *do* measure this?" Ask students, they know better than anyone else in the picture exactly what we end up measuring. For a start, let's remind ourselves that we're very hung up on measuring what students *write.* We don't say in our learning outcomes "when you've studied this module you'll be able to write neatly, quickly and eloquently about it so as to demonstrate to us your understanding of it". And what do we actually measure? We measure, to at least some extent the neatness, speed and eloquence of students' writing. What about those who aren't good at writing? Or to be more critical, what about those students who have at least some measure of *disability* when it comes to writing?

For a long time already, there have been those of us strongly arguing the case for diversifying assessment, so that the same students aren't discriminated against *repeatedly* because they don't happen to be skilled at those forms of assessment which we over-use (such as, in some disciplines, tutor-marked time-constrained, unseen written examinations, tutor-marked coursework essays, and tutor-marked practical reports).

So we're not really in a position to be self-satisfied regarding the validity of even our most-used, and most practised assessment instruments and processes. But the situation isn't new—we've used these devices forever it seems. That doesn't make them more valid. But we're experienced in using them. Admittedly, that makes us better able to make the best of a bad job with them. But should we not be making a better job with something else?

Reliability

For many, the word reliability is synonymous with 'fairness' and 'consistency'. Reliability is easier than validity to put to the test. If several assessors mark the same piece of work and all agree (within reasonable error limits) about the grade or mark, we can

claim we're being reliable. This is not to be confused with mere moderation, of course. Reliability can only be tested by blind multiple marking. Double marking is about as far as we usually manage to get. Do we agree often enough? No we don't, in many disciplines.

There are some honourable exceptions. 'Hard' subjects such as, areas of maths and science, lend themselves to better measures of agreement regarding reliability than 'softer' subjects such as literature, history, philosophy, psychology. By 'hard' and 'soft' I don't mean 'difficult' and 'easy'—far from it. Not surprisingly staff are resistant to the suggestion that they may need to undertake yet more marking. "But multiple marking just causes regression to the mean" can be the reply. "And after all, the purpose of assessment is to sort students out—to discriminate between them—so it's no use everyone just ending up with a middle mark". "And besides, we spend quite long enough at the assessment grindstone; we just haven't room in our lives for more marking".

So why is reliability so important? Not least, because assessing students' work is the single most important thing we ever do for them. Many staff in education regard themselves as teachers, with assessment as an additional chore (not to mention those who regard themselves as *researchers* with teaching and assessing as additional chores). Perhaps if we were all to be called *assessors* rather than teachers it would help. And perhaps better still, we should all regard ourselves as researchers into assessment.

Transparency

One way of describing 'transparency' is the extent to which students know where the goalposts are. The goalposts, we may argue, are laid down by the intended learning outcomes, matched nicely to the assessment criteria which specify the standards to which these intended outcomes are to be demonstrated by students, and also specify the forms in which students will present evidence of their achievement of the outcomes. There is a nice sense of closure matching up assessment criteria to intended learning outcomes.

How well do students themselves appreciate the links between assessment, and evidence of achievement of the intended learning outcomes? How well, indeed, do assessors themselves consciously exercise their assessment-decision judgements to consolidate these links? Students often admit that one of their main problems is that they still don't really know where the goalposts lie, even despite our best efforts to spell out syllabus content in terms of intended learning outcomes in course handbooks, and to illustrate to students during our teaching the exact nature of the associated assessment criteria—and sometimes even our attempts to clarify the evidence indicators associated with achievement of the learning outcomes are not clear enough to students. In other words, students often find it hard to get their heads inside our assessment culture—the very culture which will determine the level of their awards.

Therefore, we're not too hot on achieving transparency either. In fact, the arguments above can be taken as indicating that we rather often fail ourselves on all three—validity, reliability and transparency, when considered separately. What, then, is our probability of getting all three right at the same time? Indeed, is it even *possible* to get all three right at the same time?

Authenticity

This one seems straightforward. It's about (on one level, at least) knowing that we're assessing the work of the candidate, not other people's work. In traditional, time-constrained, unseen written exams, we can be fairly sure that we are indeed assessing the work of each candidate, provided we ensure that unfair practices such as, cheating or copying are prevented. But what about coursework? In the age of the Internet, word processing and electronic communication, students can download ready-made essays and incorporate elements from these into their own work. Some such practices can be detected electronically, but the most skilful plagiarists can remain one step ahead of us and make sufficient adjustments to the work they have found (or purchased) to prevent us from seeing that it is not their own work.

Plagiarism is becoming one of the most significant problems which coursework assessors find themselves facing. Indeed, the difficulties associated with plagiarism are so severe that there is considerable pressure to retreat into the relative safety of traditional unseen written exams once again, and we are coming round full circle to resorting to assessment processes and instruments which can guarantee authenticity but at the expense of validity. However, probably too much of the energy which is being put into tackling plagiarism is devoted to *detecting* the symptoms and punishing those found guilty of unfairly passing off other people's work as their own. After all, where are the moral and ethical borderlines? In many parts of the world, to quote back a teacher's words in an exam answer or coursework assignment is culturally accepted as 'honouring the teacher'. When students from these cultures, who happen to be continuing their studies in other countries, find themselves accused of plagiarism, they are often surprised at the attitude to plagiarism. Prevention is better than the cure. We need to be much more careful to explain exactly what is acceptable, and what is not. While some students may indeed deliberately engage in plagiarism, many others find themselves in trouble because they were not fully aware of how they are expected to treat other people's work. Sometimes they simply do not fully understand how they are expected to cite others' work in their own discussions, or how to follow the appropriate referencing conventions.

It is also worth facing up to the difficulty of the question 'where are the borderlines between originality and authenticity?' In a sense, true originality is extremely rare. In most disciplines, it is seldom possible to write anything without having already been influenced by what has been done before, what has been read, what has been heard, and so on.

More assessment terminology: norm-referenced, criterion-referenced, formative, summative.

Norm-referenced versus criterion-referenced

This is simple to describe—but hard to get right! Norm-referenced assessment could be described as a way of creaming off the top layer of the students who gain the highest level of achievement, and so on, with always about the same proportion achieving this highest grade. Criterion-referenced assessment would allow *all* of the students

to achieve the 'highest' award if they all reached the relevant standard. We all know that in some cohorts, many more students are worthy of achieving the top standard than in others. Criterion-referenced assessment is, therefore, more objective, but in the competitive world we live in, rank-order creeps in, and with it a tendency to revert to norm-referencing.

Summative and formative assessment

'Summative' assessment is often described as end-of-studies assessment—in other words, a measure of how far our students have got in their learning. 'Formative' assessment is more about using assessment along the journey of learning, so that students can learn from their mistakes, remedy their deficiencies, and advance their learning. In formative assessment, it is our feedback that is more important than the scores or grades. In particular, it is the feed-forward that is the critically useful part of feedback—the guidance to students about how exactly to go about improving their learning and their performance. But, in a way, *all* assessment is at least to some extent formative, as even exam marks or grades give students at least a little information about how their learning is going. And *all* the assessment elements which count towards students' qualifications are, to some extent, summative. It would probably be wise for us to stop fussing about which assessment elements were intended to be formative or summative, and to concentrate on giving students useful feedback on *all* the elements of their work which are assessed.

Learning from experience

We all learn from our efforts at designing and implementing assessment. But this is slow, and many wheels end up being reinvented, and many mistakes are repeated. That's where this collection of case studies comes in. You now have the opportunity to learn from the experiences of a worthy collection of colleagues, and you can avoid reinventing at least some of the wheels, and avoid repeating many of the mistakes.

I shall end this preamble by simply suggesting that as you peruse each case study in this book, you keep asking yourself "what can I use from this, with my own students in my own discipline, to make my own assessment systems, processes, practices and instruments better?"

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URL: `http://tinyurl.com/yf9lgm` (Accessed: 4 January 2007.)

Case 1

Examining Students' Clinical Skills: Assessment of the 'Unseen' Client in a Speech and Language Therapy Clinic

Contributors	Irene Walsh Kathleen McTiernan Margaret Leahy
Email	ipwalsh@tcd.ie kathleen.mctiernan@tcd.ie mleahy@tcd.ie
Telephone	+353-1-608-1588 or +353-1-608-2420
Affiliation	Department of Clinical Speech and Language Studies, Trinity College Dublin, Dublin 2, Ireland.

1.1 Context

Towards the end of their undergraduate careers, speech and language therapy students are expected to have developed an advanced level of clinical expertise, in the assessment, diagnosis and management of a wide range of communication disorders in children and adults. At the beginning of their final 30-day block placement, students have completed approximately 400 hours of supervised clinical work, and they are in the final stages of acquiring the knowledge and skills necessary to become practitioner scientists.

1.1.1 Teaching and learning methods

During this final experiential block, students have regular one-to-one tutorials with clinical supervisor(s) to discuss client management, including the planning and implementation of therapy, as well as engaging in discussions relating theory to practice.

Students engage with clients presenting with any possible communication disorder, and gain experience in taking case histories, in assessment and evaluation of clients difficulties and priorities, and in overall management of the client, from initial assessment to discharge. The expectation is that students will gain direct experiential work with a minimum average of three clients daily, as well as gaining experience in observation and in general clinical management skills. Students are closely supervised during this learning process, with one-to-one supervision provided by experienced clinicians. Opportunities for consultation with the student's mentor (an experienced academic/practitioner from College) are arranged at least once during the placement by request from any of the parties involved: the student, the supervisor and/or the mentor.

1.2 Learning Outcomes being Assessed

By the end of this module students will:

- demonstrate rapport building and initial interviewing skills;
- demonstrate appropriate assessment procedures through formal (e.g., testing) and informal means (e.g., observation);
- discuss a tentative diagnosis for the communication impairment assessed and relevant issues pertinent to client presentation;
- discuss the core principles of future intervention; and
- self-evaluate their own clinical performance and identify gaps in knowledge and clinical competency.

1.3 Assessment Procedures/Details

1.3.1 Overview

The final clinical examination, which takes place towards the end of the placement, has two main elements: two clinical sessions where the student engages with a 'seen' client and an 'unseen' client and a *viva voce* (oral examination) following each session where the student engages in discussion with two examiners, i.e., the college mentor and the clinical supervisor. The 'seen' client is one with whom the student will have extensive experience over the 40 days of the placement; the 'unseen' client is one who has had *no* prior contact with the student before the examination. In many instances, particularly in Community Care clinics, this student-led session with the previously 'unseen' client may be the client's initial visit to the clinic; in other instances, e.g., long-stay hospitalization, or hospital out-patient clinics, the client may have been attending at the clinic (perhaps with another therapist) over a period, but will not be familiar to the student. Thus, the session with the 'unseen' client is an assessment session that is actually (or similar to) a client's first appointment at a clinic. In all instances, the clients

will have been fully informed about the session, and consented to involvement with the student examination.

1.3.2 Details given to the student

On the day before the examination some details regarding the 'unseen' client are given to the student in order to reflect the 'real life' initial consultation process in speech and language therapy practice. These details are strictly limited, e.g., client name and age, accompanying person, and only general information regarding the communication problem. However, the nature of the clinical setting determines the category of client referral (e.g., paediatric/developmental, adult acquired neurological disorder, etc.). No data can be provided that will indicate a possible diagnosis to the student. Standardizing the limited information the student receives ensures that no student has the advantage of knowing details beforehand that may interfere with the objectives of the exercise.

1.3.3 Expectations of student performance

Each student is expected to engage with the client (and accompanying person) to get a brief case history and to begin to determine client priorities. The assessment session period is limited to 60 minutes, and can include formal and informal testing procedures. Following the session, the student provides an overview of findings to the client with some indication of further assessment that may be necessary.

Following the 'unseen' client session, the student has approximately 20 minutes to evaluate assessments and arrive at a *tentative* description of the client's presentation, which s/he discusses in a *viva voce* (oral) examination following the session. The *viva voce* then provides the student with the opportunity to present findings from the session, to present a rationale for the clinical description, and to recommend further investigations that may be necessary to confirm the clinical description. The student also presents an overview of therapy management, plus other relevant issues, which may impact upon the intervention, to the examiners. Feedback on the outcome of the assessment to the client (or in the case of a child, to the child's parents) is not undertaken at the time of the exam to avoid the ethical consideration of possibly incorrect feedback being given. In practice, a follow up appointment is usually made whereby the supervising therapist interprets the agreed results of the assessment for the client.

1.4 Strengths and Limitations

1.4.1 Strengths

- Students prepare for this examination by gaining experience in meeting and talking with clients, consulting clients about their difficulties, and in using informal and formal assessment procedures. This experience involves the kinds of client contact that is to be part of the therapist's day-to-day work in the future, and complements the preparation necessary for planning and implementing therapy and management.

- The assessment provides the opportunity to evaluate the level of independence that a student has attained in the crucial diagnostic process.
- This exam allows the student to demonstrate differential diagnosis ability, and to begin to evaluate the severity of the presenting problem, and its impact on the client. As time is limited, the student can outline further investigations deemed necessary.

1.4.2 Limitations

- In some instances, a tentative diagnosis may not be easy to determine, particularly when a client presents with multiple problems, or where insufficient evidence is presented during the session. However, students should be able to speculate about the range of difficulties encountered and present a tentative description of the client's communication profile.

1.5 Contributor's Reflections on the Assessment

1.5.1 Students' responses to the assessment

Initially, students find the thought of assessing the 'unseen' client daunting; but following experience, they appreciate the relevance of the assessment, and generally approach it with confidence. On occasion, during the 30-day block, the clinical supervisor will have given the student some practice in assessing other 'unseen' clients in this way.

Both the students and the clinicians report positive experiences of the 'unseen' assessment procedure. External examiners have commented on its usefulness in tapping into aspects of student performance that are not obvious in other clinical assessment situations.

We consider the procedure to be both *valid* and *reliable* in that it provides detailed information regarding the students' rapport and personal interaction with 'unseen' clients. The students' choice of assessment procedures and analytic abilities to determine the level of clients' capacity and performance are demonstrated. Ultimately, diagnostic ability in labelling the category in which the clients' disorders are likely to be classified is revealed. The reliability of this assessment method is demonstrated in that it continues to achieve these objectives in different clinical settings and conditions over many years.

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Case 2

Students' Continuous Assessment through Discussion Threads within Blended Teaching Method (face-to-face and e-learning)

Contributor	Dr. Eleni Mangina
Email	eleni.mangina@ucd.ie
Telephone	+353-1-716-2858
Affiliation	School of Computer Science and Informatics, College of Engineering Mathematical and Physical Sciences, University College Dublin, Belfield, Dublin 4, Ireland.

2.1 Context

This case study describes a 4th year module, *Introduction to Artificial Intelligence*, that is offered in the BSc in Computer Science, which is a joint degree between the School of Computer Science and Informatics, College of Engineering, Mathematical and Physical Sciences, University College Dublin and the Software School, Fudan University, Shanghai, China.

Following the rapid development of information and communication technology, which has influenced education worldwide, many students have the opportunity to learn any time, anywhere. As the lecturer for the Artificial Intelligence (AI) module for undergraduate students of the Software School at Fudan University, I used a combination of face-to-face and on-line classes due to restrictive timescales for face-to-face lectures and the students' internship responsibilities in the private sector for three days a week. This blended type of lecturing had to be linked with the assessment criteria by which the students are evaluated in terms of their personal achievement at the conclusion of the module. The assessment of students helps the teacher to evaluate the students' performance and the effectiveness of the teacher's effort (Bridges *et al.*, 2002).

In contrast to traditional forms of assessment such as, the unseen end of the year examination, the link between the students' learning activities, the resources and the assessment had to be emphasized clearly (Brown, 2000). Lectures took place only once a week for three consecutive lecturing hours. The Moodle web-based e-learning environment was used for on-line activities such as, discussion forums, during which I could be in contact with the whole class, despite the fact that there was face-to-face contact only once a week (Rowntree, 1995). Apart from assignments and a final examination, assessment tasks included contributions to the on-line discussion threads. These mixed modes of assessment reflected the blended approach to teaching (i.e., face-to-face and e-learning).

Each week, the material from the lectures was made available, assessment tasks for their discussion threads were pre-defined and the discussion threads were monitored within the forums assigned by the lecturer (Rossman, 1999). Group work was also given during the face-to-face classes in order to encourage active learning within the class. The rationale behind this strategy was that the students' final marks should be representative of their whole effort during the module.

2.2 Learning Outcomes being Assessed

2.2.1 Broad-based learning outcome

At the end of this module the students should be able to demonstrate knowledge of different AI-based software systems and to evaluate them.

2.2.2 Learning objectives

At the end of this module the students should be able to:

- define and describe the basic AI-related concepts;
- explain and recognize the value of AI learning methods and classify them based on different applications;
- use JESS or CLIPS and demonstrate the use of either within a certain intelligent application and test it; and
- evaluate and design a diagnostic expert system.

2.3 Assessment Procedures/Details

The marking scheme for each module is constructed as follows: 50% exam paper, 20% assignment, and 30% weekly participation and forum questions.

The students were informed, during the first lecture, of the standard rules concerning plagiarism and copyright issues. They had to read the announcements and postings for each module on a weekly basis, attend lectures, study the lecture notes and the recommended chapters from the textbook and answer the initial question in the forum

posted from the lecturer by the end of the third day of classes. A maximum of three contributions to each discussion thread was allowed from each student, taking into account that one-liners would not be counted as participation. The discussion threads proved to be knowledge constructive for the students. Especially for the topics related to the software development, the students could share concerns and solve problems through the e-collaborative environment that they created though their postings in the forum. The assessment of the quality of the students' participation in the online discussions was based on the evaluation of the three most important criteria in discussion threads: 'Participation in Discussion' (level of interaction and provision of new information for the discussion thread), 'Content of Posting' (level of understanding of the topic and provision of responses based on research) and 'Critical Thinking' evidenced by posting (level of critical analysis of a posted idea and justification/explanation of any comments posted). This assessment took place at the end of each week and the e-moderator (lecturer in this case) reviewed the students' overall participation.

2.4 Strengths and Limitations

2.4.1 Strengths

- Continuous monitoring of student progress.
- Transparency of assessment.
- Unambiguous assessment criteria.
- Early identification of student's difficulties during term.
- Enhanced interaction between the teacher and student.
- Promotion of knowledge construction through monitored discussion threads.
- Promotion of students' interaction by reducing inhibitions within a virtual classroom (i.e., shyness).

2.4.2 Limitations

- High administrative overhead.
- Security issues related to students' identification.

2.5 Contributor's Reflections on the Assessment

Student feedback on the module was very positive and encouraged me to use the web-based environment in other modules. This led to other colleagues adapting this method for their own use. Reflecting upon this combination of teaching strategy, I found it fruitful, exciting and creative. Apart from the active face-to-face and on-line environment, the progress of the students over the nine weeks could be monitored,

and the most proactive and hard-working students could be identified from continuous assessment. The task of e-moderation has been the most stressful one.

Good student performance, measured by student assessment results, depends on effective teaching strategies and module organization and the learning styles of the individual students. Further work might include the clustering of assignments in terms of students' learning styles, whereby, the students can choose one form of assessment over another based on their own preferences.

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Table 2.1: Module details

Module Title	Introduction to Artificial Intelligence
Degree Programme	BSc in Computer Science (UCD-FUDAN)
Level/Year	4
Teaching/Learning Activities	• Case studies of AI applications (Knowledge Based Systems, Intelligent Engineering Applications, etc.) • Case Based Reasoning • Game Playing • Genetic Algorithms • Machine Learning (Artificial Neural Networks) • Problem Solving—Knowledge Based Systems • Search algorithms • Knowledge Representation • Introduction to AI (Roots and Scopes)
Curriculum Outcomes	• A: 1st Evaluate, compare and design a diagnostic expert system • B: 2.1 Use JESS or CLIPS and demonstrate the use of it within a certain intelligent application and test it • C: 2.2 Explain and recognise the value of artificial learning methods and classify them based on different applications • D: 3rd / Pass Define and describe the basic AI related concepts
Assessment Tasks	• Assignment, Demo • Group Work, Discussion Thread • Examination, Assignment, Discussion Thread • Examination, Discussion Thread

Case 3

The Use of Reflective Research Journals in a 1st Year Information Literacy Module

Contributor	Dr. Claire McGuinness
Email	claire.mcguinness@ucd.ie
Telephone	+353-1-716-7077
Affiliation	School of Information and Library Studies, University College Dublin, Belfield, Dublin 4, Ireland.

3.1 Context

This method was used as part of the assessment protocol for a new 1st year module, which was offered for the first time in September 2005 by the School of Information and Library Studies (SILS) in University College Dublin (UCD), Belfield. The course, entitled *Introduction to Information Literacy*, constitutes a compulsory, core module for students majoring in Information Studies in the undergraduate Bachelor of Arts (BA), Bachelor of Social Science (BSocSc) and BA (Computer Science) degree programmes, and is also available as an elective module for 1st year students on other degree programmes, as per the new UCD Horizons modularisation structure. The duration of the course is 12 weeks, with two hours of contact class time per week. Students of the module are also required to attend a one-hour tutorial every second week, equalling five in total for the entire module. As the student enrolment for the course is 100+, the primary teaching method is lectures, with one hands-on searching session in a computer laboratory.

Introduction to Information Literacy aims to foster and develop basic information skills among 1st year students, with the overall objective of enabling them to complete information tasks successfully in the academic context and beyond. The module was developed in response to concerns expressed, both in the research literature and

by colleagues, about the preparedness of incoming 1st year students with regard to researching and writing academic essays, particularly from an information-seeking perspective. It was felt that the essay-writing assignments undertaken in secondary school require a different form of research, and that consequently, students were arriving in university unequipped with the information skills required to complete an academic essay of acceptable quality. Students' unfamiliarity with the structures of scholarly communication, their lack of knowledge of citation and referencing conventions, unintentional (or intentional) plagiarism, and an inability to approach information from a critical-analytic perspective were just some of the issues causing concern, particularly in a world where the use of the unregulated World Wide Web to satisfy information needs has become commonplace. Similarly, more basic literacy issues such as, poor spelling, syntax and grammar were also felt to be causing problems.

The module is essentially task-based, and structured around the process of information problem-solving in a step-by-step sequence, including recognizing and articulating information needs, evaluating potential information sources, choosing appropriate sources from the available range, searching and manipulating a variety of information media to access and retrieve required information, assessing the retrieved information for bias and relevance, and synthesizing the gathered information to complete the information task and produce an acceptable final product.

Introduction to Information Literacy is unique in that it represents a full collaboration between academic staff from SILS, and information professionals from UCD library, who designed and delivered a number of the information-seeking and library-oriented sessions for the module.

3.2 Learning Outcomes being Assessed

On completion of this module students should be able to:

- identify and clearly articulate information needs in the context of specific information tasks;
- identify the range of potential information sources, and evaluate and choose the appropriate source(s) for specific information tasks;
- access and retrieve needed information efficiently from a variety of information media, through the formulation and execution of effective search strategies;
- critically evaluate information and its sources in terms of bias and relevance to specific information tasks;
- synthesize the gathered information to successfully solve an information problem and create a final product; and
- recognize and reflect on their information-seeking strategies and behaviour.

3.3 Assessment Procedures/Details

Three forms of assessment were used for the module:

- **1500-word Essay** (50% of overall course marks). The essay was designed to engage students in the research process fully; from selecting a topic, to carrying out secondary research, to presenting an acceptable final product.
- **Essay Proposal** (10% of overall course marks). A short, 200-word assignment in which students outlined their intended essay topics and the information-seeking strategy they intended to follow.
- **Reflective Research Journal** (30% of overall course marks). Basically, the journal had two purposes:

    1. To keep students on track with their research and writing; helping them maintain a clear vision of what they were trying to accomplish in the essay assignment, and the steps that they should follow to get them there.
    2. To demonstrate the extent to which students had absorbed and understood the research topics that were covered in class, and whether they had applied them to the practice of preparing and writing an essay.

Students were asked to keep the journal for 10 weeks, starting in the third week of the term. Weekly entries, which were in the region of 100 words, covered five categories:

1. **goals:** what the student intended to cover that week;
2. **activities:** what the student *actually* accomplished that week;
3. **readings:** any information sources referred to during the week;
4. **problems:** students were asked to outline *honestly* any difficulties encountered with the research process; and
5. **reflection:** this category provided space for students to reflect on the experience of research, and how they believed they were coping with the task. This was a creative category, designed to tap into the students' awareness of themselves as researchers.

The journals were completed outside of class time, to allow the students the requisite time and space to engage in focused reflection, and to adequately convey their thoughts in writing. The students were also asked to include any interesting appendices that they felt were appropriate, such as concept maps, newspapers articles, printouts of search strategies, etc. The final week's entry consisted of a series of evaluative questions, designed to uncover the students' feelings about the research process and the journal itself, and the extent to which they believed the latter had been useful to them (or not).

3.4 Strengths and Limitations

3.4.1 Strengths

- Focuses on *process,* rather than just on the final product (essay).
- Allows us to assess information seeking strategies, which are usually unclear in essays.
- Encourages a *meta-cognitive* approach to learning—students reflect on their experience, and identify the areas in which they can improve, as well as their strengths and talents.
- Allows students to showcase their creativity and originality.

3.4.2 Limitations

- Problems with student motivation—some students did not understand the reasons for the exercise, and resented the effort required.
- Students unfamiliar with the concept of research journal—as a novel method, students were uncertain at first about how to approach it. A sample entry was thus posted on Blackboard to provide guidance.
- Possible for students to complete the journal in one go at the end of term, rather than week-by-week.
- Staff workload. As all journals were submitted simultaneously at the end of term, there was a great deal of pressure on the graders to meet deadlines.

3.5 Contributor's Reflections on the Assessment

Despite the logistical problems it generated, the research journal provided wonderful insight into how students cope with researching and writing academic essays. Motivated students responded to the task with immense creativity, producing deeply personal and honest accounts of their experiences. The journal demonstrated the iterative, and often frustrating, process of searching for relevant information, and using it to develop strong arguments.

The main problem, however, concerned students who appeared unmotivated and resistant towards the journal concept. Despite the instructor's emphasis that this was ultimately a creative exercise, several students complained about the lack of precise guidelines, and expressed the wish to be told exactly how to go about it. Students also observed that they found it difficult to update the journal weekly, due to workload pressures and because they felt they had nothing to write about in the weeks where there was very little research activity. Other students simply lacked the confidence to express themselves openly in the journals.

A proposed change for the forthcoming academic year will see the students submitting sections of the journal on a two- or three-weekly basis, in order to ensure sustained

effort, and to spread the workload for those grading the journals. This will also have the effect of changing the assessment from *summative* to *formative*, which should ideally highlight areas requiring further attention in class.

3.6 Bibliography

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Case 4

Applying a Criterion and Standards Approach to Assessment by Examination in Law

Contributor	Dr. Clair Hughes
Email	clair.hughes@uq.edu.au
Telephone	+61-7-3365-2456
Affiliation	Teaching and Educational Development Institute, University of Queensland, St Lucia, Q 4072, Australia.

Contributor	Russell Hinchy
Email	r.hinchy@law.uq.edu.au
Telephone	+61-7-3365-2357
Affiliation	T C Beirne School of Law, University of Queensland, St Lucia, Q 4072, Australia

Contributor	Clare Cappa
Email	c.cappa@law.uq.edu.au
Telephone	+61-7-3365-2252
Affiliation	T C Beirne School of Law, University of Queensland, St Lucia, Q 4072, Australia

4.1 Context

This case study describes the application of a criterion- and standards- referenced assessment (CSRA) policy to an examination in a School of Law. Though CRSA had been institutional policy for some time, the requirement to give students advance notice of the criteria and standards to be used in making assessment judgements had been most commonly observed for tasks such as essays that were not undertaken in invigilated or timed conditions. By contrast, application of CSRA to examinations had been far less common. In 2005, the availability of a newly developed assessment resource provided both motivation and opportunity for reconsidering how student learning could be developed and assessed through the application of CSRA to examinations.

During 2005, two lecturers from the TC Beirne School of Law (The University of Queensland, Australia) worked with an educational consultant to develop a detailed set of generic criteria and standards—a Law Assessment Framework (LAF)—from which selections could be made to support assessment in individual subjects. As part of the development process, the lecturers conducted a trial to investigate whether the LAF could be successfully applied to an examination planned for a large first-year student cohort.

In previous years, students in this subject had been given access to past examination papers and explanations of the type of questions that would be asked. The trial involved providing students with additional detail about examination requirements in the form of a set of criteria and standards derived from the LAF.

4.2 Learning Outcomes being Assessed

The assessment task selected for the trial was a short-answer, closed-book examination to be conducted early in the semester to assess learning objectives related to the students' ability to:

- recall knowledge of foundation facts and concepts;
- understand and interpret legal judgments through:
  - identification of relevant information
  - succinct expression of interpretations.

4.3 Assessment Procedures/Details

The examination (weighting 20%), which was conducted in Week 5 of the semester in an invigilated examination room, required students to answer four short questions. Marking criteria and standards, the same for each question, were included in the print and online subject informational materials made available prior to the commencement of classes and also discussed in lectures. The presentation format was designed for ease of annotation for marking and feedback purposes. Table 4.1 illustrates the type of wording used.

Table 4.1: Illustrative standards for one criterion derived from the Law Assessment Framework (LAF)

Marks	**1**	**2**	**3**	**4**	**5**
Criterion 1: Knowledge of foundation facts and concepts	Evidence of limited reproduction of required knowledge of facts and concepts with significant inaccuracies		Evidence of expression of required breadth of knowledge of facts and concepts in own words—generally accurate but with some inappropriate emphasis (i.e., over-emphasis on minor areas and under-emphasis on others of greater significance in the context)		Evidence of: • required breadth of knowledge of facts and concepts expressed in own words with consistent accuracy • elaboration and emphasis provided with consistent discernment • consistently succinct expression (i.e., the 'packaging' of information through selection of precise terminology and compact sentence construction)

4.4 Strengths and Limitations

4.4.1 Strengths

Lecturers perceived the use of the criteria and standards as useful in:

- helping them perceive assessment tasks as integral to the subject rather than an activity undertaken 'in a vacuum';
- clarifying intended learning with consequent impact on their teaching approach and marking consistency.

For students, the strengths of the approach were less clear. This assessment task had not been used before so comparison with the learning outcomes of previous cohorts was not possible. Lecturers observed fewer challenges to marks assigned, as students appeared to understand and accept the links between marks and verbal descriptions of standards.

4.4.2 Limitations

Though no obvious limitations emerged from the trial, concerns identified by lecturers included the possibility of:

- disadvantage to students through provision of poor-quality criteria and standards developed by inexperienced lecturers while they 'learned on the job';
- misapplication of this set of criteria and standards to an assessment task for which they were unsuited.

4.5 Contributors' Reflections on the Assessment

4.5.1 The Lecturers' perspective

The trial helped us to identify some limitations of the LAF. We realised that in developing this resource we had unconsciously over-emphasised descriptions of learning demonstrated through the type of "problem-based" examination questions and assignments that are endemic to law assessment. This had resulted in an understandable focus on critical reasoning or "thinking like a lawyer" but had reduced the applicability of the resource to other forms of examination also in common use. In order to accommodate short-answer examinations the LAF was revised to boost its potential application to a broader range of assessment tasks. This process of adaptation and revision will be valuable as the use of the resource is expanded to include other subjects within the law discipline.

The development of criteria and standards helped us to clarify how we expected the students to respond to trial examination questions, which in turn helped in their formulation.

4.5.2 The Subject Coordinator's perspective

Involvement in the development of the LAF has highlighted for me the importance of congruence between assessment and assessment criteria and subject material and learning objectives. Though the need for assessment to fit within the context of the subject material/learning objectives is obvious, this trial has increased my understanding of how the person with responsibility for the overall running of a subject can ensure that this occurs.

As a result of the 2005 trial, there will be an expanded use of the LAF in 2006 through revision of course content and teaching methodology in the trial subject. This revision has included a different approach to the delivery of lectures, a more conceptual approach to subject material and a reworking of tutorial problems. Greater emphasis will also be placed on reference to the LAF in the development of assessment tasks including one worth 30% and a final examination worth 70%.

The development and application of the LAF has been only the start of an ongoing learning experience for both lecturers and students. It is therefore far from the 'end of the story' and, as anticipated during the development phase, early efforts have not always been perfect and future adjustments will be necessary.

4.5.3 The Educational Consultant's perspective

Involvement in the development of the LAF and the trial application to the examination assessment task has confirmed my belief in the utility of a generic resource such as the LAF. An expanded repertoire of language to describe learning has also been of benefit to my consultancy work across a range of diverse disciplines including Dentistry, Pharmacy and Nursing. This collaborative project has deepened my understanding of the challenges lecturers address in their assessment practice such as:

- describing criteria and standards that convey clear expectations of learning while avoiding the specificity of marking guides that divulge anticipated 'answers';
- acknowledging student achievement on tasks requiring recall and understanding without unduly raising expectations of similar marks on later tasks with greater cognitive demands;
- describing standards in sufficient detail to guide student assessment preparation without confusing or discouraging through seeking overwhelming precision.

There are still many challenges to be addressed in finding effective ways to apply CSRA to examinations. The simple design of the examination used in this case study—four questions requiring similar responses—lent itself to a relatively straightforward set of criteria and standards. A more challenging task will be the development of criteria and standards of practical use to both lecturers and students for examinations comprised of complex combinations of short- and long-answer questions and various forms of multiple-choice items.

Perhaps the most significant outcome of this trial has been the change in the way lecturers view assessment as integral to subject design and, as a result, the emergence of a curriculum development process where assessment decisions exert a major influence on the design of teaching approaches and activities.

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Case 5

The Use of Assessment in Study Skills Development

Contributor	Orna Ryan
Email	orna.ryan@ucd.ie
Telephone	+353-01-716-4818
Affiliation	Centre for Distance Learning, Room Q203, Quinn School of Business, University College Dublin, Belfield, Dublin 4, Ireland.

5.1 Context

This case study is based on the assessment strategies used for the skills development module, *Induction and Returning to Learning*, on the Diploma in Business at University College Dublin. The *Induction and Returning to Learning* module is the first of three skills development modules that students undertake. Many of the students are returning to education after a long number of years and *study skills development* is an intrinsic dimension of the programme. The other two of this 'suite of skills' modules, *Developing Learning Competencies* and *Developing Communication Competencies*, are delivered in the second semester of first and second year respectively. While these modules are part of a programme delivered by distance learning, the assessment strategies are transferable to more traditional programmes and would be of benefit to 1st year undergraduate students in particular.

In August 2005, the *Induction and Returning to Learning* module commenced a number of weeks in advance of the first block release session to allow students time to prepare their first class, to meet as a group and to begin working on their study skills development. For this module, each student received a comprehensive study guide and a copy of the textbook *Managing Your Learning at University*. In August 2006, the students had two days of induction sessions and activities and an additional three sessions were held in September, October and November.

It should be noted that distance learning is defined as:

> ... those forms of education in which organized learning opportunities are usually provided through a technical media to learners who normally study individually, and removed from the teacher in both space and time.
> —(Jarvis, 2004, p. 219).

This programme does not conform to this generic definition, primarily for two reasons. Firstly, it is a blended approach to teaching and learning, i.e., a combination of limited attendance, coupled with home study, supported by materials specifically written for each module. No emphasis is placed on technical media, however, students can successfully complete the programme with the use of technology as an additional source of support. Secondly, while students are studying at a distance, they are not 'removed' from the tutor as there is a *comprehensive support system* in place. A daily academic support system is available in the form of a personal tutor who addresses any questions concerning academic and administrative matters including guidance on study skills development. As the tutor provides guidance on all modules on the programme, s/he is in a unique position to integrate study skills development into all aspects and modules. This also provides the tutor with the opportunity to identify and address key individual strengths and weaknesses.

5.2 Learning Outcomes being Assessed

This module was designed for mature students returning to education on a part-time, distance-learning basis. It is designed to facilitate their learning of the *essential tools and techniques* necessary to complete the programme and is designed to work in tandem with the other modules which they are undertaking (e.g., *Principles of Management*). Among the areas covered in this module are:

- returning to education;
- learning methods;
- study approaches;
- planning and organising study;
- time management;
- reading techniques;
- note-taking techniques;
- memory techniques;
- principles of effective essay-writing;
- referencing protocol;
- use of library; and

- examination techniques.

At the end of the modules, students will:

- be familiar with different learning and study methods;
- have developed key study skills including planning and organising study; time management, reading techniques, note-taking techniques;
- demonstrate the principles of essay-writing and be familiar with referencing protocol; and
- have advanced their examination techniques.

5.3 Assessment Procedures/Details

This module was examined by four assessment submissions; each assessment was allocated 25% of the module. In terms of the European Credit Transfer and Accumulation System (ECTS), the module was worth 5 ECTS. The assessment submission dates were strategically scheduled in the semester to allow students to maximise their learning. For example, Submission 3 (the essay plan) was sent in three weeks before the second assignment for *Principles of Management* so that students could receive feedback on the plan in advance of the *Principles of Management* submission deadline. The assessment topics were selected to deliberately encourage students to focus on the key skills of essay writing, note-taking and examination technique. The students were invited to handwrite each submission; the rationale for this was to assist the staff in detecting any students who may have a learning or writing difficulty e.g., dyslexia.

The individual assessment submissions are detailed in the following subsections.

5.3.1 Submission 1

An essay (approximately 1,500 words) on returning to education and studying at a distance, which displayed the academic writing conventions covered in the module. This allowed the students to attempt an academic writing style on a subject that they had tacit knowledge of. Some of the criteria for the grading of this submission included the demonstration of succinct, fluent writing, the ability to develop an argument and provide structure to content, and finally, the ability to be analytical and objective.

5.3.2 Submission 2

A sample of the notes taken for a topic from either of their other subjects, i.e., *Principles of Management* or *Introduction to Human Resource Management*. This was designed to encourage students to try to take notes in a different manner and to explore their own learning style. For this submission, students submitted examples of mind maps and spider diagrams.

5.3.3 Submission 3

An essay plan that would be used for the next assignment on either of the other two modules of that semester. This assignment was used to demonstrate the conventions of planning and researching an assignment and to feed directly into the other modules.

5.3.4 Submission 4

A sample examination question for either of the two other modules of the semester. Examinations are frequently a phenomenon that is particularly daunting to this cohort of students. Submitting a sample examination question assisted students with their examination preparation; a number of weeks before the actual examination they received feedback, in terms of the structure and approach that they had adopted. The sample examination question was of particular use to the students for examination revision.

The opportunity to sit a mock examination was also made available to the students and was well attended.

5.4 Strengths and Limitations

5.4.1 Strengths

The assessment methods used on this module were very useful in proactively encouraging the students to develop their study techniques. The provision of timely *summative and formative feedback* allowed the students to develop their skills over the semester and to apply them to the other modules that they were undertaking. It also helped to overcome the 'schism' experienced by students in 1st year in terms of the *transition to higher education*.

The module had a positive impact on the level of confidence of the students and has extended the period of induction for each student. This has already had a positive affect on the *retention levels* in the 1st year of the programme. In addition, the other modules have benefited from this module as the level of academic writing, materials sourced and referencing, etc., is much stronger than what is usually anticipated from a 1st year cohort.

5.4.2 Limitations

The assessment methods were *time consuming* and *demanding on resources* within the unit but were invaluable in tracking the progress of a student and in identifying the individual strengths and weaknesses of the students.

5.5 Contributor's Reflections on the Assessment

The module gave a *structure to the development of skills* and encouraged students to proactively engage in their own development. The module was particularly well received by the students, indeed, some students commented that it was on the basis of

the skills development modules which they had undertaken this particular diploma and degree programme (see Appendix A: Sample of Student Comments on Module and Assessment).

The circulation of marking criteria to the students was invaluable for the assessment of each submission and was of great use with the more subjective assessments, such as, note-taking. For the next offering of the module, the use of a reflective journal, as an assessment method, is being considered as an alternative to one of the other assessment methods.

The skills development modules are highly transferable to a number of other programmes. The methods of assessment are of particular use to a mature student cohort but the development of academic writing, in particular, is a skill that can apply to most disciplines in the humanities and business areas and would also be of benefit to traditional programmes. The key to the success of such a module is to align it with other modules undertaken during the same study period. Otherwise, there is a danger that it is viewed as a stand-alone module and that the true value of such a module is not realised for the student.

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Appendix A: Sample of Student Comments on Module and Assessment

This module was hugely beneficial with other modules and one of the reasons that attracted me to this programme.

Definitely worthwhile having this on the course—I would have been lost without it.

Great help to get students back into study mindset and develop skills for learning.

I really felt that it was great to do this course to get one into the proper frame of mind to approach study and assignments. The mock examination was invaluable.

This course proved to be very useful in preparing for the other modules. The concept is very beneficial to one participating in a study programme after a prolonged absence. The course provided the tools to fulfil the requirements of other subjects.

Case 6

Task Oriented Online Learning (TOOL)—Social Interaction in an Online Environment

Contributors	Mr Seamus Fox and Ms Elaine Walsh
Email	foxs@dcu.ie, elaine.walsh@dcu.ie
Telephone	+353-01-700-5502, +353-01-700-5662
Affiliation	Oscail—National Distance Education Centre Dublin City University (DCU) Dublin 9, Ireland.

6.1 Context

The context in which this new form of assessment was introduced is a Bachelor of Science (BSc) in the Information Technology (IT) programme presented by Oscail—the National Distance Education Centre in Dublin City University (DCU). This is a modular programme in which students have to successfully complete 14 modules (in subject areas as diverse as Communications Technology, Computing, Management and Human Sciences) in order to qualify for a degree.

Initially, the programme was presented by traditional distance education methods, i.e., specially written self-learning module texts to convey content with tutorial support provided at a range of study centres around Ireland. Traditionally, assessment on each module was a mixture of continuous assessment and examination with, for most modules, continuous assessment accounting for 50% of each module's mark and the examination accounting for the remaining 50%. The continuous assessment usually consisted of three written assignments per module, which students submitted (by post) to their tutors.

Over the last four years, (i.e., since 2002) the programme has been converted into an online programme with the majority of tutorial support now being provided online. The move to converting the IT programme to an online programme allowed the Course Team (Programme Board) to explore a number of avenues aimed at improving

teaching and learning on the programme using a variety of online pedagogical techniques and concomitant alternative forms of assessment. The Course Team for the IT programme has responsibility for the academic direction of the programme and has members drawn from a number of universities and Institutes of Technology around Ireland as well as members from industry and the public service.

A primary focus of the efforts to improve student learning and assessment was the Human Science A (HSA) module. HSA is a module on the Cultures of Technology and is one of the four compulsory degree level modules. Other new online pedagogical techniques were implemented in other modules of the programme. However, the techniques used in the HSA module and the allied new forms of assessment are the subject of this case study.

The move to alternative forms of assessment on the HSA module was aimed primarily at improving student online engagement. Given the discursive nature of the content of the HSA module, improving the online engagement of students was seen as critical to improved student learning. In other words, in line with a number of social constructivist learning theories, it was considered that the key to improving student learning was to encourage students to engage online in in-depth discussion of the content of the HSA module. A number of attempts had been made to encourage student online engagement in various modules while keeping the old forms of assessment. However, with some notable exceptions, these attempts were not successful in maintaining sustained online engagement. The techniques introduced in the HSA module made online engagement an integral part of the summative assessment of the module.

In addition, for reasons related to encouraging engagement but also to attain other learning outcomes, the Course Team wanted to introduce elements of group work into the IT programme. Before the programme went online, logistical problems caused by the geographical dispersion of the students had prevented the incorporation of group work methods into the IT programme. Therefore, group work was also incorporated into the pedagogical techniques used in the online teaching of the HSA module.

The students on the BSc in IT programme are practically all 'second chance' students, ranging in age from 19 to 62 with a median age in the early thirties. They are practically all currently in full-time employment and undertaking the IT programme on a part-time basis. On average, these students would take just over two modules per year (i.e., roughly equivalent to half a year of full-time study). The students reside throughout Ireland with a small proportion resident abroad.

6.2 Learning Outcomes being Assessed

As the learning outcomes being assessed are directly linked to the online pedagogical methods used, these will be detailed first before the learning outcomes are adduced.

The academic year for students taking the HSA module is broken into three periods. During each of these periods a different online pedagogical method is used as follows:

- **1st period—Online debates/resources**

  The students are presented with four topics relevant to the content of the first section of the HSA module. In as far as possible, controversial—or, at least,

debatable—topics are used. For each topic, the students are told the relevant sections of the HSA module text; they are also given the relevant sections of their textbooks (if appropriate) and a small number of relevant journal articles. The full-text of all articles is available online, usually from the online journal databases provided by DCU Library. This is particularly important for distance education students, as they do not have the same ease of access to academic libraries as full-time students. The students were given two weeks in which to research the topics. For the following three weeks, they had to debate four topics online with the fellow students and tutors. The students have to make a minimum number of online contributions per week (with most students making significantly more than the minimum). They are given guidelines on what is considered a good contribution.

- **2nd period—Peer tutoring**

  During this period, the students were divided into groups of three. Each group is given a topic/question relevant to the second section of the module text. As in the first period, each topic/question is accompanied by relevant resources, in particular, relevant articles which are available online. Each group is given two weeks in which to research the topic. After two weeks, each group has to post a 200- to 300-word synopsis of their topic. For the following three weeks, the students are required to post questions to the other groups and to answer any questions asked by other students (or tutors) on their topic. At the end of the three weeks, each group posts an amended synopsis, which incorporates answers to questions asked over the three weeks of 'peer tutoring'.

- **3rd period—Collaborative group project**

  The students are divided into groups of five or six. All groups have to produce a report on a topic relevant to the third section of the module text. The report always incorporates an in-depth analysis of the empirical evidence available on a topic. The students do not carry out empirical research rather they gather and analyse information available on the report topic. They are given guidelines in how to organise their groups but it is up to each group to decide on the methods that best suit the group members. Each group has to post online regular reports of their progress.

Collectively, the above three pedagogical methods are, what we call, Task Oriented Online Learning (TOOL) methods.

In order that students are aware of exactly what is required from them in each period, they are given a detailed Instructional Schedule. Because it contains a number of ancillary resources, this document is some 80 pages long. However, the detailed work schedule, which informs students what is required from them on a week-by-week basis, is still over 20 pages. This level of detail and exposition is required because students are geographically dispersed and therefore there is no guarantee that all students can be got together for briefing purposes (or, indeed, one cannot rely on word of mouth from other students informing students of the course requirements).

Learning outcomes being assessed are as follows:

- Demonstrate conceptual understanding.
- Develop and demonstrate critical skills.
- Sustain an argument (by analysing, synthesizing and evaluating).
- Demonstrate, practice and expand research skills.
- Employ and increase communications skills.
- Demonstrate interpersonal skills.
- Identify, demonstrate and evaluate team working skills.

6.3 Assessment Procedures/Details

6.3.1 First assignment period

For the first assignment period, the students have to submit to their tutor their online contributions. The students are given guidelines on how their contributions are assessed and each student receives an individual mark based mainly on the quality of their contributions.

6.3.2 Second assignment period

For the second assignment period, the students submit their initial synopsis; the questions and answers posted online to their topic, and their final synopsis. The marks are a group mark, i.e., each member of the (usually three person) group receives the same mark. The level of the mark is based on synopses quality and the timeliness and quality of their contributions.

6.3.3 Third assignment period

For the third assignment period, *each* student submits (1) the group report; (2) their online progress reports; (3) personal evaluation of the collaborative learning process in which they are asked to evaluate their own contribution, i.e., a self-reflective piece and (4) a peer evaluation in which they are asked to assess the contribution of each of their group members both descriptively and numerically on a number of characteristics. Fifty percent of the available marks are allocated to the group report, while the remaining marks are allocated to the process oriented elements. The first two parts are group marks while the second two parts are individual marks. The students can decide not to put a group member's name on the group report; however, this must be the unanimous decision of the remaining group members.

6.3.4 Monitoring and equity of marking

Before the marks awarded to each student are returned to them, a senior academic monitors a selection of the work submitted and the marks awarded by the tutor. The monitor can modify marks. This ensures equitable marking (and feedback) between the tutors and also mirrors the monitoring of examination marking that would be carried out in the traditional examination process.

6.3.5 Aggregation of assessments

In addition to engaging in the three pieces of online/group work, the students also complete three individual assignments. The assignments account for 50% of the module mark and the remaining 50% is allocated to the three pieces of online/group work in the proportions 10%, 20% and 20%.

6.4 Strengths and Limitations

6.4.1 Strengths

Each of the three TOOL methods outlined above has particular strengths. The use of asynchronous communication (permitted by the online forums) in the online debate method allows the students to think about what they read and to research their responses. This led to good reflective online discussions. Using the peer tutoring method gave students the experience of having to clearly explain their thoughts and to refine those that were not clear to their fellow students. The collaborative group projects provided the students with the experience of forming and maintaining an online group. In addition, the online community, which developed over time, helped to reduce the feelings of isolation often experienced by distance education students.

6.4.2 Limitations

The key limitation was flexibility. Distance education/online courses permit students a high degree of time and place independence. The use of the methods outlined above still gave students place independence but limited, somewhat, their time independence in that they have to devote particular weeks to their online work. However, it should be noted that (a) the use of asynchronous—rather than synchronous—communication as the main means of communication increased this time independence considerably even within the designated weeks and (b) compared to face-to-face courses, the level of time (and place) independence afforded by the use of the techniques outlined above is still substantial.

6.5 Contributor's Reflections on the Assessment

6.5.1 Student reaction

The students were surveyed on completion of the HSA module. Of the 63 students who undertook the HSA module in 2005, 29 students responded to the survey (a response rate of 46%). The students expressed the opinion that a lot of extra time and effort was required to successfully complete this module relative to other modules assessed with the traditional assessment methods. In their view, the use of the TOOL methods leads to less flexibility than modules delivered using traditional methods (see limitation mentioned above). However, a number of students did see that the quality of their learning increased, while others saw the benefits of group work. Some of the comments were:

> I feel that the online assessment during the year was probably a fairer way of assessing a person's knowledge on a subject than getting them to learn off course material and spend 3 hours writing everything they know.

> I thought that the 'learning' experience was of a Higher Quality as the groupwork was in my opinion superior to the type of 'knowledge' required for an examination.

> The group work was rewarding ... It was a good experience and challenge to build up trust and teamwork.

When asked if the TOOL methods should be extended to other modules, 45% of the students who responded said that they should. This is interesting as practically all students said that the TOOL methods took more time and a sizeable proportion considered it a lot less flexible.

6.5.2 External examiner's reaction

After reviewing a sample of the material produced by the students for each of the three pieces of online/group work, the External Examiner stated:

> I was impressed with the sample of online work I received, and the calibration procedures look rigorous. The [Instructional Schedule was] helpful in understanding the allocation of marks ... The different assignments appear to encourage students to develop good study and other transferable skills in addition to motivating them to engage well with the subject material.

6.5.3 Module co-ordinators' reaction

It probably does not need to be made explicit that there was a high level of effort required to set up the TOOL methods. However, as we now enter our third year of using these methods, it should be noted that updating does not require too much effort.

We have 'tweaked' the methods each year but this effort is minimal in comparison to the initial work required to set it up. Once the students are 'up and running', a certain amount of effort is required to tutor and monitor the students' contributions but this is not excessive in comparison to what would be required in other modules.

The TOOL methods outlined above could be adapted for use in the classroom or, better still, for use with the 'extended' online classroom. For example, a debate could be started in class (possibly based on topics, readings, etc. distributed in advance) and then continued in an asynchronous online environment. This would ensure that (a) every student would get an opportunity to contribute—not just the extroverts! and (b) the undoubted advantage of asynchronous online discussion groups—noted by a number of researchers—would be achieved, i.e., online discussion groups encourage reflection as students can take time to research and consider their replies before responding online. The peer tutoring method could also be adapted for classroom delivery. The students could be given their topics and split into groups as with the online version. Class time could be used for groups to give presentations on their topics and then, in the online environment, students could post questions for the presenters.

One major advantage of the classroom use of the TOOL methods would be that the highly explicit instructional schedule that we had to write for the online students would not be required and changes could be made that adapt to issues that emerge during the academic year.

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Case 7

Where are the Examinations? Using Learning Journals in Mathematics Assessment

Contributor	Michael Lanigan
Email	mlanigan@WIT.ie
Telephone	+353-51-302-885
Affiliation	Department of Adult and Continuing Education, School of Education and Professional Development, Waterford Institute of Technology, Room CL6, St. Dominic's, College Street Campus, Waterford, Ireland.

7.1 Context

The *Waterford Institute of Technology (WIT) Certificate in Foundation Studies*, accredited by the Further Education and Training Awards Council (FETAC) and WIT, targets adult learners intending to progress onto 3rd level education. The assessment methodology, outlined here, relates to the *Business Mathematics* and *Technology Mathematics* modules. The objective of these modules is to enable the learner to undertake any full-time Business or Science/Engineering course at WIT. Although achieving these objectives requires varying levels of mathematics, the overall level approximates the FETAC level 5/Leaving Certificate (National Qualification Authority of Ireland [NQAI] level 5). Some areas are necessarily covered in greater depth than others so that the levels approach that of 1st year mathematics.

Assessment is by means of formative and summative examinations and a 50/50 weighting of continuous assessment/final examination exists providing an overall final mark.

7.2 Learning Outcomes being Assessed

The overall aims and learning outcomes for the programme are stated in the course document as follows:

> At the end of the course, the participants will have:
>
> - been given opportunities to diagnose their own education and training needs in relation to the educational and vocational opportunities presented by society;
> - acquired a set of transferable core skills which will prepare them to access further education and training opportunities; and
> - acquired a set of subject skills, which will prepare them for entry into Year 1 of a full-time college course

The learning journal assessed the so-called 'softer' or transferable skills more than the 'harder' skills; in other words, learning was assessed by the learner in the form of a dialogue between learner and tutor as opposed to, say, simply assessing mathematical ability or competency in a written examination. A major aim of the programme is to enable learners to transform their typically didactic expectation of learning to a more self-directed type; the journal facilitated learners and the tutor in this regard. In addition, a primary goal was to assist the learners in engaging with members of their study groups and with myself, as tutor, so that they would become interdependent learners. This goal was expressed as an overall programme aim, however, the course document was not specific in terms of how this goal was to be achieved, and the use of learning journals for mathematics was never expressed or implied.

Against this backdrop, using learning journals placed me in somewhat uncharted territory in terms of my own pedagogy and assessment methodology. To begin with, I framed the journal learning outcomes, conscious of the primary goal noted above, by stating that at the end of the module, the learner should be able to:

- gauge learning progress and engagement with the subject;
- evaluate personal strengths/weaknesses as an adult learner of mathematics;
- evaluate remedial actions that might be necessary; and
- dialogue freely and openly with their tutor.

7.3 Assessment Procedures/Details

The module assessments, including the journal, break down as shown in Table 7.1.

The learners used the journal both inside and outside the classroom. Typically, the learners made entries after each of the three 1-hour sessions in the week; some made entries more often, some less, but each student was encouraged to write in the journal on a weekly basis at least.

Table 7.1: Breakdown of Assessments

Assessment	**Format**	**Weight**
Mid-term Assessment	1-hour written exam	5%
Written Assignment #1	Hand-up worksheet	5%
Written Assignment #2	Hand-up worksheet	5%
Christmas Assessment	1-hour written exam	10%
PowerPoint Assignment	15-minute peer-evaluated presentation	10%
Learning journal	On-going; Tutor assessed	15%
Summer Examination	2-hour written terminal exam	50%

Table 7.2: The 'What?' Model of Reflective Practice (Driscoll, 1994, 2000)

What?	A description of event
So What?	An analysis of event
Now What?	Proposed actions following event

I attempted to assist the learners who were not familiar and/or comfortable in reflecting by simplifying the process as much as possible, for example, encouraging them to answer questions as presented in Driscoll's (1994; 2000) model of reflective practice, summarised in Table 7.2.

The learners were also provided with guidance on how to reflect, and on the assessment itself, i.e.:

> What will be assessed?
>
> 1. How your learning and engagement with the subject matter is progressing.
> 2. Your identification of your strengths and weaknesses as an adult learner and as a student of mathematics.
> 3. Your identification of any remedial actions that need to be considered.
> 4. Noting improvements where you have taken action(s).
> 5. Your engagement with the dialogue afforded by the learning journal

As a percentage of the learners' continuous assessment, the journal was worth 30% (15% of the total module assessment). I provided each learner with formative submission milestones, throughout the year, and a final summative deadline towards the end of the academic year. The journal was assessed across four categories, each comprising 25% of the overall marks. The categories, based on the points above, were:

- quality of reflection-in-action [encompassing points 1, 5];

- quality of reflection-on-action [encompassing points 2, 3, 4];
- frequency of reflections [encompassing point 5]; and
- overall presentation of reflections.

7.3.1 The benefits of journals

From the many journals read over the last two years, I have noted just some of the benefits of such an enterprise and have quoted portions for explanation/illustration.

Confidence building

A major goal of the project from the outset was confidence building. Examples of quotes from various students include the following:

> I'm helping out in my local homework club and I'm breaking the maths down so a kid can get it—I'm loving it! Before this course I'd never have bothered because I didn't think I could do it but now I know I can and if I don't do it I'll always regret not trying.

> We did formulae today again. I had a very good 'maths day'. I got the sums right and more importantly I understand what I was doing. I asked the right questions and understood the answers. It feels very good when you actually know what you're doing ...

A student, who was later to get an overall result of 89% in maths, wrote:

> Since the day I left school I never envisaged myself being confident about maths. I did Leaving Certificate maths twice and got an F-grade both times. That "F" has represented "FEAR" to me and maths for the past 20 years. In the last 8 months "We" [student and tutor] managed to change it to "FEARLESS".

In a unique class that I remember vividly, this same somewhat timid woman, who had struggled hard with mathematics for years, derived a new and improved method of working out a solution. Here is her entry from that occasion:

> Michael said today I got the 'x-factor'; didn't quite know what he meant by that but later at the tutorial I accidentally! made known a simpler way to do the sum. Quite honestly it was the first day the statistics made sense to me and I just saw what Michael had explained moments before in the sum. Sometimes its so easy to miss that which is most obvious—happens [to] me all the time! It's really given me a boost so it seems having the 'x-factor' means using logic in a unique way ...

Another student who wrote, looking back over the year, wrote:

> I'm really glad I kept the journal now because reading through it not only helped me relive the highs and lows, but has also helped me to see the growth that's taken place in me.

Health and attitude 'check-up'

Students noted their feelings and attitudes, for example, one student wrote:

> I've been thinking over the stuff I discussed yesterday and I am realising that its ok for me to feel the way I do, it's the realities of my life that are staring me in the face and the amount of time I can give to the course is limited. I'm going to take stock of my time management again! It's all gone out the window with me over the past few weeks. Looking forward to the break next week, take a bit of time out to make some realistic decisions.

Another student stated:

> Not really making head or tail of the maths today, but have felt like this before and I know that "this feeling too shall pass", if I hang in there. Michael's going to give me extra help on Monday so ... hopefully.

Earlier in the year the same student wrote:

> ... sometimes how I'm looking at a situation has a huge effect on the outcome. If I sit in class thinking 'I can't get this—I can't understand', chances are I won't. Whereas if I think I'm here to learn—I'm listening up in class, I am attempting to understand, then eventually I will.

Dealing with examinations and anxiety

In terms of examinations and anxiety, the students made statements, such as:

> Feel pretty good about the test even though I missed all the classes in the week before.

Another wrote after her midterm result:

> Words cannot describe—I got 74% in my test. I nearly knocked Michael over with the hug I gave him. I really didn't think I'd do that well, I'm so thrilled—the kids and my mother were at home when I walked in with my results—think everyone in [my] Street knows!

The open nature of the learner-tutor dialogue that is afforded by the learning journal is indicated in the words of a veteran of a previous examination:

> I did worry that my mind would go blank and I wouldn't know how to do any of the sums as I'd been out last week, but I remained calm and I didn't have a headache this time.

Assessment of one's own needs including learning blocks and hang-ups

A student who had negative experiences of institutional education wrote:

> ... I can't believe how upset I've been over maths. I've been taking a deeper look at why it is I'm so upset about the maths—it definitely relates back to my time in school and the beliefs I developed in myself about me and maths.

Earlier the same student had written:

> I feel more inadequate than ever towards maths after today's test. I know these feelings of incapability are deep-rooted. I used to think the fact that I was inattentive in class whilst in school was the reason I didn't do well at maths but I've been at every maths class and tutorial bar one and I feel more inadequate and confused than ever ... and that's leaking into other areas of the course for me. I said in a few entries ago that it "couldn't hurt" to do the test but by golly it did.

Collaboration and interdependent learning

Having the learners cooperate and work together in groups is something that is almost entirely dependent on the learners themselves. One student, who was pleasantly surprised by this type of experience, wrote:

> ... what surprised me was that I had to explain Permutations & Combinations to S [male student, quite competent at maths]! I couldn't believe it! What surprised me even more was that when I explained it—he got it!'

This female student had been intimidated somewhat by her male colleague, but through collaboration with him, on this occasion, and on others, she developed confidence and used his experience and knowledge to help her with a presentation on maths later on in the year.

Another group of students who collaborated in the same study group wrote the following entries—individuals' names are represented by initials:

> Didn't have a clue today. Totally lost the plot. Couldn't understand a thing. Personally having a bad day, so it was probably more that than the lesson. I pulled myself together though and a few of us stayed behind after class and things started to make sense.

> Today was a bit of an 'Eureka day' for me. I understood the maths and managed to keep up. Stayed behind with a few people (no tutorial). After B explained one part to me, I got it all and I was then able to explain it to P. I found that by explaining it to him I understood even more myself. A very good day.

Had it, lost it and found it again after class with some of the others! Stayed for tutorial and found that great. B and H are very good. They take time to help and explain. What I did know I tried to explain to S and M.

We went back over formulae today. I was very positive and concentrated well. The hour is just not long enough. A few of us stayed back. H and I did a sum. B already had it done and Michael said it was right. So we asked B to check ours. We both had it wrong. So B (God bless her) did it on the board for us. We'd be lost without that girl. She is so helpful and ready to share her knowledge. She went through it all step-by-step and I think I really understand it now.

7.4 Strengths and Limitations

Strengths	**Limitations**
Assessment of the students' own needs	Feedback is time consuming
Confidence building	Student opposition to journaling
Gradual awareness	Superficiality
Monitoring and evaluation of own progress	Tutor's own prejudices
Change in attitude (+ve)	Not for everyone
Self-directed learning	
Making mistakes is 'okay'	

These strengths and limitations are discussed further below with students' quotations in italics.

7.4.1 Strengths

- **Assessment of own needs.** Examination techniques and learning strategies identified; some trial and error methodologies apparent; some learners quoted this stage as *'... sussing out ...'*. Some moved position in class separating from a group to form with another.

- **Confidence building.** Assertiveness—not intimidated; transformation from fearful to tentative, from timidity to assertiveness; conscious and open questioning.

- **Gradual awareness**: Contrast regarding adult learning in 3rd level versus child in school; the latter being the predominant experience of the group.

- **Monitoring and evaluation of own progress** and remedial attention. Included learner-tutor dialogue; coping strategies for academic and personal/private areas of students' lives—*'... getting a balance'*.

- **Change in attitude.** Identified from early negative outlook to positive later viewpoint. Some identification as 'life-long' learners; value of experience *'... carried forward'* with progression.

- **Self-directed learning.** Requesting further information and exercises. Actively seeking learning opportunities other than in classroom. Early formation/ramp-up of study groups. Four-fifths of student group attached to one or more study groups. Didactic approach rejected for enquiry-based learning environment.

- **Making mistakes is okay.** Making and admitting to making mistakes; accepting mistakes as learning opportunities; engagement with trial and error—experimentation. Permission given to themselves to make mistakes; not perceived any longer as 'stupidity' to them: evidence of paradigm shift amongst this cohort with *'... maths to "blame"...'*. Most cited their reasons for this as being their exposure to transposition of formulae, affectionately known to them as *'... solve for "x" and prove'*.

7.4.2 Limitations

- **Feedback is time consuming.** Feedback to all students is time consuming for the tutor and the students. However, I combated this by engaging with a dozen journals per week; this was advantageous in allowing me to be more attentive and thoughtful.

- **Student opposition to journaling** is not to be underestimated. Some students vehemently dislike it for any number of reasons; the most common reasons being an unwillingness to engage due to past, upsetting memories and an unwillingness to change.

- **Superficiality.** I wonder sometimes if the learners' journal is what they think I expect rather than what they feel. There is a limit to the depth of tutor engagement with learners demonstrating such superficiality. This is a major limitation.

- **Tutor's own prejudices.** I offer the opinion that the tutor who is not comfortable with journaling him/herself finds such an exercise off-putting, disconcerting and downright uncomfortable.

- **Not for everyone.** The Journal is limited to what it can assess. It is not a panacea; on the contrary, it can cause as many problems as it cures. However, in my experience, it is a worthwhile method of engaging the students in diagnosing (assessing) their own learning needs. This is a large help to me, as a tutor, meaning that I do not need to examine the learners 'on day one', thereby, fulfilling their worst fears of being exposed as stupid or worthless (as some actually believe themselves to be).

7.5 Contributor's Reflections on the Assessment

I attempted to assess maths levels and ability early in the programme as historically, [mathematically] weaker students disengaged and I believed early intervention would mean a better prognosis. A traditional means of assessment, i.e., examination is not effective in preventing learners from disengaging. Therefore, a means of self-assessment, in the form of the learning journal was devised. Although the term 'self-assessment' is used throughout this case study, the term applies to the learners' assessment of their own learning needs with respect to mathematics. Ultimately, the execution of the journal constituted 15% of overall module results.

One of my goals, in this experiment, was to help adult learners become more self-directed and assertive, especially in seeking and requesting assistance from the most appropriate source(s), once needs were assessed. I desired an outcome, whereby the learner would emerge from the reflexivity process having gained insights into his/her own learning preference(s) and needs. The student gained an insight into his/her own learning style(s), and how s/he internalised learning—s/he developed discernment. By participation in this experiment, the learner gradually learned to learn in a manner that was unique to him/her.

From an administrative perspective, the amount of commitment on my behalf was considerable as the weekly readings of journals took much time and effort. I managed this task because I kept the following in mind:

- Firstly, to watch for the learner who noted (in the diary) his/her struggles with the subject—I engaged in dialogue with this learner frequently.
- Secondly, I selected several journals from the main group and engaged with them. Thus, on any given week, I engaged with a dozen or so of the learners—thereby allowing much deeper engagement.

The learning journal has become an integral part of my pedagogy repertoire. The weaker students are identified and assisted earlier, thereby, increasing the chances of retention and completion; thus, their dream becomes achievable.

The continuity of the learning journal is encouraging for the future. Prior to the collation of the data for this case study, I observed attitudinal and behavioural changes in the group that, anecdotally, I attributed to the learning journal (this was subsequently validated). These changes were manifested as increased questioning of material, greater diligence in problem solving, improvement in interpersonal collaboration, and prioritising and addressing one's own needs. This latter phenomenon caused much soul-searching, exposed in journaling as false humility, in some, guilty that they could take time for their own needs, exclusively however, a female trait, remarkable amongst those with a partner/ex-partner and family and/or other commitments.

Assertiveness to ask questions is paramount for 3rd level students, therefore, there existed within the journal, an open learner-tutor dialogue. Noticeably, increased personal development paralleled growing assertiveness. Moreover, tutor reliance diminished with self-directedness.

The learner-tutor dialogue explored learning issues; some reflected deeper than others, providing personal learning insights; others accepted the 'necessary evil' status

of mathematics in humorously philosophical accounts. Under- or over-estimations of maths ability was recognised and dealt with.

In conclusion, most of the learners adjusted their attitudes; over time, some developed personal learning strategies illustrating one benefit of the mathematics journal. Moreover, the journal was the student's space; s/he was relatively secure in controlling the environment. The students perceived learner-tutor equality, perhaps, something that is not perceived within the classroom context. The learner-tutor dialogue occurred semi-informally; the student 'safely' questioned his/her perceptions, attitudes, pre-suppositions, even, prejudices. The students' vulnerability and exposure were minimised through this indirect relationship. My findings were presented to and validated by the learner groups.

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7.7 Useful Resources

- MathCentre—Mathematics support resources for staff and students
  URL: `http://www.mathcentre.ac.uk/`
  (Accessed: 22 January 2007.)

Case 8

Web-based Electronic Annotation and Rapid Feedback for Computer Science Programming Exercises

Contributor	Dr. Fintan J. Costello
Email	fintan.costello@ucd.ie
Telephone	+353-1-716-2918
Affiliation	School of Computer Science and Informatics, University College Dublin, Belfield, Dublin 4, Ireland.

8.1 Context

Computer Science, like many science subjects, has a strong practical component. For example, students learning computer-programming techniques need to spend time writing computer programs to try out these techniques and gain some experience of how they can be used. In most computer programming courses, this practical component is provided by a weekly coursework requirement, where students write computer programs to solve various problems and are assessed on their performance. For students to achieve their learning outcomes successfully, it is crucial that they receive rapid feedback on their programming coursework, pointing out any errors they might be making, as quickly as possible.

As a lecturer teaching computer programming techniques to a large group (250–300) of 1st year computer science students in University College Dublin (UCD), I have developed a system that allows students to receive feedback and assessment on their coursework rapidly and easily. This system allows the students to submit programming coursework electronically and allows the demonstrators to electronically write comments (annotations) 'on top of' the submitted coursework, indicating where the student has made errors. Coursework is distributed to demonstrators automatically

via the web, allowing for easy and rapid correction. Currently, each week's coursework for all students is returned (again via the web) in the week following submission, giving the students rapid feedback and responsive guidance.

8.2 Learning Outcomes being Assessed

The web-based assessment software that I have developed is designed to allow demonstrators to assess the student's practical understanding and use of computer programming techniques as taught in a 1st year computer science course.

8.3 Assessment Procedures/Details

Students taking 1st year programming modules in computer science carry out coursework assignments in computer labs 10 weeks out of 12 for each semester these modules run. Each week all students taking these programming modules (between 250 and 300 students in total) spend two hours in a computer lab carrying out a programming exercise related to the topics discussed in their programming lectures the previous week. The first hour of their lab involves a practice exercise, on which students can work in collaboration and for which they obtain help from course tutors and demonstrators in the lab. The second hour involves a test exercise, related to the practice exercise, on which the students must work singly and without help. These exercises are made available via a web page and at the end of each lab. all students submit their coursework for that lab via that web page.

In the UCD School of Computer Science and Informatics Programming, exercises take place each day in computer labs, from Monday to Thursday, with 40 to 50 students taking part in each lab session. On the Friday of each week, a new web page is automatically constructed and distributed to demonstrators. On that page each demonstrator is allocated a number of student assignments to correct. The demonstrators correct these assignments via the web, using a specially developed piece of software that allows the demonstrators to write on top of and to annotate each student's assignment, explaining where they have made mistakes and giving them feedback on their progress. The demonstrators also assign marks to the students, reflecting their performance. Currently, these practical marks count for 40% of the marks awarded to students in these modules (with a final examination counting for 60%).

On the Friday of the week following the assignment submission, the demonstrators' marks and comments for all students are gathered automatically, again via the web page. A new page is then generated for each student, showing them the programming coursework assignment they submitted the week before, annotated with the demonstrators' comments and suggestions, and showing the mark awarded. This page also shows the students a sample solution for this assignment, allowing them to compare their solution to that sample.

The system also automatically produces a page showing the students their cumulative performance in computer courses over the course of the module, allowing them to assess their overall standard easily.

8.4 Strengths and Limitations

8.4.1 Strengths

- Rapid feedback for students on their performance in computer programming assignments, catching any errors in practice or understanding early, before they have a chance to develop.
- Easy distribution of programming assignments for correction to demonstrators and tutors, and of corrected assignments back to students.
- The system is secured by allowing access to the correction and annotation pages from limited IP ranges (i.e., only demonstrator, tutor and staff machines are able to obtain access to correction pages: student machines cannot see those pages.)

8.4.2 Limitations

- Student access to their program comments and marks is currently controlled simply by the student identification number: the students enter their identification number on a webpage, which returns their marks and annotated coursework. This means that student marks for coursework are not completely private: any student, knowing another student's identification number, can look at that student's marks and coursework.

8.5 Contributor's Reflections on the Assessment

Students reacted very well to the web-based assessment procedure, finding it easy to use and understand. In a student survey of teaching (again, carried out via the web), a number of students mentioned the helpfulness of the rapid feedback and the comments on their submitted assignments.

The web-based commenting and marking system was developed with computer programming assignments in mind, but it is not limited to that domain in any way. The system is suitable for any context in which the students produce coursework electronically.

The main resource implications are in terms of computer space on the web server running the system. Currently. there are approximately 300 (students) x 10 (weeks) x 2 (modules) = 6,000 pieces of coursework produced and corrected each year: expansion of the system would possibly require some investment in terms of disk space.

8.6 Useful Resources

A demonstration of part of the annotation system discussed in this case study is online. URL: `http://tinyurl.com/2r9k8e` (Accessed: 29 January 2007.) Demonstration of other parts of the system are available on request to `fintan.costello@ucd.ie`

Case 9

On the Use of Multiple Class Test Assessments to Promote and Encourage Student Learning

Contributor	Séamus McLoone
Email	seamus.mcloone@eeng.nuim.ie
Telephone	+353-1-708-6201
Affiliation	Department of Electronic Engineering, National University of Ireland (NUI) Maynooth, Maynooth, Co. Kildare, Ireland.

9.1 Context

The use of multiple class test assessments is employed in two different modules taught at the undergraduate level in the Department of Electronic Engineering in the National University of Ireland, Maynooth, Co. Kildare. These modules are Digital Systems 1, a 2nd year module, and Control Systems Design, a final year module. These modules form part of an overall programme leading to an honours Bachelor of Engineering (B.E.) degree in Electronic, Computer or Telecommunications Engineering. The number of students enrolled in each module currently averages around 18.

Two different teaching strategies are employed. For Digital Systems, the content is delivered via a set of lectures and accompanying notes. In contrast, Control Systems Design is taught solely through a series of workshop-type tutorials. By providing the complete set of notes and problem sets at the start of the module, students are given the responsibility of self-learning. The tutorials provide a means for students to work through the notes and problem sets at their own pace, within reason, and a forum for having their questions answered.

9.2 Learning Outcomes being Assessed

At the end of the Digital Systems module, students should be able to:

- efficiently minimize logic using Karnaugh Maps;
- implement a logic circuit using NAND or NOR gates;
- design a basic counter; and
- convey a basic understanding of programmable logic devices.

In the case of the Control Systems Design module students should be able to:

- recognize the need for feedback control;
- carry out basic feedback design in both the time and frequency domains; and
- distinguish between linear and nonlinear systems.

9.3 Assessment Procedures/Details

Despite the different teaching approaches employed in the two modules, the basic assessment concept remains the same. Digital Systems has four key sections while Control Systems Design has five. A class test is used to examine each of these sections, thus, allowing each of the learning outcomes to be suitably assessed. All class tests are compulsory and all questions on each test have to be attempted. Generally, the class tests take place shortly after completion of the corresponding section of notes.

The class tests contain varying number of questions that range from straightforward, short-answers to more difficult, problem-solving. Generally, emphasis is placed on the method and not on the final answer. Furthermore, the tests tend to focus on the students' understanding of the notes and not simply on their ability to memorize them.

The class tests form a significant percentage of the overall mark—15% for Digital Systems and 25% for Control Systems Design. In addition to the class tests, assessment also includes either laboratories or assignments respectively and a final examination at the end of each module. This examination is based on the whole module, and not just sections of it, as is the case with the class tests. The class tests help the students to prepare for this final examination, which has the greatest percentage weighting of all the assessment elements. The structure and level of difficulty of the final examination has not been affected as a result of introducing the class tests into the respective modules.

9.4 Strengths and Limitations

9.4.1 Strengths

- Class tests serve as a great means of motivation. In general, the students learn the material for the class tests and, thus, are always up-to-date for the subsequent

sections of the course. Consequently, the students are able to follow the next sections of the course notes with more ease.

- The students tend to have less difficulty revising for the main examination at the end of the module, as they are not learning the material for the first time.
- While the students have to work harder throughout the module, they are under a lot less stress and pressure for the final examination. They also tend to develop a better attitude to and focus for work.
- As the students are no longer under the same pressure to learn everything at the last minute, they actually learn more of the course content.
- The class tests are very much a formative style of assessment. The students can find out what parts of the course they are struggling with and can always revisit these if required.

9.4.2 Limitations

- Studying for multiple class tests can be time consuming for the students. This can detract from their studies in other modules.
- From the lecturer's point of view, there is obviously a lot more work involved in having to correct multiple tests.

9.5 Contributor's Reflections on the Assessment

Lately, greater emphasis is being placed on learning outcomes, especially by the relevant professional bodies. It is now desired that these outcomes are suitably assessed by each module. However, the modules that rely primarily on a final examination to assess learning outcomes cannot always guarantee this. Since the students typically have a choice in the examination paper (a typical choice in Electronic Engineering is four out of six questions) the learning outcomes are not readily guaranteed. A possible solution is to make specific questions compulsory and to ensure that these target the learning outcomes. However, this can inadvertently add more pressure and stress to the students who leave studying until the last minute. An alternative solution, the one I adopted here, is to have multiple class tests throughout the course of the module, where each class test can easily target one or more of the learning outcomes. Alternative assessments to class tests could be used, but I find that these can sometimes present other difficulties, such as, ensuring that the assessments are individualised and/or properly supervised.

Another influencing factor behind the use of multiple class tests is that of student motivation. I have found that students are not easily motivated and only tend to study for tests. Without class tests, they do not really engage with the module until it is too late. The amount of valuable information that the students gain is also questionable. By employing class tests throughout the module, the students are encouraged to engage continually with the module. Furthermore, as the tests are of a formative nature, the

student learning experience is far more valuable and rewarding (Davis *et al.*, 2005). The class tests are of particular importance in the Control Systems Design module as they also act as a motivation for students to work through the notes and ensure that they maintain a reasonable pace of study.

The student feedback clearly shows that they are in favour of class tests, a sentiment also noted by Davis *et al.* (2005). Some of the students felt that it kept them focused throughout the module, maintained their interest in the course content and motivated them to study. Many of them commented on the fact that they felt it would be a lot easier to revise for the final examination for this module than for others that did not use class tests. It is interesting to note that a few suggested that the other modules should actually make more use of class tests.

From my point of view, the correcting of class tests can be time-consuming. This could prove problematic for large classes. Fortunately, to date, my average class size is approximately 18. For larger classes, there is the possibility of using multiple-choice class tests to ease the problem of correction, but I find that these cannot satisfactorily examine problems where the solution methodology is more important than the final answer.

Multiple class tests are clearly time-consuming for students and may also sometimes detract from the students' studies in other modules, a fact noted by some of the students themselves. While I feel that part of this is directly related to poor time management by some of the students, a lot of time is, nevertheless, spent in studying for the class tests. This assessment procedure would likely prove too stressful on the students if every module had four or five class tests, especially in final year where the course material is significantly more challenging.

Class tests allow for more detailed questions on each section of the notes. Furthermore, they act as a self-assessment for the students, allowing them to monitor their own progress. It also allows them to see how they are doing in relation to the rest of the class, as the average of each test is always available. Black *et al.* (2004) provide an interesting discussion on feedback through grading.

Finally, class tests also serve to provide the lecturer with a relatively accurate representation of the difficulties a student and, indeed, a class are having with relation to a particular section of the notes. These issues can easily be addressed before it is too late, i.e., after the final examination, thus allowing for an improved overall learning experience for the student.

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Case 10

Teaching Portfolio

Contributor	Roisin Donnelly
Email	Roisin.Donnelly@dit.ie
Telephone	+353-1-402-7886
Affiliation	The Learning and Teaching Centre, Dublin Institute of Technology, 14 Upper Mount Street, Dublin 2, Ireland.

10.1 Context

The *Teaching Portfolio* is the assessment for the Postgraduate Certificate in Third Level Learning and Teaching, and is located in the Faculty of Academic Affairs in the Dublin Institute of Technology (DIT).

This certificate is aimed at new and existing academic staff in higher education (3^{rd} level) institutions in the Republic of Ireland, including lecturers, librarians, and academic support staff. The latter two have responsibility for teaching in their areas. Initially offered in 2000, this postgraduate certificate is continuing apace today with over 90 academic staff having successfully graduated from the programme to date.

The teachers, from a number of higher education institutions throughout the Republic of Ireland, represent a wide variety of subject disciplines in Applied Arts, Science, Tourism and Food, Engineering, the Built Environment and Business. In addition, the teachers are also varied in their teaching background, ranging from apprenticeship courses to undergraduate and postgraduate degrees.

The aim of portfolio assessment is to give the programme participants an ideal source from which to view their own teaching philosophy, practice, effectiveness, goals and development.

10.2 Learning Outcomes being Assessed

There are two modules on the certificate programme. Module 1, entitled *Learning and Teaching in Higher Education*, aims to provide teachers in higher education with a wide

range of practical learning and teaching methods including the use of relevant learning technologies that will help their students learn more effectively. The teachers will gain solid background knowledge in recognised theories and national and international best practices in learning and teaching in higher education so that they will understand the reasons for choosing certain teaching strategies.

In addition, the following specific areas are salient for new teachers:

- identifying learning needs of individuals and groups;
- demonstrating the application of principles of equal opportunities and social inclusion in their own teaching practice;
- analysing teaching experiences through research about learning in their own courses and through student feedback;
- evaluating effective learning and teaching through self, peer and tutor observation of teaching;
- effectively participating in special interest groups and networks in third level learning and teaching;
- identifying specific areas of interest in learning and teaching for further study and professional development; and
- all the above is to be realised through the compilation of a teaching portfolio based on an experiential model of learning.

Module 2, entitled *Developing Curricula and Assessment Strategies,* aims to facilitate lecturers to take a competent and proactive role in the development of high quality curricula in their own 3rd level contexts. This module will enable the participants to creatively explore and apply a range of ideas in the design of curricula and assessment strategies.

A number of key areas have been identified for learning:

- developing personal critical philosophies of curriculum development including the application of equal opportunity and social inclusion principles;
- identifying educational needs of target student groups and developing curricula of appropriate types and suitable levels accordingly;
- creatively applying a range of curriculum development models showing cognizance of national and international debates;
- demonstrating a critical understanding of a wide range of assessment strategies and mechanisms;
- selecting, applying and evaluating appropriate learning technologies to support curriculum design and assessment;
- applying an appropriate evaluation strategy for curriculum design and assessment for the participants' own specific contexts.

10.3 Assessment Procedures/Details

A number of formative feedback opportunities are built into each module. The participants are divided into groups of no more than six to seven and are allocated a tutor to provide portfolio support. In the tutorial groups, all of the participants are offered the opportunity to avail of written formative assessment by a tutor on submitted draft work partway through each module. To ensure the consistency of feedback, a formative feedback form has been devised and distributed to all of the tutors. Alongside this, work-in-progress seminars are built into the module timetable to allow the participants the opportunity to share and discuss their portfolio entries with each other and the tutor.

It is pointed out to the participants, from the outset, that it is useful to remember that *time* is an important element in teaching portfolio development and that it *should* be a time-intensive process. Meaningful collections of work cannot be put together all at once: reflection and review should make the portfolio development an iterative process. The participants are told that they may find themselves re-visiting aspects of their portfolio throughout the entire development period and that there is no single, correct recipe for preparing a teaching portfolio. Since a portfolio is a highly personalised product, no two are exactly alike. However, a guidelines booklet on the development process, alongside web course tools (WebCT) support, and a set of clearly defined assessment criteria are available to ensure that the process is clear and the product is assessable.

At the close of each module, the portfolios are summatively assessed as Pass/Fail on a number of criteria:

- organisation and planning
- implementation, development and innovation
- evaluation and reflection
- scholarship
- presentation

An overall assessment comment is included to ensure that, through the development of the portfolio, the participant has met the learning outcomes for that module. A decision on this is taken based on an overall piece of critical reflective writing provided to make a case that the participant has successfully met all of the module's learning outcomes. To help the participants structure that piece of writing, it is suggested that they relate their analysis to the module learning outcomes by taking each module learning outcome and exploring it from the perspective of what and how they have implemented it in their own classroom practice. When this process is completed, the participants use their responses to write an analysis of their overall learning from the module and state how the experiences have influenced how they think about their teaching and whether it has led to changes within their overall practice.

10.4 Strengths and Limitations

10.4.1 Strengths

Undergoing the portfolio development process provides the course participants with distinct benefits; it captures the complexities of the participants' actual teaching and matches assessment to the teaching style of the module. The process of portfolio development has clear goals, which are decided at the beginning of the module and are clear to both tutors and participants. The aim of portfolio development is to promote new conversations about teaching in the institutions represented in Ireland and it has the potential to create a culture in which *thoughtful discourse* about teaching becomes the norm.

Portfolio development:

- provides concrete evidence of teaching over time, documenting the development or *unfolding of expertise* in teaching;
- gives a profile of the participants' abilities in terms of:
  - *depth*: it enables participants to show quality work, that is done with the help of resources, reference material and collaboration with others;
  - *breadth:* it allows a wide range of skills to be demonstrated;
  - *growth:* it shows efforts to improve and develop and demonstrates progress over time;
- is a tool for assessing a variety of skills: written, oral and graphic products can easily be included;
- develops awareness of one's own learning; the participants have to reflect on their own progress and the quality of work in relation to known goals;
- caters to individuals in the heterogeneous class;
- since it is open-ended, the participants can show work on their own level;
- as there is a choice, it caters to different learning styles and allows the expression of different strengths;
- develops independent and active learners: the participants must select and justify portfolio choices, monitor progress and set learning goals.

10.4.2 Limitations

- Encouraging reflective writing amongst participants can be challenging, alongside ensuring that adequate support is provided in the area of academic writing.

10.5 Contributor's Reflections on the Assessment

The teaching portfolio has been used as the assessment mechanism for the Postgraduate Certificate in 3rd Level Learning and Teaching for over five years. During that time, bi-annual formal evaluations have been conducted, the results of which have been transmitted back to the programme participants. The evaluations included collecting data about the portfolio as a form of assessment. A number of lessons have been learned by the course team:

- Regular discussions take place on the need for deeper personal reflection and in the provision of evidence of theory influencing their own practice.
- It is strongly emphasised that there is need for greater detail of what is going on in their own classroom practice, and how it has been informed by the course.
- In this postgraduate certificate, individual participants develop their own teaching portfolios, but in the process of doing so, they are actively engaged in a community of peers and course tutors as co-learners in this process. They participate in the portfolio process as a cohort, beginning their work in September and handing in their portfolios in May of that academic year. The formation of such a community of respect among the participants is critical to creating an environment for successful reflection and for successful learning and teaching.

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Case 11

Multiple Approaches to Reflection as a Key Component of Assessment

Contributors	Justin Rami John Lalor Dr. Gerry McNamara
Email	justin.rami@dcu.ie
Telephone	+353-1-700-7701
Affiliation	School of Education Studies, Faculty of Humanities and Social Sciences, Dublin City University (DCU), Glasnevin, Dublin 9, Ireland.

11.1 Context

The School of Education Studies, which is located within the Faculty of Humanities and Social Sciences at Dublin City University (DCU), offers a number of programmes at under-graduate and post-graduate level. This case study examines one element related to assessment and professional development of teachers and trainers within the School. The *BSc in Education and Training* is offered on a part-time or full-time basis for those interested in training or entering the field of Vocational Education and Training with particular emphasis on Adult education. The part-time course is designed for those who wish to develop knowledge and skills in the field of Education and Training, theory and practice and for those who wish to pursue a career in teaching/training in Adult and Vocational Education and Training or in private or public sector training.

The programme offers modules in the following areas: Curriculum studies; Teaching, Group Work and Presentation Skills; Information and Communications Technologies; Communication Skills; Facilitating Adult Learning; Citizenship, Values and Multiculturalism in Education and Training; Experiential and Work-Based Learning; Teaching/Training Practice and Microteaching.

11.2 Learning Outcomes being Assessed

Due to the fact that many of the learners on this programme are already engaged in part-time teaching and training, one of the programmes' primary aims is to encourage a process of reflection-on-practice. Freire (1986) said *'action without reflection is mere activism and reflection without action is mere verbalism'*. This is achieved by linking the students' experiences to the conceptual frameworks provided by the programme and by relating this insight to their workplace.

This case study focuses on the learning outcomes of two separate modules within the programme: *Supervised Work-Based Practice* (*SWBP*) and *Microteaching*. Using *'constructive alignment'* (Biggs, 1996), the assessors are interested in the students not only having an understanding of the skills and knowledge required as a teacher/trainer but also the 'higher order elements' leading to a deep understanding of themselves and the environment they are working in. The emphasis on *'reflection'* is crucial to the assessment as the School aims to produce students who are not only *knowledgeable* but *competent*.

On the completion of these related modules the learners will be able to:

- Plan, implement and evaluate a broad range of generic teaching and facilitation skills in both the laboratory and the learning centre environment.
- Engage in peer based critical reflection on the process of skill development and implementation.
- Observe and describe the key interactions in a range of learning situations.
- Understand and explain the link between laboratory skills practice and learning episode implementation.
- Demonstrate in the work-based or simulated practice situation a high level of competence in planning, implementing, assessing and evaluating their teaching/facilitation of learners.
- Work collaboratively to practice and evaluate specific competencies.

11.3 Assessment Procedures/Details

The practical ways in which reflective practice is featured in assessment contexts can be found in the School's Teaching Practice Module: SWBP (Supervised Work Based Practice). Here, the students are placed in an educational/training setting where they practice and implement a range of teaching, facilitation and evaluation strategies. The module allows the students to engage in a substantial period of guided and self-guided work-based teaching practice.

As part of the assessment of the module, the students engage in *peer-based critical reflection* on the process. They also observe and describe the key interactions in a learning situation. By engaging in this process, the students' understanding of the link between

skills practice and classroom implementation is developed. The students' understanding of their own approaches to assessment in educational settings is also developed through implementation, practice and *reflection*.

The student is offered other opportunities to engage in *personal reflection.* One such method is a written assignment, which recounts the students' experiences of and *reflections* on their supervised teaching programme. In addition, and running concurrently throughout the module, the student engages with a Virtual Learning Environment (VLE), which is hosted by the University. Here, the student *reflects* online on his/her teaching practice experiences with his/her peers. The module coordinator and the external examiners can also access this dialogue. These *reflections* allow the student to access support and guidance throughout the process and gain a deeper understanding of themselves as practitioners.

The complete SWBP Process is summarised in Table 11.1.

Another example of *reflective practice* in the assessment methods used by the School in its modules can be found in the Microteaching module. This involves two students, working as a team, to deliver a series of short lessons over a semester, in an authentic or simulated learning environment, to a number of their peers using a range of teaching strategies and resources. This process is digitally recorded and then critically analysed by an external teaching expert and the student pair. This process is peer-reviewed by the student teachers and their student group under the supervision of the teaching expert, once again, using DCU's VLE called Moodle. The peer review occurs at the end of each teaching episode with the learning and amendments to the students' practice implemented in the following week's teaching. It is this process of reflecting on action that is crucial to the student learning. This element of the assessment ensures that the student is involved in a continuous cycle of learning, doing, *reflecting*, amending and re-planning. This cycle ensures that the students are given the skills to continually *reflect* on and improve their practice as teachers. The students also *reflect* individually on their Microteaching experiences in an end of module essay, which is also posted on the VLE to seek further peer comments.

An outline of the assessment approaches in the Microteaching module is given in Table 11.2.

Table 11.1: SWBP Process

Student Activity	**Assessment Process**
1. Student Teacher delivers first observed lesson in Educational/ Training environment. This lesson takes place in the early stages of a twelve week teaching block that the student delivers in the Education/ Training environment.	1. First visiting Teaching/Training expert from University observes lesson and after the lesson meets with the student teacher to discuss with the student and agree on areas of achievement and areas for development in their teaching practice.
2. Student delivers second observed lesson. This lesson usually takes place towards the end of the twelve week block.	2. Second visiting Teaching/Training expert from University observes lesson and after the lesson meets with the student teacher to discuss with the student and agree on areas of achievement and areas for development in their teaching practice. The visiting experts then meet to discuss the student's teaching practice and to agree on a mark for this element of the assessment.
3. Throughout the teaching block the student teacher uses the Virtual Learning Environment in DCU called *Moodle* to reflect online on their teaching practice experiences and learning.	3. This online environment is accessed by the student teacher's peers and course co-ordinator. This forum facilitates ongoing guidance and support from three perspectives: • the student's own reflections; • the student's fellow trainee teacher/trainers; and • the course co-ordinator.
4. The student completes an individual written assignment which reflects on their experiences of, and learning from, their teaching/training.	4. The written assignment is corrected and marked by the course co-ordinator.

Table 11.2: Reflection within the Microteaching Process

Student Activity	**Assessment Process**
1. Student teaching pair delivers a short 10 minute session to a small group of their peers. They practice a specific teaching skill or set of skills.	1. This process is video-taped by the students. The teaching pair views the video tape and reflects on the specific element(s) of their teaching practice with a teaching/training expert using a specially designed assessment sheet.
2. Student teaching pair delivers a second short 10 minute session to a small group of their peers. They practice another specific teaching skill or set of skills. This process is repeated over the course of the semester.	2. This process is again video-taped by the students. The teaching pair views the video tape and reflects on the specific element(s) of their teaching practice with a teaching/training expert using a specially designed assessment sheet.
3. Towards the end of the semester, the student pair delivers a lesson to their peers which incorporates all of the teaching skills they have been using up to this point.	3. The video-tape of this session is viewed and reflected on by the teaching pair and their peers using the same assessment sheet.
4. The students complete a written assignment which reflects on their microteaching experiences and understandings.	4. This assignment is corrected and marked by the teaching/training expert. The entire process allows the student to implement teaching strategies in a controlled environment, to reflect on their practice with the support of their peers and supervisors and to analyse and reflect on their experiences in a written assignment.

11.4 Strengths and Limitations

11.4.1 Strengths

The constant reiteration of the philosophy and practice of continuous *reflection* in the examples outlined above ensures that the student is engaged in a detailed, continuous examination of their own practice. The student is encouraged to find and develop the links between practice and theory through this cyclical process. This mechanism allows the student to firmly focus on the relationships that exist between all elements of the teaching and learning process, which, in turn, emphasises the primacy of the relationship between assessment and learning.

11.4.2 Limitations

As the School continues to grow it may not be possible to have as many direct reflective feedback meetings with peers or tutors. Visits by tutors and supervisors to workplaces can also be financially restrictive. However with the introduction of VLEs this, perhaps, is the way forward, as it is an inexpensive and accessible forum that does not require students or supervisors to be *in situ*.

11.5 Contributor's Reflections on the Assessment

Reflection, as part of assessment in higher education, is not new. Kolb (1984) identified reflection as playing a key role in experiential learning. Added to this, Schön (1983) argued that reflection is necessary for practitioners to improve professional judgements and understanding of new situations. Within the experiential learning model, according to Brown and Knight (1994), feedback as part of the reflection process can also be an excellent motivator to promote the student's engagement with a task or assignment. Clearly, the experience of reflection in assessment is beneficial to the students. They learn about the complexities of action, reflection and improving their own practice and begin to comprehend the relationship between theory and the nuances of their own real life experiences guided by feelings and emotions (Boud *et al.*, 1985). To ensure that the assessment is valid and reliable, a multiplicity of methods approach is used. In educational settings, especially in the area of vocational and interdisciplinary courses, adopting a multiplicity of assessments can result in a more accurate picture of student achievement. By combining multiple observers, methods, and empirical materials, educators and assessors can hope to overcome the weaknesses, inherent biases and problems that may be contained within single method, single-observer assessment techniques. Using a multiplicity of methods is a form of triangulation and, within assessment, it may become an alternative to traditional vocabulary, such as, reliability and validity.

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Case 12

Learning to Do by Doing: Understanding Observation Methods through Participation

Contributor	Dr. Crystal Fulton
Email	Crystal.Fulton@ucd.ie
Telephone	+353-1-716-7593
Affiliation	UCD School of Information & Library Studies (SILS), University College Dublin, Belfield, Dublin 4, Ireland.

12.1 Context

Librarians and Information Seeking in the 21st Century Workplace is an advanced seminar module, open to postgraduate and 3rd year students and offered through the University College Dublin (UCD) School of Information and Library Studies. The module trains librarians and information professionals to understand and, thereby, to act as intermediaries in the information worlds of a variety of work groups, in particular, professionals, such as, medical professionals, engineers, lawyers, etc., who work in both traditional and flexible work environments. The students explore theories of information behaviour and landmark and current information behaviour research and then apply this knowledge to information services in different work contexts and to their research into the information behaviour of these groups. By understanding the information behaviour of a given clientele, information professionals are better prepared to respond to the information needs of that group.

The main teaching and learning method involves seminar meetings, which are discussion-based, with the students and the instructor reading widely and then meeting to explore the readings together. The assessment for the module involves a first-hand, small piece of research where the student implements an observation method, as explored in class and in readings, with a particular group. The students are expected

to frame their observational research in one or more theories of information behaviour from the field of Library and Information Science. The project prepares students to explore the information behaviour of a group, so that they can implement a similar exploration in the workplace in such activities as needs assessments of clientele.

12.2 Learning Outcomes being Assessed

Whether students continue their studies as a researcher or enter the workforce as an information professional, they will, at some point, find themselves conducting research firsthand. The purpose of this assignment is to provide students with the opportunity to explore the information behaviour of a particular group in an alternative workplace or information environment and to analyze that information behaviour using theoretical frameworks from the field of Library and Information Science, fulfilling the following learning outcomes for the overall module:

- apply models of information seeking behaviour of professionals to a variety of work contexts;
- analyse methodological approaches to information behaviour research in various work contexts;
- actualize a research exploration into the information behaviour of a group;
- identify critical information issues for particular groups of professionals; and
- identify and implement best practices for information service for professionals working in different work environments.

12.3 Assessment Procedures/Details

12.3.1 Class preparation for the assessment

In preparation for the assessment, the students read about observation and discuss these readings together in class. Different forms and approaches to observation as a research method are reviewed (e.g., unobtrusive observation, participant observation); the students identify and evaluate the advantages and disadvantages of each approach. The students then put the lesson into practice. The instructor and the students, as a group, enter a predetermined space and try out their observational skills together and as individuals. After this practice session, the class meets to review lessons learned from the field and to consider best practices for observation on theoretical and practical levels. As the assessment continues and the students move to the individual assessment phase (outlined below), the assessment is discussed periodically in class to review their progress. This discussion allows the instructor to assist individuals and encourages the students to share their experiences with each other.

12.3.2 Individual assessment

Students are given the following instructions to complete the assignment:

> **Assessment instructions**
>
> Select a theory or framework for study from the module text: *Theories of Information Behavior*. Eds. K.E. Fisher, S. Erdelez, and E.F. McKechnie. ASIS&T Monograph Series. Medford, N.J.: Information Today, Inc., 2005.
>
> Select a user group and a context in which to study this group, e.g., staff in a hospital waiting room, lawyers in a courtroom, taxi drivers, dog racers, delivery people on bicycles, etc. Be creative!
>
> Using your selected means of observation, visit your user group in context and explore their information behaviour. Be sure to read about the different means of observing people and plan your approach carefully before you enter the field. Observation for this project may be conducted in one or multiple visits, but the overall observation time must be at least six hours long.
>
> Write a research report in which you address the following questions:
>
> - Define the user group you observed.
> - Describe the information behaviour of your group, including unique information seeking patterns, information uses, interactions with others, etc.
> - Explain how the theory/framework you have chosen applies/does not apply to your group. Compare and contrast the applicability of this theory/framework to your group's behaviour with other approaches to understanding information behaviour.
>
> **Structure of final report** Your finished report should take the form of a formal research report (maximum 20 pages, 1" margins, 12pt font, typed, double spaced), including title page, references, and appendices.
>
> **Oral presentation of research** Each person will have 10 minutes in the final class to present her/his research project to the class. No overheads are necessary; however, you should consider this a "Research Forum," in which other researchers will comment on your approach and findings.
>
> **Grading** 80% Written Report; 20% Presentation of Research Project.

12.4 Strengths and Limitations

12.4.1 Strengths

The assessment transcends the traditional essay. First-hand observation enables the students to participate actively in their learning and to deepen their commitment as

stakeholders in their education and research activities. Implementing observation techniques enables the students to put ideas about theory and methodologies into practice. The assessment provides opportunities for continuous informal and formal feedback throughout the learning process. Learned research skills help to build a foundation for the students' ongoing thesis research in our programme, as well as, for research work after graduation. Students, in particular those enrolled in programmes with a thesis component, are encouraged to consider the assessment as a pilot or exploratory piece of research for a thesis project.

12.4.2 Limitations

This is a time-intensive assessment, which works best with small groups. That is not to say that the assessment cannot work in larger classes; however, some reorganization is necessary with larger classes. For example, larger classes might be broken into small groups that may then co-ordinate their research work and report back to the class.

12.5 Contributor's Reflections on the Assessment

12.5.1 Student reactions

Students have responded very positively and enthusiastically to this assessment. They have found the assessment exciting, because it offered them a change from the traditional essay-style assessment. By enabling students to take an active role in their learning, they have taken control of their learning. Their first-hand experience with observational techniques has enabled them to identify applications for this research approach in their future work.

12.5.2 Transferring to other contexts

This form of assessment is likely to work well in a variety of other educational contexts, including sociology, medicine, natural science, education, etc., wherever observation is an important part of research and professional training. This assessment will not only help researchers to use observation techniques, but will also help prepare professionals to provide better service in their workplaces through improved observational skills.

12.5.3 Advice to instructors

Success with this assessment depends on treating the assessment as part of the wider learning process in a given module. It is essential to prepare the students with an understanding of observation, techniques, ethical considerations, and data collection and analysis before the assessment begins and on an ongoing basis throughout the assessment. Critically, the students must feel confident to explore and to learn by doing. As a result, ongoing discussion of the observations completed, challenges encountered, and data gathered are all essential to encouraging the students to continue to achieve to their maximum potential throughout the exercise.

12.5.4 Validity/reliability issues

Using a hands-on approach to understanding a research approach reinforced the students' learning. By offering the students the opportunity to put classroom learning into action, the students gained confidence and were empowered to conduct their own research. The learning in this assessment promises to have a far-reaching impact, laying a strong foundation for students' future research work in our school's programme and in their own future research endeavours.

12.5.5 Resource implications

The main requirement for this assessment is time. Instructors should plan adequate time to discuss observation as a group before the class embarks on the assessment, but also time to touch base with students as they progress through the process of collecting observational data and analyzing their findings. The assessment requires a few texts. A sample list is provided below; however, this list could be lengthened or modified to suit the specific needs of a particular discipline (e.g., Fisher *et al*. might be replaced with another text related to a given discipline).

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Case 13

Using Peer and Self-assessment Practices to Assess Written Tasks

Contributor	Rosario Hernández
Email	charo.hernandez@ucd.ie
Telephone	+353-1-716-8283
Affiliation	School of Languages, Literatures and Film, Hispanic Studies, University College Dublin, Newman Building, Belfield, Dublin 4, Ireland.

13.1 Context

This case study has been undertaken with a group of students participating in a semester-long module, a total of 24 teaching hours, at University College Dublin. *Expresión Escrita* is a final-year, level-3 undergraduate option module offered to students of Hispanic Studies. The number of students taking this module is limited to 20.

The overall aim of this module is to develop the learners' communicative competence in writing Spanish. The teaching methodology adopted promotes the students' participation in class, and the teacher is perceived as a facilitator of learning. Four specific learning tasks form the basis to attain the overall aim of the module: written activities, a learning journal, a written portfolio and a written examination.

13.2 Learning Outcomes being Assessed

On successful completion of this module the participants should be able to:

1. demonstrate their familiarity with and application of the writing process, in terms of planning, elaboration and revision;

2. produce a variety of texts written in Spanish;

3. use appropriately and correctly a writing style that incorporates a range of vocabulary and complex linguistic structures;

4. engage in self- and peer-assessment of writing activities;

5. reflect on their learning process; and

6. have greater confidence in their ability to write in Spanish.

The case study presented here refers particularly to outcomes 4 and 5 stated above. It focuses on the assessment of a written task previously produced, by the students, as an answer to a fictitious writing competition for young writers. The assessment process requires students to:

- get involved in the development of assessment criteria;
- work co-operatively and negotiate among themselves;
- apply the agreed criteria to assess the work of their peers; and
- reflect about their learning.

13.3 Assessment Procedures/Details

The class is divided into groups of 4–5 students and each group is given the task of agreeing on the characteristics that they consider important in a short story. All groups report on their decisions and a list of characteristics supported by the whole class becomes the criteria that will be adopted to assess the written short stories they had previously produced. The teacher makes sure that essential characteristics are not missing.

Once the criteria are agreed, each student—still in groups of 4–5—is given an anonymous story to read, written by one of their peers. It is important to ensure that the groups receive stories written by other members of the class. The students' task is to read the 4–5 stories individually and decide, as a group, which one would obtain the prize for the best short story, as previously advertised. In a further review of the short stories, the story selected by each group is read by all of the students in order to agree on the overall winner.

The peer assessment exercise is followed by a linguistic activity based on the stories written by each learner. The teacher had previously photocopied the students' assignments and written feedback is provided to each student indicating both the strengths and limitations of the text written by the students. Inaccuracies, particularly in relation to linguistic features, are pointed out to the learners with suggestions on how to improve their texts. It is essential to provide them with constructive feedback that motivates them to improve their learning.

The writing experience concludes with a self-assessment task: a reflective entry in the student's learning journal based on the effect that the peer assessment task had on his/her learning process. This takes place outside of the classroom environment. Writing a reflective journal forms part of the tasks that characterise this module. Therefore, the students are already familiar with the criteria applied in the assessment of this learning instrument.

13.4 Strengths and Limitations

13.4.1 Strengths

- The first strength of this assessment exercise is that learners are involved in the development of the assessment criteria that will be applied to assess their written assignment (Jordan, 1999). Negotiation among the students generally helps them to internalise the criteria, and to become aware of their features.

- The peer assessment exercise is non-threatening because the names of the students have been removed from the assignments. Anonymity is also ensured by the fact that the assignments are all typed. Handwritten texts would provide clues as to the authors. The negotiation that students engage in tends to be quite sincere as they are not afraid to comment on anonymous assignments.

- The self-assessment reflection allows the learners to compare the standards achieved by the other learners against their own work (Cassany, 1999; Race *et al.*, 2005). It usually allows them to assess aspects of their work, such as, the range of vocabulary, originality, structure, etc., and to incorporate that reflection in producing a written text that incorporates the aspects being raised in their reflection.

13.4.2 Limitations

- The most obvious limitation of this type of assessment is the difficulty of implementing it with a large group of students, as the process of developing criteria may take too much time.

- Another limitation arises if the linguistic ability of learners in the group varies significantly. The weaker students usually need the support of the teacher to deal with their grammatical inaccuracies, in order to solve their problems. To benefit from the peer assessment exercise, a close look at the text between the students and the teacher may be necessary in order to address linguistic issues. This limitation does not apply to other disciplines where English is the language employed.

13.5 Contributor's Reflections on the Assessment

The involvement of learners in peer- and self-assessment practices can be adopted in many educational contexts where assessment is mainly of a formative nature. It is an excellent way to provide feedback that becomes feedforward, i.e., when learners have to act o the feedback received to improve their work (Brew, 1999). This type of formative assessment has a positive effect in summative assessment because learners are able to apply what they have previously learnt (Brown *et al.*, 1997). More importantly, peer- and self-assessment practices contribute to the enhancement of student learning regarding the development of life-long skills, meta-cognitive competencies or affective abilities (Brew, 1999; Topping, 2003). The following excerpts from the students'

journals (translated from Spanish into English by the teacher) are an indication of the above.

> The peer assessment exercise made me think about the work of literary critics and about how they judge writers' work ...
>
> I can transfer what I have learnt to other situations outside the university.
>
> I found the peer assessment exercise very interesting. I realised that John and myself had developed the action of our stories in New York, however both stories were very different.
>
> Learning and assessment have taken place in a very relaxed atmosphere.
>
> Now I am conscious about what I write, and about the readers of what I write.
>
> I was happy with the story I wrote. I did not make many mistakes and I think that my story was funny, original and it maintained the readers' interest. I also managed to achieve a good structure and style. There was one mistake that I did not understand. The teacher explained it to me and now I understand it.
>
> Now I feel more confident about my ability to write and speak in Spanish

The case study presented here focuses on assessment for learning so that students can apply what they have learnt to another writing task, and to other activities outside of the university environment.

Above all, it is important to build trust among students and between the teacher and the learners to be able to create a relaxed atmosphere where collaborative learning and peer assessment can take place.

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Case 14

Reflection as a Method of Assessment in Paediatric Palliative Care Education

Contributor	Jayne Price and Patricia McNeilly
Email	j.price@qub.ac.uk
Telephone	+44-2890-975-806
Affiliation	Queen's University of Belfast, 97 Lisburn Road, Belfast BT97BL, Northern Ireland.

14.1 Context

Northern Ireland, like many countries, is facing a time of change and reform in relation to patterns of healthcare delivery, technological advancement, changes in public health and demographics coupled with the rising expectation of patients and their families (NIPEC, 2004). Such radical change has a major impact not only on those delivering the care, but also on educational providers who offer continuing educational opportunities for practitioners. Paediatric Palliative Care has evolved as a small, but distinct specialty locally, nationally, and internationally in recent years (Price *et al.*, 2005). Cooley *et al.* (2000) highlighted that the key to future developments within the specialty, would be the importance of expatiating on the training and educational needs of professionals caring for these children and their families.

Last year, Queen's University of Belfast (QUB) responded to the needs of practitioners working within the field of children's palliative care in the province, by introducing the first multi-professional palliative care programme in Ireland. The programme was evaluated extremely positively and has developed and expanded in terms of numbers of students this year

This submission presents the first model of reflection for paediatric palliative care, which has been constructed and introduced by the course coordinators as a learning and teaching strategy and also as a framework for the assessment process inherent in the first module of this 2-modular programme. Its conception came about due to a lack of certain key areas relevant to the unique specialty of Paediatric Palliative Care in the numerous useful models of reflection that abound within the literature. Input into the

design of the model also involved a clinician who was working within this specialty ensuring that theory and practice were integrated in a collaborative approach.

Given the evolving nature of palliative care services for children and the need for an increased evidence base to underpin this practice, the demonstration of the students' (and, indeed, the practitioners') ability to reflect on their practice and to think critically has never been more important. There is also pressure within nursing education to employ assessment strategies, which the students can use in their practice (Knight, 2002). It is vital that assessments within educational programmes foster such critical thinking and drive student learning in a positive, comprehensive manner, if outcomes for children and their families are to continue to be improved. One way of achieving this is to utilize the process of reflection within the assessment strategy of educational programmes, which we illustrate here highlighting the success of linking theory and practice effectively.

14.2 Learning Outcomes being Assessed

The assessment process has been designed to address the overall aim of the module, i.e., to develop the student's knowledge to improve quality care. The following sections present the aims and objectives of the module.

14.2.1 Aim

To develop the student's existing knowledge of child and family centred palliative care in order that quality of care is improved for the children/young people and their families wherever they are cared for.

14.2.2 Module Objectives

At the end of this module the student will be able to:

- critically discuss the principles of palliative care for life-limited children and their families;
- critically discuss the psychological, social and spiritual needs of the child and his/her family and how these may best be met;
- establish the importance of multi-professional/interagency working and effective communication when dealing with such children and their families;
- identify ethical, legal and professional implications of caring for life-limited or life-threatened children and their families.

14.3 Assessment Procedures/Details

The students in the QUB Paediatric Palliative Care Programme are required to submit a written reflection of an incident or issue arising when delivering care to a child

and his/her family requiring a palliative approach to care. The written assignment for level-2 is 2,000 words and 3,000 words at level-3. The Model of Reflection for Paediatric Palliative Care is a narrative tool that provides a framework for the students' thought process, exploring specific issues whilst encouraging professional and personal development (see Appendix A: Model of Reflection for Children's Palliative Care).

The aim of the model is to guide paediatric palliative care professionals across the multi-professional interface to reflect on their experiences of caring for life-limited children and their families, in order to advance the provision of quality care. The model centres on the uniqueness of each individual child and his/her family and comprises of a series of phases, including a preliminary and post-reflection phase and also requires the practitioner to examine additional elements, specifically, socio-economic influences and cultural/spiritual/ethical issues (McNeilly *et al.*, 2006).

Students present their reflection in a seminar, thus, sharing their experiences with their student cohort. Much rich discussion follows, which enhances and widens the students' learning. Feedback from the course team is given following the seminar presentation and also with the written submission.

14.4 Strengths and Limitations

14.4.1 Strengths

- Enhances the use of critical incidents by providing specific direction in terms of the relevant speciality using an innovative tool.
- Using reflection aided the students to examine practice and learn from this for future care interventions both personally and professionally.
- This model, as well as being efficacious in assessment of educational activities, has been used locally for personal reflection or team debriefing in practice.
- Moreover, used effectively, it can provide one means of ensuring that the best possible care is available for children and families requiring a palliative care approach through the integration of education and practice.

14.4.2 Limitations

- One limitation is that this field of practice, while rapidly expanding, is a very specific area of expertise. The authors anticipate, however, that such an approach may be readily adapted for other disciplines.

14.5 Contributor's Reflections on the Assessment

As the field of children's palliative care continues to advance and develop, educationalists and practitioners are required to collaborate in order that dynamic innovative educational programmes challenge the health care professionals to develop their knowledge and skills, thus aiding them to develop their knowledge and ability to critically

appraise and to enhance the care they deliver. The assessment process in this programme aims to achieve this and we believe that the newly devised model of reflection guides the student to examine and analyse areas of practice pertinent to the field in which they work, promoting problem solving, as well as personal and professional development.

While other models of reflection in the literature are useful, they are very generalist and non-specific, whereas, this model is specific to the holistic and varying needs of the child and family requiring a palliative approach to care. This model is unique and guides the student's thought processes on the very specific issues inherent in children's palliative care; it gives the students focus and challenges their practice, fostering deep learning. The external examiner commended the assignments as showing sensitivity, maturity and clear development, which was aided by the use of this comprehensive and all embracing model of reflection. This model adds to the limited evidence-base underpinning practice in this arena, links theory to practice, demonstrates collaborative working, using an assessment strategy that can be used by professionals, promotes an ethos of lifelong learning and ultimately, improves quality care packages for the child and family.

14.6 Bibliography

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Appendix A: Model of Reflection for Children's Palliative Care

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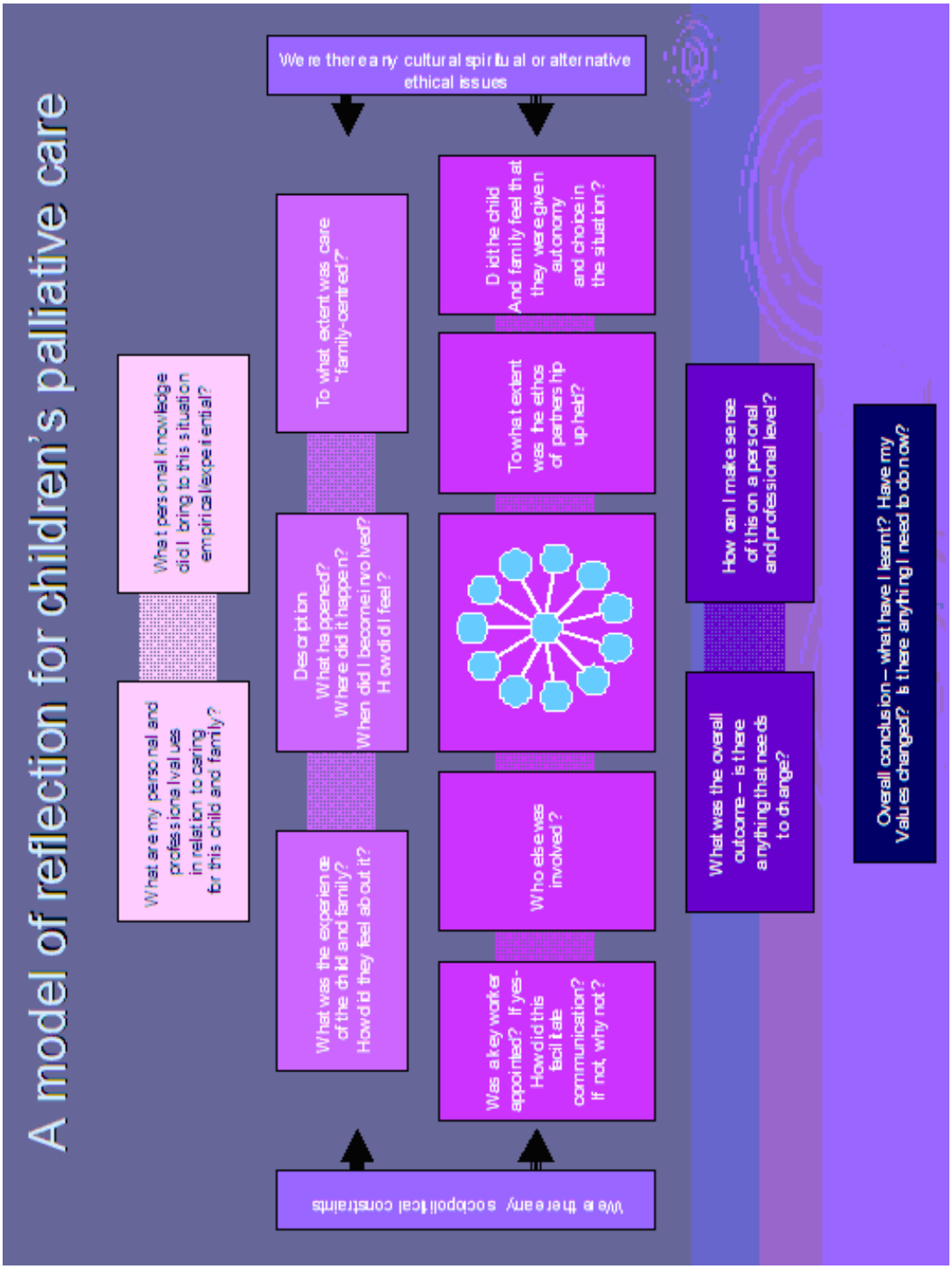

Case 15

Creative Methods and Critical Reflection

Contributor	Paul McIntosh
Email	paulmcintosh@suffolk.ac.uk
Telephone	+44-1473-296-612
Affiliation	School of Interprofessional Studies, Faculty of Health, Wellbeing and Science, Suffolk College, Rope Walk, Ipswich, Suffolk IP 1LT, England.

Contributor	Claire Webb
Affiliation	School of Radiography, Faculty of Health, Wellbeing and Science, Suffolk College, Rope Walk, Ipswich, Suffolk IP 1LT, England.

Contributor	Paul Keenan
Email	paul.keenan@tcd.ie
Affiliation	School of Nursing and Midwifery, Trinity College Dublin, Ireland.

15.1 Context

In September 2004, Suffolk College introduced a Postgraduate Certificate (PGC) / Postgraduate Diploma (PGD) / Master of Arts (MA) in Interprofessional Health Care Education. It was felt that this programme, aimed at people from a wide range of professional disciplines in the health services within the United Kingdom (UK) who have an

educational role, required a balance in its modular format between the need to develop teaching, learning and assessment skills and reflective practice. As a result, the module, *Reflexivity in Professional Practice,* was developed, and this sits between two other modules within the PGC element of the programme: one developed around teaching and learning and the management of the learning environment, the other around assessment. The focus of this case study is on the *Reflexivity in Professional Practice* module and the assessment process.

Underpinning this module is the premise that practitioners often sleepwalk their way through the working day. Practice itself becomes mechanistic, but so also does the use of reflective models designed to facilitate a deeper understanding both of self and the situations practitioners find themselves in. In this view, the models themselves become reductionist, facilitating mainly superficial description. The *Reflexivity in Professional Practice* module seeks to take a more creative approach in its content, delivery, and assessment that focuses on reflection as a self-realising process, utilising the literary and visual arts as a means to this expression. Broadly speaking, the learning and assessment methods fall within a psychoanalytical domain, particularly the ideas of Carl Jung (2005) in relation to the development and interpretation of images as part of this self-realisation process, and the concept of 'Practitioner Researcher' (Fish, 1998) was used to refine these ideas within the context of health and social care.

The content of the module ties together philosophical constructs such as, phenomenology, with the philosophy of neuroscience, consciousness and unconsciousness, the literary, film, and visual arts, the use of metaphor, women's studies, and feminist writing. Individual sessions are given over to explore these subjects. For instance, the use of poetic language, constructing and interpreting images, narratives, story telling and editorial control.

The participants are asked to develop a hypothesis of reflection at the beginning of the module (which is re-evaluated at the end of the module) and are asked to consider this within their critical commentary component of the assessment.

15.2 Learning Outcomes being Assessed

Assessed learning outcomes are:

- evaluate/reflect on practice in a multi-dimensional way;
- understand the roots of reflection and the development of conscious awareness;
- recognise and manage the relationship between the scientific and humanistic approaches to our understanding of performance;
- hypothesise on, develop, and evaluate the nature of the reflective experience; and
- identify areas of practice which require evaluation and, acting as practitioner researcher, apply and disseminate findings.

The criteria for assessment are:

- critical appraisal of the reflective process;

- erudite use of supporting literature;
- analysis of the relationship between the reflexive object and the critical commentary;
- analysis of subjectivity and inconsistency in knowledge production; and
- exploration and analysis of the reflective hypothesis.

15.3 Assessment Procedures/Details

Assessment is constructed in two parts:

1. The formative element of the assessment is the development and submission of a reflective portfolio based in the individually chosen media of the student. In the formative assessment, the term 'portfolio' is a loose description; it can include storyboards, photographs, poems and short stories, collage, sequential image frames, line drawings, music CD's, DVD's etc., or a mixture of media forming a patchwork text (Winter *et al.*, 2000).
2. The summative element is the production of a 3,000 word critical commentary of the reflective portfolio, evaluating the reflective process produced through the portfolio development. Importantly, the summative assessment focuses not on the nature of the reflective event, but on the reflective process triggered by the portfolio development. Learners are asked not to restrict themselves to traditional health care reflective texts, but to seek out literature which explores their own insights, and which adds critical depth to their sense of self-realisation and understanding. It is only the critical commentary that is 'marked', however, feedback is also given in relation to the creative portfolio as a matter of courtesy and respect to the author of that work.

15.4 Strengths and Limitations

15.4.1 Strengths

There is a synthesis of teaching and learning with assessment. Although the module is 'taught', it is the learners who learn about themselves through the process of reflection and the subsequent critique of that process. It also allows latent creativity to be legitimised, even with those who feel 'uncreative'.

15.4.2 Limitations

When confronted by such teaching and assessment methods, there can be resistance. Methods, such as these, do not fit easily within the tradition of healthcare worker's education and, culturally, this is a seismic shift away from the safety of the learner's sense of knowing. It is also possible that some personal tutors may not be familiar with,

or convinced by this approach. Secondly, all education is transformative, and the aim of this module is explicitly so. This territory comes with significant ethical problems to be managed, both at a resistance level, but also at a potential for disclosure or re-emergence of forgotten or suppressed feeling. The emphasis on the author's editorial control is fundamental to the module

15.5 Contributor's Reflections on the Assessment

Initially there can be resistance as the participants may not see themselves as artists, poets or story-tellers. The participants may also question the value of arts-based learning for their practice, and the validity of the assessment method as it does not 'measure' competence. Initial evaluations at the end of the module were inconclusive, with most unsure of what the process had achieved. However, further along in time, the learners see the process as being significant to their working and personal lives.

This method has the potential to be used not only with professionals, but service users of all types as a means to exploring their sense of self and the context of their life.

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15.7 Useful Resources

- Centre for Research in the Arts, Social Sciences and Humanities
  URL: `http://www.crassh.cam.ac.uk`
  (Accessed: 4 January 2007.)
- Centre for the Arts and Humanities in Health and Medicine
  URL: `http://www.dur.ac.uk/cahhm/`
  (Accessed: 4 January 2007.)
- Creative Methods Network
  URL: `http://www.creativemethods.org.uk/`
  (Accessed: 4 January 2007.)

Case 16

The Use of Learning Journals in Assessment

Contributor	Alison Farrell
Email	alison.m.farrell@nuim.ie
Telephone	+ 353-1-708-6045
Affiliation	Humanity House, National University of Ireland (NUI) Maynooth, Maynooth, Co Kildare, Ireland.

16.1 Context

This case study will focus on the use of learning journals as an assessment tool in an undergraduate module entitled *Creativity, Culture and Imagination*, module code VM103. This module is part of the 1st year programme of the Bachelor of Arts (BA) in Finance and Venture Management[1]. The course is housed in the Economics Department of National University of Ireland (NUI) Maynooth.

There were 29 students in the class group. The module was taught by four different people each of whom was responsible for different elements associated with VM103. This case-study refers to the assessment used for one element of the module, VM103-Part 2, which involved 12 teacher-student contact hours. The methodologies employed within this element of the module were student-centred and active learning focused. The module is part of a programme that is managed by a course director/professor who actively encourages innovative, engaging and effective approaches to the learning experience and environment; this approach affords the flexibility necessary for innovation in assessment.

[1] http://www.nuim.ie/academic/economics/courses.html

16.2 Learning Outcomes being Assessed

Two forms of assessment were used to evaluate learning in VM103-Part 2, namely, the learning/creative journal and a group presentation of a project plan. This case-study focuses solely on the journal element. The key learning outcome associated with the journal element of the course was that students would have:

> ... engaged in their own creative thinking and acts.

Evidence of this engagement would be provided through the keeping of the journal in which students would record, develop, enhance and reflect on their creative and critical thinking.

Another learning outcome for the module was that:

> ... students would have contributed to the assessment methods used.

16.3 Assessment Procedures/Details

The teacher decided the basic content for the journal in advance. The journals could contain three elements: two compulsory, namely, 'Creative Tasks' and 'Assignments and Coursework'; and one optional entitled 'etc.'. Students were provided with guidance regarding what they might record under each heading and with guidelines regarding writing a journal. The guidelenes were adapted and annotated from Jenny Moon's book, *Learning journals: a handbook for academics, students and professional development* (Moon, 1999a). For this element of the module, the journal represented 60% of the overall mark.

Other processes associated with the journal were discussed and negotiated with the students. The most important element of this negotiation was the student/teacher discussion regarding the criteria for assessing the journals; these were devised, debated, negotiated, redrafted and ultimately agreed by the students and teacher as follows:

The journal would demonstrate quality in terms of:

- fulfilment of the purpose of the journal;
- number, regularity and length of entries;
- presentation and legibility;
- clarity of observation and evidence of speculation and reflection;
- evidence of creative and critical thinking;
- a deep approach to the journal;
- ability to place the journal both within and outside of the course; and
- the journal as a creative piece (the group and the teacher also discussed and agreed on what constitutes a 'creative piece').

The teacher judged the students' journals on how well they fulfilled these criteria. Although the students submitted their journals at the end of the module, they were expected to make journal entries on a weekly basis.

16.4 Strengths and Limitations

Following the module, the students were asked to identify the strengths/limitations of the journal as an assessment tool. The following sections are based entirely on the students' written feedback and include quotations from that feedback.

16.4.1 Strengths

The students found the continuous nature of the assessment to be more 'manageable' than an end of module assessment. They described keeping the journal as 'enjoyable' and indicated that the journal gave them more options, variety and 'freedom' than conventional assessment. Other comments from the students regarding the strengths of the journal are listed below:

> I think that as an assessment tool it gives the marker a better insight not only as to how the class went but also to get to know the student more personally than you would through the classroom arena.

> It is effective because you tend to take pride in your personal chosen topics ... Therefore you tend to spend a good bit of time on getting it right and in turn learn more about your chosen subject.

> The creative journals allowed each individual student to showcase their own personal abilities, talents, and interests. I think this was very important because not everyone can simply compress their skills into an essay, or report. The creative journal offered complete freedom to display them in various ways.

16.4.2 Limitations

Some students noted that the fact that the journal was written and the fact that guidelines were offered regarding completing the journal was a limitation. They also noted that the 'solitary' nature of the journal could be limiting and, perhaps, there should have been greater scope for team/group entries. In some instances, the flexibility offered by the journal was seen by students as a possible limitation—one student noted that:

> Some people need strict guidelines as to what is expected of them with regards to anything they are graded on and the broad spectrum that the creative journal had, concerning the content of each students journal, can make feel some students feeling dumbfounded as to what to do and therefore not produce something to the best of their abilities.

The difficulty associated with grading the journals was also mentioned:

> It is very hard to grade a creative journal as there is technically no correct answer.

16.5 Contributor's Reflections on the Assessment

16.5.1 Initial concerns regarding using journals for assessment

One of the key concerns about using journals in this context was the issue of how fair and reliable they might be as an assessment tool. In order to address this issue, the use of the journal for assessment and the criteria against which it was assessed were discussed and negotiated with students. For the teacher, another potential concern was the private and personal nature of the journals and the disclosure involved in submitting them for assessment; interestingly, the students noted no such concern and, indeed, in their comments noted that they would have liked the opportunity to share some elements of the journal with their classmates. As one of the students noted:

> I think that if people were comfortable with perhaps doing a presentation on their (journal) or passing it around the class, it would give their classmates a better understanding of who they are and perhaps see them in a new light.

16.5.2 General comments on the process

Based on the feedback received from the students, it appears that the process was effective, enjoyable and closely aligned with demonstrating the achievement of the module's learning outcomes. On the basis of this experience, the journal might well be equally effective employed in other contexts, provided that a similar alignment to learning outcomes existed and that the purpose of the journal was clearly outlined at the outset. Negotiation with the students about using journals and, especially, regarding the criteria against which it would be assessed is integral to the success of the process.

16.5.3 Application to larger groups

The journals are low on resource implications; however they are time-consuming to mark. With a group of 29, the marking process is manageable, but with a group of say 100 it would be an onerous task. One way of coping with higher numbers might be to ask the students to submit a full journal and request that they identify only 2 to 3 entries, which would be marked.

16.5.4 Pleasant surprises

The level of creativity displayed in the journals, in terms of both content and presentation, was really impressive. The journals that were submitted were of all shapes and sizes—many were submitted as scrap books and conventional journals, but some were delivered in decorated boxes, on CD and one was in a bottle! Many of the journals included images, photographs, newspaper cuttings and a range of colours and textures. All of the journals displayed evidence of effort and creativity and the assessment process was very rewarding for both the teacher and the students.

16.5.5 Planning for future use of journals

Students were asked for their opinion regarding how the use of journals as an assessment tool might be improved; some saw no need for changes or improvement, others noted that although the assessment was continuous, the single end of module deadline could be improved with the identification of task specific deadlines. A few students noted that they would like to have presented entries from their journal to the class group and that there should be no restriction regarding presentation method, i.e., the journal should not *have* to be written.

Having received such positive feedback from students and being satisfied personally that the journals achieved the purpose for which they were designed, I will have no hesitation in using them again with the next group who will take VM103- Part 2. My approach will be very similar, but I will stress that not all entries need to incorporate a written element. I will also discuss with students the question of whether they might like to show the journal, or some of the entries, to each other.

16.5.6 Final words

Two comments from students to finish:

> I was very proud of my final journal, truly I don't really know if it was good or not, but I put the work into it and felt a sense of achievement when it was complete, compared to other assignments, which are only a laborious necessity to get the marks.

> What is so effective about the creative journal in my view is the ownership the students has over it. It was probably the best project last year for expressing our individuality. The journal actually did what most projects seek but fail to do and that is to apply classroom knowledge to life.

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Case 17

SPEL—Student Passport for E-Learning: an Integrated Approach to Assessment

Contributors	Francesca Lorenzi and Kay MacKeogh
Email	Francesca.Lorenzi@dcu.ie, kay.mackeogh@dcu.ie
Telephone	+353-1-700-5322
Affiliation	Oscail, National Distance Education Centre, Dublin City University (DCU), Glasnevin, Dublin 9, Ireland.

17.1 Context

Oscail, the Irish National Distance Education Centre has developed its strategy of using technology to improve learning opportunities at a pace which matches the expectations, access, and skills of its students. Since its inception in 1982, Oscail has monitored new technological developments on a continuing basis, while taking account of access to technology among its students.

Oscail undergraduates are required to take an Introductory Module prior to starting credit modules. These modules act as a filtering programme that allows the students to assess their readiness to learn in the distance learning environment. The modules are designed to help students to update or to acquire skills for studying at university level; they provide a 'taster' of distance education and give students the opportunity to try out the format without committing themselves to a long course; they also give a general introduction to the discipline. In the traditional mode of delivery, these modules use conventional text based material, supported by face-to-face tutorials.

In 2004, Student Passport to E-Learning (SPEL) Project, was launched with financial support from the Health Education Authority (HEA) Targeted Initiative Fund. Essentially, the SPEL Project combines the principles of the Introductory Module with E-Learning. An integrated approach is taken, whereby, technology is not seen as a separate add-on but, rather, as a cohesive element allowing learners to acquire e-learning

competence while sharpening their study skills and acquiring some initial knowledge of the subjects they intend to undertake at undergraduate level.

The SPEL Module was offered on a voluntary basis to students wishing to enrol for the Bachelor of Arts (BA) in Humanities and for the Bachelor of Science (BSc) in Information Technology (IT). For the pilot version of SPEL, 40 students volunteered for SPEL Humanities (BA) and 32 volunteered for SPEL IT (BSc). The students ranged in age from 24 to 55 years; the majority of the Humanities students were female (60%), while the majority of IT students were male (70%).

The students completed assignments designed to allow them practise their study skills within a disciplinary context. The SPEL modules are presented entirely online, over a period of eight weeks, with no face-to-face tutorials. Instead, students are led through a carefully designed journey using a detailed roadmap, carrying out specified tasks, and interacting with their tutor and fellow students online[1].

The students read course materials on screen or printed offline, participate in online activities, post messages to a discussion area and carry out assessment tasks based on both their readings and online activities. Students are assessed on a final portfolio, which consists of all the assessment tasks and printouts of their online activities. The teacher assesses the portfolio and moderates the online interaction.

A tutor is allocated to groups of approximately 20 students and s/he keeps the discussions structured and focused. The tutors interact with students in the general discussion area or by personal e-mail, where appropriate. While tutors vary in their approach, the nature of the discipline is also of significance in determining the form of the interaction.

17.2 Learning Outcomes being Assessed

The following SPEL learning outcomes have been assessed:

- An initial understanding of the core subjects that they will be studying at undergraduate level through to the student's contribution to specific online discussion topics.
- The development of 3rd level learning skills, such as, information gathering, essay writing and so on, through completion of specifically designed tasks.
- The development of time management skills through the preparation and self-assessment of individual study schedules.
- The development of the learners' metacognitive awareness in relation to their learning style and interests through online discussions and learning diaries.
- The development of e-learning skills, not in isolation (i.e., for the sake of learning how to use a particular computer application), but as emerging from their application for the completion of specific learning activities/tasks. An example of

[1]Initially this was done within the Web Course Tools (WebCT) environment. Due to escalating costs of commercially available Virtual Learning Environments (VLEs), Oscail adopted the open source Moodle environment in 2004.

an application is, for instance, searching in online databases to source reputable information for writing an essay.

No prior knowledge was assumed. The students were provided with a manual with a detailed description of weekly tasks, which framed activities in a general plan. The SPEL modules adopt the Task Oriented Online Learning (TOOL) approach pioneered in earlier Oscail experiments. The students develop skills in using the online medium through carrying out tasks using e-mail, internet search engines, computer asynchronous conferencing communication, web-based library databases and basic software packages, such as, Microsoft Word and Excel.

A scaffolding approach to task-design was chosen as the one more likely to succeed in gradually introducing students to the use of electronic media. The students started off with simple tasks, for example, posting a message to introduce themselves and progressed to more complex ones, such as, searching and reviewing websites, and entering data on the learning experience in an Excel spreadsheet and, finally, analysing the learning experience in both quantitative and qualitative terms.

The 16 tasks required for the Humanities SPEL module are listed below:

1. Maintain a learning log throughout the course using Excel and Word
2. Write a personal introduction and post it to the discussion forum
3. Prepare a study schedule for the module
4. Post at least two contributions per week to discussion forums
5. Write a weekly reflection on learning experience
6. Review websites related to the course content
7. Write a film review
8. Make short notes on one of the course units
9. Search DCU library catalogue and prepare bibliography for an essay.
10. Prepare spider diagram and outline structure for an essay
11. Summarise an article accessed through the university's online full-text database
12. Comment on another student's film review
13. Prepare an answer to exam question
14. Prepare a report on a statistical analysis of time spent on different learning activities
15. Write essay on 'Learning with Oscail: where to from here?'
16. Assemble and submit portfolio for assessment by tutor

17.2.1 Assessment procedures/details

Scaffolding was applied to enable students to progress gradually. This helped to ease some of the initial anxiety associated with the use of technology, particularly for the Humanities students who initially appeared to have less experience in using information and communication technologies (ICTs). In other programmes, computer skills have been an add-on, often in the form of a European Computer Driving License (ECDL)-type separate course. However, it was felt that, in order to optimise the acquisition of computer skills, it was necessary to integrate technical knowledge acquisition with study skills. Furthermore, technical knowledge and study skills were applied to course specific content and this gave students the opportunity to acquire an initial understanding of the subjects they wished to undertake at undergraduate level.

A meta-cognitive dimension to the learning experience is added by asking students to keep statistical records of the time spent on various activities in their studies, as well as, writing a reflection diary. This helps the students to develop greater self-awareness in terms of time management and learning style.

The overall assessment structure is a *portfolio assessment* with the following components:

- Print-out of online contributions.
- Weekly online and offline tasks.
- Learning diary—reflection on process—qualitative.
- Learning log—reflection on time management—quantitative.
- Final report on the learning experience in quantitative and qualitative terms.

17.3 Strengths and Limitations

17.3.1 Strengths

The holistic approach taken in this module has ensured that the students do not perceive the assessment as separate from learning. Furthermore, the scaffolded structure of the assessment tasks enables the students to acquire confidence in their ability and skills while progressing with their learning. This is a particularly important element for learners returning to education after a long period of time. Furthermore the integration of online discussions in the final portfolio has ensured greater participation in the online exchange of ideas and has created a sense of community among learners. Lastly, the learning diary and the learning log have helped learners to develop a better self-awareness in terms of learning style and time management.

17.3.2 Limitations

The SPEL module requires a structured support system and this requires resources, both in terms of times and tutorial support. While the online peer interactions were

a great source of support, tutor intervention was often crucial in steering discussions and refocusing debates.

Furthermore, the short timescale (8 weeks) for this module meant that assessment tasks had to be completed according to a very pressurised schedule. Unfortunately, this did not suit all of the students who had originally enrolled for this module and who had underestimated the level of commitment required for completing this module.

17.4 Contributors' Reflections on the Assessment

The SPEL project has now reached its fourth year of presentation. Along the way it has been further developed and tutors have been involved as 'action researchers' in the development of some additional tasks in response to their learners' needs. It should be noted that the contributors have been involved in the design and management of the project and in monitoring teaching and learning activities, and that contracted tutors carried out the assessment activities. The contributors have worked closely with the students and the tutors to evaluate the programme and this has resulted in several revised versions of the assessment structure. From the course design perspective, the evaluation has led the contributors to identify the following two factors as the key to the success of this project:

1. The scaffolded approach:

   The scaffolded approach has ensured that progression of activities was gradual and that students were progressing within their zone of proximal development. This has been a motivational factor as students were pushed only slightly beyond their comfort zone and felt that completion of tasks was within their reach.

2. The reflection diaries incorporated in the assessment structure:

   At first, the reflection diaries were perceived as superfluous by some of the students who felt that recording their thoughts was not contributing to their learning and was taking time from more valuable activities. However, this element of the assessment produced some of the most remarkable results in terms of turning students towards a more reflective approach to learning. Even some of the most resistant students, who had initially protested against the value of this activity admitted, at the end of the course, that having been able to go over their past thoughts had made them realise what they had achieved and made them more aware of their learning style and interests. Some of the students reported that if they had not been forced to keep a learning diary, they would have not done it, and the fact that the learning diary was one of the compulsory components of the portfolio was initially only an extrinsically motivating factor. By the end of the course, the learning diary had become an intrinsically motivating factor and, for this reason, many of the students manifested their intention to keep a learning diary for their future studies.

This assessment approach has proven to be valid in so far as it managed to maintain a close link with the stated learning objectives. Furthermore, an end of module questionnaire has revealed a great level of satisfaction among those learners who have

completed the module. The reflections offered by the following student summarise opinions expressed by the vast majority:

> I am glad I did this course, because I have gained loads of knowledge with reference to my computer and of course the course content. This will help me with my future study skills ... The daily log was useful as it showed me what I had done that day, and what other areas I should spend more time on. The study schedule was helpful but I had to be very flexible with reference to adapting my study time around my children, husband and other factors which influence my life.

The only negative aspect flagged by the students was the tight scheduling of the assessment tasks, which has often interfered with other personal commitments. Considering that our students are mainly mature students, with many calls in their lives, we are now considering diluting the assessment schedule and extending the module over a longer period of time.

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Case 18

All for One and One for All or Every Student for Themselves? Using Group Posters in the Assessment of the Sociology of Health and Illness

Contributor	Sylvia Huntley-Moore
Email	shuntley@tcd.ie
Telephone	+353-1-608-3704
Affiliation	School of Nursing and Midwifery, Trinity College Dublin, Dublin 2, Ireland.

Contributor	Dr. Maria Lohan
Email	shuntley@tcd.ie
Telephone	+44-4890-299-441
Affiliation	School of Nursing and Midwifery Research Unit, Queen's University Belfast, 21 Stranmillis Road, Belfast BT9 5AF, Northern Ireland.

18.1 Context

In October 2002, pre-registration nurse education in the Republic of Ireland moved to Universities and Institutes of Technology and became a four year undergraduate programme leading to a Bachelor of Science (BSc) (Nursing) Degree. A key aim of the degree is to produce graduate nurses who are equipped to work effectively in teams (ABA, 2005).

The Sociology of Health and Illness is a compulsory module in the 1st year of the BSc (Nursing) Degree at Trinity College Dublin. The student enrolment is approximately 200. The module is taught through a series of lectures where students are introduced to key themes and theoretical issues in the subject, and workshops, averaging 20 students each, where the students are assigned to project groups to plan, research and produce a poster on one of five set topics.

At the initial workshop some advantages of group work are discussed with the students, briefly these are:

- Studying alone can be isolating, especially in large classes and group work can provide a way of getting to know other students.
- Group work can help to develop a range of transferable skills which are valued by employers such as, leadership, interpersonal skills, negotiation, tolerance, oral and written communication, time and task management, meetings skills and information retrieval and analysis skills.
- Group projects are usually more complex and interesting than individual tasks and students often find them more fun than working alone.
- Weaker students have an opportunity to see how more able students approach their work while more able students have an opportunity to act as peer tutors which can improve their own understanding even more.
- The chance of out right failure is greatly reduced by the need to confer and to share understanding with group members (Gibbs, 1995a,b).

Following on from this discussion, each project group is given three exercises to complete before the second workshop. This task serves several key purposes. Firstly, it provides an impetus to groups to begin to arrange meetings outside of class time, which will be necessary if they are to complete the project to the required standard within the timeframe. Secondly, the exercises encourage the students to talk to each other about their previous experiences of groups (likes and dislikes, strengths and weaknesses), what they can contribute to this group, as well as, what they want to get out of it and, finally, how they plan to divide up the project and allocate tasks between them.

In subsequent workshops, the students work on their projects while the teacher moves between groups to monitor progress, answer questions and to assist in solving any difficulties relating to the functioning of the groups.

18.2 Learning Outcomes being Assessed

On successful completion of this module, students should be able to:

- describe the distinguishing features or characteristics of the discipline of Sociology;
- discuss the relevance of Sociology to understandings of health and illness;

- critically explore how social factors, such as, class, ethnicity and gender affect health and lifespan;
- critically explore how Sociology challenges biomedical understandings of health; and
- recognise the key elements of effective team working and project management and apply these in the context of their group project.

18.3 Assessment Procedures/Details

The assessment for this module includes both formative and summative elements.

18.3.1 Summative elements

- A **group** mark is awarded for the poster (60%).
- An **individual** mark is awarded to each student for their performance in a question and answer session which occurs after the posters have been assessed (30%).
- An **individual** mark is awarded to each student on the basis of his/her workshop attendance (10%).
- Students must be present for the question and answer session or face a 30% reduction of their overall marks.
- Where students fail the project, they will be invited to sit a supplemental examination during the summer vacation.

18.3.2 Formative elements

- During the first workshop each project group is given three exercises, which focus on group process and planning. Each group is expected to feed back the results of these exercises to the whole class at the second workshop.
- During subsequent workshops, the students are given feedback on their plans and drafts.
- Within their project groups, the students are expected to give and to receive regular peer feedback on their individual contributions

18.4 Contributor's Reflections on the Assessment

Based on our experience of running this module over four years, the students' initial response to the prospect of assessment by group project tends be polarised. Some will be delighted at the chance to engage in something different from the usual essay-type assignment or examination, while others are immediately concerned to know how

their individual contributions will be assessed and what will happen if their group fails to produce a poster. These are legitimate concerns, which should be addressed from the outset.

As Graham Gibbs (1995b, p. 9) notes: 'it is individuals who gain qualifications not teams and some way has to be found to allocate marks fairly to individuals within teams'. On the other hand, if students are assessed solely on their individual contributions, the more strategic among them are unlikely to put much effort into the project as a whole. One way around this problem is to allocate a group mark to the assignment product, which in this case is a poster, and individual marks for attendance at workshops and the quality of student's contributions at the question and answer session. Students are also required, on submission of the assignment, to itemise their individual contributions to the project in writing and have their statement verified by the other group members. By these means, it is possible to assess group and individual contributions fairly and, for high achieving students working in low achieving groups to be awarded a significantly higher grade than the other group members.

As well as their initial concerns about the fairness of the assessment process, the students are often puzzled by the nature of the assignment itself. While posters are a common feature of academic conferences, they are new to most undergraduate students. At the first class, by providing detailed written assignment guidelines, including information on poster layout, content, structuring and referencing, we find that most misconceptions can be addressed. We have also found that displaying a selection of the best posters from the previous year on notice boards around the School gives students concrete examples of the expected standard and, also, gives them opportunities to practise in critiquing posters.

To prepare students for the question and answer session conducted at the conclusion of the module, indicative questions are provided in the assignment guidelines. According to Biggs (1999), students learn what they think they will be marked on. By giving students the questions in advance we hope to guide their thinking in appropriate directions. For this reason, one of the indicative questions asks the students to explain how their groups functioned and what teamwork and project management skills they may have developed during the process.

In 2005, we undertook a research project to explore the students' attitudes to group poster projects and the extent to which students' perceived that the projects promoted the development of their teamwork and project management skills. Semi-structured interviews were conducted with most of the 2005 project groups. The findings were extremely positive with the great majority of the participants reporting positive attitudes to this type of assessment to the extent that most of them, if given the choice again, would choose a group project over an individual project or examination. Of the minority of students who preferred individual projects or examinations, a significant number found it difficult to meet with their project group outside of class time.

Some students felt that forming groups with their friends would have promoted collaborative learning and helped them to produce better posters. From our perspective, allowing group self-selection would have defeated the aim of encouraging greater social cohesion and interaction, particularly as most respondents felt that getting to know students outside their circle of friends was a welcome project outcome.

During the interviews, we were particularly impressed by the students' descriptions of the role of formative peer feedback in the development of their projects:

> We came up with our own opinions and then came up with a generalised opinion ... and we could teach each other as well.

> It was good to look at other peoples' ideas. Everyone had a different perspective on things so everything wasn't black and white.

> We learned more from working together and comparing ideas and different opinions.

> You have to learn to take criticism and learn to be diplomatic as well.

With regard to their teamwork and management skills, most of the participants felt that they had improved as a direct result of the group project. In addition, many of the participants recognised what they would do differently, particularly in relation to time and task management, to improve the process and the products of future group projects. This finding led us to consider whether more group projects should be threaded through the degree programme to allow students to develop teamwork and project management skills in a more systematic way.

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Case 19

The 'Triple Jump' Assessment in Problem Based Learning: an Evaluative Method Used in the Appraisal of both Knowledge Acquisition and Problem Solving Skills

Contributors	Kathleen McTiernan Margaret Leahy Irene Walsh Pauline Sloane Martine Smith
Email	kathleen.mctiernan@tcd.ie mleahy@tcd.ie ipwalsh@tcd.ie
Telephone	+353-1-608-2947
Affiliation	Department of Clinical Speech and Language Studies, Trinity College Dublin, Dublin 2, Ireland.

19.1 Context

Learning and evaluation are inextricably linked, and students who are active participants in their own learning should be active participants in the assessment of their acquired knowledge (Rangachari, 2002). The triple jump is a type of assessment that evaluates the students' ability to organize information, to formulate hypotheses, to identify individual learning issues, and to reformulate a case using newly acquired information.

The 'triple jump' (or three stage) assessment is a method of evaluation used in problem based learning (PBL) curricula. PBL encourages independent learning and gives

students practice in tackling puzzling situations and defining their own gaps in understanding. In the context of professional courses, such as, speech and language studies, relevant problems are presented to the students, which mirror 'real life' clinical situations. PBL is a way of learning which encourages a deeper understanding of the material rather than superficial coverage.

The PBL learning process is guided by the following steps:

- Terms and concepts are clarified and the problem is defined.
- Problem is analysed, hypotheses and inquiry strategies are formulated.
- Problem is summarised.
- Learning objectives or student-generated learning issues are agreed upon.
- Learning resources are sought out and self-study takes place.
- Possible resolutions of problem are determined.
- Resolution of problem is reported back to the class.
- Findings are discussed and assimilated.

19.2 Learning Outcomes being Assessed

The 'triple jump' assessment serves as a measurement tool for a number of learning outcomes. The learning outcomes that are assessed through the triple jump evaluation mirror both of the learning goals of the PBL process. As a result, the students are assessed on the knowledge gained through the process and on the method of problem solving they employed in their acquisition of that knowledge. In other words, the triple jump not only assesses what the students learned, but how they learned it. In this way, the triple jump assesses life-long learning and problem solving skills; these skills are being practiced and honed during each learning module of every course. The learning outcomes of the triple jump evaluation are as follows:

- learn to identify knowledge gaps;
- learn how to identify and use resources for retrieval of information;
- evaluate and apply new knowledge;
- learn to interact effectively with peers and faculty in the problem solving environment;
- employ effective communication skills; and
- demonstrate standards of professionalism.

19.3 Assessment Procedures/Details

The 'triple jump' assessment exercise is a comprehensive method of measuring the aims of problem based learning and, also, the specific learning objectives set forth for students in a particular problem. The 'triple jump' is a unique form of assessment because it is one of the few examination methods that measures both specific acquired knowledge and problem solving processes. The examination, if time allows, typically takes place in one day. The assessment procedures are detailed in the following sections.

19.3.1 First stage

During the first stage (problem definition), students are given a clinical problem with a minimal amount of information. The students use the information to ask their 'triple jump' facilitators a series of questions to elicit more information about the problem. The problem definition stage enables the students to bring prior knowledge to bear on a novel problem and devise an educational plan to identify the items of information needed to solve that problem.

19.3.2 Second stage

During the second stage students conduct an information search for 2–3 hours. They use the information that they have gathered to find a problem resolution and prepare a presentation of their findings.

19.3.3 Third stage

During the third stage, the synthesis and feedback stage, students return to present the resolution of the problem. A period of re-appraisal and synthesis follows.

19.4 Strengths and Limitations

19.4.1 Strengths

The 'triple jump' assessment problems aim to mimic the types of problems that the students are likely to encounter in real life clinical settings. The practice at researching an unknown topic area under a time limit and applying problem solving skills to reach an acceptable resolution to a problem are reflective of the professional competencies that are necessary for speech and language therapy practice. For this reason, the 'triple jump' is one of the most valuable methods of assessment utilized in professional education courses.

19.4.2 Limitations

There may be a tendency for students to believe that the 'triple jump' is disassociated from real life clinical practice and, therefore, the purpose of the evaluation may be

lost in the students' efforts to narrowly solve the problem at hand. It is important to continually remind students that the 'triple jump' assessment reflects the types of real life problems that they will encounter in clinical practice. The links with future potential clinical scenarios must be constantly reinforced, as must the relevancy of the 'triple jump' journey to problem resolution.

19.5 Contributor's Reflections on the Assessment

The students' retrospective reactions to the 'triple jump' have been overwhelmingly positive. However, prior to the assessment, there can often be a tone of concern among students in relation to the 'triple jump'. There is always a certain amount of apprehension before any form of assessment and, certainly in the case of the 'triple jump' assessment, the students may be somewhat worried by this novel method of evaluation. To address this concern, the 'triple jump' procedures are given to the students in advance and key points of the 'triple jump' and PBL processes are underscored so that the approach taken on the assessment day is closely aligned with accepted protocol. It is often the case that the potential breadth of the possible problem topics for the assessment daunts the students. To address this concern, the students are put at ease in relation to the unknown topic factor by being led through a process of deduction so that likely topics can be identified prior to the problem presentation. Both the students and the staff agree that the depth of knowledge about the topic focus that is gained through the 'triple jump' and the practice at applying problem solving skills are a unique and invaluable combination of learning outcomes associated with this method of assessment.

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Case 20

Peer Assessment of Problem Based Learning—Fostering Reflective Practice in Social Work Students

Contributor	Maeve Foreman
Email	mforeman@tcd.ie
Telephone	+353-1608-3242
Affiliation	School of Social Work and Social Policy, Trinity College, College Green, Dublin 2, Ireland.

20.1 Context

This paper reflects the author's experience, since 2003, of designing and delivering a Health Related Social Work course for the final year of a Master's in Social Work Course, School of Social Work and Social Policy in Trinity College, Dublin. Initially, assessment was by unseen examination and/or essay. In 2005, following an annual review of the course which included student evaluations and discussion with the Course Committee and the External Examiner, it was agreed that the assessment of this module would be based on 'in class' group presentations, supplemented by a short written submission of 750 words, outlining reading and key learning from the exercise.

My previous experience of class presentations was not good—they were tedious and feedback from students indicated that they were not great learning experiences. In looking to alternatives, both problem based learning (PBL) and peer assessment have been shown to contribute to reflective practice (Burgess, 2006a; Race, 2001; Boud, 1995; Burgess, 1992), a factor that is essential for linking social work theory to practice (Payne, 2002; Gould and Taylor, 1996; Schön, 1987). It was decided to base class presentations on 'virtual' social work cases, drawing on PBL techniques, and to experiment using peer assessment to grade them.

Acknowledging that there are several definitions of PBL, this course drew on Burgess's definition (2006a) and viewed problem based learning as starting from sce-

narios, based on real life cases, which had a number of learning themes and many potential solutions. The students share their existing knowledge and understanding, agreeing what they need to learn and how to go about this.

The aim of using both PBL and peer assessment was to link learning outcomes, learning activities and assessment and to enhance the students' understanding of some of the challenges they would meet in social work practice, thus, contributing to their professional development in this constantly changing field. This case study concentrates on the peer assessment element of the course.

20.2 Learning Outcomes being Assessed

20.2.1 Health related social work

The course aims to examine a selection of issues in health related social work and to develop the students' understanding of the nature of social work in various health care settings. Selected theories, like loss and bereavement and crisis intervention, are examined critically and their value in these settings demonstrated. Counselling, advocacy and interdisciplinary teamwork are emphasised as core to social work practice in health care.

20.2.2 Learning outcomes

- To become aware of issues involved in tackling challenging health related social work cases in various settings, including hospital, hospice and primary healthcare.
- To be able to apply social work theory to practice;
- to engage with course material and reading list;
- to develop skills relevant to working on multidisciplinary teams; and
- to develop critical assessment skills.

20.3 Assessment Procedures/Details

20.3.1 Peer assessment

A problem based learning approach, using peer assessment, was adopted because the evidence suggests that they both assist in the development of reflective practice, essential for social workers today and contribute to deeper learning (Burgess, 2006a,b; Race, 2001). While it has been suggested that peer assessment should only be used initially for formative assessment or for relatively few marks, studies of summative peer assessment indicate that student ratings are both reliable and valid, with little difference between the lecturer and the student ratings. Bostock (2001) suggests that accuracy is generally good if assessment has clear criteria, is anonymous, moderated by lecturer,

and assessors have some experience or training. The size of the group and the fact that they were mature students in their 2nd year of a professional course suggested that it might work as a means of summative assessment.

20.3.2 The Process

- **Stage 1.** Develop criteria for assessment through small group discussion. Class feedback on grid (see Appendix A: Sample Grid) to be used for assessment, modifying if necessary.
- **Stage 2.** Assign 'virtual case' to each group. Two weeks given to prepare class presentation.
- **Stage 3.** Presentations. 15 minutes allowed for presentation and 15 minutes for discussion.
- **Stage 4**. Assessment. Completion of peer review grids. One week later, submission of short written assignment. Combined mark returned to student

20.3.3 Assessment criteria

Assessment criteria were developed in class, following an approach recommended by Race (1993). Each student listed six things they would expect from a good class presentation of a 'virtual' social work case. In groups of three to four, the students discussed the criteria they had devised; together they refined criteria and developed a checklist, with instructions to avoid 'subjective' words such as 'interesting'. The groups were then asked to make a list of the most important criteria, prioritizing them. Feedback taken from each group started with the most important criteria, then next most important, and so on. Criteria were clustered and combined where possible. As it was important to ensure that the criteria were aligned with learning objectives, I retained the right to moderate at this stage to ensure certain important criteria were included. The students were asked to distribute marks among the criteria but in this case they decided to give equal weighting, giving 10 marks to each of five criteria chosen. A grid was then produced ready for use in peer assessment

The criteria chosen were as follows:

1. **Clarity of content:** coherent, stayed within time limit, good use of overheads or powerpoint.
2. **Quality of content:** innovative or creative approach, key themes identified.
3. **Relevance of content:** how practical is approach taken.
4. **Content backed up:** use of core social work skills, theories, evidence, research.
5. **Good facilitation:** ability to lead discussion and tease out critiques and alternatives to approach given (see Appendix A: Sample Grid).

The students' final grade was based on both the presentation (50%) and a short written submission (50%), based on their reading and learning from the exercise.

20.3.4 Problem based learning

Case studies were drawn from personal work experience in a healthcare setting and based on areas covered in class, including terminal illness, elder abuse, domestic violence, para-suicide, long term chronic conditions and HIV. The students were divided randomly into small groups of three or four and each group was given a different 'virtual case'. (See Appendix B: Sample Cases).

20.3.5 Instructions to the class

Discuss allocated case in your assigned group as follows:

- What might be the main issues facing the person referred and their family/significant others?
- What do you need to know to make a full assessment and plan intervention? What experience is there within the group?
- What are the key social work tasks?
- What is known from existing relevant research, to ensure evidence based practice?
- Agree a plan of action.
- Review literature and search internet.
- Speak to support group for particular condition.
- Book time with course tutor, if needed.
- Arrange to meet before your presentation to agree format and plan content.
- Presentation (present your planned social work intervention as if to multidisciplinary team).
- Overview of case referred, key issues and how you have decided to approach work with the person(s) concerned (15 minutes).
- Discussion. Class can seek clarification, question your approach and/or offer an alternative (15 minutes) .
- Students and course tutor to complete assessment grid on each presentation based on criteria agreed in class.
- Assessments to be handed in at end of presentations, and average scores computed.

20.4 Strengths and Limitations

20.4.1 Strengths of peer assessment

The evidence extolling the virtues of peer assessment is large. Benefits are said to include (Race *et al.*, 2005; Race, 2001; Bostock, 2001; Brown and Glasner, 1999; Boud, 1995):

- promotion of learner autonomy and life long learning;
- deep rather than surface learning;
- development of key skills—critical, analytical and reflective thinking, self motivation and time management;
- fostering of collaboration rather than competition—good training for teamwork;
- sense of ownership of assessment process, thus improving motivation;
- greater understanding, not just of subject, but of how assessment works;
- increased ability to recognise and apply criteria, and evaluate own and peers' work;
- more closely parallels social work practice in health care settings where social workers are part of multidisciplinary group;
- reduced marking load for lecturer.

20.4.2 Limitations of peer assessment

Burgess (2006b) suggests that the students and the staff need to be prepared for this type of assessment, as some difficult questions may be asked and it can raise complex questions about culture and gender. Peer assessment can be helped if the student group is clear about the assessment criteria and, ideally, devises them; on the other hand, it can be hindered by lack of confidence or unwillingness to accept this approach on the part of the students.

It may lack some of the precision of more formal forms of assessment but this is more than compensated for by its benefits. As Race (1993, p. 6) noted: 'Learners find out a lot about any subject simply by applying assessment criteria to examples of work in that subject'.

Other possible limitations include the following:

- students may not feel confident in evaluating each other;
- students may not treat exercise seriously and allow solidarity with classmates to influence their marking;
- students may misinform each other—the lecturer may need to intervene.

What about passengers in group work? The students were told that they could divide the overall score between members according to their contribution, although this was an option they did not take up. Race (1993) suggests this is seldom necessary if the issue of 'passengers' is discussed in advance.

20.5 Contributor's Reflections on the Assessment

Although this was the third year of the course, it was the first time I actually enjoyed class presentations and learned from them. The feedback from students concurred with this—they found the sessions stimulating and were fully engaged. While, initially, they were very apprehensive, once they knew they could negotiate the criteria for assessment (Race, 2001) and were given clear written instructions (Bostock, 2001), their anxiety levels dropped. The grading was higher than average, although as it was only 50% of the total mark, the written submission moderated this somewhat.

As one of the criteria chosen by the students was 'good facilitation', all groups made an effort to involve the class in some form of experiential exercise and/or discussion. This concurs with Race's 1993, p. 11 experience:

> The most important outcome of involving learners in the formulation of self assessment or peer assessment criteria is that learners address the task with criteria in their minds and the quality of their work seems to be much higher than it may otherwise have been.

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Appendix A: Sample Grid

Health Related Social Work, Masters' In Social Work, Year Two: 'Virtual' Cases—Agreed Peer Assessment Criteria

Each group/case presentation will be marked out of 10 on each of the following:

Clarity of Content: coherent, stayed within time limit, good use of overheads or powerpoint.

Quality of Content: innovative or creative approach, key themes identified.

Relevance of content: how practical is approach taken?

Content backed up: use of core social work skills, theories, evidence, research.

Good facilitation: ability to lead discussion and tease out critiques and alternatives to approach given.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Clarity of content						
Quality of content						
Relevance of content						
Content backed up						
Good facilitation						
TOTAL MARK (maximum 50%)						

Appendix B: Sample Cases

Case 1

You are a medical social worker in an acute hospital setting, assigned to an infectious diseases clinic. The O'Brien Family is referred for assessment and possible follow up supportive counselling.

You are given the following information. Father, John O'Brien, aged 30 years, was suffering from severe weight loss and generally feeling unwell. His GP conducted an HIV test which came back HIV positive. The GP gave him this news last week and referred both John and wife Mary, aged 28 years, to the hospital consultant based in the Infectious Disease Clinic where you work. Mary subsequently had the HIV test and has just been told today by the consultant that she too is HIV positive.

They have three children aged eight, four and two years, who all need to be tested for HIV. John was a drug user for several years but has been stable on a methadone maintenance programme for the past two years. Mary has never used drugs.

Case 2

You are a social worker in the Medicine for the Elderly in-patient unit of a hospital.

Jessica O'Connor is an 82 year old woman who has been admitted from a nursing home with a broken arm. Her husband was with her at the time of her accident and says she fell trying to get out of bed unaided. She also has unexplained bruising on her upper arms and thigh.

She suffers from senile dementia and, although she is lucid on occasion, her short term memory is affected. The ward staff are concerned that she is being abused, either by nursing home staff or by her husband, and ask you to make an assessment and advise the multidisciplinary team as to how to proceed.

Case 3

You are a social worker in a busy Accident and Emergency Unit. You have been referred a 'para-suicide' case. A 15 year old girl, Una Maguire, has been admitted after she took an overdose of her mother's tranquilliser tablets. She very nearly died and is now in recovery. She has been assessed by the psychiatrist 'on call' who has said that she is not clinically depressed, is no longer suicidal and can be discharged home. They recommend a referral to you for 'follow up support'.

Her mother is angry with her for upsetting the family and while she has been visiting, has spent most of the time 'giving out' to her. Una is upset and tearful after each visit, and has told a nurse that she does not want to go home as her mother has a drink problem and is always picking on her and fighting with her. She has two younger siblings; a 12 year old brother and a 10 year old sister, both of whom have come in to see her in the evening on their own, as they live quite near the hospital.

The doctor wants to discharge her home today. The nursing staff ask you to see her and possibly the mother, as they are concerned about her discharge home.

Group Task

- What are the issues for the person and their family?
- What might their main concerns be?
- How would you approach this case?
- What is your role?
- What is informing your decision?
- Present what you plan to do to the multidisciplinary team meeting.

Case 21

Open Book Assessments and Quizzes in Statistics

Contributor	Joan Cleary
Email	Joan.Cleary@staff.ittralee.ie
Telephone	+353-66-714-5616, extension 2358
Affiliation	School of Science, Institute of Technology, Tralee, South Campus, Clash, Tralee, Co. Kerry, Ireland.

21.1 Context

The module described here is called *Business Mathematics and Statistics*, and has been run as one half of a subject in what was an add-on Diploma in the School of Business. The students doing this subject had successfully completed a Certificate in Office Information Systems, and had gained entry to the Diploma in Information Systems Management. This typically required that the student had achieved a 55 percent average in their Certificate. In recent years, this requirement for entry to Diploma level courses has been dropped and now a grade of Pass (40%) will suffice. One of the most interesting aspects of this student group each year is that it is almost entirely female.

The e-learning platform Web Course Tools (WebCT) was introduced in the academic year 2003–04. The syllabus, full lecture notes, instructions for using the Statistical Package for the Social Sciences (SPSS), assessments and model solutions, and all other material previously printed for students are available on WebCT. The calendar facility is used to give an assessment schedule for the year and to link material relevant to each lecture and laboratory session. This academic year, the assessment tool was utilized, where students submitted a project on-line. To complement the course, the author found an excellent textbook that had an associated e-pack, which is supported by WebCT. This has some very good student and instructor resources, links to websites for resources and a set of quizzes corresponding to each chapter of the book. The students were not expected to buy the (very expensive) book, however, multiple copies were bought for the library.

For the first half -year, the students attend two 1-hour lectures per week and one 2-hour laboratory session where they are introduced to the statistical package SPSS. Typically continuous assessment strategies have included two unseen tests and two projects and, as the module has been half of a full-year subject, the final examination was then run at the end of the year.

With the implementation of the National Qualifications Awards of Ireland (NQAI) framework and the advent of modularisation within the Institute, the module has been reviewed and it will become a Level 8, 5-credit point module. To more closely align the assessment strategies with the learning outcomes, I changed the types of assessments, and trialled these changes in 2005–06. From 2006–07, continuous assessment will also include an integrated project with a marketing research module.

21.2 Learning Outcomes being Assessed

This module focuses on students being competent in manipulating and presenting data and being able to conduct appropriate hypothesis tests. The students learn how to use a typical statistical package (SPSS) to help solve statistical problems. The students were assessed on their ability to set up and conduct appropriate statistical tests and interpret the results, and on their use of SPSS.

21.3 Assessment Procedures/Details

As the student profile has changed over the past few years, it has become more difficult to cover the material set down for the module, and assessing the later sections of the module has become more problematic. In particular, there was less time for students to submit a project based on the later material. So, a change in the schedule and the assessments was negotiated with the students. Instead of a project and an unseen written test, a set of quizzes from the e-pack and a laboratory assessment was agreed.

The laboratory assessment was a 2-hour assessment where students were to use SPSS and other technology and material available to solve a set of problems. It was an open-notes assessment, as described by Race (2006, p. 52). Students were allowed to bring in three hand-written pages of notes and they could access any notes on WebCT. The reason for limiting the material they could bring with them was to encourage them to study, and this was stated explicitly. As this was a new addition to the module, a sample assessment was covered in the last laboratory session before the assessment.

In previous years the WebCT multiple-choice quizzes had been used as self-study tools and, again this year, the first few quizzes were open to students for self-study. The students could attempt each of the remaining four quizzes as many times as they wished and the average mark was recorded. The average of each student's top two quizzes would make up the assessment mark. There was no restriction on what they could use to help them with the questions.

21.4 Strengths and Limitations

21.4.1 Laboratory Assessment

Strengths

The students were definitely more confident coming into the laboratory assessment; they knew that they were going to be tested on how well they could use their knowledge and skills to solve problems, rather than on what they could remember. Particularly after trying the sample assessment, the students' studying was more focussed, as they were aware of the types of knowledge and the level of skills they would be expected to display.

For the lecturer, it was a much-improved method of assessing learning outcomes, allowing the students to show their ability to apply knowledge to unseen problems and to show the appropriate use of technology.

Limitations

The main limitation for both the students and lecturer was the time limit. Two hours were allocated, which was the same time given for previous unseen tests, but it was not enough. More time needs to be allocated to cover the same material, mainly due to inputting data and printing the outputs required for the solutions.

21.4.2 Quizzes

Strengths

The quizzes in the e-pack are made up of extremely well designed multiple-choice questions; each time the students submit their answers their result is given immediately. So, with this feedback, the students could identify where they made mistakes and redo questions, referring to notes and completed problems, if needed.

As the quizzes are all corrected electronically, there is very little work involved for the lecturer. The average mark for each quiz is produced by the e-pack and a spreadsheet was made so that the best two marks could be averaged.

Limitations

Students needed to be on-line to do the quizzes. Those students who did not have on-line access at home, needed to allocate sufficient time at college to complete the quizzes. As described below, some students decided to just guess the answers until, hopefully, they obtained a result they were happy with. Some even guessed correctly the first time!

21.5 Contributor's Reflections on the Assessment

The lecturer was surprised by the students' results, and questioned 22 of the students about their learning and preparation before and after releasing the results. This survey

Table 21.1: Students views on open book examination

How did you feel about open book exam?	Frequency
Notes were helpful	10
Notes were a psychological help	5
Still have Limitations	4
Negative comment	1
Other	2
Total	22

brought out some interesting aspects regarding the students' experiences and perceptions of the assessment. Even though they were third year students, it was the first time they had experienced open-book exams. Table 21.1 summarises the student responses.

Some of the comments from students who thought having notes in the exam were helpful include 'couldn't learn all the theory', 'sometimes my mind goes blank' and 'needed direction'. Others commented that it gave them a psychological boost saying, for example, that they were 'more confidant and found it easier' and that there was 'not as much pressure to memorize SPSS'. A few students realized that there were still limitations to doing such an examination, they stated that they 'still need to know how to do questions' and that they 'still need to know material for notes to be useful'. There was only one student with a negative attitude to the open book examination, she stated that she got more confused with the information that she had brought in.

Research has shown that in open-book mathematics examinations, the better students do better, and the less able students do worse than in standard exams (Michael and Kierans in Brown *et al.*, 2003, p. 43). The lecturer opted for open-notes examinations, and allowing the students to bring in a limited number of pages of notes proved to be a very good tactic. Most of the students brought in the maximum (three) pages.

When asked if they studied more, less, or the same as they would have studied for an unseen test, the theme of the students who said they studied at least as much as for a standard test is represented in comments, such as, 'wanted to ensure good notes' and 'deciding what notes to bring, learnt more'. In contrast, two students who brought in less than three pages said 'couldn't give any more, lack of access to SPSS' and 'Thought notes would help' (and so studied less).

The results from the quizzes were disappointing. As noted above, the students were given the opportunity to complete the WebCT quizzes as many times as they wanted, in their own time, and with all available resources. The overall average was under 52 percent and one student did not attempt any quiz. It appears that the instant feedback was not taken into account, with most students repeating the quiz immediately and, sometimes, scoring lower. This points to the students' lack of motivation to achieve their best, and the survey backs this up, with half of those questioned admitting to guessing, half had referred to notes, and only a small number (5 of the 22 surveyed) revised before and/or between attempts. The most telling statistic is the average time a student spent doing a quiz. Overall, the average time was only 8.5 minutes, which

dropped to under 4-minutes when outliers were discounted. This is, in effect, less than 30 seconds per question.

The lecturer is repeating the procedure with another group of students. Although the the possibility of negative marking for the quizzes was explored, the lecturer decided to discuss some of the pitfalls that the first group encountered and to set the same conditions. The current group has already started doing the quizzes, and is spending an average of 47 minutes per quiz, and achieving much higher results.

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Case 22

Three Stages of Apprenticing Students into Portfolio Ownership

Contributor	Juliana Chau
Email	ecjchau@inet.polyu.edu.hk
Telephone	+852-2766-7521
Affiliation	English Language Centre, Core A, Hong Kong Polytechnic University, Hung Hom, Hong Kong (SAR).

22.1 Context

A few years ago, the English Language Centre of the Hong Kong Polytechnic University adopted the use of the portfolio for language learning. Initially, portfolio implementation was confined to mandatory credited courses, such as, *English for Academic Purposes, English in the Workplace and English for Professional Purposes,* where submission or non-submission of work by the students would have no bearing on the course grade. In other words, portfolios did not constitute part of the course requirement. However, changes at the institutional level, including restructuring of departments and programmes, drastic cut of government-funded student places and emphasis on lifelong learning and creativity, have begun to demand corresponding shifts in the provision of language training by the English Language Centre in two areas.

The first area of change stresses the need for proficiency courses that encompass the development of language skills, as well as, the students' ability to think critically and to transform acquired knowledge into knowledge for action, or 'wisdom of practice' (Shulman 1987, cited in Chetcuti *et al.*, 2006, p. 105). The second area stems from the gradual discontinuation and replacement of credit-bearing language programmes with non-crediting ones, with the possible consequence of reduced student motivation to study seriously. The issue of offering non-credited language enhancement programmes without prejudicing the English Language Centre's role in providing training, support services and self-learning facilities to help students acquire the neces-

sary profession-related language skills beneficial to their future career is a critical one (HKPU, 2005, pp. 1–2).

In 2005/06, in response to these changes, the English Language Centre launched a series of new language enhancement initiatives in the form of Profession-related language training (credited) courses and English Language Enhancement Programme (ELEP) (non-credited) modules, each dealing specifically with one aspect of language proficiency: vocabulary, writing, speaking and listening, presentation skills, grammar, pronunciation. Portfolio work is an integral component for successful completion of both programmes.

The primary aim of this case study is to apprentice students into the practice of using portfolios for language learning and assessment through three stages. It involved 11 Hong Kong Polytechnic University 1st year students enrolled in a language enhancement writing module over a span of 11 weeks in the summer of 2005. The students came from a variety of disciplines—Textiles and Clothing, School of Design, Hotel and Tourism Management, Accounting and Computing. The 'blended delivery mode' of the module incorporated classroom instruction (22 hours, 75% of module grade), web-based exercises (5 hours, 15% of module grade) and independent learning (3 hours, 10% of module grade). As a record of their achievements and self-directed language development, the students were required to submit a portfolio at the end of module, showcasing both progress and product through their collection of work. Some of the rubrics in the portfolio are provided below.

22.1.1 What do students include in their portfolio?

The portfolio is essentially a reflection of how much time and effort the students have put into their English study. As such, there is no right or wrong way to put a portfolio together. Each student's portfolio will look different. Below are some suggested items of evidence that could be included. The students can discuss any other suggestions with their teacher.

Suggested items

- Drafts and final copies of any writing tasks undertaken in or out of class.
- Copies of exercises including corrections or comments.
- Reflections on their study and any achievements made after completing a number of objectives.
- Work related to any language course offered by the English Language Centre.
- Work related to their IELTS or other test preparation study.

22.1.2 Will the portfolio carry any weighting in assessment?

Yes. For language enhancement modules, the portfolio will account for a maximum of 10% of the overall grade and will be allocated as follows:

- **Full 10% allocation.** The portfolio is **well presented** with a **sufficient** amount of relevant content to demonstrate the work undertaken outside of class. Students have included **a lot** of work in the portfolio that demonstrates a commitment to improving their English. They have also demonstrated the ***ability to reflect upon their learning*.**
- **5% allocation.** The portfolio is **presentable** with **some** relevant content to demonstrate the work undertaken outside of class. Students have included **some** work in the portfolio, which demonstrates a commitment to improving their English. They have also ***attempted to reflect upon their learning*.**
- **1% allocation.** The portfolio demonstrates **some** improvement in the student's English out of class.
- **0 % allocation.** The portfolio demonstrates **no effort** of improvement in the student's English out of class.

In order to complete the language enhancement writing module satisfactorily, the students are required to fulfil the following:

- obtain a pass in three in-class writing tests (35%, 20% and 20% respectively);
- finish web-based activities (15%); and
- provide evidence of independent study through submission of a portfolio (10%).

22.2 Learning Outcomes being Assessed

With portfolio work, students are expected to be able to:

- reflect on what and how they have learned; and
- record their reflections and plans.

Examples of guiding questions to help students to compose their reflections include:

- To what extent was the activity important to me?
- What problems or challenges did I face?
- How did I resolve the problems or challenges?
- What have I learned from this study?
- If I had more time, what else would I do to improve my skills/language/method of study?
- What do I want to do next?

Table 22.1: Three stages of apprenticing students into portfolio ownership

Stage	Weeks	Orientation	Dominant Portfolio type	Ownership
Modelling	1–4	Teacher as instructor	*Formalist* portfolio: product as model	Least
Practising	5–8	Teacher as partner; Student as negotiator	*Expressivist* portfolio: product to promote personal/emotional response	↕
Applying	9–12	Student as owner/ initiator; Teacher as guide/mediator	*Cognitivist* portfolio: product to deepen awareness; *Social Constructivist* portfolio: product to highlight the genres of the discourse community	Most

22.3 Assessment Procedures/Details

Anecdotal evidence, derived from the initial portfolio implementation, raised two main concerns:

1. the use of portfolios for learning and assessment is a novel practice for most students (and possibly tutors); *and*

2. the increased workload for tutors due to the need for dialogue and feedback.

To address the first concern, it was felt necessary that students be given training in three stages to apprentice them into the construction of a portfolio (see Table 22.1).

The first stage relied on the use of a 'model,' where students were encouraged to pursue, in writing, what was discussed in class (for example, marriage versus cohabitation) and to collect related articles and underline useful or interesting expressions. At this stage, with the aid of explicit instruction and a sample, the students' attention would be directed towards criteria 1 to 3 in the checklist (see Appendix A). However, artefacts that reflected or fulfilled other criteria would also be considered acceptable. The second stage involved 'practising'—the students could choose to respond to any issue in writing and to bring up for further discussion the meaning- or language-related matters, with reference to criteria 4 to 6 (see Appendix A). The last stage -'applying'—highlighted the role of the student as owner or initiator in the construction of the portfolio, stressing what and how they had learned through justifying or reflecting on the choice of writing / article, and how they would use this newly learned experience (see Appendix A, criteria 7 to 9).

A generic feedback form-cum-checklist for students (Appendix A) was developed. This served a dual purpose of keeping the tutor workload to a minimum while maintaining two-way communication. The students were required to submit their portfolios in week 4 (end of the 'modelling' stage), week 8 (end of 'practising' stage) and week 12 (a week after completion of 'applying' stage and end of the whole module).

A 'successful' rating would translate into the 10% module grade, 'adequate' 5%, 'thin' 1%. 0% would be awarded to either non-submission of the portfolio or no effort or evidence of own work. A final grade would be obtained by averaging out the three ratings.

As shown in Table 22.2, the nine criteria would correspond to the three stages of apprenticeship and three domains of development (meta-language, affect and cognition).

Table 22.2: Language development through portfolio use (checklist for teachers)

Stage	**Criterion**	**Development Domain**	**Dominant Portfolio type**
Modelling	1. Have an understanding of what was discussed in class	(meta-) linguistic	*formalist*
	2. Have some further practice	(meta-) linguistic	*formalist*
	3. Have made progress	(meta-) linguistic	*formalist*
Practising	4. Have reflected on the experience	affective; cognitive	*expressivist; cognitivist*
	5. Have identified reason(s) for the choice	cognitive	*cognitivist*
	6. Have mastered the skill/fulfilled the objective	cognitive; (meta-) linguistic	*cognitivist; formalist*
Applying	7. Have developed the capacity to use this new experience in learning or other contexts	cognitive; affective; meta-linguistic	*cognitivist; expressivist; formalist; social constructivist*
	8. Are able to self-assess and exercise self-discipline	cognitive; affective; meta-linguistic	*cognitivist; expressivist; formalist; social constructivist*
	9. Are aware of your strengths and weaknesses and the need for further development	cognitive; affective; meta-linguistic	*cognitivist; expressivist; formalist; social constructivist*

22.3.1 Significance of the Checklists

The checklists for students (see Appendix A) and for teachers (see Table 22.2) are of significant value in the portfolio-mediated teaching-learning process. Notably, both the students and the teachers need specific guidelines for (self-)assessment in initial portfolio implementation to acquaint themselves with the system. In Hong Kong, teacher-fronted instruction and conformity still dominate classroom pedagogy. It is scarcely surprising that changes or innovative practices are often greeted with skepticism and anxiety. The inclusion of a checklist, delineating clearly the criteria for development and the amount (or quantity) of input, will help to lessen ambiguity, thereby, reduce resistance. Despite a lack of depth in the students' portfolio comments, evidence from this study points to the need for teachers to accept the paradox that, in fostering student ownership, more (not less) guidance and (teacher) responsibility are required in the early stages of portfolio-based learning.

22.4 Strengths and Limitations

22.4.1 Strengths

By delineating the stages of apprenticeship, the students seemed to develop a better understanding of how the portfolios were constructed, of how portfolio construction could be a learning experience in itself, and of the nature of learning being recursive, cyclical and iterative. The reason for this is that they could revisit any stage of the apprenticeship or showcase artefacts, highlighting any aspect of their experience/achievement by referring to the criteria. More importantly, both the summative and formative functions of the portfolios were accorded due weighting—summative (module grade) and formative (generic feedback and/or written comments, dialogue sustained over 11 weeks of the ELEP module).

22.4.2 Limitations

Given the small number of participants, it was relatively manageable for the tutor to examine each artefact closely and to comment on each to encourage two-way conferences and reflection. The primary concern is that there is no knowing how likely students are to apply the acquired knowledge in other contexts.

22.5 Contributor's Reflections on the Assessment

Below are some unedited comments articulated by the students:

> **Choice:** 'If time is allowed and when we don't have too much workload, writing reflections would be the most effective way in language learning ... it allows us to express what we have achieved in learning ... portfolio activities can help develop our English ... better than spoon-feeding.'

> **Reflection and analysis:** 'Learning English is absolutely ineffective when there is no direction. The method (portfolio) can help us analyse and change our weakness ... encourage us to improve our language ourselves. It is a big incentive for me to write a paper in English without much constraint.'
>
> **Modelling and feedback:** 'I prefer comments and corrections ... I can learn from the articles, improve my vocabulary and help me to use them in other situations ... the checklist is easy to use, not too time-consuming.'

There is much debate about the role of portfolios in education, in particular, the pain and gain of its implementation for the purpose of learning and assessment (Chetcuti *et al.*, 2006; Jones and Shelton, 2006; Klenowski, 2002; Hamp-Lyons and Condon, 1993, 2000). It is hoped that this case study will help to shed light on how apprenticeship into portfolio ownership can be achieved and how the summative and formative dimensions of assessment can be addressed with the use of portfolios. Further exploration along the path will be of significance. As Hamp-Lyons and Condon (1993, p. 177) caution:

> Like all beneficial innovations, its greatest benefits come when it is not entered into lightly or unquestioningly, but when critical eyes are brought to bear upon it, demanding enlightenment and thereby helping to ensure excellence.

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Appendix A

Portfolio checklist for students

In what way have you developed as a proficient learner? Items that show you: *(entries in one study portfolio as an example)*

Criterion	**Item Number/Description**	**Teacher's comment**		
		Successful	**Adequate**	**Thin**
1. Have an understanding of what was discussed in class	*Learned about genres. Interesting, I looked at articles in a different way.*	*Glad to know that you've learned something new.*		
2. Have some further practice	*Found an article about gay couples, but a lot of the words I don't know*		*Don't worry too much about this for now. Keep reading.*	
3. Have made progress	*Look up some words, but I used a Chinese-English dictionary*		*Did you try an English-only dictionary?*	
4. Have reflected on the experience	*Didn't know where to look at first, or I'm too lazy.*		*Consider doing something about this?*	
5. Have identified reason(s) for the choice	*Illustration helped me.*		*OK, did you check the table of contents?*	
6. Have mastered the skill/ fulfilled the objective	*Found that I am less afraid of words that I don't know. Able to write fast*			*Perhaps you'd like to think about whether the ideas are clear?*
7. Have developed the capacity to use this new experience in learning or other contexts	*Looked for other articles and got help from the teacher*	*Great. Do talk to me or other teachers.*		
8. Are able to self-assess and exercise self-discipline	*I now write more often, but something frustrated with so many mistakes*		*Why not write short paragraphs first rather than one long essay?*	
9. Are aware of your strengths and weaknesses and the need for further development	*A bit lazy, but need to work harder*		*Perhaps you can draw up a study plan and stick to the schedule*	

Date submitted: _____ **Date returned:** _____

Overall rating: (☑) Successful (10%): ☐ Adequate (5%): ☑ Thin (1%): ☐ No effort or evidence (0%): ☐

Suggestions: *I've enjoyed in particular reading about your dreams; thank you for sharing them with me. I also like the way you designed the cover. What does the 'bow' stand for? It seems you like fantasy novels. If you do, we have got quite a collection for you. Check them out and let me know what you think. Keep up the good work.*

Case 23

Life after University: Assessing Final-year Environmental Science Students to Ensure Success in a Research Workplace

Contributor	Dr. Debra Panizzon
Email	dpanizzo@une.edu.au
Telephone	+61-2-6773-5061
Affiliation	SiMERR National Centre, Education Building, University of New England, Armidale, NSW, Australia.

23.1 Context

Science students at the University of New England complete a group of core and elective units as part of a Bachelor of Science, Bachelor of Environmental Science, or Bachelor of Natural Resources degree. *Resource Survey and Habitat Evaluation* (RSHE) is one elective unit available to students in their final year of study. It comprises 26 1-hour lectures and 13 3-hour practical sessions over a period of 13 weeks (i.e., a semester). Approximately 50 students complete the unit each semester.

The unit is aimed at providing environmental science students with an understanding of the survey methods applicable to ecological research by developing skills in planning, conducting and reporting on an individual research project. To assist students in data analyses, they are introduced to a suite of statistical procedures, which are used to help them support or negate their hypotheses. Not surprisingly, the life-science students who enroll in the unit are challenged initially by the idea of statistics (Neumann, 2001). This fear is often based upon previous teaching experiences whereby statistical analyses are presented as recipes for data analysis with little real-world application. As a coping strategy, many students learn by memorizing and regurgitating statistical procedures (Murtonen and Lehtinen, 2003).

To overcome the dread that many students express in the first lecture for RSHE, an inquiry approach is used. Unlike most other science units, the practical sessions become the major focus with much of the time being spent trialing different survey method designs (e.g., use of different sized quadrats) and discussing the various components of research design (e.g., size of sample, replication, etc.). Lectures support these practical experiences providing students with the theory necessary to understand why particular methods are more appropriate in particular areas. This ensures that teaching is focused and contextually relevant to student learning facilitating a deeper understanding of the research process (Panizzon and Boulton, 2005).

The case study reported here is the result of three years of evolution by the science lecturer based on reflective practice, student feedback and collaboration with a science educator.

23.2 Learning Outcomes being Assessed

By the end of the unit students are expected to have:

- gained an understanding of a range of ecological research methods and their suitability for different types of biological fieldwork;
- developed a research project so as to provide a clear outline of the aim, design, protocols, and data analysis procedures;
- conducted a research project in the field and collected data over a 4-week period;
- experienced a variety of statistical analyses and applied them to 'real' data sets;
- demonstrated an ability to communicate the findings of their research to a wider scientific audience; and
- composed a detailed research report based on an individual fieldwork study.

23.3 Assessment Procedures/Details

The assessment tasks for RSHE are designed to represent the real-life steps involved in the working context of ecological scientists, thereby, preparing the students for careers as researchers or natural resource managers. Rather than appearing as isolated tasks, the staged sequence provides the students with the opportunity to build up their skills and expertise using feedback from preceding assessments. So, while tasks are being assessed summatively, they are used formatively to improve student learning in an ongoing manner. The effect of this approach is a demonstrable improvement in the students' understandings of the research process.

23.3.1 Assignment 1: Development of a research proposal

In this task, the students identify an area of research interest (e.g., the leaf breakdown rate of poplar leaves compared to eucalypt leaves in a local stream) and develop testable hypotheses. Subsequently, the students develop a research design including details about the location, research sample, data collection methods (how and when), data analyses, and a timeline for their proposed project.

This assignment is introduced and discussed after the practical session and introductory lectures in the first week, so that students are familiar with the concepts identified. In the ongoing weeks, these concepts are developed further so that students are able to use the information gained from lectures to complete their assignment task.

Peer assessment of research proposals (Formative only)

With a draft of their research proposals completed, the students are put into groups to review other proposals. This is undertaken during a practical session with each student encouraged to pose questions, raise possible research issues, and seek clarification about any aspect of a proposal. Students are able to use this feedback to rework their original research proposals before submitting them to their lecturer for marking.

On submission, the lecturer marks and returns the research proposals within a week. This assessment precedes a mid-semester break (4 weeks) when the students complete their fieldwork. Subsequently, they return to study in the following semester ready to prepare the first draft of their research findings.

23.3.2 Assignment 2: Seminar involving a presentation of findings

For the seminar, their students present their hypothesis, an overview of their research design, details about the sampling methods and analyses, and their initial findings. This is completed in a 15-minute timeslot with a question period allowed at the completion of the seminar. Evaluation occurs by peer review using a template consisting of a series of Likert scales. Each of the criteria is allocated a mark with the lecturer pooling the data from the evaluation sheets to determine an overall mark for each student.

In addition to this mark, each student receives valuable feedback from the process, particularly in relation to the questions raised by their peers during the presentation. This information can be used by students in writing up their final reports.

23.3.3 Assignment 3: Written research report (Summative)

The final report, in essence, is a traditional research report. In reality, it represents a compilation of the research process that each student has experienced from the initiation of the hypothesis to the analysis and presentation of the data.

23.3.4 Assignment 4: Examination

The focus of the 2-hour exam is to provide students with the opportunity to demonstrate what they *know* by applying their knowledge and understanding to a series of ecological research scenarios. These are developed around real-world environmental

issues in Australia that are topical and of interest to the wider community. This approach contrasts greatly from a traditional science exam that favours students who are able to memorize and regurgitate scientific facts and content.

23.4 Strengths and Limitations

23.4.1 Strengths

- Students are provided with assessment tasks relevant to their future careers.
- A range of assessment tasks is utililized, so that students must demonstrate a number of key scientific research skills.
- Assessment is aligned to the practical sessions and lectures, so that it becomes embedded in the teaching and learning process.
- Understanding through the application of knowledge and skills is at the core of the assessment strategies, rather than a focus on memorization and regurgitation.

23.4.2 Limitations

- This style of engagement is intensive and is possible given the number of students enrolled in the unit. There are greater constraints with units attracting hundreds of students.
- It is clearly more time-consuming for the lecturer in developing and organizing the range of practical experiences/fieldwork necessary. Also, in being able to assess student work so that it can be used to improve the next stage of the research process.

23.5 Contributor's Reflections on the Assessment

Part of the success of the approach outlined in this case study is the crucial link between pedagogy, content and assessment. Biggs (1996, p. 360) refers to this as 'constructive alignment', whereby, frequent assessment allows the students to appraise and to evaluate their own performance in relation to individual learning goals. For example, the staged variety of assessment tasks linked into the sequence of steps in the scientific method, the 'ownership' of a small research project by students, the peer interaction along with the cumulative feedback provided an engaging learning environment that allowed students to monitor their own progress in an ongoing manner (Hannan and Silver, 2000; Toohey, 1999).

The major advantage for students was the perceived relevance of the assessment tasks in preparing them for their future careers. Interestingly, nearly all of the students interviewed over the last few years identified that the unit provided them with the first opportunity to write a research proposal and design a scientific investigation. This is surprising given that students are in their final year of study when undertaking the

unit. Efforts are now underway to apply these strategies to other units in the biological sciences.

23.6 Acknowledgement

Appreciation to Professor Andrew Boulton from the Department of Ecosystem Management for allowing me to observe and study his teaching methods and approaches.

23.7 Bibliography

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Case 24

Engaging with the Standards: Using Feed-forward and Feedback

Contributor	Ian Cathers
Email	i.cathers@usyd.edu.au
Telephone	+612-9351-9287
Affiliation	Faculty of Health Sciences, The University of Sydney, PO Box 170, Lidcombe NSW 1825, Australia

24.1 Context

This assessment method is used with a group of 1st year health science students at the University of Sydney (Australia) undertaking an introductory subject in physical sciences. There are currently about 160 students, in total, enrolled in generic health science, generic behavioural health science, or the oral health program.

The students, in the introductory subject in physical sciences, undertake a series of three simple, lab-based research projects that begin from their second day at university and lasting two weeks each. In groups of two or three students, they decide on a research question, then design and carry out an experiment to answer their question. Individually, the students write up and submit reports of each of the experiments.

This structure was chosen to provide small-group interaction, and early, regular feedback on the scientific method and some written communication skills.

24.2 Learning Outcomes being Assessed

The subject aims to assist students develop some generic skills in application of the 'scientific method', and in relation to technical report writing. In particular, the students are assessed on their ability to formulate, to carry out, to interpret and to report on a small experiment. They are assessed on these dimensions using their written report.

The subject, as a whole, is based on standards referenced assessment and the grading of student performance in these reports is explicitly based on published standards.

24.3 Assessment Procedures/Details

24.3.1 The Students

The students submit each report with an attached cover sheet. The cover sheet includes a grid that describes the standards for the various grades of the report's main components. This part of the cover sheet is shown in the sample (see Appendix A). The students are required to self-assess their report against these standards and use ticks to indicate their judgments on the cover sheet before submission. Thus, the students not only submit their reports, but they also have to engage in a meta-analysis and 'feedforward' their understanding of what they have done.

24.3.2 The Staff

The staff use the same cover sheet to indicate their judgments and grading of each component of the report. These completed report sheets, together with other comments on the report, are then used as 'feedback' to students.

24.4 Strengths and Limitations

24.4.1 Strengths

The assessment procedure helps the students to actively engage with the standards. The students give an indication of what they think they have done, and this allows the staff to provide individualized and specific feedback. The assessment, therefore, becomes a more useful tool for teaching and learning.

24.4.2 Limitations

- The staff are not blinded to the students' self-assessment, consequently, they might be influenced by the student judgements in their application of the standards to a piece of work.
- It is clear that a small fraction of students do not think about their self-assessment but rather just quickly tick the highest levels for all sections.

24.5 Contributor's Reflections on the Assessment

The University's Academic Board has embraced standards referencing as the preferred model of assessment and most of our undergraduate students are very familiar with its principles as a result of its use in matriculation assessments since 2001. However, informal observation suggests that, when given the chance, both the students and the staff can quickly revert to norm-referenced thinking and modes of operating. This is a shame, since well-executed standards referencing is far more transparent and can shape productive dialogue between the students and the staff.

In previous years, I had published and drawn students' attention to the standards used in assessing their reports. However, it was clear that many students did not actively engage with the standards. The requirement of feedforward self-assessment has meant that most of the students give thought to what they have written—and now also actively use the standards to help craft their submissions.

Discrepancies between the student and the staff judgments can form the basis for individualized feedback, addressing particular student misconceptions about what they have done. The assessment of the students' written work is time-consuming, and this is also the case here. However, it does make the provision of unstructured feedback more targeted and, therefore, more efficient since misconceptions about achievement are primarily addressed. For instance, there is no need to tell a student that they have not 'integrated their conclusions with other research' if they have already indicated this in their feedforward.

The students are positive about the clarity of the standards and the fact that these are also taught.

24.6 Bibliography

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Appendix A

A sample assessment table showing checked boxes (⊠) indicating a student's feedforward and checked circles (⊗) showing the structured component of the assessor's feedback. Discrepancies between the student's and the assessor's judgments can form the basis for other targeted feedback in the form of comments.

Section	Aspect	Fail	Pass	Credit	Distinction	High Distinction
Introduction	Research Question and Context	Research question is not clearly stated. □○	States research question only or relates to an irrelevant context. □⊗	States research question and reason for importance and relates these to a wider context. ⊠⊗	Research question is integrated into relevant literature and other research. Proper referencing. □○	Research question is integrated into relevant literature and other research. Coherently and concisely explained and properly referenced. □○
Materials and Methods		Only lists equipment used and/or a numbered "recipe" that was followed. □○	Equipment and arrangement described in such a way that the experiment could be repeated. Any significant safety issues highlighted. ⊠⊗	As for Pass but reasons given for choices. □○	As for Credit but description of experiment indicates that it has been carried out with care. □○	As for Distinction but coherently and concisely explained. □○
Results	Tables, Graphs and Analysis	Graphs poorly/wrongly plotted and labeled, tables poorly constructed. □○	Results clearly labeled and presented. Appropriate axes, headings, legends etc. Irrelevant data presented or data presented repetitively. □○	As for Pass but only relevant tables/values/graphs provided that are related to research question. □○	As for Credit but also implemented a thoughtful analysis of results, such as errors and distributions. ⊠⊗	As for Distinction but also considered higher level analyses. □○

Results	Description	No, little or inaccurate description of results. □○	Description of main results. □○	Important trends in results indicated, particularly those related to research question. □⊗	Main features of results described as well as any other important trends or features of the results. ⊠○	As for Distinction but coherently and concisely explained. □○
Discussion and Conclusion	Experiment	No significant comments about the experimental method. □○	Comments on the problems with the experiment. □○	Identifies particular ways that the experiment could be improved. ⊠○	As for Pass and also suggests other relevant experiments. □⊗	As for Distinction but relates these aspects to the literature. Coherently and concisely explained. □○
Discussion and Conclusion	Context	Only restates or summarizes the results. No accurate connection between experimental findings and research question. □○	Connection made between results and research question. □○	As for Pass but relates results to a broader and relevant context. ⊠⊗	As for Credit but integrated with relevant literature. Properly referenced. □○	As for Distinction but coherently and concisely argued. □○