

WORKSHOP: RESEARCH-TEACHING LINKAGES: BEYOND DEFINITIONS (OR HOW TO PITCH YOUR RESEARCH PROPOSAL TO MAXIMISE THE INTEGRATION OF RESEARCH, TEACHING AND LEARNING)

Contributors: Marian McCarthy, University College Cork; Jennifer Murphy, NAIRTL; and Stephen Cassidy, Cork Institute of Technology

BIOGRAPHICAL NOTE

Marian McCarthy was seconded full time from her post as lecturer in the Education Department, University College Cork (UCC) to work in Ionad Bairre, the Teaching and Learning Centre in UCC, which she co-founded in 2006. Marian has been teaching since 1977, having worked at second level for many years. She is coordinator of the Certificate, Diploma and Masters in Teaching and Learning in Higher Education. Marian's doctoral research is in the area of Teaching for Understanding and of approaches that facilitate the development of a Scholarship of Teaching and Learning within the university. She is particularly interested in the synergies between the work of Project Zero at the Harvard Graduate School of Education, with its focus on the student-centred approach of Multiple Intelligences and Teaching for Understanding, and those of the Carnegie Foundation for the Advancement of Teaching, with its focus on teaching as an integral part of scholarship and research.



Jennifer Murphy is currently pursuing a Doctorate of Business Administration in Higher Education Management. Her research interests include Organisational Behaviour, Strategy, Management and Teaching and Learning. Following completion of her Bachelor's degree she completed a Masters in ICT in Education and more recently graduated with a postgraduate diploma in Educational Administration. She worked as a teacher for over six years and subsequently worked as Project Co-ordinator of the Access Programme in University College Cork before being appointed as Project Manager of NAIRTL in 2007. Jennifer has presented at conferences nationally and internationally and has published and edited a number of publications related to the integration of research, teaching and learning.



Stephen Cassidy currently holds the position of Head of Teaching and Learning at Cork Institute of Technology. In this role, he is responsible for managing, promoting, and facilitating the development of effective learning, teaching, and assessment strategies within the Institute. His current interests are in the areas of curriculum design, teaching with technology, and student centred learning. Stephen holds a PhD in Mechanical Engineering from National University of Ireland, Galway and is a former senior lecturer in the Department of Mechanical Engineering. He has supervised a number of postgraduate students in his specialist research areas of heat transfer and sustainable energy.



KEYWORDS

Research – teaching linkages (research - led, research- oriented, research - based and research - informed); integration of research, teaching and learning.

INTRODUCTION

This workshop grows out of the Research-Teaching Linkages working group* of NAIRTL. The group was established to focus on clarifying links between teaching and research, particularly on those

sustaining the integration of research and teaching and learning. To date, NAIRTL has identified four research teaching linkages (research - led, research- orientated, research - based and research – informed teaching) to guide grant applicants and those wishing to publish in the research area of teaching and learning. These definitions are well grounded in the literature on research, teaching and learning internationally (for example: Boyer, 1990; Brew, 1999; Elsen *et al*, 2009; Griffiths, 2004, Healey, 2005; Shulman, 1993, and Shulman and Hutchings,1999) and served to provide a context for the session.

The workshop was well attended by participants from various disciplines and higher education institutional contexts. Its objective was to discuss and critique the four ways of linking research, teaching and learning already provided by NAIRTL. Case study scenarios/examples of each form of integrating research, teaching and learning were put forward to guide the discussion. Participants were given the opportunity to consider the meaning and implications of each research – teaching perspective and to highlight what might be problematic, or challenging, or acceptable. Further insights regarding how research-teaching linkages might be refined and expanded were gleaned from the participants’ inputs. In return, participants were enabled to fine tune their own understanding of research – teaching linkages.

BACKGROUND AND METHODOLOGY

The research-teaching linkages working group further clarified the four categories of integrating research, teaching and learning outlined by NAIRTL as follows:

1. *Research-led teaching and learning*: teachers doing the research and talking about it to students without actively involving them in the research.
2. *Research-oriented teaching and learning*: teachers preparing students to do projects; discussing the processes of research; teaching about how to do the research; learning to think in the discipline; for example, how does an engineer think?
3. *Research-based teaching and learning*: student doing the authentic projects using processes of enquiry.
4. *Research-informed teaching and learning*: Research on teaching, as opposed to research on the discipline itself. This also includes the idea of the students, or the wider community, informing the research questions.

These definitions were presented to participants on the day and represented the idea of the integration of research, teaching and learning as happening along a continuum. The working group found this to be a more inclusive way of introducing the concept of integration, than to construe it hierarchically. In an effort to develop the understanding of each of the approaches, the working group members agreed to record short video clips with staff or students in their institutions to be used in the workshop. This was an effort to illustrate in real terms with real people the approaches advocated. To avoid confusion in the language and definitions used, it was agreed that interviewers would prompt the interviewees in a pre-discussion about the four ways of integrating research, teaching and learning that had been identified.

The conference workshop would advocate the continuity approach to integrating research, teaching and learning, i.e. that it is good to be engaged in research-led teaching, but better to be practising all forms.

The questions to be put to staff and students were agreed in advance as follows:

QUESTIONS FOR STAFF

1. Tell us about yourself? (Name/ Institution/ Disciplinary Area)
2. How do you integrate research teaching and learning in your area?
3. What are the benefits of this approach?
4. What are the challenges of teaching and assessment for you?
5. Are there any other implications?

QUESTIONS FOR STUDENTS

1. Name of the course you are undertaking?
2. Are you aware of the current research happening in your area?
3. Have you been taught research methodologies?
4. Have you been involved in doing any research projects?
5. Have you participated in any research on your learning?
6. During your course are you exposed to research in any way?
7. If undertaking undergraduate research project tell me about it?
8. What are the benefits to being exposed to research?

The workshop began by highlighting the policy shift towards inclusion in third level research. Many national grant awarding bodies including PRTL1, HRB, IRCHSS,¹ NAIRTL and others require applicants to report on the impact of their research on their teaching. Attention was drawn to key comments from some of these bodies, made as part of the conference’s panel discussion entitled “*How can research funding organisations shape teaching and learning*”? For example, the comment by Dr Eucharía Meehan of the Higher Education Authority (HEA) that “*teaching and research are inextricably linked and part of the educational continuum...*” drew attention to the central idea of the workshop. Her focus on the student as researcher also highlighted the interconnected nature of research, teaching and learning: “*in essence all students are researchers- this is necessary if we are to perform in a knowledge society*”. Ms Dipti Pandya, representing the Irish Research Council for the Humanities and Social Sciences (IRCHSS), also made the connection between research and teaching, commenting that “*the grant scheme requires detail regarding how the proposals impact on teaching*”. Mr Martin Hynes of the Irish Research Council for Science, Engineering and Technology (IRCSET) also acknowledged that “*teaching and learning are part of the formative experience of scholars...teaching and learning provide a considerable part of science and society*”. Attention was also drawn at this contextual stage of the workshop to the PRTL1 5 guidelines which underline the importance of establishing research-teaching linkages (HEA, 2010, p. 9): “*It will be necessary to outline the specific measures which are proposed, or which are already in operation, which will enhance innovative and inclusive teaching and learning activities in the research area and strengthen the links between teaching and learning and research, within the institution*”. Finally, the NAIRTL (2009/2010) grant application guidelines were also invoked to strengthen the case for integrating research, teaching and learning. These included the four research definitions central to this workshop.

Classic examples of the four approaches to integrating research, teaching and learning were then identified and the video clips of staff and students talking about these approaches were played as stimuli. The implications of each definition were teased out as the workshop progressed, leading to meaningful and interesting discussion about research – teaching synergies.

¹ Programme for Research in Third-Level Institutions (PRTL1); Health Research Board (HRB); Irish Research Council for the Humanities and Social Sciences (IRCHSS).

RESEARCH-LED TEACHING: VIDEO ONE

Interviewee: Dr Roy Slator, lecturer in Bioformatics and Systems Biology, Cork Institute of Technology

In response to the question of how he integrated research and teaching, Dr Slator commented:

"I would like to think that my lecturing style included research led, research based and research orientated approaches. So, for example, with the biology and bioformatics, my own research features very heavily in the lectures which are delivered using PowerPoint presentations and an online learning environment ... it's very much based on my own research papers and review articles ..."

Dr Slator discussed all four research-teaching linkages, indicating that one begets the other. It was clear from his comments that he expects the students to get involved in the research, as part of his and their work, thus leading seamlessly into research orientated teaching and, ultimately, to research informed teaching and the evidence for student learning. However, for the purposes of the workshop, we focused on his reference to research-led teaching, letting his student's learning speak for itself later in the workshop in Video Five.

RESPONSE: RESEARCH-LED TEACHING

To guide the response to each video and research definition, two questions were asked:

What are the kinds of research- teaching linkages being identified here?

What are the challenges for the teacher regarding this kind of research?

A lively discussion followed this first vignette and led to the following generic questions: Can the research interests of the lecturer be too esoteric or specialised to be usefully incorporated into the classroom? Do the students have the vocabulary of the research area to understand the research? Is it too easy for the lecturer to 'talk over' the student by assuming the students have some familiarity with the material? Some insightful comments were also made regarding the student perspective. Students at an early stage of their formation have a belief that all knowledge is incontestable, that the 'facts' are black and white. Students may be frightened or intimidated if exposed too quickly to uncertain, ambiguous or contentious material which tends to form the basis of research. Students may be afraid to challenge the information and opinions presented in their lecturers' research.

RESEARCH-ORIENTED TEACHING: VIDEO TWO

Interviewee: Mr James Cronin, lecturer in History of Art and Adult and Continuing Education, UCC

Again, Mr Cronin invoked all four research-teaching linkages in indicating how he integrated research and teaching. We focused, however, on his commentary which most closely echoed our definition of research-oriented teaching for the purpose of this workshop:

"In terms of the research orientated teaching, one of the things we discover and find in adult education is, to quote Malcolm S. Knowles, adults returning to college have a huge bank of experience that they want to draw upon, but sometimes they are not familiar with the disciplinary understanding. So we try to foster the disciplinary understanding by linking back to their experience. So in the first week or so of the Certificate programme (in Art History in the Department of Adult and Continuing Education), we encourage them to sketch their map or metaphor of art history and to work with this over the year and to periodically revisit it. And then we also build into their work programmes gallery

visits, field trips to museums, where they are encouraged to look at the art in a focused way and then reflect on it, not through essays but through critiques of art...that is, something that will be real and authentic within the art practice world as well as the art theory element of the discipline. We are in the process of moving away from essay based and terminal assessment and we move more to project, authentic and formative assessment... One of the most pertinent feedbacks that we have had in the last two years is students coming back to us and saying we now see the discipline of art history with new eyes – we go to a gallery and our viewing is transformed..."

RESPONSE: RESEARCH-ORIENTED TEACHING

The first point of note in the generic discussion related to the importance of lecturers being aware of their own research processes, in order to make these explicit for students. Some challenging questions regarding this type of research - teaching synergy also emerged. For example, could such an approach become a straitjacket where the taught method of doing research is seen as the only way to do research? Could the process be flexible enough to allow students to develop a research style which suited them? There was also a key question regarding the inculcation of the student into the discipline/profession, for example, helping the student to learn to think as an engineer: Is an academic, teaching his/her own preferred research style, teaching the student to think like an engineer or like an engineering academic? Are these two one and the same? The latter question gave rise to some interesting discussion which found a common denominator in the idea that research - oriented teaching helps students to think in the discipline, ultimately opening the door to the scholarship of application or engagement, in the future. In that context, the student on work placement, for example, could begin to see how a 'real' engineer operates, while drawing on disciplinary perspectives to do so.

RESEARCH - BASED TEACHING: VIDEO THREE

Interviewee: Mr Daniel Blackshields, lecturer in Economics, UCC.

Once more, in response to the question of how he integrated research and teaching, Mr Blackshields discussed all four forms. For the purposes of the workshop, we focused only on the following comment to initiate our discussion about research-based teaching:

"... what I am attempting to do with the students, is 'self authorship' of their learning, so that the learning that they engage in is not centred on an authority, whether it be an economist or myself, but in their own beliefs, values, critical thinking faculties. What I have developed over the last number of years is a tool to scaffold them in terms of how they engage in problem solving using economics. I believe in taking economics out of the textbook... So how can we get the students to move beyond what they do in the classroom with me to actually using it in their everyday lives? This is where the Sherlock Holmes method comes in; as he says himself "my thinking is the art of systemised common sense". So what I am attempting to do is to get them engaged in the art of systemised common sense with their economics knowledge. And that entails them being much more self aware, much more reflective in their approach to how they use economics outside the classroom which, again, is what the stories of Sherlock Holmes can enable them to do because he is classified as an expert problem solver of social phenomena- a different type of social phenomena – crime. And what we do is to get the students to explore his methodology and how he engages with these problems and then to transfer that – what I call meta-cognitive thinking- to their own problem – solving issues with their economics knowledge".

RESPONSE: RESEARCH-BASED TEACHING

This generic discussion formed the centre piece of the workshop and began by acknowledging that this approach moved the control of the learning to the student, away from the lecturer. In consequence, it was pointed out that such an approach “needs good learning outcomes which emphasise that it is the process which is to be learned by the student”. In short, we have to ask ourselves the question “Are we assessing the process or the product of research”? Some felt that we should examine the process only and that the experience of students doing authentic projects leads to their ownership of knowledge, or their “self-authorship” of it.

Such an approach to research also raises practical issues if the projects are to remain authentic. For example, there are practical implications in engineering design and in building projects, such as the cost of the project, the availability of laboratories, the emergent health and safety issues, depending on the project, and the time factor involved in facilitating such research. The challenge of finding new projects which are authentic and bounded and which can be done in a twelve-week period was also noted.

Some concerns were also raised regarding the implications of undertaking authentic projects. There is, for example, the possibility of discouraging students if the authentic projects do not ‘work’. However, it was argued, again, that the focus should be on the *process*, rather than the *product*, and, indeed, that students demonstrate real learning if they can explain why their product doesn’t work. It was suggested that they could focus on the question of how they might do it better next time, as part of the research – based process. This led to another concern - the danger of the lecturer setting up an experiment, or project, to ensure that it would work. Participants felt that this would be counter-productive, leading to closed problems which wouldn’t match the more open-ended, risky problems that students would encounter later on, in research or industry. One lecturer commented that students have to be allowed to make their own mistakes, that there was a danger of falling into the trap of ‘terminal remediation’, where students’ problems can be ‘fixed’. To prepare for such a journey as inquirers, some participants pointed out that there was a need for scaffolding early on in the research-based process to build up student confidence and ability to tackle research problems. One delegate felt that setting up a problem and then saying ‘off with you’, without support, could be disastrous. This position was contested, however, with the counter claim that “throwing students in at the deep end and letting them sink/swim, at least initially, forces them to confront what they know and don’t know and to take ownership of addressing their learning deficiencies”. Another participant commented that this latter approach also helps the lecturer to understand what supports the students need, providing the opportunity for a dynamic, personalised response to the needs of a particular cohort or an individual student.

Two final points rounded up this discussion: the first was that lecturers need to be prepared for a certain amount of tension with colleagues who are using more traditional teaching methods and who don’t see the need for such a student-centred and inquiry-based approach. The second sounds a more positive note and relates to the mutual trust required between student and lecturer who take a leap of faith together into the unknown when embarking on the road of research-based teaching.

RESEARCH-INFORMED TEACHING: VIDEO FOUR

Interviewee: Dr Bettie Higgs, Senior Lecturer in Geology and Academic Co-ordinator, Ionad Baire, the Teaching and Learning Centre, UCC

Dr Higgs again ranged over the four definitions of research-teaching linkages in clarifying how she integrated them. However, her comments regarding research informed teaching and the scholarship of teaching and learning (SOTL) were particularly helpful and encouraging at this stage of the workshop. The video clip chosen reiterated the idea of seeing research and teaching in terms of a spectrum or continuum:

“I have a very broad vision of scholarship of teaching and learning and I think it just starts off by being scholarly. The academic staff within the university may be anywhere along a spectrum of scholarship of teaching and learning. ... it starts with just reading a study of somebody who has made an enquiry into their teaching. ... You might then get curious about your own. You might have a question or a puzzle, you might go that far: How can I change something, how can I tell if it is getting better, how can I collect evidence? ... Move along that spectrum to wherever suits you. Maybe you investigate your teaching one year and the next year you are not perhaps collecting evidence to the same extent. ...I don’t think all of us can aspire to that in the time we have available. But just to take a scholarly approach where you are always curious, watching, observing, collecting evidence where you can and seeing what it is telling you”.

RESPONSE: RESEARCH-INFORMED TEACHING

This was a pertinent point on which to end our discussion of the four scenarios. Since time was moving on and we were anxious to hear the student voice, we endorsed Dr. Higgs’ words regarding taking a scholarly stance to teaching and moving along the spectrum of scholarship as needed. It was clear from our summation that the focus in the research-informed approach must be on the evidence for student learning.

THE STUDENT VOICE: RESEARCH-TEACHING AND LEARNING LINKAGES: VIDEO FIVE

Interviewee: Mr Philip Kelleher, Fourth Year student, Bio-Pharmaceutical Science, Cork Institute of Technology.

Philip is a student of Dr Slator’s whose work we discussed in Video One. From the detail of the eight questions answered by Philip we focused on the two definitions that impacted most on his learning:

RESEARCH-ORIENTED TEACHING

“In terms of being taught research methodologies for researching our project and our literature review, we had to be taught about databases. We would not have encountered these before, such as PubMed and Science Direct...There was also the ability to critique these (research) papers and review them to get the correct information that was required... As well as that in the subject we avail of the Blackboard system where we run discussion groups together ...”

RESEARCH-BASED TEACHING

“Also, in terms of the classroom, we would use presentations as a method of research, with each person researching a different topic on a weekly basis...on the e-learning system, there are discussion forums running which require topics to be researched. We

discuss them as students. ...The research project phase for fourth year is linked back to the subjects studied in class and to the lecturer's own research that he performed in the past".

RESPONSE: INVOLVING STUDENTS IN RESEARCH-ORIENTATED AND RESEARCH-BASED TEACHING:

All were agreed that it would be a dream to have more students like Philip in our classes! What was clear from this final phase of the discussion was that it was indeed possible to involve students as researchers in our approach to teaching and that this process should be a key part of undergraduate education. The support structures mentioned earlier in our response to Video Three, should be endemic and a given; equally, we need to trust the students and, as one participant commented, to *"gift the learning to the learner"*.

The time-frame of the workshop did not allow us to play all the interview footage. However, in drawing this paper together, it is fitting to include the following clear account of research-based teaching as a way of reiterating Philip's message and acknowledging the centrality of student research across the disciplines. At the end of the day, integrating teaching and research is about providing opportunities for the students to present and celebrate their work. The following extract from Dr Carrie Griffin's interview captures the excitement of this process:

RESEARCH – BASED TEACHING AND THE STUDENT EXPERIENCE: VIDEO SIX

Interviewee: Dr Carrie Griffin, School of English, UCC

"I'm involving my undergraduate students in an authentic research project. The students conduct their own research investigating the changes in books and texts over time, as they are published in new versions and editions. This is their first experience of conducting research and the sense of enjoyment in this task is very apparent. Today we are showcasing the student's research at this conference which allows the students to present their research in poster form and also to become aware of the latest developments in this field and perhaps spark off ideas for how their research could evolve".

KEY FINDINGS OF THE WORKSHOP:

- All lecturers interviewed were linking their research and teaching in more than one way; hence the importance of placing the four definitions identified by NAIRTL along a continuum. To be anywhere along this spectrum is an authentic way to link teaching and research but to engage in some way with all forms of integrating research and teaching is the ultimate goal.
- There is a language and grammar of reflective practice involved in integrating research and teaching which all of the interviewees possessed and which the NAIRTL grant guidelines have helped to develop. Such a reflective, meta-cognitive capacity is enabled by the peer review context of colleagues meeting and presenting their teaching and their students' learning to one another. Participants were keen to have similar workshops where higher education teachers could tease out the teacher-researcher relationship. NAIRTL conferences provide an opportunity to develop such a community of learners.
- The discussion phases of the workshop highlighted the complexities and challenges embedded in each definition. However, it became clear as the workshop progressed that whatever way we marry research and teaching, it should beget an enhanced student learning experience.

***MEMBERS OF THE WORKING GROUP.**

Stephen Cassidy, Teaching and Learning Centre, Cork Institute of Technology; **Kelly Coate**, Centre for Excellence in Learning and Teaching (CELT), National University of Ireland, Galway; **Mary Fenton**, Adult and Continuing Education, Waterford Institute of Technology; **Marian McCarthy**, Ionad Bairre, The Teaching and Learning Centre, University College Cork; **Jennifer Murphy**, NAIRTL; **Carmel O'Sullivan**, School of Education, Trinity College Dublin.

REFERENCES

- Boyer, E. (1990). *Scholarship Reconsidered: Priorities of the Professoriate*. The Carnegie Foundation for the Advancement of Teaching, San Francisco: Jossey-Bass.
- Brew, A. (1999). "Research and teaching: Changing relationships in a changing context", *Studies in Higher Education*, vol. 24, no. 3, pp. 291-301.
- Elsen, M., Visser- Wijnveen, G.J., van der Rijst, R. and van Driel, J.H. (2009). "How to strengthen the connection between research and teaching in undergraduate university education", *Higher Education Quarterly*, vol. 63, no. 1, pp. 64-85.
- Griffiths, R. (2004). "Knowledge production and the research – teaching nexus: the case of the built environment disciplines", *Studies in Higher Education*, vol. 29, no. 6, pp. 709-726.
- Healey, M. (2005). "Linking research and teaching: exploring disciplinary spaces and the role of inquiry based learning", in *Reshaping the University: New Relationships between Research, Scholarship and Teaching*, ed C. Rust. London: McGraw Hill/Open University Press, pp. 67-78.
- Higher Education Authority (HEA) (2010). *The Programme for Research in Third Level Institutions (PRTL): Contributing to Ireland's Knowledge Economy and Society* [online]. Call for Proposals for Cycle Five, p. 9. Available from: <http://www.heai.ie/en/prtli> [accessed 29 June 2010].
- National Academy for the Integration of Research, Teaching and Learning (NAIRTL) (2010). *Grants Initiative 2010: Guidelines for Application* [online]. Available from: <http://www.nairtl.ie/funding> [accessed 29 June 2010].
- Shulman, L. (1993). "Teaching as community property: putting an end to pedagogical solitude", *Change*, vol. 25, no. 6, pp. 6-7.
- Shulman, L. and Hutchings, P. (1999). "The scholarship of teaching: new elaborations, new developments", *Change*, vol. 31, no. 5, pp. 10-15.