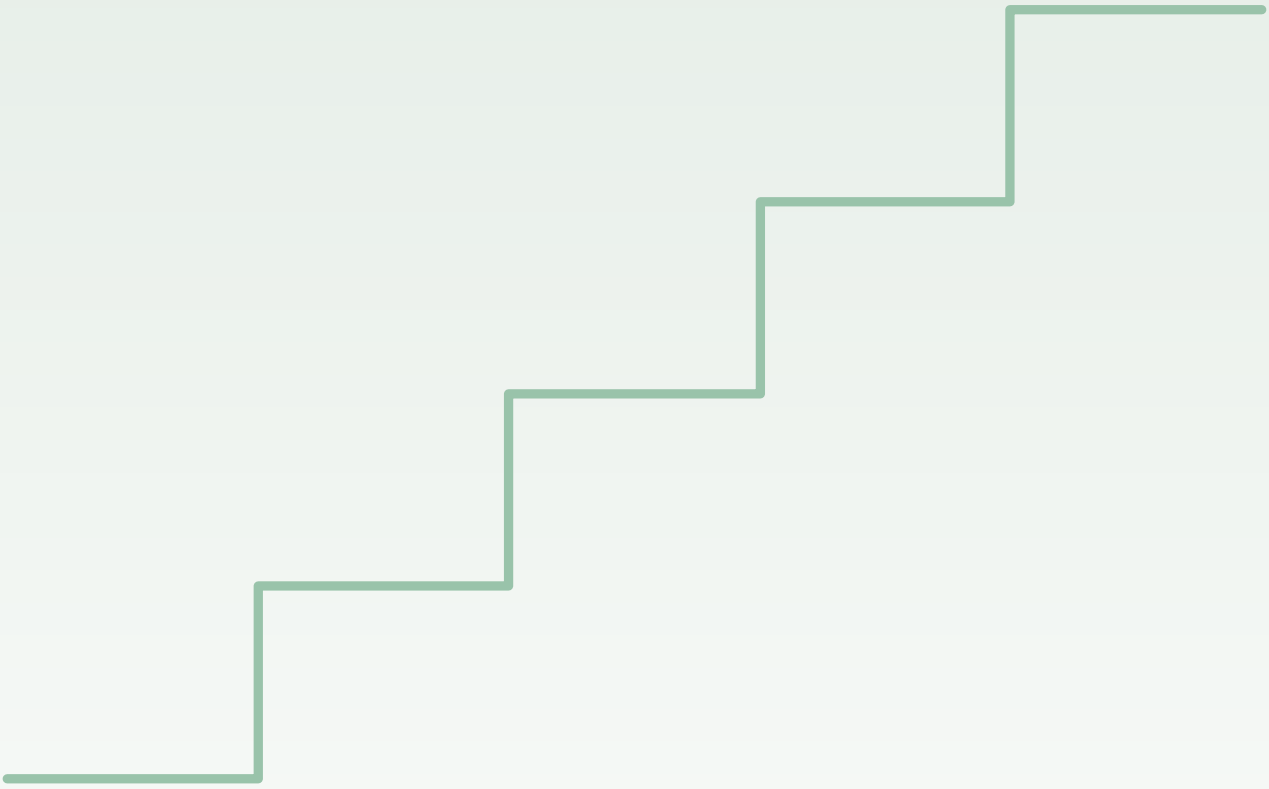
Teachers as Learners:
Exploring the impact of accredited professional development on learning and assessment in Irish Higher Education



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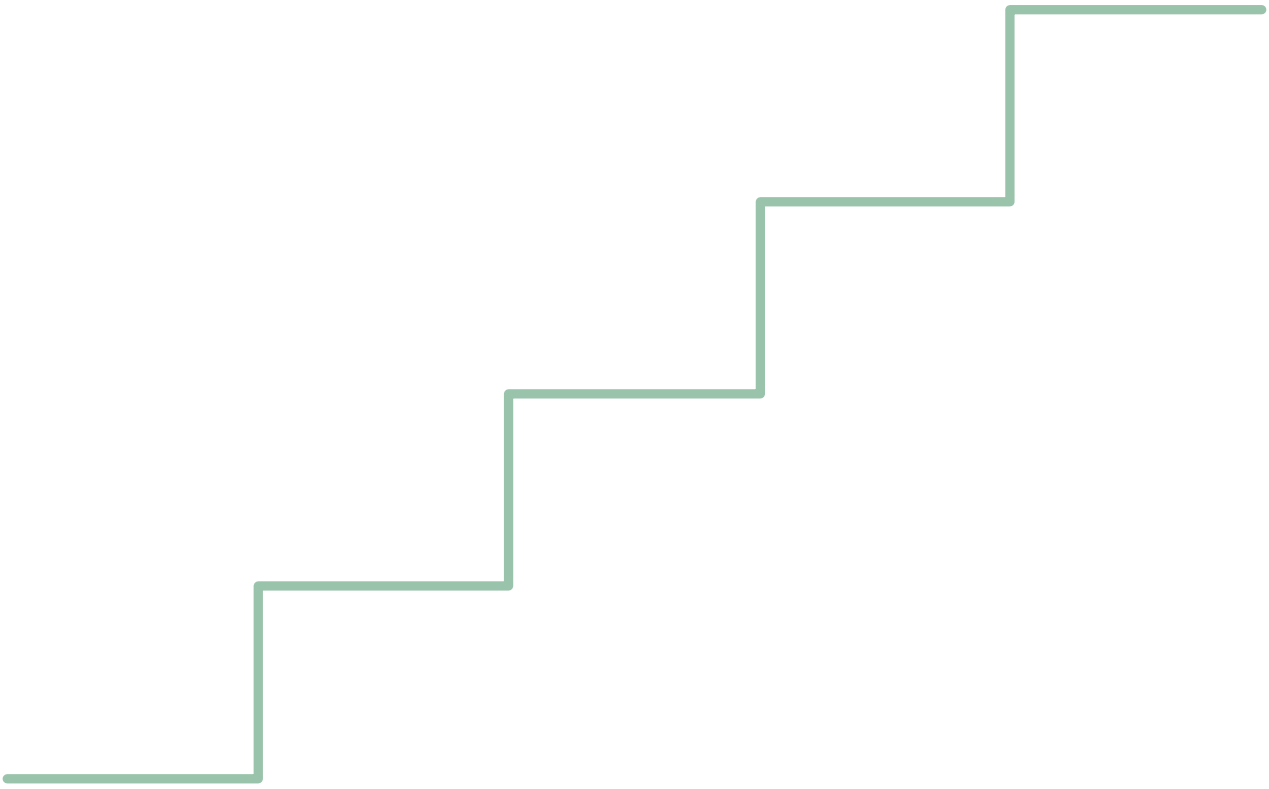

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Foreword

It is an honour and a privilege to be invited to write a foreword to this collection. As an educator with a strong commitment to student-centred learning and assessment the articles in this collection are a joy.

I moved into higher education in 1998 after twenty years as a science teacher and curriculum developer. Assessment for, of and as learning was on my radar. As a lecturer in an institute of technology I was stunned and surprised at the reliance on formal examinations and tests for assessment and I was determined to learn about assessment and implement best practice in my modules. Thanks to Dr Anne Jordan of Waterford Institute of Technology I began to explore the teaching of assessment to colleagues across higher education.

The second surprise on moving into third level was the lack of understanding about teaching and learning as well as assessment and how it was needed. Then I researched teaching in the institutes and came to the conclusion that formal accredited professional development (APD) may not be the best way forward. As a member and then Chair of the Learning Innovation Network (LIN) I worked to develop APD in my own institute and across the institutes of technology. That experience made me eat my words and this collection shows why.

The works presented in this volume exemplify the practice of assessment explored through APD across the country and the impact this has had on individual lecturers, students, modules and programmes. What is evident is the impact of doing work for assessment has had on the participants of the APD programmes. Taking part in an accredited programme and completing the associated assessment engages lecturers in practical strategies for change.

The second impact of assessment is the impact of the experience of assessment – the experiential learning about assessment that lecturers do as part of the accredited APD – has on their work as lecturers. Lecturers assess differently having considered assessment in theory and having experienced it in practice. The experience gives lecturers the language to engage in professional dialogue about assessment with themselves, their programme teams and most importantly the students.

I commend the editors, authors and all for a most engaging volume that will support the implementation of the National Professional Development Framework as well as the Enhancement Theme 2016-2018. The case studies along with advice from our international colleague Professor Gina Wisker will enable higher education lecturers to develop as reflective practitioners with a sound theoretical framework for assessment. This will benefit all who learn.

Dr Marion Palmer

Acknowledgements

This collection would not have been possible without the generous support of the National Forum for the Enhancement of Teaching and Learning; the work was funded under their 2016 Networks Funding. We gratefully acknowledge the support and guidance of the AISHE Executive and the LIN committee, with particular thanks to Saranne Magennis for her keen eye, good sense and wonderful way with words. Many thanks also to Keith McGuiness of Red&Grey for his excellent design work and his patience.

We are deeply grateful to our reviewers who gave so freely of their time and expertise: Dr Bernadette Brereton, Linda Carey, Anne Carpenter, Gerry Gallagher, Dr Alison Farrell, Dr Martin Fitzgerald, Dr Mandy French, Donna Hyland and Dr Morag Munro. Last, but by no means least, our sincere thanks to all our contributors for so generously sharing their experiences.

Thank-you all.
Moira Maguire, Nuala Harding, Gina Noonan and Tamara O'Connor

Dedication
The collection is dedicated to all those involved with accredited professional development in learning and teaching; providers and participants, past, present and future.

'When you learn, teach. When you get, give.'
Maya Angelou

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Contents

INTRODUCTION

Accredited Professional Development in Learning and Teaching as a Driver of Change: Exploring the Impact on Assessment

Moira Maguire [1], *Nuala Harding* [2], *Gina Noonan* [3] *and Tamara O'Connor* [4]
[1] Dundalk Institute of Technology, [2] Athlone Institute of Technology,
[3] Institute of Technology Carlow, [4] Trinity College Dublin

The provision of accredited professional development (APD) has been a notable development in higher education globally (Fry, 2006; Gibbs & Coffey, 2004; Lee, Manathunga, & Kandlbinder, 2010). Ireland is no exception and, in particular, there has been considerable growth in this area in recent years. Strategic Innovation Funding, commencing in 2000, focused on the improvement of quality of learning and teaching, increasing access, developing efficiencies and in particular, promoting collaboration between institutes (HEA, 2011a). Outcomes included the establishment of the Learning Innovation Network (LIN) in addition to centres for learning and teaching across the higher education sector (O'Connor & Chantler, 2011; HEA, 2011b). These initiatives are in keeping with National and European strategy and policy, including the recent publication of the *National Professional Development Framework* (DES, 2011; EUA, 2015; European Commission, 2013; NFETL, 2016). However, it has also been recognised that measuring the impact of professional development, both accredited and non-accredited, on academic practices, including assessment, is difficult to determine (Chalmers, Stoney, Goody, Goerke, & Gardiner, 2012).

Why this book?

The idea for this collection comes at a time of significant change within higher education in Ireland. With the publication of the Cassells Report (DES, 2016), much of the political focus has centred on the issue of investment and the consideration of future funding models in order to sustain a quality higher education sector. There is widespread consensus, within academic circles, that higher education continues to play an extremely significant role in the country's social, economic, cultural and civic development and that, accordingly, investment in higher education has benefits for all of Ireland's citizens. However, with the continuous decline in funding per student and a corresponding deterioration of support services, the overall student experience is under threat. With this in mind, one of the recommendations of the Cassells Report is to consider an enhanced focus on quality and engagement in teaching, to try and consider ways in which the learner experience can be improved through teaching and learning, all of which neatly align with the aim of this publication.

The publication of this book is timely, in that it follows the release by the National Forum for the Enhancement of Teaching and Learning (NFETL) of the *National Professional Development Framework for All Staff who Teach in Higher Education* (September 2016). This framework document provides guidance for all those involved in the design and provision of professional development across the sector and aims to encourage staff 'to engage in peer dialogue and support in their professional development activities' (NFETL, 2016, p.1). We hope that this collection will contribute to this dialogue by providing a platform to explore the notion of impact in relation to APD. The *National Professional Development Framework* document is underpinned by the guiding values of "inclusivity, authenticity, scholarship, learner-centredness and collaboration" (NFETL, 2016, p. 9). All of these values are evident in the contributions to this collection, each of which is also consistent with the LIN professional values, beliefs and principles which underpin academic practice (Baume, 2011).

This collection focuses on assessment, reflecting the National Forum's *Enhancement Theme 2016-2018: 'Assessment of, for and as, learning.'* The importance of assessment in influencing student motivation and behaviour and its potential for enhancing learning is widely recognised (e.g. Bloxham & Boyd, 2007; Boud, 2014; Carless, 2015; Gibbs & Simpson, 2004; Nicol, Thomason & Breslin, 2014). The enhancement theme encourages educators to reflect on assessment design and explore ways to do it better. Engaging in APD provides the impetus for critical reflection as participants undertake authentic assessment tasks designed to promote a reflexive approach and examine and enhance learning, teaching and assessment strategies.

Inspired by the launch of the *National Professional Development Framework*, the immediate impetus for this publication was a series of conversations amongst All Ireland Society for Higher Education (AISHE) and LIN members, about the impact of APD programmes in learning and teaching. In particular, many of us providing APD observed that perhaps the most visible impact is on assessment practice. The National Forum for the Enhancement of Teaching and Learning Network Funding Call for 2016 was seen by both AISHE and LIN as a timely opportunity to explore this APD impact within the Irish context. AISHE issued a call for contributions in Spring 2016 and was delighted by the volume and quality of the response and in particular by the balance between contributions from programme graduates and programme providers. In addition, AISHE and LIN invited contributions from Roisin Donnelly, Jen Harvey, Claire McAvinia and Claire McDonnell at Dublin Institute of Technology's (DIT)'s Learning, Teaching and Technology Centre (LTTC), who have been among the first to examine the impact of APD from an Irish perspective. Gina Wisker, from the University of Brighton, was also invited to contribute a piece based on her experience and views of accredited professional development and the impact of this provision on teaching and learning. Her contribution succinctly outlines the benefits of such provision, both in terms of professional and personal development. Wisker views professional development as a means of creating a learning dialogue between teachers and learners which itself benefits both the individual and the overall sector. She proposes that it is this dialogue that forms the basis for an enhanced focus on the scholarship of learning and teaching which, as she suggests, further contributes to our knowledge about how assessment works.

Currently, there is increasing emphasis on demonstrating the impact of activities right across the public sector and this is certainly true of higher education. Given the investment of time and resources in APD programmes in teaching and learning it is important to examine the impact of these. However, as Donnelly and colleagues note, in their chapter, 'Evaluating how engaging in professional development impacts on assessment practice: A proposed

framework', there is no consensus on either the definition, or its measurement. One of the aims of this collection is to explore the nature of impact(s). It is clear from the contributions that there are many different kinds of impact, including personal transformations on the part of participants, positive impacts on learning and the student experience and wider changes within programmes, institutions and beyond. The contributors illustrate how APD has provided both opportunities and support for educators to take time to reflect, change and improve their practice, especially in terms of how they view and implement assessment. Each refers to the importance of reflection and describes the transformative impact they experienced personally, in addition to their students' transformations in terms of performance and engagement. Furthermore, several contributions address the theme of the sustainability of changes achieved in their assessment practice.

Personal and Professional Journeys

The notion of a journey emerged as a significant theme in the contributions from programme graduates (see particularly Dina Brazil's chapter, Ronan Bree's and that of collaborators, Jane Holland, Martina Crehan, Clive Lee and Teresa Pawlikowska), as they explored the personal transformations that were prompted by their engagement with APD. These transformations often include profound changes in the way they viewed themselves as educators. They also include the development of new teaching and research interests and expertise. It is notable that, for our graduate contributors, professional development in learning and teaching is an ongoing part of their practice. All of them continue to be involved in learning and teaching initiatives and research.

All the contributions demonstrate a positive impact on learning and the student experience. For example, Daithí Kearney's use of video to promote formative peer assessment in music education increased student engagement and understanding of assessment, as well as improving communication. It is particularly encouraging to see that the impact extends beyond individual lecturers and their students to programme teams, departments, institutions and the wider learning and teaching community. Bree discusses an initiative developed as part of his MA Learning and Teaching that applied assessment for learning principles to laboratory reports, reducing the assessment burden for students and staff and promoting engagement with feedback. These changes have had a wide impact. They have been adopted and developed by colleagues within his department and, beyond this, they were the impetus for a multi-institutional teaching enhancement project, *Technology Enhanced Assessment Methods* (TEAM) in *Science and Health Settings* that was funded under the National Forum's 2015 Enhancement Fund. Barry Ryan provides another compelling example of the power of participation in APD. In the course of his MA in Higher Education he began to explore how to support Graduate Teaching Assistants (GTAs) in the development of their pedagogical skills. The initial case study evolved and has since developed into a bespoke course that has been integrated into the structured PhD provision at his institution and has had a demonstrably positive impact on the GTA participants' readiness to teach.

It is clear from these contributions that participation in accredited professional development does influence teaching and assessment practice and that this influence is sustained beyond the duration of the programmes concerned. The contributions also have much to say about how this impact is achieved. Contributions from programme teams note the importance of the development of a community of practice and engagement with the scholarship of learning and teaching. These contributions emphasise the scholarly outputs developed in the course of APD (see Brereton, Donnelly *et al*., Gormley, O'Keeffe & Bruce Ferguson). Nonetheless,

on the basis of these contributions, two key enablers of change emerge: the reflective practice and authentic assessment that are characteristic of these programmes. The focus on reflective practice encourages the theorisation of practice, while authentic assessment offers a model for implementing change to practice, with both enablers providing a space for innovation.

For our contributors, reflective practice was perhaps the most important factor that drove personal transformation. For many, reflective practice was new and challenging but ultimately very empowering, facilitating the linking of theory and practice. For example, Brazil explains how, as an empirical scientist, she found action research both 'alien' and 'appealing'. She embarked on a journey that saw her role transformed from that of an 'outsider' conducting a piece of objective research, to an 'insider', playing an active part in an equally rigorous piece of research. Coming from a medical background, Holland and colleagues emphasise the parallels between patient-centred care and student-centred learning. They write eloquently of the power of structured reflection to promote deep understanding and link theory and practice.

Authentic Assessment

A strong element of APD programmes, when the participants, the teachers, become the students, is the opportunity provided to examine learning, teaching and assessment from the student perspective. In particular, this occurs through undertaking authentic assessments leading to the development of pedagogic practices. The assessment of APD provision typically includes authentic learning and teaching activities, such as revising a curriculum or assessment strategy, identifying an area of practice to develop, implementing and evaluating an intervention and conducting research on one's own practice. The contributions in this publication provide evidence that this work has had powerful effects on teaching practice and the student experience, both of which are being sustained long after the programme has been completed. From the perspective of providing APD, Fiona O'Riordan examines assessment as being the impetus for curriculum change, within the context of a module 'Assessment and Programme Design'. Adopting a case study approach, she exemplifies how authentic assessment has the potential not only to contribute to professional development, but to effect change within curriculum development. Clare Gormley, Muireann O'Keeffe and Pip Bruce Ferguson emphasise the role that feedback on such assessment plays in promoting deep understanding, while Bernadette Brereton highlights the positive impact of mentoring both on participants and providers.

The contributions from participants strongly reinforce the argument in relation to authentic assessment as an enabler of change. For example, Holland *et al.* discuss the development of eight online case-based anatomy tutorials as part of a 'Design for learning' assessment. The positive student response led to a further fourteen being developed subsequently and formally evaluated as part of a research study. They note the value of assessment in making it possible for busy professionals to find the time to think about and apply the new knowledge acquired in the course of APD.

Assessing impact

The contributions take a range of approaches to assessing impact and draw on a wide range of evidence. Brazil takes an Action Research approach and within this uses a model, the Research Skills Framework, to structure both the intervention and her reflection on her own

teaching. Ryan also uses an Action Research framework and reports on three cycles, drawing on evidence from surveys, interviews and focus groups with programme participants. Bree, Kearney and O'Riordan each focus on key aspects of the student and staff experience that align with the aims of their interventions. For example, O'Riordan reports feedback from APD graduates about the positive impact of their participation on their subsequent experience of curriculum development. Bree uses both student feedback and student attainment as indicators of the impact of his work, while Kearney focused on student engagement, student understanding of assessment and lecturer responses.

Donnelly *et al* provide a valuable analysis of the challenges inherent in assessing impact of APD. They have developed a coherent framework for analysing the impact of professional development on assessment practice. The framework has four phases: self, context, pedagogy and transformative effects. Evidence underpins the entire process. Evaluative questions are included in each phase to focus on results or impact, rather than simply programme delivery. Another framework, the *Ako Aotearoa Impact Evaluation Framework* (IEF), is used by Gormley *et al.* to consider the impact of their standalone APD modules. This framework identifies four dimensions of impact: reach, impact on practice, impact on learners and impact on project team. Both frameworks offer structured and coherent approaches to evaluating the impact of professional development and other learning and teaching enhancement activities. These are useful tools for educational developers to use when evaluating changes to assessment practices.

Conclusion

In conclusion, this collection demonstrates that APD in learning and teaching has a wide ranging, sustained and positive impact, particularly on assessment practice. Authentic assessment is a key driver of this, along with reflective practice. It is notable that good quality assessment is both a driver and an outcome of impact. Given the contribution of APD provision to the increased professionalisation of teaching in higher education in Ireland, it is timely to take stock and interrogate the impact of these programmes. These contributions provide a snapshot of the complexity of these impacts and their assessment. Given this, structured evaluation frameworks are welcome tools that have the potential to allow us to examine what we are doing in a more coherent way, while respecting the diversity of richness of practice. We hope that this collection will contribute to and help develop the conversation about APD as a driver of change and particularly its impact on assessment practice.

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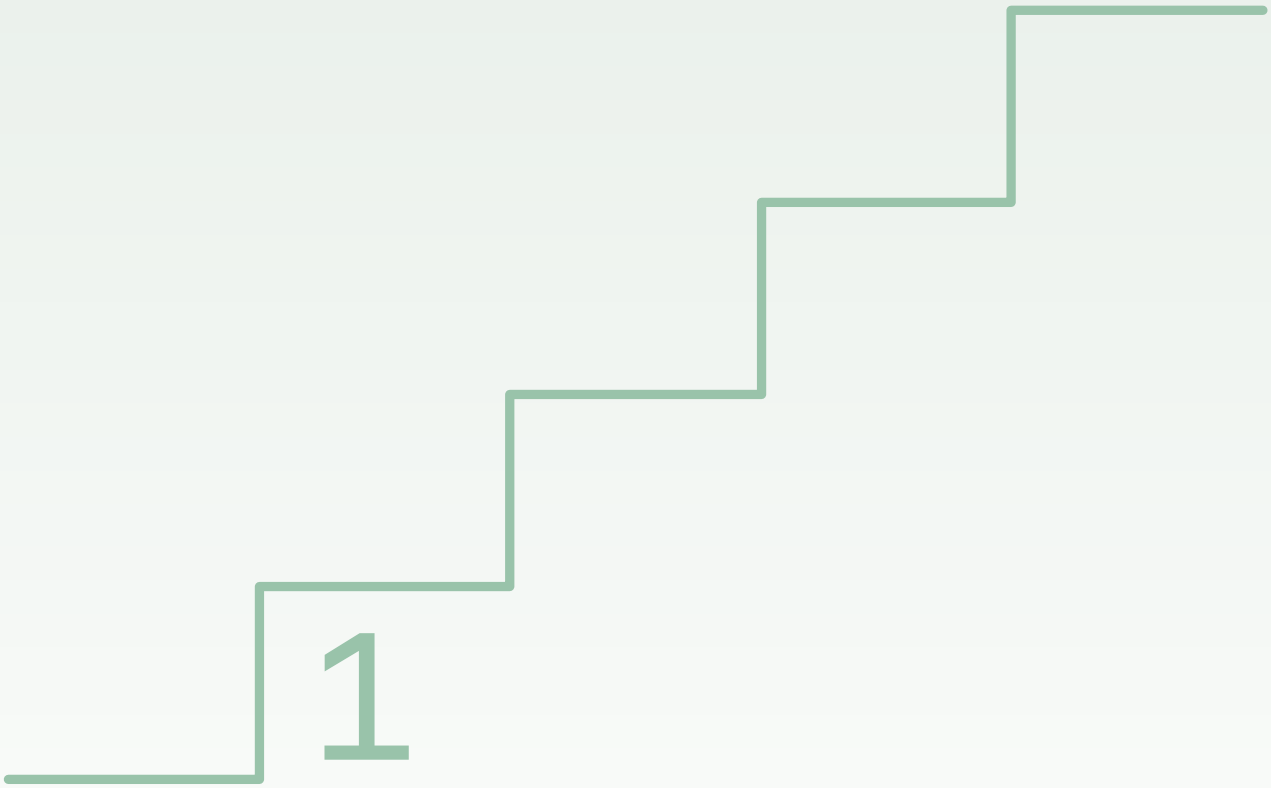
SECTION 1

Accredited Professional Development in Learning, Teaching and Assessment – Making a difference?



1. Evaluating how engaging in Professional Development impacts on Assessment Practice: A Proposed Framework

Roisin Donnelly, Jen Harvey, Claire McAvinia & Claire McDonnel.
Learning, Teaching and Technology Centre,
Dublin Institute of Technology.

Introduction

In the higher education context, the concept and implementation of measuring impact on practice of participation in academic professional development programmes has not been fully explored. More specifically, there is a lack of consideration for how assessment practices in particular have been impacted by engagement on such programmes. Generally, measuring impact is key for understanding how best to provide a coherent student experience, and academic developers are often drawn upon to support programme teams in this activity. This chapter provides guidance and direction to both academics teaching in higher education and academic developers charged with their support by discussing the key issues around how participation in professional development (PD) programmes and initiatives can impact (individual) assessment practice.

This work builds on a previous in-house study (McAvinia, Donnelly, Hanratty & Harvey, 2015) and a large scale UK Higher Education Academy (HEA) review by Parsons, Hill, Holland and Willis (2012). The former examined the extent to which we can assess whether accredited professional development programmes for academics have improved teaching and students' learning in higher education. The latter explored the strengths and merits of the available evidence of impact assessment, opportunities for improvement of impact evidence of teaching development programmes, and practical challenges evident from impact assessment and evaluation. A more recent HEA study was conducted by the University of Plymouth (Kneale, 2015) with an aim to bring the discussion forward from this point by creating state-of-the-art knowledge and understanding relating to how the impact of CPD schemes on the student learning experience can be measured. Within Australian higher education, there is further notable review work by Chalmers, Stoney, Goody, Goerke, and Gardiner (2013) and Chalmers and Gardiner (2015), which includes the development of an evaluation tool; both argue that the extent and longevity of the impact of teacher development programmes on the culture of the discipline and the institutions are less well researched and evidenced. Taken together these previous studies have identified issues with how impact is measured, with respect to content and methodology.

As a result of this, they believe that there is clearly a need for ongoing and rigorous research on the impact of teacher development programmes that looks deeper and beyond the measurements of satisfaction of academics who participate in the programmes; this is a welcome shift in focus to now exploring changes to thinking and practice which develop over time, the impact they have on students, colleagues and institutional ways of working.

Chapter Objectives

Given that there are increasingly expectations that higher education institutions today address the dual agenda of assuring the quality of teaching and providing value for money, teaching staff will increasingly be required to provide evidence of the quality of their teaching and of ongoing participation in teacher development programmes. This leads to questions on the effectiveness of professional development programmes and calls for Academic Development Centres to demonstrate that their programmes are not only linked with their HEI's strategic initiatives, but that they have resulted in improved longer term teaching and assessment practices and student learning experiences and outcomes. This chapter explores a number of objectives:

- What tools, frameworks, benchmarks, guidelines currently exist in this field? How could we better measure the impact and outcome of assessment practices arising from professional programmes?
- How do academic developers currently measure the impact and outcome of professional programmes/PD?
- Does academics' participation in PD affect their assessment practice? If so, how?
- How does participation in PD contribute to lasting improvements in assessment practice?

Throughout this chapter, we also identify examples of good or innovative assessment practice as a result of participation in PD as well as examples where PD may have contributed to changes to an individual's practice and/or changes to the way assessment is undertaken either by a programme team or individual (see the examples in Box 1 overleaf and the case study later in this chapter). Equally it is important to highlight examples of barriers encountered by individuals or programme teams when implementing assessment strategies as a result of participation in CPD and how these barriers were overcome.

What is meant by Impact on Professional Practice?

A key dimension to the chapter is the exploration and clarification of what is meant by 'impact' in this context; there can be confusion among educators about this, and currently there exists a lack of structure and consensus around evaluating the broader personal, professional and practice impacts of academic professional programmes. Much debate has surrounded the definition of impact and its measurement, which can range from among others, measurable pedagogical publications, developing (online) instructional resources, assessments, student development and teaching grants to epistemological and ontological changes in academics. Increasingly measuring an output from our academic study or work is one of the dominant conversations in the literature. From an academic professional development perspective, if one's accredited programmes are effective, then what changes might be measureable in academic staff or student behaviour?

Some examples from the LTTC: we have three accredited postgraduate programmes for academic staff. One of the goals for the MSc Applied eLearning is to provide programme participants with instruction on the pedagogy and potential of current learning technologies. If that instruction is effective, then participants should become more comfortable and confident with and proficient in using these technologies, and students should report that their lecturers use technology more frequently and more effectively in their classes.

MSc projects that have been developed in recent years and published are indicative of the learning from the programme transforming individuals' professional practice:

- *The effectiveness of online formative feedback for Optometry students on work placement*
- *E-xperience Erasmus: Online Journaling as a tool to enhance students' learning experiences of their study visits abroad*
- *A walk down the red carpet: students as producers of digital video-based knowledge* (Ryan, 2013).
- *Analysing the Impact of Digital Photography Projects on Student Engagement and Performance in a Higher Education Engineering Discipline* (Gleeson, 2014)
- *Can the Use of Online Learning and Reflective Journals improve Students' Performance for a practically taught Timber Jointing Module?* (Byrne, 2014)

One of the aims of the MA in Higher Education is to equip participants to undertake educational research using traditional and emerging research designs informed by a critical awareness of developments at the forefront of policy and practice in higher education. If this is achieved, they should have an opportunity to explore how aspects of their practice, which could include assessment, impact on learner motivation, performance, attitudes etc. Areas that have been explored include the relationship between approaches to learning and student performance (Moore, 2015) as well as effective constructive alignment for problem based learning assignments and strategies to develop higher order critical thinking in reflective blogs (Dunne, 2015).

The Postgraduate Diploma in Third Level Learning and Teaching focuses on curriculum design and assessment, in addition to practical techniques for student-centred teaching. There is further discussion of this programme presented later in this chapter, where we focus particularly on its outcomes as a key strategic PD initiative at our Institute.

Box 1: Examples of good practice.

While there is definite value in knowing information on the volume of activities in which one is engaged, it provides no direct indication of its worth to participants, nor any indication that change of any sort happened as a result of that activity. Outcomes-based evaluations, on the other hand, assess changes in the behaviour or attitudes of the participants themselves.

What is self-evaluation?

Planning and reviewing the impact of continuous professional development based on rigorous self-evaluation processes is an integral part of professional learning. But why is it important to develop a thorough knowledge of the self? This provides an opportunity for academics to engage in critically reflective dialogue about their professional learning, drawing on evidence of impact. Self-evaluation should involve asking deep and searching questions about one's professional knowledge, understanding, skills and practice. As part of this process, self-evaluation should be supported by evidence from a range of sources drawn from everyday learning and teaching. However, a crucial question here is - what do we mean by evidence? What can be considered as evidence? When and why is evidence important? When one engages in self-evaluation and reflects on practice, one's professional learning (plans for or impact of), or students' learning, it should be informed by some form of evidence. We would suggest that the following questions are an important part of this process:

- Why am I doing what I am doing?
- How do I know this is important/ worthwhile for my practice and my students' learning?
- What difference is it making for my practice and my students' learning?
- How do I know this?

There should be a triad of outcomes from self-evaluation: firstly, evidence of impact should help academics develop knowledge and understanding of practice and their students' learning; secondly it should be about a genuine reflection and analysis of their thinking, practice and professional actions; and thirdly, this process should allow academics to think about themselves and their learning, as well as their practice and student learning. A key part of this process is to consistently ask: "What have I learned?"

I have collected data on my practice - now what?

There is an argument that self-evaluation can be nothing more than introspection or navel-gazing. To counter this, it is important to move from collecting data about one's professional practice to examining the evidence; and this is where the importance of analysis appears. Evidence-based practice relies on robust, reliable and relevant evidence that should come from a wide range of sources and does not always need to be a written record. While a variety of research skills and tools is needed to gather robust evidence, it is vital that ethical guidelines are followed when gathering evidence (BERA, 2011). Although one can argue that data is everywhere, for it to be evidence it must meet the following conditions:

- Be relevant and meaningful for your purposes. What is it you need to know? Why is this the most useful/meaningful source of information for you?
- Asking the 'right' questions of the data and being critical.
- Be analysed and reflected on. What does the data tell you? What does that mean for you and your practice? How does it relate to other knowledge/information (policy, other practice, literature, research)?

Examples of Evidence

- Reflections on professional dialogue with peers, colleagues and learners
- Individual critical reflections on practice, including reflective journals
- Analysis of student work, individual or group focused
- Analysed teacher talk (from audio and/or video recording)
- Analysed student talk (individual, group and pair)
- Analysis of surveys taking account of the views of students, colleagues and other stakeholders in higher education
- Reflection on and analysis of lectures/tutorials/seminars/laboratories and/ or discussions with students
- Analysis of visual data, artefacts
- Analysed student interviews/ group discussion
- Analysed quantitative or statistical data sets/data analytics
- Analysed institutional and programme data reports, grant reports, publications, focus groups, case study methodology.

Undoubtedly challenges exist in how impact can be measured in the context of this topic. It is very difficult to show a direct (statistically reliable and meaningful) correlation between faculty development activities and improved student learning. Kelley (2014) suggests trying to establish measures that are as valid as possible, and then accept the fact that much of your data will be quite "messy" from a statistical standpoint. It is important to understand what each of your evaluation tools measures. There are a variety of tools available to us as educators to 'measure' impact; one example is 'The IDEA Form' [Individual Development and Educational Assessment (IDEA) instrument] (www.idea.ksu.edu) which provides powerful data, but it measures only student perceptions. To speak convincingly about the value of the programmes being taught, it is better to think about the data you collect to intentionally guide strategic planning. Based on the data you have generated, what areas or supports might you improve and what elements of your practice have you established that are effective?

To develop the topic further, examples from our own practice are used throughout the remainder of the chapter to illustrate the arguments on impact. In 2006, Pickering concluded that investigating the impact of these programmes on the practices and beliefs held by academics is not simple or even feasible. Indeed, quantitatively, it is difficult to demonstrate the relationship between participation in CPD and the impact on practice; there are difficulties in objectively assessing the impact of CPD on practice as there are many other variables which could account for variations in practice.

How to measure Impact on Assessment Practice?

Academic Development Centres are under increasing scrutiny to demonstrate value for money and a return upon investment. Professional development opportunities can be seen to serve a number of purposes: maintaining standards (up-skilling staff, new lecturers, exchanging effective practice) helping to address current challenges (poor ratings, evaluations, student retention) or as proactive forward thinking strategic approaches (responding to changing/anticipated needs) integrated within long term institutional planning processes.

Whether the opportunities have fulfilled their purpose is generally routinely evaluated in terms of participant questionnaires and institutional QA processes. Measuring longer term impact of specific PD activities poses more of a challenge given the changing context in which these activities are offered, the challenge of linking a specific intervention with a specific outcome and the likelihood of various stakeholders having different interests and concerns regarding impact measures e.g. potential employers might value greater authenticity or development of graduate attributes whereas students might see issues around fairness and consistency as a priority (Su, 2014).

Impact upon Assessment Design

One measurable outcome could relate to subsequent assessment design – evaluating whether assessments have changed to become effective/ efficient in the way they are designed. 'Are assessment methods or assessment strategies fit for purpose?' (Brown & Glaser, 2002). For example, are assessments valid measures of whether learning has taken place, an effective means of supporting learning process and/or assisting students to become autonomous, self-directed learners (Bloxham & Boyd, 2007)? Does an assessment strategy across a module/ programme reflect the nature of the programme? If not what changes are required in order that it might better achieve its intended purpose? Will employers and students be able to identify what is important and valued across a programme and what learners are expected to study and how this will be measured (Gibbs & Simpson, 2004). How might or can evidence be gathered to support these arguments?

Impact upon Assessment Outcomes

Assessment has been shown to have an influential role in learning, determining how and what is learned and the quality of learning achieved (Boud, 1988) Measuring these changes is dependent upon the kind of evidence needed to demonstrate this learning and a shift towards a particular theoretical stance on learning (e.g. mental representations vs behaviours). As a result there is perhaps a tendency to adopt easy to measure quantitative measures e.g. assessment marks, levels of engagement, student retention and equating these with assessment redesigns rather than exploring more qualitative evidence around attitudinal changes or different ways of thinking. In addition, it can also be problematic to separate out the resultant effects of an intervention with those arising from the investigation itself (Hawthorne Effect) This is further complicated by observable changes not necessarily being immediately apparent but part of a slower more gradual process. Cilliers and Herman (2010) have evidenced changes in practices up to seven years after participant involvement in educational development activities.

Equating Impact with Changes in Practice

Assessment is integral within curriculum and as such needs to be viewed within the context in which it is situated. Gibbs and Dunbar-Goddet's (2007) study of nine different institutional practices found a wide variation in the 'assessment environments' that students encountered. Within these settings, a broad variation existed in the diversity of assessment and feedback methods used across programmes as well as levels of support for what might be considered as 'non-traditional' assessment methods. Furthermore, Schools or Departments could be perceived as supportive or discouraging of staff considering changes in their practice.

In recent years, institutions in the UK such as Sheffield Hallam, Bradford Universities and in Ireland e.g. TCD and UCD have adopted strategic approaches to curriculum reform as a way to integrate changes in assessment practices at institutional level as part of a structured

implementation process. Combining successful policy, process and practice approaches to systemic change, these often resource intensive campaigns involve extensive pre-implementation extensive institutional in the consultations for the development of agreed shared curriculum frameworks. Such approaches can in turn enable appropriately aligned professional development opportunities to be designed to encourage the desired assessment changes across each programme (Holden 2010; Duffy 2013).

Determining Impact of Different PD Interventions on Assessment

The Irish Conceptual Model for the Professional Development of those who teach in Irish Higher Education (NFETL, 2015) has identified a range of different types of non-formal, informal and formal professional development opportunities available within Higher Education Institutions. In recent years there has been a shift towards third level lecturers having appropriate pedagogical training as a part of an ongoing professional development processes (European Commission, 2013; DES, 2011). Interestingly, however, research has demonstrated (Rust, 1998) workshops in themselves can elicit changes in practice. As well as providing an opportunity to develop new skills, they build confidence and reassure staff in making changes or provide encouragement through sharing of personal practice associated with being part of a group of learners with a shared interest. Informal intentional learning within PD activity associated communities of practice has been shown to be one of the most valued aspects of participating within PD activities (McAvinia, *et al*., 2015).

There can be an overreliance on standardised institutional forms to evaluate participant satisfaction or to follow up on perceived usefulness of non-accredited PD (Keane & Mac Labhrainn 2005). Evaluative models such as the Kirkpatrick model (1994) are helpful in providing structure with which to review the impact of different professional development activities. The Kirkpatrick model has been used as a foundation by a number of educational researchers to gather evidence, e.g. Rathbun, Leatherman and Jensen (2016); Kreber and Brooke (2001); Stes, Clement and Petegem (2007), with which to identify four levels of impact of training:

1. Reaction - what participants thought and felt about the training
2. Learning - the resulting increase in knowledge and/or skills, and change in attitudes
3. Behaviour - change in job behaviour due to training
4. Results - the final results (can be monetary, performance-based, institutional level).

Kreber and Brooke (2001) have added a further complexity to this model in order that it can be used as a tool within a professional development context in order to recognise impact upon individual belief about teaching and learning, changes in student perceptions of teaching performance, student learning, and the culture of institutions.

A valuable and practical analytical framework has been developed by Guskey (2000). This model has particular relevance to this topic since it suggested impact from teacher development programmes would be at five different levels: academic reactions; participants' conceptual change (teaching knowledge, beliefs and perceptions); participants' behavioural change (changing practice and use of skills/techniques and different learning strategies); development and change in organisational support for teacher development; changes to student learning and performance.

The methodological framework of realistic evaluation (Pawson & Tilley, 1997) focuses on both the object of the research and also the context within which it operates, to provide a rich picture of what works, for whom, and why (or why not); taking into account the different institutional settings, different specialities and teams to understand the impact of CPD on performance and practice.

A recent study of impact of professional development on teaching and assessment practice by Derting, Ebert-May, Henkel, Maher, Arnold and Passmore (2016) showed that, although teaching practice was more learning-centred, assessment practice did not change as a result. They contend that aligning learning objectives and assessments is challenging and that assessment design needs to be focussed on within professional development programmes.

Postgraduate accredited programmes e.g. the LTTC Postgraduate Diploma in Third Level Learning and Teaching are generally recognised as the main way by which staff can develop skills required to be a lecturer in Higher Education (NFETL, 2015; McAvinia *et al*., 2015). This can be considered as a substantial investment in staff for each institution. DIT remains the only Irish HEI with the requirement that all new staff should complete their PG Diploma within the first two years of commencing employment with the Institution. Such a strategy not only provides the opportunity for institutions to ensure a baseline level of skills for their staff but could also provide the opportunity to promote or encourage a particular pedagogical approach to teaching. At the least, there is an opportunity to broaden out the range of options from which academics might be able to make a selection of assessment methods. For most Academic Development programmes, formal support is combined with associated support for academics to become reflective practitioners and to be able to make decisions informed by appropriate educational research and personal reflective judgements (Jones *et al.*, 2016).

If PD is to be evaluated in terms of impact on assessment practice, it is perhaps worth revisiting the original aims of the PD activities. Are the aims institutionally led in order that staff have essential skills and knowledge to reach a baseline level or standard e.g. staff agree (change) and use an agreed set of assessment protocols *etc*? Is there an externally driven need for change to address a particular challenge or particular need (poor student ratings, change in student composition *etc*,) or is there a developmental focus on participants, their approach to learning and their potential and confidence to be able to make changes in an informed way into the future?

By recognising the potential impact of assessment and feedback on the quality of student learning (Gibbs, 1999; Boud, 1988), then perhaps the aim of PD design and the nature of these activities becomes more important. Is there a theoretical or applied approach e.g. do they explore educational research related to a particular method and/or how this might be applied in practice? Do they propose a change in assessment design and/or do they report upon their implementation of their design? Do they reflect upon their experience and then propose how they would undertake the same task differently next time?

Finally, if the intention is for PD to impact upon assessment practices then staff will need to be incentivised to make changes and for any changes seen to be formally recognised. Changes in practice need to be done in a way that any proposed changes are aligned with and help to achieve specific institutional strategic goals. Sustainable change is only likely to be achieved where there are opportunities to build confidence and exchange ideas with a structured supportive learning community that is working towards a shared goal. Impact measures,

see Stes et al. (2007) might include higher rates of receipts of teaching awards, increased student rates of satisfaction, before and after programmes etc.

The Emerging Framework

Based on the range of examples discussed below, we offer a Framework (Figure 1) to capture perceived impact on assessment practice which can be attributed to participation and engagement on professional development programmes/CPD. This framework is intended as an easy-to-use guide for programme teams and academic developers who want to explore if participation in professional development produces worthwhile results. As discussed earlier in the chapter, trying to link professional development with change in academics' assessment practice and resulting improvement in student achievement is very challenging because of the number of intervening variables.

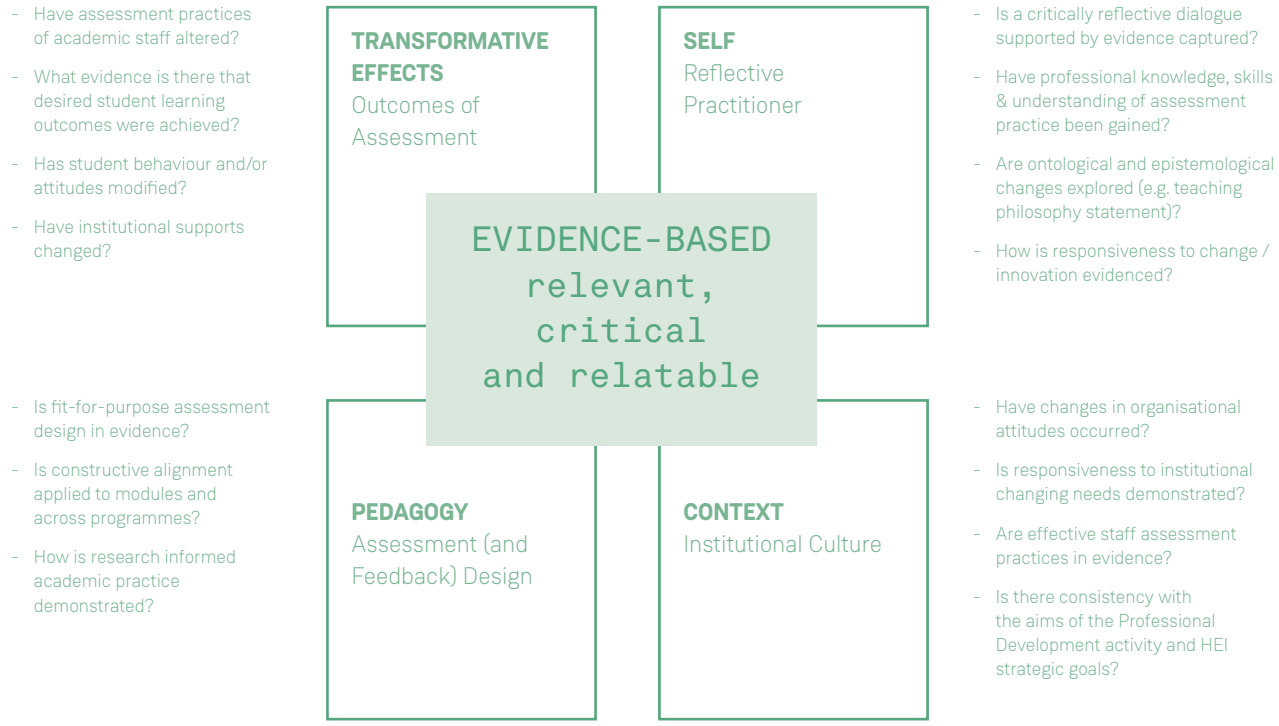


Figure 1
Exploratory Framework for Measuring Impact of Academic Professional Development on Assessment Change

This framework has emerged from our practice in the LTTC of delivering a number of postgraduate professional development programmes since 2001, and can be used to measure the impact of professional learning on teacher behaviour and student learning. The framework is divided into a series of overlapping quadrants. All four aspects are essential and interdependent: The SELF as a reflective practitioner; CONTEXT of the institutional culture; PEDAGOGY of Assessment Design; and TRANSFORMATIVE EFFECTS of the outcomes of assessment. At the centre of the framework is the need to collate and select EVIDENCE to support each of the phases. The framework includes a four-step process for engaging stakeholders with the use of evaluation questions in each phase. These questions are intended to shape decisions about the depth, breadth, and rigor of measurement of assessment practice. Trigger questions focus on the initial and intermediate outcomes and the programme's goals and objectives. By asking questions about results (e.g., did participants use the assessment strategies? did their student work demonstrate evidence of participants' application of the assessment strategies?) – you can measure impact rather than programme delivery.

The key elements of the Self phase are based on achieving a change agent position as a result of engaging in professional development. As a reflective practitioner, the participant looks back at their work done on the professional development programme and identifies their strengths and areas for continued refinement and growth in relation to their current and future assessment practice.

The Context of the institutional culture plays a key role in the framework; this involves having an awareness of disciplinary, institutional, national and perhaps international contexts, and acknowledging the diversity of contexts and the significance of this for teachers' implementation of assessment strategies within professional development learning.

Pedagogy of Assessment Design requires examining the assessment design developed by CPD participants to determine its likelihood of producing the intended results (is it fit-for-purpose and constructively aligned?). This involves scrutinizing the programme's goals, objectives, standards of success, indicators of success, and theory of change and exploring the programme's clarity, feasibility, strength, and value for practice.

For the Transformative Effects phase of the outcomes of assessment, we are proposing that ongoing PD sessions of learning, collaboration, and application, accompanied by Faculty/School/Department and classroom-based support, over a suitably sustained time period are necessary to incorporate new behaviours and thinking fully into a teacher's repertoire. If the design of professional development is sufficiently robust and long enough to promote deep changes, it can be possible to measure the impact of professional development on student learning.

Finally, Evidence is a key aspect of the whole process of measuring impact of professional development engagement on assessment practice; the framework encourages educators to build pathways with evidence to measure the impact of professional development on teacher classroom behaviour and student learning. You need to determine what evidence to collect, from whom or what sources to collect the evidence, how to collect the evidence, and how to analyze and interpret the evidence. This is an important step and interpreting the data to make sense of it involves drawing conclusions, assigning meaning, and formulating recommendations.

We now provide a worked example to show the framework in use; Figure 2 depicts the four interdependent phases illustrated through the example of the PG Diploma in Third Level Learning and Teaching, as a professional development programme that might be regarded as 'typical' in the sector. The emphasis on the development of the individual as a reflective practitioner is captured in the key reflective tasks in the Self quadrant, such as the drafting of a Teaching Philosophy Statement, and the analysis of a significant incident in teaching. The Context quadrant reflects the relationship of this programme to the institutional Learning, Teaching and Assessment Strategy (with external participants addressing the equivalent strategies and policies in their own institutions). This is captured particularly in the module redesign process, whereby institutional templates and policies must be addressed, along with the requirements of any disciplinary professional bodies. The Pedagogy quadrant shows the emphasis within the Diploma, as a postgraduate qualification at Level 9, on engagement with the scholarship of teaching and learning, and the integration of literature across the portfolios. In particular, this is expected as part of the curriculum design project and practitioner research project undertaken in Module Two. Finally, we anticipate and seek to promote Transformative Effects for graduates of the programme, their Schools/departments, and ultimately their institutions. In terms of assessment and feedback practices, these effects arise from the assessment and feedback practices within the PD programme in the first instance, and from their own enhanced practices following graduation. Transformative effects are shown through graduates' participation in informal pedagogical special interest groups within their own teams or departments; their engagement individually or with groups of colleagues in funding calls for Fellowships, technology-enhanced learning projects or National Forum initiatives; and their broader impact on the development of assessment and feedback practices within their institutions. The portfolios form the evidence of impact on the assessment practices of the participating academics in professional development programmes such as the Diploma.

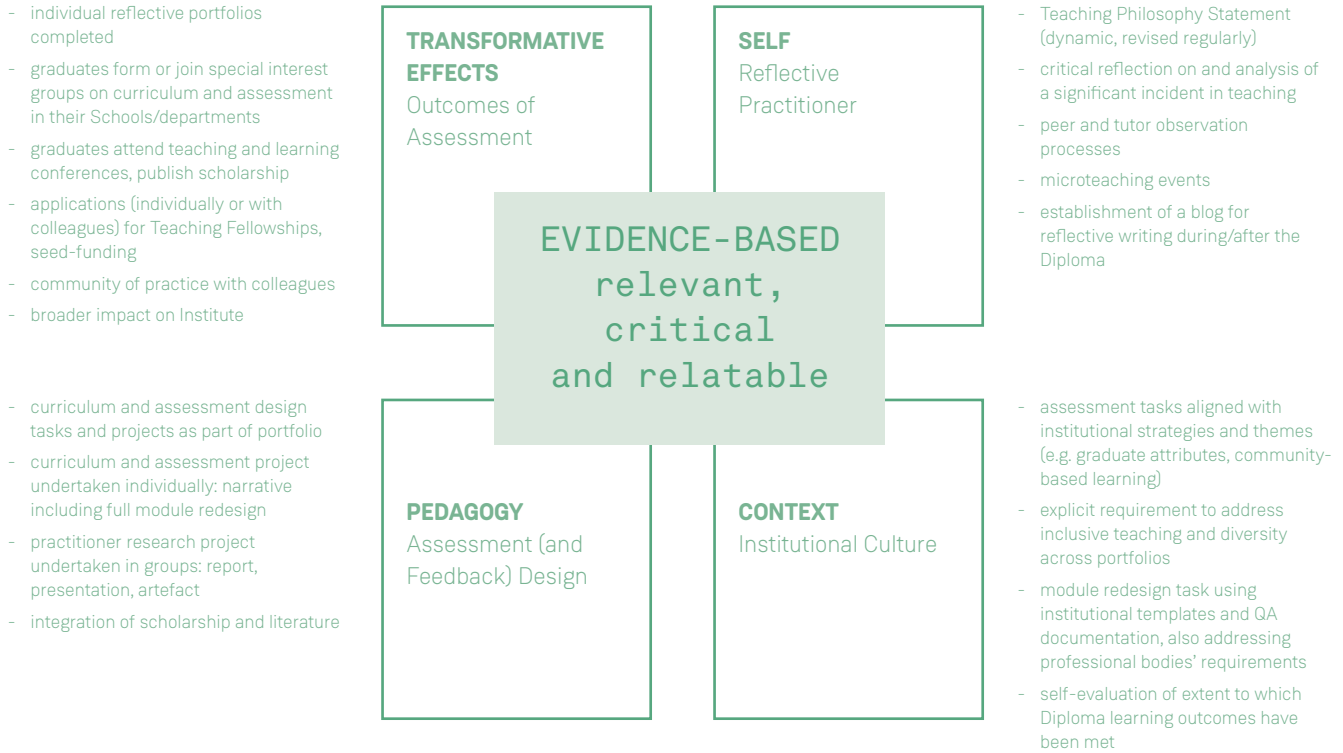


Figure 2
Worked example of the Framework for Measuring Impact of Academic Professional Development on Assessment Change applied to the Postgraduate Diploma in Third Level Learning and Teaching

We intend to continue work on this framework in order for it to be used as an interactive tool to assist educators to plan, measure and improve how they deliver their assessment practice and develop a series of worksheets to facilitate the planning and implementation of a stakeholder engagement process using the framework.

A range of examples of assessment practice are also shared in this section, including group projects from recent cohorts in the PG Diploma in Third Level Learning and Teaching; the DIT REAP Project; and a range of assessment strategies in LTTC Masters programmes.

Case Study - Postgraduate Diploma in Third Level Learning and Teaching

The Diploma, originally a Postgraduate Certificate qualification, has been offered at DIT since 1999-2000. Participants are teaching staff within and outside the DIT, and they have come from universities, Institutes of Technology, private colleges and industry. The nature of the programme is reflexive and its purpose is to develop reflective practice in participants, enabling them to continue developing their teaching after graduation and throughout their careers. Teaching, learning and assessment methods used all align with this aim.

The assessment strategy of the programme is designed first to support the development of reflective practice, and second to extend practice through independent research. A reflective portfolio in two parts is created by each individual participant, with submissions and assessment on a Pass/Fail basis at the end of each of the two Diploma modules. The portfolio shows a range of examples and evidence from practice, demonstrating the development of that practice through analysis and critical reflection. It should be noted that there are similar examples in accredited PD programmes around the Irish higher education sector (O'Farrell, 2005).

As part of the second module of the Diploma, participants are required to undertake a short independent research project in a topic of their choosing related to teaching and learning in higher education. This originated as an individual project assessed by a report and presentation. In 2015, the decision was taken by the programme team to reorient this component to become a group project. The group practitioner research project would provide participants with an opportunity to undertake group work more akin to that used with their own students, and distinct from teamwork or collaborative research projects undertaken in their professional roles. The original assessed components of a report and presentation have been retained, but are undertaken collaboratively: the report is jointly authored, and all members of the group are involved in making the presentation. In addition, each individual participant's portfolio must also include an individual critical reflection on the experience of group work as a student, and how it will influence their own use of groupwork in teaching in the future.

A challenge to students undertaking practitioner research in the context of a short, intensive programme such as the Postgraduate Diploma has been the importance of ethical procedures in data collection. The timescale in which the practitioner research should be undertaken does not match well with the development of a proposal, submission to, and approval from, institutional fora responsible for ethical clearance. In re-orienting the project towards groupwork, we also agreed to delimit the project to desk-based study and literature review, moving away from data collection and fieldwork. However, participants are invited to frame actions for further research leading out of the projects: this sets up the possibility that they can undertake fieldwork with their students after graduation, with more time to prepare formal proposals and submissions to their institutional ethics committees.

As a final outcome of the research, groups produce a simple "artefact" or resource informed by their review of literature. The brief for the artefact is broad: it can be an infographic, diagram, poster, flow chart, video clip, other interactive material or paper-based guide. Groups are invited to exhibit these resources and present their projects at the Annual Showcase of Learning and Teaching Innovations, alongside presentations from participants on our Master's programmes. The resources are shortly to be disseminated via our institutional repository, Arrow (www.dit.ie/arrow) and are designed to be used by colleagues in any discipline. Titles of the most recent artefacts are:

- Gamification to improve first year engagement
- Peer mentoring for international students
- In-class evaluation tools
- Authentic Assessment
- Facilitating Group Work: A Guide to Good Practice

In addition to these projects, a module redesign activity in Module Two of the programme provides excellent insights into cases where participants had already implemented some aspects of assessment strategy change or incorporated their assessment changes as part of a local review – e.g. case study analysis, community based learning, staged formative assessment, and group assessment incorporating self and peer assessment. Sarovan and Trigwell (2015) have recommended that changes in student learning outcomes are a significant aspect of the impact of professional development that should be examined. This argument further supports the importance of module redesigns as outputs because they involve an explicit evaluation of modifications to learning outcomes.

A 5 ECTS credit Assessment and Feedback module ran in the LTTC in 2014-15 and again in 2015-16. One of its goals is that participants develop skills to enable them to reflect upon their current assessment and feedback practice and to undertake a module assessment strategy redesign. There are three assignment tasks; a critical evaluation of a module or programme redesign, an assessment and feedback case study based on a short interview with a colleague and a short reflective piece. Impact on assessment practice is therefore designed in as an inherent outcome of the module. The option to make the case study available through the online Resources for Assessment and Feedback Toolkit (http://www.dit.ie/teaching/assessment/) allows for further potential impact. Examples of changes being introduced included case studies integrated across several subjects, reflective journals or blogs, and problem based learning incorporating peer assessment. Evaluation of the module by surveying participants afterwards also provided evidence of the impact on assessment practice that resulted: '*I have been able to bring back aspects from both the guest lecturer workshop and the technology supports into my current role*.' '*The practical work in class during the module was a very useful example of how to involve students in the process of learning*.'

An effective approach used throughout all programmes and modules offered by the LTTC is to allow participants to experience assessment and feedback methods as a learner (e.g. online reflective blogs, group assignments incorporating wikis and other collaborative technology and critical reflection) so that they have an opportunity to evaluate them for implementation in their own practice. Audio and screencast feedback on draft assignments have been implemented in four modules and across all three programmes and about 50% of those who responded to module evaluation surveys indicated that they were interested in implementing this method themselves (McDonnell, Donnelly & McAvinia, 2015).

Conclusion and Recommendations

While the idea of evidencing impact is not necessarily a new phenomenon for the third level education sector, research on impact measurement from Academic Development programmes is still at an early stage. This chapter has explored how impact measurement in general, and on assessment practice in particular, has become an increasingly important activity for the third level education sector in Ireland and elsewhere in recent years; yet impact – and how to measure it – remain contested issues in policy, research and practice. We have offered a proposed framework for measuring what impact engagement on professional development programmes can have on academics' assessment practice; this is our contribution to the ongoing discussion and debate about whether, and how, such programmes should measure their impact.

An important aspect of the professional development opportunities discussed in this chapter is that outcomes that lead to an effect on assessment practice are explicitly designed and integrated to professional development programmes. Examples from our own practice in the LTTC such as module redesigns and teaching portfolios have been discussed here.

Key questions that can continue to be explored centre on how impact and its measurement is understood in existing research, policy and practice? What is known about who is undertaking impact measurement in the sector? Why are Academic Development Centres measuring their programmes' impact? What practices and approaches are Academic Development Centres using to measure impact? What are the key challenges and implications of impact measurement on assessment practice for the sector?

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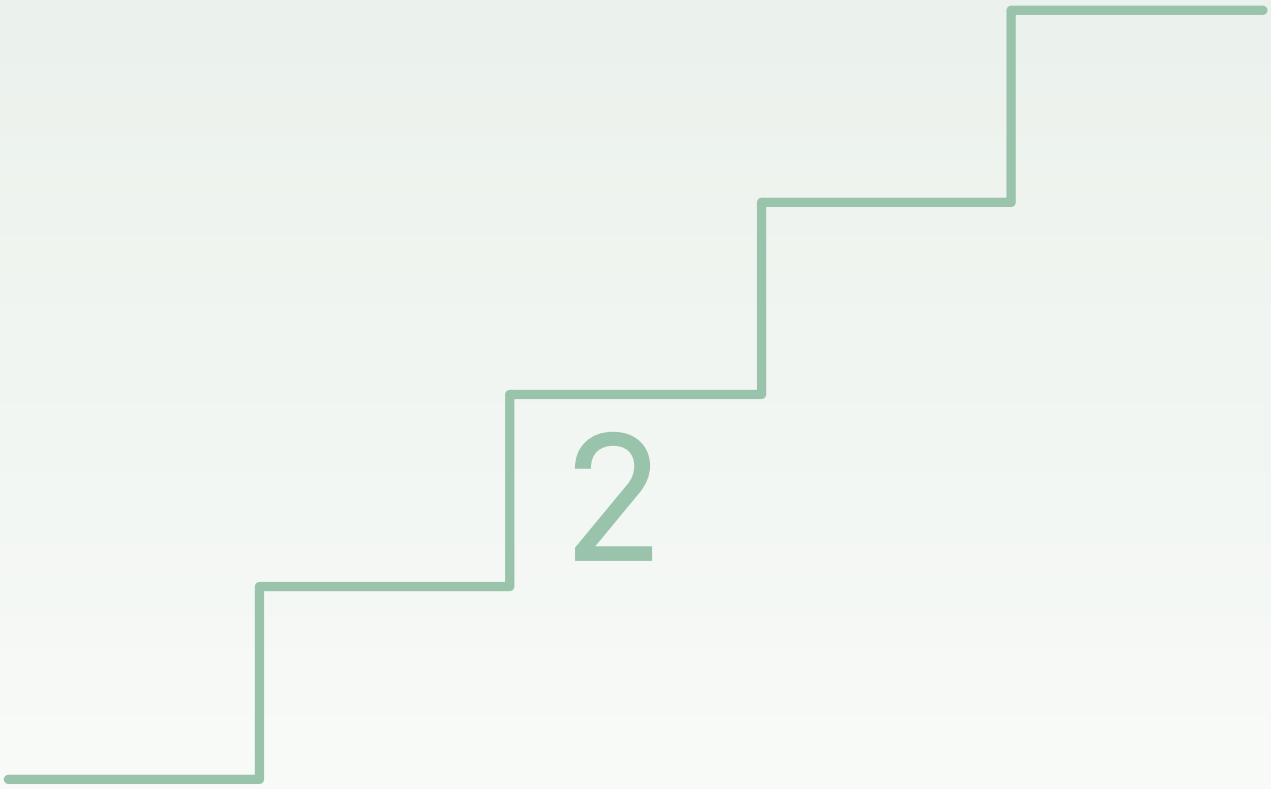
SECTION 2

Journey’s end is only the beginning: reflections on transforming learning and assessment practice.



1. From outsider to insider: the effect of engaging in action research on developing and assessing critical writing and subject knowledge in a second-year microbiology module.

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Introduction

> *The real voyage of discovery consists not in seeking new landscapes but in having new eyes.* Marcel Proust (1871 - 1922).

I came to teaching at the Department of Science and Health in the Institute of Technology Carlow (IT Carlow) from a microbiology research background and had practical experience with the concepts of knowledge construction, robust self and peer assessment and autonomous learning; features common to all levels of education. I became increasingly interested in the pedagogy of both undergraduate and postgraduate education and availed of a number of both accredited and non-accredited professional development opportunities. These I feel have improved my teaching practice, allowed me to engage with a network of supportive teaching professionals and introduced me to the underpinning pedagogical theories of higher education (Biggs & Tang, 2011; Ramsden, 2003) and the concept of the scholarship of teaching (Boyer, 1990).

In 2012, I registered for a MA in Teaching and Learning (MATL) at IT Carlow and had further opportunities to reflect on my practice, identify my core values as an educator and recognise the significance of social purpose and participatory action research in improving my practice (Coghlan, 2011; Coghlan & Coughlan, 2012; McNiff, 2014; McNiff & Whitehead, 2011). Throughout the MATL programme I examined my teaching in the light of the literature and discussions with peers, reflected and made changes accordingly. I identified two areas of special relevance to me: the tension between research and teaching especially in the Institutes of Technology and the importance of assessment and feedback in an aligned curriculum.

For my dissertation, (Brazil, 2014), I used an action research approach to address my concern of how best to support second year (level 6) Bioscience students to develop enquiry-based learning skills to facilitate enduring independent learning in a microbiology module. To facilitate this I adapted the flexible, cyclical and reiterative Research Skills Development Framework (RSD), developed by Willison and O'Regan (2007). The process of engaging with the MATL programme and of taking an action research approach, despite my initial resistance, has been personally transformative and has enabled me to be more reflective and continue to learn about and improve my practice. My personal transformation has had a positive impact on the students involved. Participants in the interventions involved, showed a willingness to embrace the new research-orientated learning activities; engaged in self- assessment and feedback, shared their views on research and enquiry, and also demonstrated autonomously researched knowledge in the terminal examination.

This chapter explores my personal transformation as I tried to develop research skills in a microbiology module among 2nd year Bioscience students and the impact this change had on the students participating in the intervention.

Core value: The importance of undergraduate research and enquiry

My own experience and the literature (Biggs & Tang, 2011; Healey & Jenkins, 2009; 2014) has convinced me, that research, meaning the construction of new knowledge, is the basis of deep and enduring learning for all learners. I conclude that my experience of the research process has helped me better understand theories of learning. Baxter Magolda's (1992) view of the different levels through which a learner passes, from certain knowledge through to the contextual nature of knowledge, resonates with my research experience.

The equally important strands of undergraduate research and teaching in the curriculum are an essential feature of modern third level education (Healey & Jenkins, 2009; Institute of Technology Carlow, 2014; NAIRTL, 2010). However, my impression is that 'research' is often seen to be in competition with teaching especially in Institutes of Technology (IoTs), whose mission is seen to be more applied than that of research intensive universities (McGuinness, 2013, pp. 17-19). However many commentators strongly argue that research skills are equally important in less research intensive institutions (Healey & Jenkins, 2014; Jenkins & Healey, 2011; Spronken-Smith, 2010). I prefer to use the more inclusive term undergraduate "research and enquiry" to describe a valuable process that all learners, not only high achievers destined for academic careers, can engage in.

My concern: Are there opportunities to engage with research and enquiry?

I had struggled with how best to develop research and enquiry skills among my own undergraduate students, at levels 6, 7 and 8 of the National Framework of Qualification (2009). In the Department of Health and Science, in keeping with Institute policies (Institute of Technology Carlow, 2014; 2015a; 2015b) all students are expected to explicitly engage in independent learning and enquiry and complete independent literature and practical-based research projects at level 7 and level 8. However, from my own observations, speaking with other colleagues and external examiners, students, even at levels 7 or 8, often fail to demonstrate the deeper approaches to learning of a topic expected from engaging in independent enquiry. Students often also fail to show the expected research-oriented skills, such as recognising credible sources, critical reading and academic writing.

I felt that if students could engage with a structured research activity involving critical reading processes and supported academic writing early in the academic programme these skills would improve and deeper and enduring learning of content and concepts might occur. To this end I tried to address some of the critical reading issues with second year Bioscience students as part of a microbiology module by giving short written independent research assignments on specific topics. While most students completed the assignments satisfactorily, difficulties with paraphrasing, citations and referencing were evident. I noticed that, American exchange students had better academic writing skills than their IT Carlow classmates, which was due in part to them having been explicitly taught how to write prior to the exchange. I realised that I had been expecting students to engage in research and academic writing yet had been failing to provide appropriate support for the independent construction of enduring learning. The challenge was to find a way to explicitly develop relevant research and enquiry skills such as critical reading from credible sources and academic writing skills within the context of the existing microbiology module that would help develop independent learning.

Research skills development framework

There are many models that develop and embed undergraduate research and enquiry skills within the curriculum (Bradley, 2007; Hanratty, Higgs & Tan, 2011; Healey & Jenkins, 2009; 2014; NAIRTL, 2010; Spronken-Smith, 2010). One model is the Research Skills Development (RSD) framework developed by Willison and O'Regan (2007) in the University of Adelaide. I was drawn to the RSD as it is very adaptable and can be applied to different learning activities, disciplines and educational levels including the Irish higher educational context (Willison, 2010).

Following evaluation, the RSD framework has been found to be useful at improving research skills across a range of disciplines and academic levels (Willison, 2012; Willison, Le Lievre & Lee, 2010).

The RSD framework provides a conceptional and practical means to develop both subject knowledge and research and enquiry skills. All enquiry/research activities, from primary school to PhD. are considered to be on the same continuum that ranges from supported closed structured enquiry, level 1, to cutting edge, level 5 (see http://www.adelaide.edu.au/rsd/). What matters is the amount of support given to the learner. This concept resonates with my own view, supported by others, (Baxter Magolda, 1992; Hodge, Haynes, Lepore, Pasquesi & Hirsh, 2008), that all learners construct, via research, their own knowledge to some extent, moving from the unknown to the known.

In the RSD framework, learning activities, from single assignments to programmes, can be reframed into six facets or indicators of learning which correspond to six key research skills (Willison & O' Regan, 2007). Recognising and developing each facet with appropriate support allows subject learning to be constructed. The facets include: embarking on the enquiry, finding the information and evaluating its credibility, appropriately organising and analysing the information and finally, communicating in a discipline appropriate manner. By framing learning activities at the appropriate level, the RSD identifies explicitly, to both teacher and learner, what is required to demonstrate each facet and the level of support needed. Learners can be facilitated to develop autonomy and expertise in each facet by an iterative process.

A second feature of the RSD is the assessment rubric, based on the six facets and the appropriate level of autonomy, that accompanies each activity (see http://www.adelaide.edu.au/rsd/). RSD rubrics have been used as assessment tools, to track student learning and as a method of evaluating the RSD (Willison, Schapper & Teo, 2009; Willison *et al.*, 2010).

The RSD framework has been successfully used to determine initial critical reading skills and subsequent skills development in a first year Biology module (Peirce & Ricci, 2009). In addition, both an evaluative questionnaire and interview protocol are available (Willison *et al*., 2010). I decided to use these resources as the basis of my intervention to develop critical reading skills and to investigate my participants' views on research and enquiry to explore semi-quantitatively any impacts of the intervention.

Action research approach

At its simplest, action research involves identifying a concern based on personal values followed by planning an intervention to address the concern, implementation and reflection on the intervention leading to further cycles (McNiff, 2014). Interestingly, action research rejects neither positivist nor interpretivist approaches and sees both as compatible (Carr & Kemmis, 1986 p. 180); although there are differences in approach. Coghlan & Coughlan (2010) discuss the difference between empiricist positivist research and action-oriented research.

> *'...the contrast of roles [between positivist and action oriented research] is between that of detached observer in positivist science and of an actor and agent of change in action-oriented research (Coghlan & Coughlan, 2010 p. 194).*

The RSD framework is suitable for action research. Others, who have used the framework have reported improvements in their own teaching, improved dialogue with students and more reflection on teaching practice (Willison, 2012; Willison *et al*., 2010).

What I had not anticipated was the personal transformation that resulted from engaging in action research, that put me, albeit grudgingly, at the centre of the research activity. I discovered a different research perspective. I had come from a quantitative, empiricist science background and had no experience in qualitative, interpretative, nor educational research. I found the concept of action research both appealing and alien, simple yet elusive. I was attracted to the cycle of change, reflection, and adaption. However I found the perceived lack of objectivity, and the acknowledgement of my values challenged my previous perceptions of research. I worried about a lack of rigour. I realise now that I was experiencing and realising the differences between empiricist and interpretivist research as elucidated so clearly by Yilmaz (2013).

Slowly my perspective shifted. My initial approach was to use the first intervention as described by Peirce and Ricci (2009), together with a survey to discover objectively the baseline critical reading skill level of the students. Following the second intervention I planned to quantitatively determine any effect in order to make general extrapolations about the effectiveness of the RSD in developing independent learning. In fact, during the process, I shifted my position from being an outsider carrying out an objective project on a set of subjects to being immersed in a no less rigorous research experience where I, students and others, were all participants. When this insight emerged from reflection, reading and discussions with my supervisor and critical friends, I reformulated my research question and revisited my plan. I was not now determining objective measures of student attainment; I was now interrogating my own practice to help develop critical reading and academic writing skills

to aid a deeper approach to learning among second year Bioscience students as described by Biggs (1999). My research question was now:

> *How can I, with the collaboration of the second year Bioscience students, improve their research and enquiry skills so that they can use a research-oriented approach to discover more about microbiology?*

While my planned interventions remained the same, the aim of the survey was now to explore rather than measure impact and provide an opportunity to discover the students' perspective. I realised that action research demanded rigour and could accommodate a variety of approaches (Denscombe, 2010; McNiff, 2014; McNiff & Whitehead, 2011).

Relevance of the RSD to my situation

Prior to beginning the first diagnostic intervention based on Peirce & Ricci (2009), I enrolled on a small open online course (SmOOC) at the University of Adelaide (RSD Introductory Module). I explored the relevance of the RSD to my own teaching practice, reframed teaching activities in the light of the RSD and discovered the use and limitations of the framework in my own context. I saw clearer how my previous practice had contributed to students' lack of expertise in effective critical reading and subsequent independent learning and began to realise that I needed to change my practice.

My previous efforts had been ineffective, due to unrealistic and unclear expectations of what students could do. I posed the followed questions. Did I have clear objectives of what I wanted students to do? Was I just lazily asking students to "look it up" as an easy way to cover content? Did students really know what I expected of them or did I just assume that they would know? Did I give enough scaffolding to develop the skills for effective enquiry? Did I provide useful and timely feedback in a form that was easy to use? Could I perhaps build on students' pre-existing skills? Could I collaborate with other colleagues including those that gave communication modules and incorporate and extend these skills within the second-year microbiology module?

I realised the second-year Bioscience students needed skill development in critical reading and academic writing in a very supported and structured manner. I had neither been providing sufficient support to scaffold learning nor effective feedback on assignments.

Using the RSD I was able to clarify my teaching objectives of various microbiology topics and constructively align active learning activities with assessment as suggested by Biggs and Tang (2011). On a practical level, I was able to use the RSD framework to better prepare the detailed teaching plan and resources needed for the forthcoming diagnostic and following interventions based on Peirce and Ricci (2009). However I felt that the available summative assessment rubrics were not appropriate for my purposes and decided to use them formatively.

Outline of the interventions

The Bioscience group was small (37) and diverse: with a mix of school leavers, mature and international students. I felt there was mutual trust and rapport; I was their primary microbiology lecturer and had autonomy with respect to teaching strategies and assessment. To undertake the interventions I had support from my supervisor and Head of Department and from colleagues, both on the MATL programme and in my department. All provided me with practical, intellectual and emotional support and in some cases acted as critical friends.

The initial aim of the diagnostic intervention was to use RSD resources to demonstrate how well Bioscience students could summarise two articles on food safety. The material provided was credible and directly relevant to the module. The formative assessment rubric identified what was required for the task and the level of autonomy. Students were asked to use the rubric to self-assess their competency at the task (see Brazil, 2014, rubric available on request). I later provided general feedback in class and face-to-face feedback during practical sessions where discussions about the interventions took place.

I reflected on the intervention and incorporated modifications into the second cycle. The aim being, that having identified the principles of critical reading and academic writing students would engage in structured in and out of class reading and writing activities to discover the essential facts about food safety. All source material was provided. Students would demonstrate their learning of critical reading, academic writing and subject knowledge by submitting, online, a short assignment giving food safety advice to other students.

I did not make the assignment mandatory but encouraged engagement with the activities as a way of meeting an explicit assessable module learning outcome. However, I provided all students with a complete set PowerPoint© notes on the topic via Blackboard©.

Again a formative assessment rubric (available on request) was provided to support the activity and in this case feedback was provided via the Grademark© option of Turnitin©. The timing of the second intervention took place close to the end of term which affected class attendance, participation and submission of the assignment.

At the end of the final term prior to the examinations an online survey was sent to Bioscience students to explore their perceptions of research and enquiry and any impact the interventions may have had.

Impact on Bioscience students

It was important to discover if these changes in my practice to a supported research-oriented approach had any impact on the research and enquiry skills or the attainment of learning outcomes in the microbiology module. I looked for evidence of impact as recorded in my reflective diary, student assignments submitted, student feedback sessions, interpretations of the student survey and terminal examination results.

Bioscience students were willing to actively engage with and complete the initial diagnostic critical reading intervention which was held in class. As part of the intervention students were able to synthetize information gleaned from their reading and provide a descriptive title for their assignment. In addition students were able to explicitly state what they had learned about the topic. The one-to-one feedback sessions using the self and teacher assessment rubrics provided an opportunity for dialogue which allowed them to identify the skills they possessed and those that needed attention. Some students who did not engage with the first intervention, due to non-attendance subsequently engaged in the second more complex intervention and submitted the voluntary assignment despite the timing being close to the examinations. The associated assessment rubrics for both interventions demonstrated how the students, who submitted the assignments met the associated learning outcomes which required students to critically read, organise, analyse, synthesise, analyse and communicate material on the topic of food safety in an academic manner.

In the terminal microbiology examination all Bioscience students chose to answer questions on the topic of food safety, even those who had not submitted assignments. Material that had been autonomously learned was included in the examination answers. Previously I had found it rare that material from assignments would be included in terminal examination answers. This suggested a level of enduring learning of autonomously researched material.

Following the interventions and prior to the examinations I used an online adapted version of the RSD survey (Willison *et al*., 2010) to explore Bioscience students' perceptions of their own research and enquiry skills as identified on the RSD framework. Details can be found in Brazil (2014). The high response rate of 73%, (27/37) I feel showed good general engagement with the process of the interventions especially as students responded even if they had not submitted assignments. Using a 6-point Likert Scale Bioscience students demonstrated awareness of their own research and enquiry skills and the relevance of these skills in an academic and work context. 85% agreed or strongly agreed that *'Carrying out research / enquiry assignments helps me better understand the subject'*. 93% agreed or strongly agreed that '*The ability to enquire or research will be important in my career.'*

Open questions in the survey gave students an opportunity to recognise a range of research and enquiry activities throughout the curriculum. Not surprising, 67% (18/27) explicitly mentioned the interventions in the microbiology module. Students showed insight into their own learning and were able to explicitly identify the internal and external factors that helped them develop research and enquiry skills. Intrinsic factors included curiosity and previous experience (25%). External factors included the opportunity to practice the skills by doing assignments (67%), explicit research skills training and help by lecturers (25%). Interestingly only one respondent mentioned that feedback was helpful.

In addition, 15 respondents explicitly identified the factors that they felt hindered research and enquiry skills development. Again these included internal factors such as not knowing where to start (47%), time and workload issues (33%) and library/information retrieval issues (6%). Twenty per cent of students felt there was a lack of explicit guidance, including feedback, suggesting more supported interventions and feedback are required.

Participation in the interventions, including the survey, became an opportunity for students to recognise for themselves that they already possessed a set of useful research skills applicable to the microbiology module and beyond. They were able to identify and practice new skills that facilitated their independent learning.

Personal impact; lessons learned

On reflection, the interventions described above primarily resulted in a transformative shift in my thinking. I became more open to developing the capacity of myself, with the participation of colleagues and students to embed a research-oriented approach to learning in my teaching. The RSD framework became a tool that facilitated the examination of and the critical refection on my own practice in addition to aiding in critical reading skills.

To continue to address the question:

> *How can I, with the collaboration of the second-year Bioscience students, improve their research and enquiry skills so that they can use a research-oriented approach to discover more about microbiology?*

I need to ensure that I continue to build on participants' prior skills and knowledge, collaborate with others and continue to reflect on my own practice.

Build on participants' skills and knowledge

I recognised that each student group is unique, with their individual strengths and weaknesses and how essential it is to build on what students already know, to be where the student is (Brunner, 1977, p. ix). Despite learning, via feedback sessions and the survey (Brazil, 2014), that the group was not very confident about their critical reading abilities, they had a capacity to contribute to their own research skill development and hence independent learning. Many already possessed a range of critical reading strategies and could, when asked, articulate their learning needs in the area of research skills. They had an awareness, when surveyed, of what helped or hindered their own learning of research and enquiry skills and recognised opportunities to learn these skills and the importance of practice. I need to continue to acknowledge and build on their previous experience from school and other courses or other modules within the programme.

Contribution of colleagues

Social purpose is an important aspect of action research (McNiff & Whitehead, 2010, pp. 36-39). During the interventions described above I found that teaching can be, paradoxically, an individual activity. I am happy to discover a group of colleagues with a common interest in using research-orientated active learning strategies with whom I could collaborate I could collaborate. I find now that I am finding opportunities to interact more with colleagues than previously.

Continuing reflection on practice

Reflection on practice is an ongoing process and new insights continue to emerge, one being that I cannot address all my concerns at once. I feel I am beginning the process of developing research and enquiry skills in an undergraduate programme and the RSD model is useful. However active learning and research-based methods are time and resource intensive and require a change in teaching strategies. I don't feel that a totally research or problem-based method would suit my situation. I see an advantage of the RSD framework as it can be used at the assignment or module level; that different levels of student support can be given and it can be also used with conventional learning strategies such as lectures.

Clear and explicit expectations

At times I have had unrealistic and unclear expectations of what was required of the students and myself. I realised that the concept of academic writing and using credible sources can be challenging and confusing to early years students where learning passages off by heart is a successful exam strategy at school. I now acknowledge students' hesitation and lack of confidence when faced with the uncertainty of what a task requires. This compounds the practical difficulties they face when attempting learning activities. I also understand the competing time pressures especially as examination time approaches and how even formative assessment can be a burden if its purpose is unclear. I need to ensure that I always have clearly aligned learning objectives, activities and assessment. I feel the RSD model was a useful tool for making expectations explicit.

I found there were divergent expectations especially with respect to formative assessment which I saw as a low stake means of identifying learning gaps. A common perceived view among students is that it is not worth the effort if there are no marks, I feel a possible solution would be to be very clear as to the purpose of the assessment and the expected learning.

Developing independent learning skills is a process that takes time and progresses via incremental stages and this requires persistence and patience by all participants. I have been on occasions over ambitious and have not followed through with sufficient reflection. Small targeted interventions are more achievable.

Appropriate and relevant support and scaffolding

I feel that structured independent research activities helped students learn both subject specific knowledge and research and enquiry skills. In these interventions, the RSD allowed me to scaffold learning and provide formative assessment and feedback. I feel that I can adapt the model to reframe a range of further learning activities to suit the needs of different groups. I also consider more the nature of the support needed and the level of autonomy required.

Feedback that promotes reflection and dialogue

From a theoretical perspective I had learned the essential link between feedback and future learning (Gibbs & Dunbarr-Goddet, 2007; Gibbs & Simpson, 2004; Rust, 2002) and was aware of the principles of effective feedback (Nicol & Macfarlane–Dick, 2006). However it was only during these interventions that I fully appreciated that feedback can also provide an important opportunity for dialogue between learners and myself, as a means to facilitate the learning process as much as assessing students' knowledge and competencies. Others using the RSD have found that reflection is a feature of the framework (Willison *et al*., 2010).

In the first diagnostic intervention students used the rubric themselves to self-assess the level of their critical reading skills. When I discussed the differences between my assessment and theirs there was an opportunity to discuss issues in more detail as students often do not have realistic views both under and overestimating their abilities.

Despite issues, the RSD rubrics are a good guide in providing feedback and I feel meet the principles of effective feedback described by Nicol and Macfarlane-Dick (2006, p. 7). It was clear what was meant by good performance and learners were given the opportunity to reflect on their performance and see practical opportunities to make improvements. Moreover, I could see opportunities for further improving my practice and to be positive and encouraging. Due to time constraints, feedback on the more complex second intervention was provided via Turnitin© which was not as well attended to by students.

I consider that feedback allowed students to be more involved in their own learning as they could identify the skills they possessed, recognise what they need to improve and discuss how they can do so. They were potentially becoming more "self-regulated" learners as described by Nicol and Macfarlane-Dick (2006) following effective feedback. Willison *et al*. (2010), when evaluating the RSD, also found that students perceived classroom dialogue as very helpful. Despite the fact that students were happy to use the rubrics as a basis for feedback only one student in the survey stated that feedback helped develop their research and enquiry skills in contrast to the sixteen who said that completing assignments helped. This may indicate that this group had not had the opportunity to reflect fully on the link between feedback and improvement.

I have a dilemma reconciling the need to give useful feedback and the time required, both by me and the students. The real dialogue that occurs from face-to-face feedback was only possible because of the small class size. When I used online feedback via Turnitin© in the second intervention, a number of students did not attend to the online feedback, possibly due to time issues and the formative nature. In other modules when a mark is included more students look at the assignment via Turnitin©, but it is unclear if they read the feedback. I need to use strategies such as those suggested by Rust (2002) to make it worth their while to read and take on board feedback provided.

Formative assessment and effective feedback remains a challenge. Feedback mechanisms need to be adapted to the particular group and situation**.** I feel it is best to use a combination of general, personal online and face-to-face feedback opportunities. Above all, I feel I need to provide students with a reasonable number of opportunities to reflect on their learning and provide the appropriate support to practice new learning .

Appropriate assessment rubrics

Rubrics, while useful, require refinement in order to be an authentic assessment tool. Many of my concerns I found were reflected by Simpson and McKay (2013) where they discuss the challenges faced by teachers and learners when using rubrics. The assessment rubrics are an integral part of the RSD framework as a means of determining students' levels of autonomy or in measuring the attainment of learning objectives (Willison *et al*., 2010). However I found the modified rubrics were difficult to use with respect to assigning students to a particular level and felt they were better used formatively. I consider that the rubrics could be used in a very inappropriate instrumentalist manner.

Despite their limitations the rubrics were very useful in making explicit the intended learning objectives of the different facets of the critical reading activity and made it clear what was required. In the initial diagnostic reading activity, students could see broadly what level they were at with respect to each of the facets of critical reading. Interestingly I realised, for many students, the concept of expected criteria and associated rubrics was new and they found them useful to discover what was expected. I feel that getting students involved with setting the criteria as suggested by Rust (2002) would be even more useful in promoting deeper approaches to learning.

My conclusion is that that I must continue with the cycle of refining, implementing and evaluating the rubrics used .

Conclusion

The impact of undertaking and reflecting on the MATL programme has been transformative. I have not simply acquired a theoretical and practical toolkit to help me "teach " better. Moreover I have developed a more reflective mind-set, aided by keeping a reflective journal of discussions with others, that explores the potential dialogue in the teacher-student relationship. I have undergone a paradigm shift to 'the insider view' that examines how I can change my practice in the light of what I learn from my students and others.

Overall, I feel the interventions were worthwhile. With my help Bioscience students in intervention one became aware of the skills they might need to read effectively; in intervention two they were able to practise these skills to find out information from primary sources, make

organised notes and write a summary about food safety suitable for their peers. I feel that even students who did not complete the exercise fully and submit the assignment, engaged with the learning activities as seen by their performance in the end-of-year examinations and their response to the student survey.

I found that the RSD was a useful framework to introduce research-based skills that can be used to promote independent learning. I found that reframing learning activities into the 6 facets of research helped me clarify what learning was expected to occur in terms of both discipline and generic skills. It also promoted refection in myself and my students.

The findings of an action research project form the basis of future action in order to continue the cycle of change and learning. I hope that I can continue the process where we all strive together to learn about our practice and improve active student learning that will enable and empower students to construct knowledge from their own research.

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2. Capturing the Moment and Replaying the Tape: Developing Technology-Enhanced Strategies for Student Learning and Engagement in Music Performance at Third Level

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Introduction

Initially motivated by a need to create clear guidelines for assessment and feedback on group performances in music, this chapter reflects on the impact of an intervention developed during an accredited professional development programme in learning and teaching to utilise audio-visual technology to improve the student learning experience by making recordings of classroom activities accessible to students through a Virtual Learning Environment (VLE). Students on the music programme engage in a series of ensemble performance projects across a range of genres. Building on the concept of assessment for learning, the project involves consideration of effective group work, student interaction and engagement in group learning activities within and beyond the classroom. Formative peer assessment becomes an integral tool in the development of motivation and understanding and can help identify areas or skills that students need to develop from week to week over the course of the module. Participation in an accredited professional development programme allowed the lecturer to share ideas, learn from critique and develop best practice in terms of research and implementation within and beyond the discipline of music.

The impact of the project can be examined through a number of factors. In the short term, any changes to grades achieved are not assessed although this may form part of a longitudinal study. Instead, attitudes and responses of students provide a qualitative means of assessing impact. The three principal factors examined are student engagement, student understanding of assessment practices, and lecturer responses to the use of technology. Through a critical evaluation of the development and implementation of an intervention, the paper presents a model that can be utilised and further developed in a range of contexts within and beyond the area of music performance, to enhance and encourage student engagement and understanding. Four impacts of the intervention will be presented, namely enhanced student

engagement, a greater understanding amongst students of assessment practices, greater levels of communication between students and with their lecturer, and moves to introduce similar models across a range of classes on the programme.

Methodology and Data Collection

The intervention initially took place over the course of one semester with students on the BA (Hons) Applied Music at Dundalk Institute of Technology. The twenty-six students involved were in the second year of a four-year programme. All but three of the students were aged between eighteen and twenty-one, with three mature students[1]. For this module, the students had a one-hour practical lecture in each of three genres of music – 'traditional', 'classical' and 'popular and jazz' – as well as a larger ensemble and choir. Assessment had conventionally been an end-of-semester performance worth 30% with 70% of marks for continuous assessment, marked in relation to preparation for and participation in class. Lecturers assessed each class as a rehearsal with individual marks given to each student. As part of the intervention, the process of marking did not change but students were encouraged to provide their own feedback both in class and online to the lecturer and their peers, with feedback also provided in class by the lecturer.

[1] A 'mature' student is one who is at least 23 years of age on January 1st of the year they enter a course.

In order to assess the impact of my change in practice, I carried out anonymous surveys with students in the final week of the semester. Prior signed permission to conduct a survey and develop research related to my MA had been sought in week three, in compliance with Institute ethical guidelines and students were made aware of my desire to assess changes in practice. The surveys were distributed as paper copies at the end of class, with time dedicated to the completion of the survey. Questions focused on student satisfaction with the module – clarity of information, level of learning, suitability of assessment and most enjoyable aspects. More developed questions related to the use of the VLE, the benefits of material on the VLE and the frequency with which they engaged with material on the VLE.

From the Music Class to the VLE

Each week I facilitate classes in group music performance. Early in the semester I choose repertoire (knowledge) that I believe is suitable for the group and the level or standard to which they need to aspire to meet the learning outcomes of the module at the stage in the programme that they are at. Each week, the students are required to practice and successive classes develop upon the knowledge acquired by developing skills. These skills may be related to technique on an instrument or related to other aspects of performance including communication. The communicative skills refer to both communicating with others in the group and learning to communicate with an audience. In every classroom the ability of students to communicate clearly with each other and with a lecturer varies greatly, as does the preferred mode of communication.

Students' participation in group performance classes is monitored weekly with marks being assigned for participation, preparation and progress. Through the semester I facilitate formative assessment, asking the students to perform for me in the classroom. I take notes. After the 'performance' I ask them for their thoughts. The response is often limited. I communicate my thoughts from my notes. They are often confusing or limited in meaning as my perspective of the performance is so different to that of the student. So, challenged by my desire to do better and informed by the theories presented during my postgraduate research in education, I press record on a little video recorder and can later point to examples of what happened during the performance. The video becomes a tool for communication.

Previous related studies in music education include developing self-regulatory skills amongst individual music students preparing for performance (Nielson, 2001), the advantages of videotaping in various music education contexts (Ryan, 2001) and the challenges relating to the use of video analysis in piano teaching (Ryan, 2006). Acknowledging the challenges associated with assessment of music performance, Baker-Jordon (1999) highlights not only the potential for examiner bias but also the importance of strong interpersonal communication in order for examiners to communicate a critique or evaluation of a student's performance. The benefits of videotaping for music education is further outlined by Daniel (2001) drawing on a variety of authors. My intervention is similar in many ways to strategies developed by Lynch (1998), developed further in the context of genre and the use of ICT.

During the class time, I become part of the group. I have a particular role as a teacher/lecturer, introducing material to the rest of the group, providing instruction and expertise and, at times, performing with the students. I am also a facilitator encouraging other members of the group to make suggestions, demonstrating their creativity, particularly in relation to the arrangement of music and approaches to presentation. However, the group dynamic is also affected by what happens when I am not there. The group practices without me and has developed an existence in virtual space where they share ideas that are not monitored by me. Usually using Facebook, the group share ideas, links to Youtube or other resources, and discuss their own progress without my involvement. They make me aware of these interactions through in-class discussion but I am happy that this is a space for them to refine their learning without my involvement. These are examples of students demonstrating intrinsic motivation (Newstead and Hoskins, 2003) and institutional encouragement to explore the use of Virtual Learning Environments (VLE) and related technology through my accredited professional development programme allows me to mirror their use of online spaces and monitor and enhance the value of these developments. The online platform becomes a space in which to communicate and learn.

The emergence of peer learning in a virtual environment echoes the study of Petocz, Duke, Bergin and Reid (2012) who state:

> *'...with a greater focus on e-learning and electronic communication, such aspects of peer learning become more important. Students are less and less likely to attend classes in person and benefit from the lecturer's live approach and the actual class interactions. Rather, they obtain learning materials electronically, experience the classes via recordings, and build their educational experiences in the virtual world' (2012, p. 91).*

Influenced in part by activities of the students and also by my own desires to enhance the learning experience, the intervention carried out during my Masters explored the potential usefulness of providing audio-visual reference in a virtual environment to encourage critical reflection and enhance feedback. However, the process provides an opportunity to also develop reflective practice and self-assessment, peer-assessment and motivation. Using a VLE, the intervention brings the learning experience beyond the classroom and develops blended learning opportunities. Aspects of learning include knowledge related to learning repertoire and context/background to music, skills including techniques and approaches on instruments and the ability to critique a musical performance. The intervention also highlighted the potential for enhanced engagement in learning and the understanding of assessment processes.

Student Engagement and Motivation

Student engagement in classroom activities is critical to the successful development of learning (Kuh, 2003; Quaye & Harper, 2014), particularly in programmes with an emphasis on skills development and experiential learning (Carini et al., 2006). A barrier for both engagement and learning can be underdeveloped skills-based learning processes whereby students are not able to engage in the evaluation of their own work. This may be further accentuated in the context of group activities such as performing in a band or ensemble. To facilitate the development of such skills, educators may use reflective activities that help identify weaknesses in a constructive manner and allow for the development of collaborative approaches to learning. In the music classroom, performers must learn to understand the development of musical sound and interpersonal musical relationships, as well as develop individual skills on an instrument or voice. It is necessary to facilitate opportunities for reflection through the recordings of performances that may be occasions for assessment. Acknowledging the potential of the internet and social media for facilitating learning (Dabbagh & Kitsantis, 2012), this project sought to use the internet as a channel for communication, collaboration, and creative expression that enhanced student engagement.

While music is an enjoyable activity for many involved, whether performing or listening, the enjoyable experience of music can often mask the level of work required to reach that point (Levitin, 2006). When the level of work becomes intensive in an effort to meet assessment criteria, the enjoyment can waiver and engagement lessen. In contrast to a live performance in front of an audience, a classroom does not necessarily allow for immediate reflection or provide the affirmation of audience applause. The enjoyment aspect may also be undermined by the necessity to perform in different genres. With many students on this programme engaging in the study of traditional music for the first time, it is not surprising that some respondents to the survey noted that they lacked the necessary skills, experience and/or confidence to critically assess others in this genre. Noting aspects of the module that they enjoyed, one respondent highlighted "coming out of my comfort zone" in relation to both the genre being learned and performed and the mode of learning – in this instance primarily aural learning approaches. It is evident from attitudes to recordings and attendance records that the act of video recording the group impacted positively on attendance and student engagement during the project.

Understanding and Engaging in Assessment

Noting the long tradition of assessment in music, Michael Fautley (2010) notes:

> *'it could be argued that it is only a specific aspect of music which has traditionally been assessed, namely performance, and that within this only a limited range of instrumental skills have been looked at. For this reason it is safe to say that practices which may have been historically appropriate are now being questioned, and at the same time newer ideas and techniques are finding their way into the daily activities of classroom music and instrumental teachers." (p. 1).*

Like Fautley, the methods employed here are based on an understanding of assessment that is not solely based on marks and grading. Assessment is a central facet of teaching not only instrumental skills but a range of transferable skills that are invaluable to the students' learning experience. In the videos, students could critically observe their stage presence, communication and interaction during a performance, and synchronicity as a group, in addition to their own performance skills.

Assessment is an integral part of the student learning experience and can shape and enhance effective teaching. Assessment of musical performance is a challenging area in education due to the ephemeral nature of a performance, the subjective emotions connected to a performance related to aesthetics and taste, and an awareness of the various factors that make up a musical performance and how to develop and improve upon these (Fautley, 2010). One of the underlying challenges to the development of this project – and for the students to be able to communicate clearly – was the need to clearly understand assessment methods and rubrics (Brown & Knight, 1994). Noting a lack of prior experience or confidence amongst students, the work of Dabback and Waldron (2012) emphasises the need to match self- or peer-assessment with informed feedback from the lecturer. Although in many instances the comments online provided by the students indicated a basic level of critical engagement, there was some inconsistency in technical awareness and in the level of marks being suggested by the students. However, by including space for lecturer feedback and in-class discussion, inaccuracies in remarks or confusion could be addressed without unintended offence to peers and student engagement in the process was enhanced. In the context of this classroom, students become more engaged in the assessment process through developing their understanding of the rubrics that have been pre-defined by an examining board and highlighting their relevance. Furthermore, by identifying different stages in the assessment process, this project facilitates different types of assessment that are conducive to enhancing learning and has informed staff discussion on changes in practice, particularly with regard to the weighting of marking criteria.

Both formative and summative assessment are utilised in this programme. The process of developing a performance, in which students demonstrate creativity, communication skills, and improvement in performance skills, is crucial to facilitating learning in the module. Whereas the summative assessment may be a live performance in front of a public audience, the formative assessments are shaped by different factors, albeit with an awareness of what is required at the end of the process, with no marks assigned to the video and response assessment. In this intervention the lecturer video records student performances during classes in agreement with students and makes these recordings available to the students using their virtual learning environment. The students are asked to critically reflect on the recordings, then develop self-assessment and later peer-assessment practices to facilitate and enhance learning through engagement and deeper understanding. Thoughts are shared online and in face-to-face discussions with the aim of developing strategies for practice and enhancing learning. Students are encouraged to include both positive and critical responses to the recordings. It is not only assessment for learning in terms of course content but facilitates the learning of transferable skills and higher-order cognitive thinking. While the lecturer has a particular role in terms of assessment, successful group work depends on the abilities of students to engage in self- and peer- assessment. This can also reinforce student engagement. Brown and Knight (1994) note:

> *'Self- and peer assessment give learners a greater ownership of the learning they are undertaking. Assessment is not then a process done to them, but is a participative process in which they are themselves involved. This, in turn, tends to motivate students, who feel they have a greater investment in what they are doing' (1994, p. 52).*

The concept of assessment as a critical skill is embedded in the act of reviewing the videos. The intervention has encouraged students to be more discerning in their appreciation and

critique of performances and to identify ways in which they can improve both as individuals and as part of a group. The intervention aided the development of critical listening and evaluation skills in order to enhance the learning experience. Although marking guidelines and a rubric were provided to all students beginning each semester, some respondents noted that they were not clear on every aspect that they were being marked on. As Brown and Knight note: 'The biggest problem is likely to be that tutors typically have multiple criteria that are often poorly articulated' (1994, p. 113). Some aspects of the criteria and rubrics were discussed with students but discussions highlighted a need for further consideration of the instructions provided and the clarity of the criteria being used.

In seeking to further develop and integrate the intervention as a regular form of assessment on the programme, the issue of assessment overload arose. Wakeford (2003) notes that this can affect the quality of the work from the student and feedback from the lecturer. There is a tendency to advocate for less assessments but this does not necessarily benefit the student. Rather, it is perhaps the type of assessment and the rationale for assessment that must be considered. Brown and Knight outline a different perspective in the debate concerning the quantity and types of assessment, with an awareness of practicalities for the lecturer or tutor and the engagement of all students:

> *'Some tutors might suspect that fewer assessed items would lead to less work being done by basically idle students. A solution which also has the advantages of allowing students to experiment, and of making it easy to introduce some form of peer- and self-assessment, is to require work to be done but to insist that findings be presented in a concise form and to make the work qualificatory, not graded'*
> *(Brown and Knight, 1994, p. 31).*

Snowball and Mostert (2013) also highlight the potential of peer assessment for providing 'more and faster feedback' than provided by tutors but note arguments concerning potential challenges of implementation often raised by those in opposition to the practice. However, noting the value of self- and peer-assessment, Brown and Knight note that such practices make 'the process much more one of learning because learners are able to share with one another the experiences that they have undertaken' (1994, p. 52). Furthermore, Snowball and Mostert highlight the importance of peer assessment in developing active and independent learners, stating: 'the evaluative, critical stance required by students in order to assess their peers' work encourages the development of higher-order cognitive skills' (2013, p. 646). The development of higher-order cognitive skills can contribute to lifelong learning, deep learning and greater motivation for learning.

The development of independence, both in terms of thinking and doing, is critically important to the development of the successful student. The success of formative self-assessment is reliant on a number of assumptions outlined by Brown and Knight, including the assumption that students 'take seriously the business of weighing their work against available criteria' (1994, p. 32). Integral to this is a shared understanding by staff and students of the criteria and expected learning outcomes or standards. Over time, videos become a reference log for standards that are expected and achieved by class groups. These may be compared to other sources available to students on platforms such as Youtube, which can further inform discussion, reflection and peer assessment.

Communicating online

Both the real and virtual classroom can and should be spaces for sharing of ideas, critiques and solutions. The intervention has allowed the integration of more discussion and instruction related to tasks and the purpose of self- and peer- assessment from an earlier stage in the classroom, allowing students more time to practice in face-to-face contexts prior to their online efforts. Despite some limitations, the intervention was successful in motivating students to consider their own learning and develop higher-order cognitive skills.

Using the VLE was viewed positively with respondents noting that the videos of other groups provided a benchmarking tool in relation to standards. Other responses noted that videos 'allowed me to analyse what I need to work on and improve', 'Moodle has aided my learning process by using video to view my performances and rectify my problems', and 'getting to listen to how we sound as a group to other people was very helpful'. Although the intervention sought to provide students with the opportunity to engage with their learning as individuals (see also Dabbagh & Kitsantis, 2012), some responses indicated that students watched videos together and discussed them face-to-face while others noted the benefit of Moodle for communication between group members. Thus, the development of blended learning did not negatively impact upon face-to-face interaction, the development of team spirit or communication amongst group members (see also Petocz *et al.*, 2012).

The module in which this research was conducted was taught through group work and experiential learning, demanding a physical presence in a classroom or rehearsal space. As noted in the introduction, the group work elements, communication and interaction extend beyond the classroom and this is usually to the benefit of the students. Petocz *et al*. note: 'Interacting with others – peer learning – has always been an important dimension for any learner and supports the learning opportunities provided in formal arenas such as lectures, tutorials, rehearsals and laboratory classes' (2012, p. 91). The potential to extend this interaction to online spaces is further explored by Purvis, Aspden, Bannister & Helm (2011). In this intervention, students were able to develop their own skills in the context of a band or ensemble by playing back rehearsal videos and/or playing along with these recordings.

The project has helped to facilitate students to develop as autonomous learners and acquire 'transferable personal skills in such areas as group work, leadership, teamwork, creative thinking and problem-solving' (Brown & Knight, 1994, p. 52). As Petocz *et al.* (2012) state: 'Peer learning can lead to high quality learning outcomes for students even with a lower level of involvement from academics' (2012, p. 93). The online spaces that allow students to interact in their own time and on terms with which they are comfortable with also assist students to feel part of a group. Hancock (2004) highlights the importance in group work contexts for all group members to feel involved and indeed essential for the success of the group. He notes the importance of 'assigning each group clear and measurable tasks and structuring and routinely reinforcing goal interdependence within the groups' (2004, p. 162). Positive interdependence is developed and necessitates the sharing of resources, mutual support and encouragement, and public acknowledgment of joint successes (ibid). While a public performance may be part of the summative assessment, the sharing of videos of classroom performances can lead to peer acknowledgement of achievement.

Conclusion

Engaging in accredited professional development programmes in learning and teaching has helped me evolve my pedagogical approaches in music performance classes to explore ways of extending the classroom into a virtual world in which students could engage further with their learning, participate in their assessment, and help each other to develop. The video camera can become a useful tool in a classroom and, guided by the scholarship of teaching and learning, can be used to address issues relating to assessment beyond merely documenting an act for purposes of grading. The importance of peer learning is widely recognised in the context of music education (Green, 2002; Hunter 1999) and I now integrate more discussion and instruction related to tasks and the purpose of self- and peer-assessment from an earlier stage, allowing students more time to practice in face to face contexts prior to their online efforts. Despite some limitations, the intervention was successful in motivating students to consider their own learning and develop higher-order cognitive skills. The exercise also highlighted limitations in the knowledge and understanding of assessment rubrics. By challenging students to use rubrics to assess their own work and the work of their peers, aspects that were not understood or misunderstood were brought to my attention.

One of the principal challenges for teaching staff implementing new methods or incorporating new technologies into their teaching is the burden of time, particularly in relation to preparation. The intervention was not overly time-consuming to implement (for staff) or participate in (for student) and had a noticeable impact on classes - it helped initiate discussion relevant to material being developed and highlighted gaps in learning amongst the student group such as unlearned material, lack of strategies for improvement and limited understanding of the breadth of assessment rubrics. Some discussions did indicate a desire to improve the layout of the VLE and also for greater consistency in its use. It is proposed that other staff will develop similar methodologies and platforms during the next stage of this project and there is potential for exploring the use of Mahara in future developments. From my engagement with the literature as part of the programme of study, I have become more interested in the group dynamics and its impact on learning. There is also potential to explore the role of personality further (Hancock, 2004), particularly in relation to student roles and motivation and to consider ways of developing the online space to be more user-friendly. A significant impact of the intervention and one that relates to changes in society rather than pedagogical pursuits was to realign learning with the increased use of social media and the familiarity of students with online modes of communication. The project has made me more aware of the power and potential role of social media in an educational context (see also Blankenship, 2011; Moran, Seaman &Tinti-Lane, 2011), bound by the parameters of the Institute's policies on social media and digital citizenship. Despite finishing my accredited professional development programme, this project is really only beginning. The project subsequently received funding for further development and will be broadened to involve other colleagues in the department. In the next phase of the project, the impact will be further assessed through the incorporation of lecturers' experiences and perspectives across a wider range of classes. By embedding such practices in a range of classrooms, knowledge may be developed at a programme rather than a module level, aiding programme development, policy decisions and consistent grading practices.

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3. Interactive anatomy: computerising clinical case-based studies

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Introduction

This chapter primarily explores my personal journey to, though, and beyond engaging with accredited continuous professional development in education, and reflects on the effects this has had on my educational practice, my research, my students, and myself. This Postgraduate Diploma in Health Professions Education was designed and is primarily delivered by two of my co-authors, Dr Martina Crehan and Professor Teresa Pawlikowska, who provided feedback and guidance over that initial year of the Diploma, and continue to do so to this day, including insights and feedback which I have incorporated into this reflective chapter. The chapter also highlights an educational initiative which I undertook during the course of this Diploma, and the impacts thereof, which was again strongly supported and facilitated by Professor Clive Lee.

Context – description of educational / institutional setting

The Royal College of Surgeons in Ireland (RCSI) was founded in 1784, and is an international not-for-profit health sciences institution, with its headquarters in Dublin. RCSI awards degrees fully aligned to the National Framework of Qualifications, from levels 7 - 10, in collaboration with the National University of Ireland. RCSI has over 3500 students (undergraduate and postgraduate), in healthcare professions including medicine, pharmacy, nursing and physiotherapy, and is also the professional training body for Surgery in Ireland, managing postgraduate residency training, memberships and fellowships and continuous professional development. As a member of the Department of Anatomy, I contribute to many of these courses and examinations, from first year undergraduate exams in medicine or physiotherapy, to the Surgical membership (MRCSI) examinations.

Impetus to engage in professional development

I had already completed a number of degrees and courses in medicine, science and education during the course of my career prior to 2014, including my original undergraduate medical degree (MB, BCh, BAO), postgraduate surgical qualifications, and research degrees (MSc, MD & PhD, in anatomical, clinical & biosciences research respectively). However, any recognised qualifications that I held in education or training at this time were restricted to the fields of Technology Enhanced Learning (Moodle Course Creator Certificate), and sailing (Keelboat & Dingy [SBSS] Instructor). While some commonalities are present across these

different and varied fields, to my mind there exist very distinct "habits of mind" within these different disciplines of Medicine, Science and Education (Shulman, 2005). The resultant mental "schema" that graduates in these disciplines develop may affect their subsequent approaches to learning or analysis of information, something that I was becoming increasingly cognisant of, as my own readings took me into allied fields such as cognitive psychology (Ghosh & Gilboa, 2014). However, upon arriving in academia as an anatomy lecturer in 2004, my preparation of lectures and class materials was influenced by observing the example of colleagues. Small group teaching was similar to clinical tutorials delivered while a clinician, both to undergraduates and junior colleagues. My interest in Medical Education as a discipline probably began in 2007, when I was asked to run an educational pilot (Assessment) in a module I administered. Since then, my involvement with educational pilots within RCSI developed apace, and I have delivered a number of workshops, internally & externally, over the past number of years, primarily with regard to assessment.

"*Excellence in Education*" is one of the goals of the RCSI strategic plan 2013-2017, and the RCSI Postgraduate Diploma in Health Professions Education was piloted in autumn 2014 to support the educational and developmental needs of faculty involved in teaching RCSI students. The programme was promoted among existing staff members, and I received support from my Department to participate in this; at the time my main rationale for engaging with the programme was to gain a broader view of the evidence-base and current pedagogies in (Medical) Education. I specifically wanted to ensure that I filled in any aforementioned known (or unknown) gaps in my existing knowledge base.

RCSI's Diploma is delivered by our Health Professions Education Centre (HPEC); it has a modular structure, and is run over the course of an academic year. The programme was, and remains, targeted at both experienced and early career educators, including post-doctoral scholars and clinical lecturers and tutors. It is designed to enable all participants to be effective, competent and reflective practitioners by facilitating them in the development and demonstration of good practice in the design, delivery and evaluation of curricula. Our pilot cohort was a varied group, ranging in experience from tutor to professorial grade, and encompassing faculty from nursing, medical, pharmacy and biosciences backgrounds. The length and duration of the course enabled us to reflect on practice, and to begin to implement and evaluate change in practice as we progressed through the programme (Ladden, Peters, Kotch & Fletcher, 2004). While it was designed to include both a solid grounding in educational theory and pedagogies as a whole, it also served to emphasise key discipline-specific elements, such as teaching in both the clinical and classroom/non-clinical settings. This support for professional development in the workplace, in the context of connection with others in the settings in which teaching occurs, was key to our engagement and development as adult learners (Knowles, 1980; Ladden *et al.*, 2004).

Reflective portfolios

The principle assessment strategy for the programme is the completion of a reflective Portfolio at the conclusion of each module (see Table 1). These were written collections of work, focused around a number of key reflective tasks; many undertaking the programme, including myself, were used to a more technical, and objective manner of writing. However, portfolios contribute to assessment by stimulating the use of reflective strategies, expanding understanding of professional competence, and assessing learning outcomes perhaps not easily evaluated by other methods, and so align well with the learning and assessment

requirements of a professional development programme (Lyons, 2006; Sandars, 2009; Wear, Zarconi, Garden & Jones, 2012).

This is not to say that the writing and submission of such personal assignments were not daunting to consider at first; our first portfolio asked for a Philosophy Statement, something quite foreign to my experience, or way of thinking at this time (Shulman, 2005). However, we were supported by a workshop during our course explaining the role and purpose of these portfolios, and guidelines with regard to the individual sections within each of these. These instructions to reflect in a targeted fashion are often particularly relevant for those, such as myself, who come from a science or biomedical background (Knight, 2006). However, a strength within reflective teaching portfolios lies in enabling faculty to redirect their practice in line with their new insights, linking theory with practice, in an iterative cycle of asking questions in practice, studying these questions, and testing the answers (Desimone, 2009; Lyons, 2006). While caveats must be applied to their use in assessment, the reflective process can be extremely useful in promoting deeper understanding of past experiences, and encouraging transformative reflections to consider strategies to utilise in future experiences or situations (Hodges, 2015; Sandars, 2009; Wear *et al*., 2012).

Module	**Portfolio sections – reflections on:**
Introduction to Health Professions Education	- Context & Background - Philosophy statement - Personal Learning & Teaching development - Teaching demonstrations - Critical incident analysis
Principles of Teaching & Learning	- Personal Learning & Teaching development - Teaching demonstrations - Peer observation of teaching - Design for Learning
Assessment & Feedback in Health Professions Education	- Reflection on practice - Personal Learning & Teaching development - Design for Learning · Assessment
Curriculum Design & Evaluation	- Reflection on practice - Personal Learning & Teaching development - Evaluation of Design for Learning - Review of Teaching Philosophy statement

Table 1
Overview of RCSI Postgraduate Diploma in Health Professions Education

Development / design for learning:

The *"Design for Learning"* segment within our second portfolio encouraged us to apply our experiences from the first two modules, and develop "*a small scale project to include consideration of a learning context, the broader requirements of a programme or qualification design as well as planning the overall structure, content and assessment*". An additional section within this portfolio was a reflection on a recent Peer Observation of Teaching experience, wherein a clinical colleague and I had observed each other's small group teaching sessions, primarily to gain a greater appreciation of each other's programmes, but also to see what opportunities might be present for further synergy within our medical curriculum. While writing about this experience for the portfolio, I was struck by the number of similarities in the structure and underlying pedagogies of these anatomy and clinical competency teaching sessions. Both employ the signature pedagogy of medicine, which may best be described as small-group teaching at the bedside, focused on an individual patient (Shulman, 2005). Students are encouraged to interact with the cadaver, or simulated patient, and then eventually present their anatomical or clinical findings to the tutor, demonstrating anatomical or clinical features and then engaging in discussion about clinical implications. Within our anatomy room tutorials, the clinical relevance of the subject matter is further emphasised by working through a case-based study at the end of the session; this is a simple patient scenario, which requires the students to diagnose the injury indicated, or explain aspects of the clinical presentation. In addition to reinforcing anatomical content, these scenarios are designed to promote problem solving and clinical reasoning skills; essential *"habits of mind"* (Hattie, 2009; Kassirer, 2010). So, these small group teaching sessions and case-based studies were to the fore of my mind when coming to the next section of the portfolio, and considering which project or innovation to develop as my proposed *"Design for Learning"*.

Case-based studies in Medical Education may be utilised in a number of different contexts, and there is no single unified approach or methodology (Thistlethwaite *et al*., 2012). Some cases are used as simple examples to illustrate or contextualise content in didactic teaching (Thistlethwaite *et al*., 2012). Other case-studies may be utilised in Problem-Based Learning sessions, implemented using a framework such as those developed by Harvard or Maastricht, to promote active student-centred learning (Davis, 1999). Within our undergraduate anatomy programme, we use simple case studies, with three main aims. Firstly, we use them to contextualise the anatomical content taught to our students, and promote deeper learning thereof (Hansen & Krackov, 1994). Secondly, discussions utilising these cases in the small group tutorials are perceived to enable communication skills (Chan, Hsu & Hong, 2008). Lastly, the exploration of simple differential diagnoses and management options is also intended to instil habits of mind such as inquiry-based learning and clinical reasoning (Kassirer, 2010; Shulman, 2005).

Context evaluation:

In the anatomy small group setting, our case-based studies utilise simplified clinical patient scenarios, which require the students to diagnose the injury indicated, or explain aspects of the clinical presentation. While patients in the real world often have a combination of medical conditions, care is taken to keep these scenarios simple and anatomically orientated; examples given were often those of a simple fall and fracture, or acute illness. In instances where a more chronic condition is used, co-morbidities are kept to a minimum, with as little layering as possible. This scenario is read aloud by one student to the rest. This can be a useful way to encourage shyer students to interact in these tutorials, gaining experience and confidence in speaking to the group. Even those who are initially reluctant to answer

questions, or express opinions, will happily read out the history from a sheet given to them. After ensuring that everyone understands the scenario and vocabulary therein, usually by means of directed discourse, we then move on to discuss the questions (Boghossian, 2006). These will be discussed one by one within the group, typically beginning with *"What is the most likely diagnosis?"* The following questions then explore anatomical or clinical aspects of the selected condition (Figure 1).

A 72 year-old visits his Doctor, with episodes of chest pain while walking. He describes the pain as gripping, in the centre of his chest, and then shooting over to his left jaw and arm. These attacks of pain were very uncommon (occurring weeks apart) but he has now had 4 episodes in the last 2 weeks. The pain is not severe (and is always relieved by sitting and resting) but he is concerned that it is getting worse.

1. What is the most likely diagnosis?
2. What is the blood supply of the heart muscle?
3. From where do these arteries arise?
4. Where can cardiac pain 'radiate' to, and why?

Figure 1
Example of Cardiac anatomical case-based study

As previously described, the intention of these scenarios is not only to reinforce anatomical content, but also to promote problem-solving and clinical reasoning skills (Hattie, 2009; Kassirer, 2010). For students more used to didactic teaching methods, this level of interactivity and verbal communication can be quite daunting initially. However, communication skills and teamwork are essential for practicing clinicians; these skills need time and experience to develop and the extent to which the anatomical and clinical tutorials enable this process is something that can often be overlooked (Older, 2004). While the cases are posted for students online as PDFs, and published within our anatomy workbook, discussion in a small group tutorial setting gives the opportunity for critical discourse and immediate, directed feedback to the students, both as individuals and as a group (Boghossian, 2006; Hattie & Timperley, 2007).

Unfortunately, time constraints mean that sometimes these may not be discussed with all groups; some tutorials require more dissection than others, or contain some complex concepts that require additional focus or didactic teaching. Our biannual Student Feedback Surveys indicated that while students rated these case-based studies highly, there was not always the opportunity to complete them in the Anatomy Room Tutorials:

- adminstrators (sic) should pay attention to Case histories more ...
- Anatomy case histories were not always discussed.
- ... if we solve them alone at home, how are we supposed to make sure that everything is correct?

Input and process evaluation

So, while our case-based studies were originally designed for use within a small group setting, my aim within the "*Design for Learning*" project was to provide them to students in the alternate format of an optional online tutorial, which they could complete in their own time, and at their own pace (Cook, 2007; Taylor, 2002). However, while amending them for an online format, I wished to preserve, as much as possible, the critical thinking and feedback elements associated with these cases within the anatomy room. Therefore, I chose to adapt them into "*Moodle Lessons*", an activity type within our Virtual Learning Environment (VLE), which allows the designer to develop an adaptive, interactive tutorial (MoodleDocs). Designing and creating these lessons was relatively straightforward, and was completed by myself, with no additional IT or specialised support required, other than some initial online training. Students can be presented with initial information or a case-based scenario, and then be required to make choices, or answer a variety of question types, throughout. Another example of one of these case-studies in the online format is shown in Figure 2; it begins with a description of a simple patient scenario, incorporating a small number of positive clinical signs and symptoms. This is followed by a number of questions which are written with the intent to explore simple anatomical and clinical aspects of the injury or condition. Once again, a typical first question is *"What is the most likely diagnosis?"* followed by questions focused on additional anatomical or clinical aspects of the selected condition or injury.

A 22 year-old male is brought into the Emergency Department with lower abdominal pain. He states that the pain was mild when it began yesterday and was just mild cramps around his umbilicus. Since then the pain has become worse, and shifted to his right iliac fossa. He has no appetite and had 2 episodes of diarrhoea this morning.

On examination, you note that he has a high temperature (38.5°C). When he lies down for examination he finds that he is more comfortable when he flexes his right hip a little. On palpation, he has tenderness and guarding in the right iliac fossa, maximal over McBurney's point.

1. What is your diagnosis?
   - Appendicitis
   - Peptic ulcer disease
   - Strangulated inguinal hernia

Figure 2
Example of GIHEP case-based study; clinical scenario and initial question

In order to ensure that the feedback given to these answers is effective and appropriate, the lesson page can be edited so that specific feedback can be given for each choice or answer given, whether correct or incorrect (Hattie, 2009; Rawson & Quinlan, 2002) (Table 2). The lesson designer may also insert additional content pages containing text or multimedia, in order to either reinforce correct choices, or immediately address misunderstandings (Rawson & Quinlan, 2002). Ensuring timely provision of effective feedback to students in this manner can offer them invaluable insight into their performance, and so enhance learning

and development (Archer, 2010). The feedback that I embedded within the lessons varied slightly according to the question to which it was related, but with an aspiration to provide process-based feedback where possible. At a basic level, feedback may be given with regard to a specific task, simply informing the learner as to whether it was performed correctly or incorrectly (Archer, 2010; Hattie & Timperley, 2007; Shute, 2008). Alternatively, the feedback may focus on the process of the task, giving specific advice and suggestions as to how performance may be improved (Archer, 2010; Hattie & Timperley, 2007; Shute, 2008).

Option chosen	Feedback provided
Appendicitis	Correct! On the next page we will discuss which aspects of the history and examination make you suspect this diagnosis.
Peptic ulcer disease	No - that will usually give upper abdominal, or epigastric pains. Try again!
Strangulated inguinal hernia	No - the pain from this will usually start at the localised, hernia site, and then become generalised, not the other way around! Try again :)

Table 2
Example of GIHEP case-based study; feedback provided for potential options

Product evaluation

Eight of these online case-studies were piloted within the 2014-2015 academic year, within the *Gastrointestinal & Hepatology* (GIHEP) module, and feedback from the students was generally positive. Fifty-two students (44% of respondents) in our end-of-semester survey indicated that they had completed one or more of these online case-based tutorials during the semester; 86% of these indicated that both the level of feedback given and the clinical complexity of the cases were "*Just right*". Additionally, there were a number of free text comments submitted by the students referring to the online cases, describing them as "*fantastic*" and "*very useful*". However, most students did complete these cases alone (96%) rather than in a study group. As previously mentioned, their use in our small group tutorials is designed to develop communication skills, in addition to contextualising content and developing reasoning skills (Older, 2004). However, our initial pilot suggests that while our case-based studies were originally designed for use within a small group setting, they appear to transfer well to an adaptive online tutorial. The focus is kept very much within the framework of the signature pedagogy of medicine – centred on an individual patient with active consideration of their condition, whether within the clinical, cadaveric or online setting (Shulman, 2005). We propose that these online cases are an appropriate alternative medium with which to enable students to develop their problem-solving and clinical reasoning skills, so long as care is taken with design to preserve interactivity and to provide integrated feedback (Maleck *et al.*, 2001, Rawson & Quinlan, 2002). Unfortunately, their drawback is that they are unable to replicate the communication and team-work that occurs when used in a typical Socratic or constructivist setting (Boghossian, 2006; Older, 2004;

Shulman, 2005; Taylor, 2002). The omission of this function within the online format is a loss, but is preferable the students not having the opportunity to complete the cases at all, if lack of time in the anatomy room does not allow for their use there.

Identification and discussion of impacts:

Educational / assessment practice

So, to now summarising impacts, the first would be that I have very much enjoyed participating in the Diploma, including the reflective process, portfolio submission and project development, and have found it beneficial to my professional development as an educator. As mentioned previously, while caveats must be applied to the use of reflective portfolios in assessment (Hodges, 2015; Norman, 2008), the reflective process can be extremely useful in promoting deeper understanding of past experiences, and encouraging transformative reflections to consider strategies to utilise in future experiences or situations (Driessen, 2008; Hodges, 2015; Sandars, 2009; Wear *et al*., 2012). While the theories and concepts introduced by the Diploma are fascinating, work-based time pressures do mean it can be difficult to find time to think or read on these topics; having to write the portfolio ensures that we *found* the time necessary to do so, and made us apply our new knowledge and insights to our own lives and practice, to the benefit of ourselves and (hopefully) our students. Moreover, the incorporation of the *Design for Learning* segments, wherein we planned, enacted and evaluated an educational intervention, was a wonderful learning experience. In addition to the case-studies, which I have discussed in detail, I also made a number of videos for use in conjunction with my embryology lectures, and reflected on my recent update of our online histology resources. Participating in tutor and peer observed teaching sessions gave me valuable feedback, and an opportunity to observe others and gain some inspiration and ideas, as well as a greater appreciation for the content that other faculty are teaching my students in parallel to myself. My own understanding of educational processes and practices has now deepened to a great extent, enabling me to articulate exactly *why* I now choose to approach certain lectures or tutorials in a particular manner. With regard to the evidence base and theoretical underpinnings of education, I found these concepts equally fascinating and frustrating when first doing the Diploma; education draws theory from a number of fields, and so the frameworks here developed organically, with a variety of vocabulary and approaches. I recently co-taught these sessions on the *"Theories of Learning"* for the current iteration of the Dipoma, alongside our Head of HPEC, Prof. Teresa Pawlikoska, something I couldn't have conceived of doing two years ago.

Research

While I had undertaken some research projects in aspects of medical education and assessment in previous years, these were mainly descriptive in nature, with some evaluation of whether these interventions appeared to have "worked", or enabled learning (Cook, Bordage & Schmidt, 2008). The deeper understanding that I gained during the year enabled me to delve further, attempting to clarify and explain *why* I was seeing these observable effects, drawing from the available evidence-base of educational theory (Cook *et al*., 2008; Holland, Clarke & Glynn, 2016; Holland, O'Sullivan & Arnett, 2015) . Some of my on-going research projects now make use of qualitative methodologies familiar to those in education or the social sciences, but which were again unknown to me three years ago, coming as I do from a primarily quantitative background in biosciences research (Robson, 2011).

Students

With regard to my own interventions, introduced during this Diploma, I have discussed the impact on the students of just one in detail (Case-studies). With regard to longer-term outcomes and implications, following the positive reaction to this pilot project (and multiple e-mail requests!) an additional fourteen online case-studies were developed for the 2015-2016 academic year, covering aspects of thoracic and upper limb anatomy within the Cardiovascular module. Furthermore, ethical approval was obtained to perform a formal research study examining the use of the GIHEP case-studies in 2016, with questions more explicitly framed to explore the themes such as usability, convenience, feedback and clinical complexity of these cases in both small group and online formats. However, the students have also benefited from a number of other positive interventions, by myself and my colleagues, during the course of this Diploma. While the modes or formats of activities by which we teach our students may be many and varied, designing them according to sound educational and psychological principles is essential, and empowering our educators in this regard is of high priority to RCSI (Hattie, 2009).

Personal

My very first sentence within the Philosophy statement of my first portfolio was that the "*more I learn of education, the less prescriptive I tend to be about specific pedagogies or learning theories; most approaches have some benefit when used in the right place, at the right time and in the right way*". While I remained in general agreement with this statement at the end of my Diploma, I finished with a greater appreciation of the evidence-base for my practice, and an even larger "toolbox" of techniques and approaches to play with. For the future, I look forward to learning even more about education, and metacognition, and am planning further research in this area. It is so interesting to think about how we think, and there is a vast evidence-base to read if one has the time and inclination to do it. Understanding my students, and how to utilise the various methodologies in my teaching practice in order to help them achieve their potential, is both fulfilling and intellectually stimulating. I am often asked whether I miss clinical practice, and my answer now returns to an insight developed from exploring signature pedagogies, and habits of mind (Shulman, 2005). Vocational training in the Health Professions emphasises patient-centred care, prioritising the physical and mental well-being of our patients. The move to a student-centred educational career, prioritising the cognitive, social and emotional development of the next generation of healthcare professionals, is not such a large step to make.

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4. Measuring the impact of accredited professional development on the Student Learning Experience in Undergraduate Science

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Author Overview: From Science to Learning & Teaching

Memories from my early childhood contain numerous references to science: receiving a chemistry set on my 6th birthday; being as excited about every NASA shuttle launch as I was for Christmas; and reading, over and over again, a science book entitled 'Facts and Lists'. From there, numerous elements had a steering effect on my career path, none more so than an incredible secondary school biology teacher, followed by a suite of inspiring lecturers in college. Hence, encountering elements of science from an early age, I consider myself extremely fortunate to now be employed in Dundalk Institute of Technology (DkIT) as a lecturer in Biochemistry and Molecular Biology, having joined in 2009. After being awarded a BSc (Hons) in Biochemistry from NUI Galway in 1999, I performed a PhD identifying novel genes involved in embryo development before moving my focus to DNA damage and cancer research for my post-doctoral work. My scientific research, while primarily based in Galway, encompassed invaluable stints in the University of California (San Francisco), The Beatson Institute (Glasgow) and the Institute of Genetics and Molecular and Cellular Biology (Strasbourg). Combining my people and communication skills with my acquired scientific expertise, I subsequently went on to be employed as a Senior Study Lead and Proposals Manager in ICON Clinical Research before joining the academic team at DkIT. I embarked on a journey of learning some time ago, and this continued in Dundalk where I was awarded an MA in Learning and Teaching (MALT) in 2013.

I enrolled in the MALT to identify new approaches to facilitate learning and engagement in the classroom and to develop interventions that could empower students, leading to the development of a higher quality, and more skilled, graduate. I also identified the research potential of the learning and teaching field, and was keen to bring my suite of research skills to this new arena.

Educating Educators

In 2011, the Irish Government published 'The Hunt Report' (Department of Education and Skills, 2011), with one recommendation stating people in a teaching capacity should not solely be experts in their own discipline, but also in learning and teaching practices. This reinforces the scholarship of learning and teaching which recommends educators research and focus on the quality of their students' learning, encouraging learner-focused practices and conceptions to be implemented (Boyer, 1991; Light, Cox, & Calkins, 2009).

From my experience, engaging in learning and teaching continuing and accredited professional development (CPD/APD) courses can assist in the development of an improved learning environment, build self-confidence in educators, introduce technology to teaching practices and, overall, can improve the student experience of higher education, developing higher skilled and more employable graduates. Educators, while possessing significant experience in their fields, are becoming aware of the need for meta-cognitive skill development in learners in addition to subject theory. For example, the works of David Boud (Boud, 1989, 2001) highly stress the importance of developing lifelong self-reflection and self-assessment skills in students (and equally in educators) for their careers/life after their time in higher education. In order to fulfil these goals, it is critical the teaching environment becomes more student-centred, versus teacher-centred, with educators engaging with opportunities for the development of meta-cognitive and other lifelong skills in learners as well as a deeper approach to learning (Elen, Clarebout, Léonard, & Lowyck, 2007; Kember, 1997; O'Neill & McMahon, 2005; Trigwell et al., 1999).

While creating a stimulating and engaging teaching environment is one important element for any educator, realising the role of assessment and feedback is vital. Hence, APD courses can provide an avenue for training, implementation and evaluation of assessments and other interventions. In fact assessment, described as being "*at the heart of the student experience,*" has developed a critical presence in education APD courses (Brown & Knight, 1994, p. 12). The form assessment takes can guide and impact on students' motivation, learning style and how the learning process is perceived (Black & Wiliam, 1998; Miller, Imrie, & Cox, 1998; Prades & Espinar, 2010). It is important to focus heavily on assessment in APD courses as third level educators need to become aware of assessment for/of/as learning – realising their differences and roles in education. Often complementing assessments is feedback, which needs to be implemented in unison. Feedback, the "*oil that lubricates the cogs of understanding*" (Brown, 2007, p. 1), has been described as the "*most powerful single moderator that enhances achievement*" (Hattie, 2003, p. 8). Constructive, supportive comments on a submitted piece of work aimed at improving subsequent submissions is a simple concept to comprehend; however, it is critical this concept becomes understood and ultimately a common entity in every classroom through dialogue (Carnell, 2007; Carnell & Lodge, 2002; Sadler, 2010; Watkins, Carnell, Lodge, Wagner & Whalley, 2002). APD courses in higher education play an essential role in ensuring educators become aware of the power of assessment and feedback, and the strategies for how they can be used to assist and develop learning. The impact of this realisation in educators knows no bounds; it can literally transform their teaching practice.

Considering the recent growth in learning and teaching courses nationally (there are currently 68 accredited learning and teaching programmes across 22 Higher Education Institutions (The National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015), it is justifiable that an interest has mounted in understanding the impact these courses can have on student learning, teaching and on the course participants. The following

sections will outline two projects I designed and implemented during my completed MALT course undertaken at DkIT, providing details on the rationale, implementation and their wider, sustainable impact.

APD Course Outputs: Project Rationale and Impact

My MALT APD course ultimately generated two projects which remain ongoing and have evolved further since their fruition.

1. Determining the 'X-factor' in Science Education
2. Enhancing the student learning experience in undergraduate science laboratory sessions

Determining the 'X-factor' in Science Education

As part of the MALT, one module focused on the design, implementation and evaluation of a technology-enhanced learning (TEL) based approach. As discussed by Light *et al.* (2009, p. 180), technology is not meant to transform learning but it can encourage or enhance learning. Light and colleagues go on to discuss how it is important to ensure that technology is not used to add "*bells and whistles*" to a module, but that one ensures there is an impact on learning from its introduction. Having personally realised and witnessed the power of videos in teaching and enhancing understanding, I was keen to generate a bank of student-designed and recorded videos that could assist in educating others.

During our MALT classes, the group was made aware of the startling statistic that students will retain just 5-10% of material covered in lectures as compared to 90% when learning from other students (see Figure 1). With this in mind, I devised an intervention whereby video technology could be used for students to teach other students.

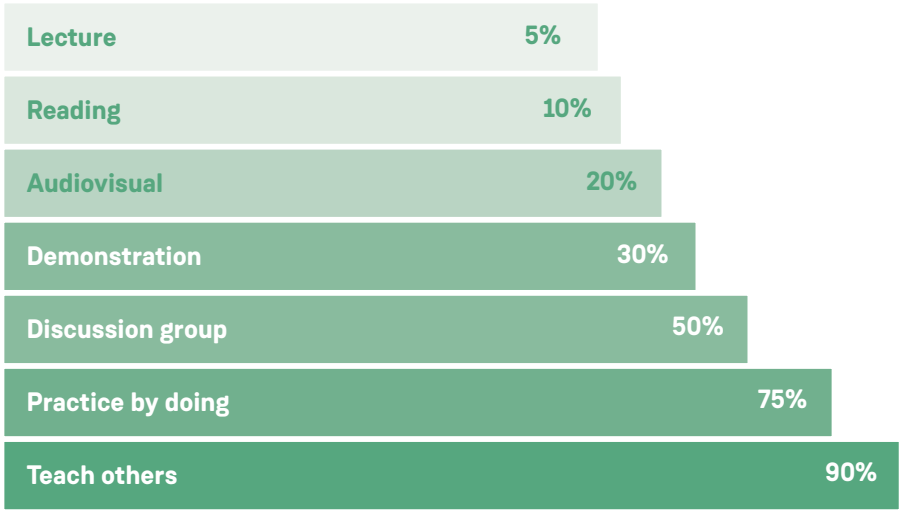

Figure 1
Average student information retention rates from educational methods
(Adapted from National Training Laboratories, Bethel, Maine (Yildirim, Baur, & LaBoube, 2014)).

Project rationale and Implementation

The concept involved a Year 4 (Y4) science class being divided into groups of 3. The groups were provided with a list of scientific topics familiar to the students to select from (each topic related to a relevant Year 2 (Y2) scientific principle). The plan of the project was for each group to record a brief 2-4 minute video communicating, explaining or demonstrating the chosen scientific topic to a general scientific audience. They were advised to be creative and that they could use white boards/PowerPoint/props, etc. A High Definition Digital Camera was provided to the group as a means of recording their video, along with a mini tripod. Each group was allowed one week to perform their recording, edit their movie, upload it to YouTube and finally, submit. In essence, the students were going to create reusable learning objects (RLOs) which can be used in the future for peer-to-peer learning. As described in Boettcher and Conrad (2010), incorporating video into teaching can create a "*richer, more interesting, and more satisfying experience for you and your students*" (p. 140). Once all the videos were recorded, they were assessed using criteria to gauge the creativity, communication and the science behind the video. A presentation session was held with the class voting for their favourite video, which won a small prize – with the winning group being told they had the '*X-factor in Science*'.

Overall, there were numerous inputs and outputs involved in this project (see Figure 2), with the ultimate development of a library of RLOs for helping Y2 students understand their coursework

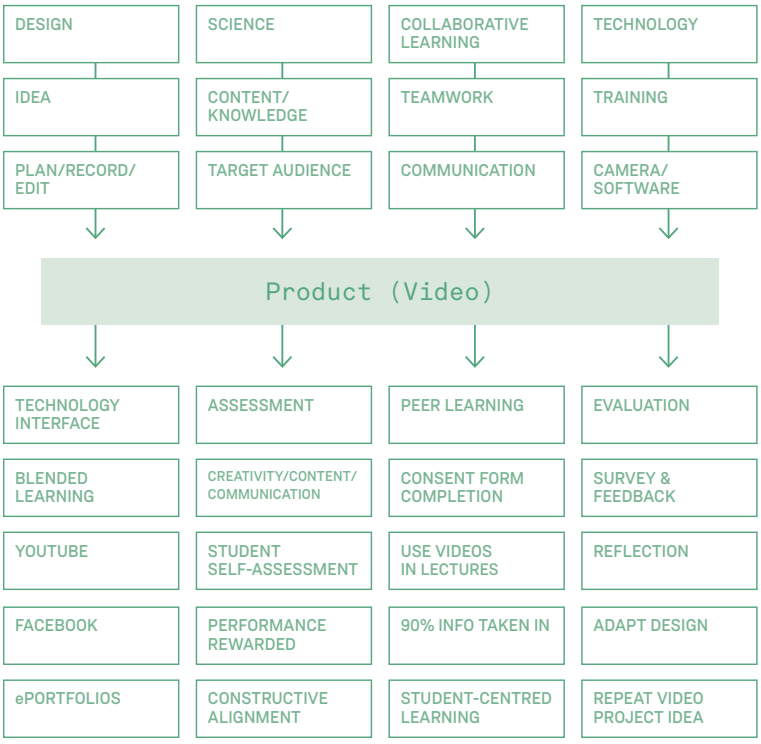

Figure 2

Input and Outputs in the Science X-Factor intervention. Inputs centred on project design by the students incorporating brainstorming, teamwork and clear communications while using technology to reach the ultimate goal. The video output engages with a technology interface while allowing assessment on different forms of criteria (i.e. communication/use of technology /creativity etc.) as compared to the standard sets. Within the video development, teamwork and peer learning can be seen yet this also extends to the videos being able to be used in other modules, hence the student-created videos can assist other student learning peer-to-peer.

topics. The project is now entering its 6th year, while the RLO library continues to grow in parallel. The students are provided with the option of uploading their video to YouTube as 'unlisted' or 'public'. One such video, uploaded as public, has gone on to reach 23,254 views at the time of writing (simply scan the QR barcode or access the hyperlink in Figure 3 to view the video).

Figure 3
Example of a student recorded video https://www.youtube.com/watch?v=p2xf1hYvvpg Permission for inclusion gratefully obtained from the creators of the video; Caoimhín Griffin, Shi Hui Ng and Sinead Bellew.

Impact and Sustainability

During the design and development phase of this video project, I realised its potential and was keen for it to continue year-on-year. Currently entering its sixth year, it has proven to be a success in many ways.

Student Impact

The 'X-factor video project' has had a significant impact, both on the students creating the videos, and those viewing them as learning tools. As shown in Figure 2, the creators engage with brainstorming, group work collaboration and technology, all while being empowered to create their own video. Student feedback via anonymous evaluation surveys from both the creators of the videos (Y4 group) and the viewers (Y2 group) has proven very positive since the creation of the project. The Y4 classes have appreciated being able to select their own winner of the competition while regularly commenting on the '*fun*' involved in the project. Many of the creators have even reported mentioning their video project in job interviews as examples of team work, meeting deadlines, creativity and engagement with technology – differentiating themselves from other applicants. Further information and details on the winning videos over the years can be viewed by scanning the QR code or accessing the hyperlink in Figure 4 below:

Figure 4
Further information and details on the Science X-Factor video project http://www.breebio.com/courses-modules/upstream-processing/video-project/

Project Evolution

During 2016, this project has evolved slightly to an enhanced and more interactive form. Funding was successfully obtained from the 'What Works & Why" initiative (a multi-instutitional digital skills enhancement project, led by DCU and funded by the National Forum for the Enhancement of Teaching and Learning) to establish augmented reality (AR) in Science education using the Aurasma smartphone app. Here, AR (*i.e.* when a virtual element is superimposed on a real life element) is being implemented to bring 1-dimensional lecture handouts '*to life*'. The goal is that students will be able to scan trigger images on handouts to activate playing of a related video on their phones (a process similar to that of QR code scanning). The project aims to have the RLOs/videos created by the Y4 students being made available to Y2 students at the right location in their course/handout to assist comprehension of certain topics at the appropriate time versus searching previously received e-mails for circulated hyperlinks. By scanning a 'trigger image' on the handout with their smartphone aurasma app camera, the corresponding video will automatically play on their smartphone. This invaluable concept will assist in the development of peer-to-peer teaching, facilitating knowledge and understanding, and addressing some of the concerns demonstrated in Figure 1 (students without access to a smartphone will have the option to view the videos via YouTube). Hence the addition of a 'new dimension' has evolved this video project, further assisting peer learning.

Enhancing the student learning experience in undergraduate science laboratory sessions

Central to any APD course is the final output, in this case, the MALT research project. For this project to be granted approval, a research proposal outlining the project, indicating its relevance, justifying every element of the format and outlining its potential was prepared and submitted, in combination with a separate submission for ethical approval. Once approval was obtained, the research project commenced.

Paramount to my teachings in science are practical sessions. Indeed, practical sessions are central to the development of skilled graduates in many disciplines, whereby they complement lectures and allow hands-on application of the theory being learned in the classroom. Being aware of the importance of the practical session, but conscious of how their assessment has been somewhat dated, I was keen to focus on designing a novel approach to the sessions' format and assessment, with a goal of developing an always-improving mind-set in students.

Project rationale and Implementation

During their degree, Science undergraduates spend a significant amount of time in the laboratory developing practical and communication skills. For example, in DkIT, a Y2 undergraduate can spend up to 12 hours per week in the laboratory (performing 4 x 3-hour practical sessions). Historically, globally, the learning style implemented has often remained 'expository', meaning students follow a recipe-like manual to reach a pre-determined outcome - a process reported to lack self-reflection, thinking and contextualisation (Bennett, Seery, & Sovegjarto-Wigbers, 2009; Domin 1999; Dunne & Ryan, 2012; Hofstein & Lunetta, 2004).

Associated assessment procedures have also remained stagnant over time and limited student development. The primary mode of assessment often involves the generation of a

hand-written 'lab report', composed of the same section headings as most would be familiar with from school, namely: Aim, Introduction, Methods, Results, Discussion and Conclusion. Writing one report per laboratory session amounts to 240 reports over a 3-year degree in an Institute of Technology – this represents significant over-assessment, with educators often examining the same skill set (Hughes, 2004). Concerns have also been reported regarding this mode of assessment as there can sometimes be an expectation on students to produce high quality reports with little or no training, guidance or feedback sessions (Hunt, Koenders, & Gynnild, 2012; Pickford & Brown, 2006). Students end up becoming completely fixated with the *quantity*, and not the *quality*, of their lab reports. This leads to the understanding of the scientific concept in a practical session and/or skill development being overlooked. With a high number of lab reports being performed over time, one would expect students to achieve high marks repeatedly. However, many are only interested in the grade awarded – and do not reflect on the feedback provided – hence, the potential of feedback and student improvement is not always witnessed (Gibbs & Simpson, 2004; Sadler, 2010). As part of the constructivist theory of learning, feedback represents the scaffold provided by the lecturer to enable students to learn (Orsmond, Merry, & Reiling, 2005). Bjorkman (1972) coined the phrase '*feed-forward*' to outline the true role of feedback. Ideal feedback must provide positive and supportive comments on the submitted piece of work while also showing what can be done to enhance the submission/performance (Boud & Falchikov, 2006; Brown, 2007; Nicol & Macfarlane Dick, 2006; Sadler, 2010). Hence, the practical sessions' format and assessment had numerous shortcomings which I set out to address and modify in the MALT research project. The project focused on improving the student learning experience in practical sessions on several levels. Hunt and colleagues (Hunt *et al*., 2012) cite a quotation from Bamber, Trowler, Saunders and Knight (2009) which states that "*changing only an element at one level may have limited, local and provisional success… because the rest of the system is not touched and established patterns prevail over the single change*" (p. 3). Thus it was important that changes were implemented on several different elements of the practical sessions in order to have a true, sustainable impact.

Firstly, the number of lab reports per subject, per semester, was reduced from ten to four. In order to achieve the project goals, *i.e.* make these reports more effective, promote feedback engagement and see improvements over a semester, an incremental marking system was designed (Bree, Dunne, Brereton, Gallagher & Dallat, 2014). This involved reports being worth 4%, 7%, 9% and 10% respectively – as compared to ten reports worth 3% each. The reason for this approach was to stimulate feedback uptake and improve lab report quality while attempting to generate an always-improving mind-set. As recommended in the literature, time-slots for feedback review and dialogue were implemented to assist reaching the goals (Carnell, 2007; Carnell & Lodge, 2002; Orsmond & Stiles, 2002; Price, Handley, Millar, & O'Donovan, 2010; Watkins *et al.,* 2002).

In addition to modifying the structure of the assessments, self-assessment forms were introduced allowing students to self-reflect on their lab reports before submission. Here the students had to identify the strengths, weaknesses and areas for improvement in their submissions. Implementing self-assessment opportunities, whose importance in lifelong skill development cannot be understated, can develop the ability in students to reflect on their work, accomplishments and feelings – this has been shown to have the power to develop self-regulated and problem-solving learners (Boud, 1991; Dochy, Segers, & Sluijsmans, 1999; Stefani, 1994; van Kraayenoord & Paris, 1997). David Boud referred to self-assessment as being fundamental to all aspects of learning (Boud, 1990). Formative skill set tests on topics

such as pipetting, data analysis, graphing and tabulating data were introduced in combination with peer assessment elements, allowing practical skill development to take place during the sessions. Central to the practical sessions is the development of hands-on skills, hence introducing the assessments provided an opportunity for students to improve their technical skills and data analysis abilities.

As discussed previously, there existed one mode of assessment in many practical sessions – the lab report. While it remains an important learning tool for any scientist aiming to develop academic report writing skills and theoretical learning (Hunt *et al.,* 2012), it needed to be complemented with other 'assessment for learning' approaches. McDowell, Wakelin, Montgomery, and King (2011) found that the introduction of these learning approaches can stimulate and develop deeper learning. Therefore, the laboratory manual was revised introducing questions to examine knowledge, understanding and application of the lab principles. These questions would be performed in the laboratory, rather than at home, so that further dialogue and debate could take place with both peers and the lecturer – all focused on stimulating learning.

Overall, the MALT project concept represented a major change to the standard practical session. Several elements, rather than one, were modified as recommended by Bamber *et al.* (2009). Each of the implemented changes were aimed at enhancing the learning environment and experience, the assessment process and the development of both technical and metacognitive skills in students, making them more attractive to employers. An animation summary of the MALT project can be viewed by scanning the QR code or accessing the hyperlink in Figure 5 below.

Figure 5
Animation Summary of MALT Project:
https://youtu.be/1mSX7RDR2y8

Impact and Sustainability

To truly measure impact, evidence of the difference an innovation has had, rather than claims of same, is required. From this innovation, evidence of impact can be witnessed on numerous levels, for example with learners, educators and the wider education community.

Student Impact

With this innovative system, the reduction in the number of summative lab reports was an aspect welcomed by the students, where they recognised the quality of their submissions could now improve as with "*a lab (report) every week there would be an overload and not enough time would be put in to them*"; "*because of the volume of work* (with one report per week) *it would be difficult maintaining the quality*". There were also comments indicating students could now focus on the practical session in hand rather than be distracted by report requirements: "*I personally found myself learning a lot more because I was enjoying the laboratory practicals and not constantly fretting about what I was going to write in the reports*".

The combination of the incremental system and high-quality, personalised feedback ensured the quality of lab reports and basic practical skills improved (Bree *et al.,* 2014). Students viewed the incremental system in a positive way, highlighting that it "*encourages you to do your best, keep improving*" through developing a "*new mind-set*" leading to "*improved quality*". Overall, with subsequent reports being worth more, you "*work harder*" and "*right your wrongs*", through the implementation of feedback. In general, mistakes were no longer being repeated and errors were being corrected, demonstrating students were now engaging with, and realising, the value and role of feedback, *i.e.* to feed-forward. Evaluation of the study allowed the student voice to be heard, and with regard to feedback, it supported the concept of empowering them with feedback to feed-forward (see Table 1 for sample comments). This was also reflected in the grades being achieved in the submitted lab reports; for example the mean grade in the first submission (60.7%) increased to 67.7% in the final submission. Some students even developed their own 'feedback journal', noting the key points to improve on in future submissions.

"You can't improve without feedback" ; "Improve as you go" ; "You knew exactly where you went wrong and how to fix it"

"This really helped me as you had paragraphs of feedback, so you knew exactly where you were going wrong and were also told what was done well, which I really liked."

"The feedback sheets gave me the information I needed to improve my mark with every submission. Prior to completing my reports, I referred to the feedback sheets of previous submissions. This ensured that I would not repeat the same mistakes."

"I felt like the difference in the quality of my first submission and my last submission was huge because of it (feedback)."

Table 1
A collection of comments from students with regard to the importance and use of feedback (Bree *et al.,* 2014).

Students were also self-assessing, proof-reading, and improving their work before submitting, often adding extra text/comments (see Table 2 and Figure 6).

"I think it (self-assessment) forced students into actually thinking about the quality of the work that's being submitted one last time and even encourages students to improve as they're judging their own work." "It helped a lot with lab submissions as it made me check my report more thoroughly."

Table 2
A collection of student comments with regard to the process of Self-Assessment, a process introduced to develop self-reflection and meta-cognitive skills (Bree *et al.*, 2014).

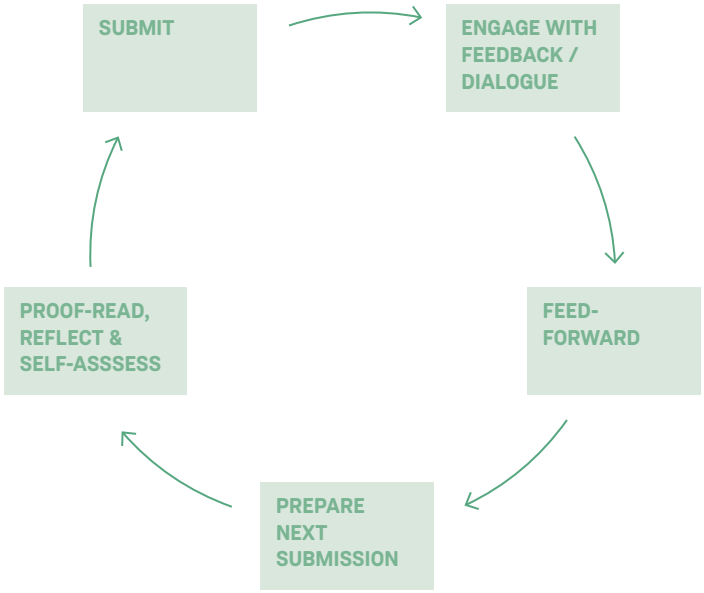

Figure 6
A schematic overview of the process being established in students' mind-sets from the project. The presence of an incremental marking system encourages students to work with this model.

The inclusion of in-class formative assessments and skill set tests were also welcomed: "*lab exercises helped me understand the experiments more*", while including a lecturer sign-off on tasks ensured skill set tests were supervised and completed successfully. A further benefit is that this approach allows students to "*adapt*" to different lecturer/module requirements easily without any mistakes being too costly with the first submission: "*The first write-up/report is experimental. You have to make your own mistakes to learn from it. Build on them*".

Overall, the widespread impact on assessment literacy was evident through the engagement with feedback, behaviour and performance. In addition, as shown above, the development of self-regulated learners and an 'always improving' mind-set from performing this intervention became more and more evident from its evaluation.

Educator Impact

The incremental marking system and the reduction in the number of lab reports have been implemented by other staff members at DkIT, allowing students to improve submissions in other modules. In addition, submitted elements of the learning and teaching MALT course which I developed have been used as exemplars for staff members who since signed up to the course. Since graduating, I have also presented several times to the other staff cohorts participating in the APD course to share my positive experiences and the impact the course can have on various stakeholders.

Wider Impact and Sustainability

From this study, two peer-reviewed articles have been published in the learning and teaching arena, ensuring the concepts, benefits and impact of the study can extend their reach globally (Bree, 2014; Bree & Gallagher, 2016). The paper describing the results of the main study (Bree *et al.,* 2014) includes resources such as rubrics, focus group questions, survey questions to assist others in its implementation and evaluation, while the more recent publication (Bree & Gallagher, 2016), describing a cost-effective qualitative data analysis procedure devised during the project, includes a screencast demonstrating how the process occurs.

Through initial discussions with DkIT's Head of School of Health and Science (Dr. Edel Healy) and the Head of Department of Learning and Teaching (Dr. Moira Maguire), the concepts addressed in the practical session assessment innovation more recently evolved into a successful application to the National Forum for the Enhancement of Teaching and Learning's 2015 Enhancement Fund. This national project, referred to as TEAM (*Technology Enhanced Assessment Methods* in Health and Science practical settings) being performed across four partner institutions (DkIT, IT Sligo, IT Carlow and Athlone IT), is focused on improving technology-enhanced assessment methods in Science and Health practical settings, facilitating change and improvements in the wider sense. The project commenced in January 2016 and continues for 24 months. It aims, based on literature as well as student and employer recommendations, to pilot and subsequently evaluate the implementation of technology-based assessment approaches to enhance learning in scientific, veterinary and health practical sessions. Within the project, there are numerous stakeholders, namely: students, employers, library and academic staff.

Ultimately, a best-practice web resource outlining each intervention and its evaluation will be made available to the wider community to assist educators. Also, a national peer network is being established to sustain progress in the field and ensure progress is being maintained and enhanced further, continuing the development of higher skilled and more employable graduates. A very successful initial workshop attended by the peer network established thus far was held in June 2016 in Athlone IT.

Impact on Personal Development

This particular MALT APD experience has impacted significantly on numerous stakeholders, including students, staff, the wider community, and also with me on a personal development level.

While many courses can advance a participant's skill set and knowledge base, certain courses have the ability to have a profound impact on a person, capable of altering their mind-set which may have been developed from a previous career path. For example, my background was 'scientific' to the core. Experiments were carried out to prove/disprove a hypothesis with said experiments producing results/data for analysis. Experiments were often performed in triplicate and in the company of controls, with the latter allowing results to be validated, verified and trusted. Tabulated or graphed results underwent statistical analysis to determine their significance. The results, and the derived conclusions, ultimately became factual. Becoming aware of this mind-set being "hard-wired" in a scientist can prove surprising, as was the case for me, who ultimately went on to build on this, adapting and improving.

During the MALT APD course, I made several entries in my personal reflective journal, again a new feature of this new field, regarding becoming aware of the engrained approach developed during a scientific career and that in the learning and teaching arena, there was a need to become more malleable, relaxing the rigid scientific mind-set while adapting to a new, reflective environment. In saying that, the previously acquired analytical approach to experimental design, research ethics and active research, married with expertise in writing grants and publications, did allow me to carry valid skills to this new arena, while still adapting to its new landscape.

With regard to interventions, from the APD classwork I quickly realised the potential of assessment and importance of feedback quality to motivate and help in determining a student's learning style. While it was clear to all educators that assessment is an important element in education, the realisation of the power of formative assessment, versus summative alone, can be enlightening. I used the APD course learnings to completely re-design a course module. In this instance, two individual semester-long modules were being merged into one year-long module. The new format of the module provides students with assessments throughout the year in addition to an exam at the end of the course, allowing students to learn and perform as they progress through the module. This assists in learning being a continuous process where students continue to construct new knowledge based on what they already know, while gaining marks along the way. This would compare to the majority of marks solely being linked with final exam performance. With regard to the running of the module, I engaged with a virtual learning environment and social media to assist students accessing new developments and breakthroughs, class notes, online animations, personalised screencast videos and quizzes. In the classroom, I now engage more frequently with technology, for example using quiz based Apps such as 'Socrative' for real-time formative assessments (Dervan, 2014). These have the power to assist students in determining what they know and understand well while also identifying gaps that need to be filled. Also, they can dramatically assist the educator by identifying in real-time where the gaps exist. These elements can be reviewed prior to the end of a lecture ensuring students get up to speed before leaving the room.

Being awarded the MA in learning and teaching qualification has ultimately enabled me to make an impact across several avenues, for example:

- To become elected to vice-chair of the learning and teaching sub-committee of Academic Council at DkIT,
- To act as a peer-reviewer with learning and teaching journals,
- To present to current cohort of MALT class on experience of modules/course,
- To attend national conferences (e.g. EdTech 2016; The National Summit for the Enhancement of Teaching and Learning in Higher Education 2015),
- To present at Institute 'TEL (technology enhanced learning) Tales' event,
- To join collaborative research groups with other institutions,
- To collaborate with other staff members on learning and teaching projects (see Dunne et al., 2015),
- To successfully acquire funding for a TEL based project in the "What Works and Why" initiative,
- To act as an academic lead on a national learning and teaching project,
- To present at a national workshop on practical sessions in science and health.

Hence, as can be seen from the list above, the MALT APD experience at DkIT has had a significant and extremely positive impact on me since graduating in 2013. However, it is the wider stakeholder and sustainable impact of the research performed that is of significance – in particular the impact on the learner.

Conclusion

In summary, performing the MALT APD course has had a profound impact on me, both in the short-term and long-term as demonstrated in this article. Sustainable approaches to enhanced student learning have been designed, developed and established as well as being shared with the wider education community via presentations, screencasts and peer-reviewed publications. Research projects, both local and national, have been designed, commenced and are underway. With the CELT department recently enrolling its 100th APD student in the MALT programme, DkIT as the supporting institution employs a reflective and confident academic team, a peer network, capable of delivering at every level in learning and teaching. At the recent EdTech 2016 conference held in May 2016, there were over 20 DkIT staff involved in projects on display. The fruits of this success is being witnessed in numerous avenues: module design during programmatic review, student satisfaction with teaching, learning and teaching being recognised as an emerging research area, learning and teaching guidelines and policies being implemented and also students developing new lifelong metacognitive skills, ultimately yielding higher quality graduates who are more attractive to employers.

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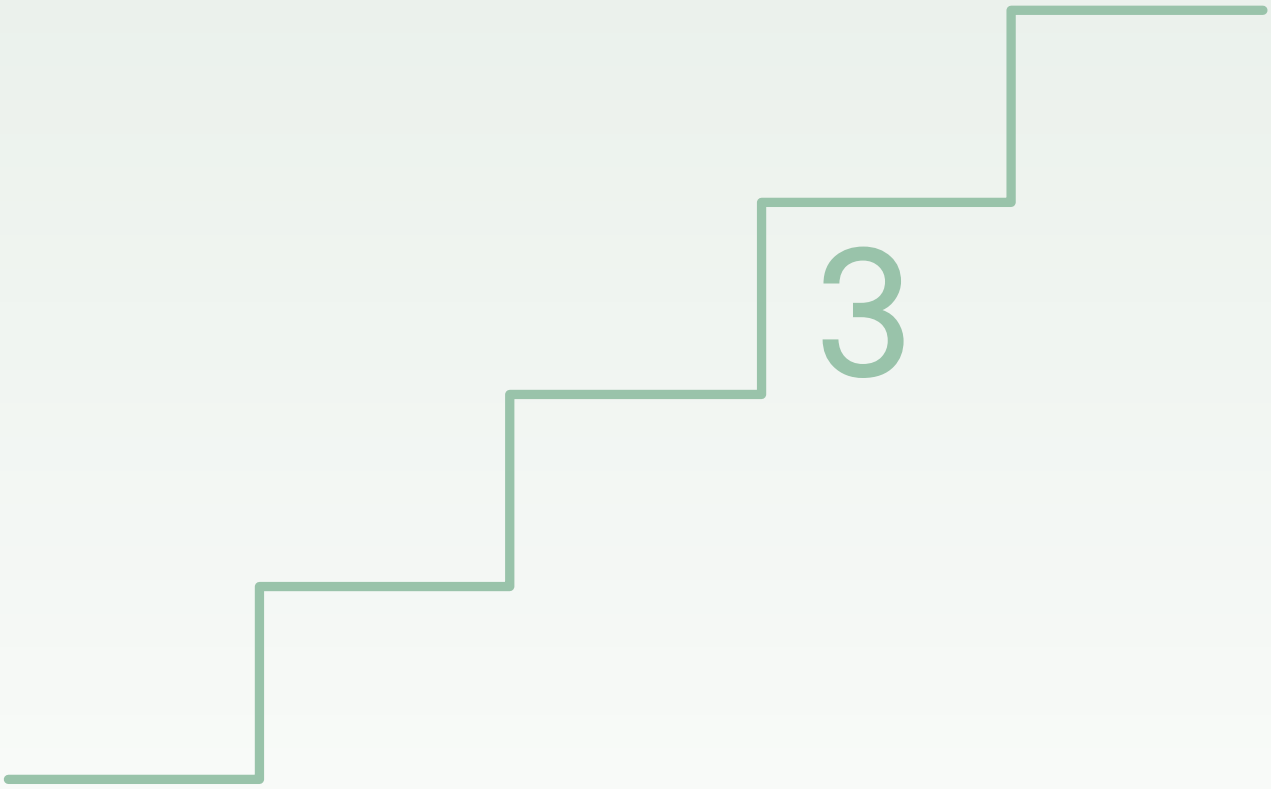
SECTION 3

The power of pedagogy: The widening impact of accredited professional development programmes.



1. Authentic Assessment as a Change Catalyst in Curriculum Development

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Introduction

My early experience as educational developer within an institution was that, although the role was welcomed and applauded, there was little appetite at school and faculty level to engage with initiatives. Professional development within the context of teaching in higher education was not widely accepted or valued by the lecturer on the ground. Their emphasis was on being discipline current and well prepared for teaching. Support initiatives that were well-received tended to be light-touch and more directed at social events with dissemination of college-wide information. Events that were more focused on professional development were not well attended, despite the fact that the lecturers themselves informed and requested the sessions. After two years of trying to hit the right note for lecturers we eventually asked them why the initiatives being organized were not attended. Their insight was simple. They wanted a value added take-away and recognition. So began the Special Purpose Award in Training and Education that was validated in 2008. The title was deliberate by way of building capacity and engagement as many of our educators are professionals within their own industry and as such found accreditation within the training space as attractive as education.

The first decade of this century was a time of flux for curriculum development in higher education and so professional development to support the paradigm shift was of key importance. Modularization, constructive alignment and learning outcomes were the buzz terms and these represented a significant change in curriculum development approach and process. Underpinning effective teaching and learning strategies to ensure successful achievement of learning outcomes was central. Thus the 20 ECTS credit Special Purpose Award (SPA) was designed with the objective of tooling up the professional higher education teacher in the nuts and bolts of programme design, assessment, pedagogy and reflective practice. The case study being presented in this chapter focuses on one 10 ECTS credit module of the professional development SPA, namely Assessment and Programme Design (APD). In particular, attention is on how the authentic assessment strategy used in this module, acts as a change catalyst for programme design (curriculum development).

Relevant Literature

The literature explored for this study relates to three areas. Firstly, curriculum development because that is the key competency learners are expected to demonstrate upon completion of the module discussed in this case study. Secondly, the module discussed is part of a professional development programme aimed at supporting educators develop curriculum development competency. Finally, the literature presented here explores authentic assessment to affirm that this type of assessment offers practical and real learning and professional development opportunities for students.

Curriculum Development

As the predecessor to the European Higher Education Area (EHEA), the Bologna process commenced in 1999 when Ministers for Education in twenty-nine European Countries signed a declaration stating their intention to work towards the creation of a common European Higher Education Area by 2010. Since then forty-six European countries have joined (www.ehea.info). In an effort to create a more transparent and quality assured driven curriculum, all EHEA members use an outcome-based model, which is reflective of the objective or behavioural model that reflects the work of many seminal theorists of the early to mid-twentieth century, such as Bobbit and Tyler. For example, curriculum influenced by scientific management principles, referred to also as the social efficiency model, marks the beginning of the field of curriculum study; in particular the work of Bobbit (Hlebowitsh, 2005). This approach was objectives driven, aimed at providing clarity in terms of tangible and measurable outcomes. Bobbit was concerned that education was vague and imprecise and was drawn to the exactness and particularity being championed by the new age of science at that time. He suggested an approach based on scientific management principles which were enjoying great success at that time in terms of industry and productivity (Kelly, 2009). Scott (2007) posits that Bobbit's work is an early example of behavioural objectives curriculum. Tyler (1949), an intellectual progeny of Bobbit, supported a means-end model of curriculum whereby achievement of pre-stated objectives was key – commonly referred to as the 'Tyler Rationale' (Hlebowitsh in Tyler, 2013 [1949]). In this way curriculum was viewed as a linear process, commencing with the articulation of clear objectives or goals; content was then decided upon to underpin achievement of the objectives and measurement of learner behaviour demonstrated the extent to which the objectives had been met (Cullen & Harris, 2012; Scott, 2007; Tyler, 2013 [1949]).

The outcomes used in the current model are closely aligned to state concerns of skills based education and the creation of a knowledge economy, although there is scope for wider competency development. The curriculum outcomes are aligned to the National Framework of Qualifications (NFQ) which requires learner pathway and progression to be clearly articulated in conjunction with award standards (QQI, 2014). All providers of Higher Education (HE) are obliged to comply with curriculum development using the relevant subject benchmarks (i.e. Award Standards) thus adhering to a policy-led, systematic and standardized approach to curriculum development, which includes programme review and validation. Whilst this more robust and standardised approach offers many benefits such as transparency, consistency, and in some ways, greater collaboration through expert panels; for some this regulatory approach may be viewed as coercive given the sanctions that are applied for non-compliance, for example, closure of providers in extreme cases, or non-validation of programme provision in specific cases. In any event, what is clear from the educator's perspective is that knowledge of the curriculum development model and regulatory framework guiding programme design and review is essential if they are to inform curriculum in a considered manner.

Professional Development

Current national and international focus is very much on professional teacher development in the higher educational space. Primary and second level have long since required such professional development through accredited programmes. In 2011 the Department of Education and Skills commissioned a report to help inform government policy on the development of higher education in Ireland up to 2030. One of the recommendations in this report was that 'All higher education institutions must ensure that all teaching staff are both qualified and competent in teaching and learning, and should support ongoing development and improvement of their skills' (DES, 2011, p. 62). By way of reporting on the progress of the objectives set out in the national strategy, the Higher Education Authority (HEA) published a report where they welcomed commitment of the institutions to the objective of 'Excellence in teaching and learning to underpin a high quality student experience' and state that this commitment, combined with other HEA national initiatives, will greatly facilitate enhanced student performance (HEA, 2014, p. 23). More recently the National Forum for the Enhancement of Teaching and Learning in Higher Education (the National Forum) took up this call. Their work plan, identified in the recent consultation document, has a key aim in the 'creation of a professional development framework for those who teach in higher education' (National Forum for the Enhancement of Teaching and Learning, 2016, p. 3). Moreover, the National Forum says that the 'professional development activities need to be responsive to where, how and with whom staff work (the institutional, unit/department/faculty, discipline context of practice)' (Ibid., p. 6). The SPA programme discussed in this chapter is both targeted and applied as advised by the National Forum.

In a recent piece of research conducted by the author (O'Riordan, 2015, p. 82), findings show that educators are calling for more professional development support, in particular with regard to the curriculum development:

> *'What is necessary is some kind of concomitant or contemporaneous staff development…around change [in the curriculum you are developing]…if we had this expertise [curriculum development] anywhere in the house to sit down with us for a couple of hours in a workshop…some coaching or mentoring to encourage us to think and talk about it [curriculum development] before we put a stamp on it'* (CollegeB_FocusGroup).

Some colleges who partook in this piece of research have lecturer support functions but the findings did not show that these units were used specifically to drive curriculum development. Perhaps this is a lost opportunity. As discussed earlier, compliance with the regulated environment of higher education is essential if a programme is to be successfully validated, and thus delivered. Navigating one's way through this space is essential if the educator is to robustly inform curriculum development. The APD module offers both time and space, within a professional development environment, to advance and enhance programme development in a way that offers transformative potential for learners.

Authentic Assessment

Wiggins (1993, p. 8) defines authentic assessments as the extent to which students 'experience questions and tasks under constraints as they typically and 'naturally' occur'. In other words, an assessment task that is valid and true to what the learners will ultimately be doing in the real world. Elsewhere, Wiggins (2002, p. 2) states that assessment is authentic 'in the sense that it's real. It's realistic'. He continues by saying that '[I]f you go into the work place, they don't give you a multiple-choice test to see if you're doing your job'. You will note in the early discussion on literature around professional development the National Forum says that

'professional development activities need to be responsive to where, how and with whom staff work (the institutional, unit/department/faculty, discipline context of practice)'. In my view there is little differentiation between authentic assessment and professional development requirements.

More recently, leading educationalist Sally Brown advises that authentic assessment needs to be aligned to programme outcomes and real world scenarios. She continues by saying the benefits of authentic assessment are an engaged student who has transformative learning experiences (Brown, 2015). Furthermore she proposes that students value authentic assessment tasks because they can expose what Meyer and Land (2013) refer to as threshold concepts and troublesome knowledge. In the context of the authentic assessment discussed in this chapter the objective is to very much challenge students by asking them to engage in a genuine module review or development activity where they are exposed to troublesome challenges resulting from applying theory and regulations. Formative assessment opportunities in the class help students to overcome the challenges and develop a robust, well considered and informed module ready for a real life programme development or review process.

The Case Study

A case study is used for this inquiry because the study refers to a specific instance with boundaries of a particular assessment strategy within a professional development module in one institution. This is referred to by Yin (2009) as a single case design where one unique case is explored. Cohen *et al.* (2011, p. 290) advise case studies 'will have boundaries which allow for definition' - in this case the boundary is one module (APD) on a professional development programme (SPA); 'may be defined by the characteristics of the group' – with regard to this inquiry the characteristics of the group are that they are all educators in one institution; and 'blends a description of events with the analysis of them' – this is the approach adopted in presentation of this case study below. Feedback on the intervention is three-fold – (i) self-reported feedback in my role as educational developer working with programme design teams; (ii) survey of 55 graduates with a 49% response rate (n=27) where 66% (n=18) of those who responded recently participated in a programme design or review process; and (iii) interviews with two Heads of School/Faculty.

The Special Purpose Award in Training and Education (SPA) is a three-month (20 ECTS credits) postgraduate professional teaching qualification. It was validated originally in 2008, and more recently as an embedded programme in a Masters in Arts in Training and Education (MATE), validated in 2014. The genesis for development of the SPA as a professional qualification in 2008 was two-fold – (i) to deepen, consolidate and provide value for lecturers with respect to professional development opportunities being offered by the college at that time; and (ii) to quality assure and enhance the teaching and learning experience for students. Recognition and endorsement of the College's approach was provided in a College Institutional Review in 2009 where the review panel commended the College 'for its efforts in ensuring that teaching staff members are appropriately qualified, and for its encouragement and support of staff wishing to update their qualifications' (Panel Report, Commendation 7, 2009, p. 20); in addition to 'its development of a postgraduate Special Purpose Award in Training and Education' (Panel Report, Commendation 9, 2009, p. 22). Furthermore the panel recommended that 'the College ensure that all academic staff members are required to undertake the postgraduate Special Purpose Award in Training and Education or have a similar qualification' (Panel Report, Recommendation 13, 2009, p. 22). Griffith College is committed to ensuring all academic staff

have access to the programme. It forms part of the College Teaching and Learning Strategy and is a key performance indicator in its own right. The College sponsors the programme fee for all lecturers, both full and part time.

Assessment and Programme Design Module

This module introduces learners to the landscape of higher education. It aims to enable learners (higher educators) understand how models, philosophies and regulatory bodies impact and influence programme design and assessment. Students are expected to be able to effectively contribute to curriculum development as a result of assessing implications of current issues in higher education, exploring the different models of curriculum development, and designing a module that is compliant with policy and best practice.

As discussed earlier, this is very much an applied programme. Learner entry requirements are a level eight (on the NFQ) qualification in their own area of expertise and a minimum of 20 hours lecturing experience. The rationale for these entry requirements is that learners practically apply their learning to their own teaching in an authentic way thus allowing their professional development have real impact on their practice. In the case of this module learners are critiquing a current module they are teaching on, or designing a new module as part of a programme design process.

The module is delivered over three workshop days across three months with a strong emphasis on preparatory reading and work for each session. Formative assessment forms part of the pedagogical approach throughout the module. Preparatory work and ensuing class discussions are always related to, and explored, in the context of the programmes and modules the learners are teaching on. Every class discussion, blended learning activity, and preparatory readings are designed to be practically applied in each learner's own context. For this reason it is essential that the learners engaging in the programme have teaching experience in higher education otherwise the application would be in the abstract with limited potential for authentic learning.

The assessment strategy for the APD module is embedded in the pedagogical approach, consequently it is assessment *for* and *as* learning. Learners are required to critically evaluate the landscape of higher education and show how current policies, regulations and models impact on programme design and assessment. Learners critique their own modules in the context of the current regulatory environment. This requires them to become familiar with the jargon, processes and policies impacting on programme design. In doing so they learn how to navigate the system to create a robust programme. They are required to demonstrate how relevant literature, policies and practices in programme design and assessment inform curriculum development by way of a personalised case study relating to a specific module they are teaching. In their case study they need to include (i) a detailed module descriptor that is compliant with current regulations and guidelines; (ii) a comprehensive and constructively aligned assessment strategy, demonstrating inclusion of both summative and formative assessments, and marking criteria; and (iii) a commentary on how their understanding of the current landscape of higher education and best practice in assessment informed critique and design or redesign of their chosen module.

The applied nature of the module and associated authentic assessment strategy provides for assessment opportunities *for* learning in the manner in which feedback and guidance is given to the learners on their individual case studies, *as* learning because they are applying the learning in an authentic way, and *of* learning because the assessment strategy is part of an accredited professional development programme. By way of formative feedback learners

present an outline to their peers and tutors one month before final submission. This offers the group valuable insight and learning in relation to module design across disciplines and levels. Peers and tutor are afforded the opportunity to question presenters on the design of the module thereby encouraging them to consider and provide a rationale for the design in the context of their overall programme and learners. Final summative submissions often act as the first draft for a programme validation or revalidation.

Impact

By far the most powerful aspect of this assessment strategy is the assessment as learning potential. All graduates who recently took part in a curriculum development process (100%, n=18) reported that as a result of the assessment in the APD module they feel empowered to confidently contribute to a programme design process in a much more informed manner as evidenced from the following sample excerpt:

> *'I gained a better understanding and as such felt more confident contributing to a programme design and validation process…particularly in terms of my own discipline and what I fundamentally believed should be included in a module and programme to benefit the learner…I know my own industry.'* (Participant A)

Feedback from participants found that prior to this experience, associated programme design jargon and policies often acted as a barrier to them participating proactively. Whilst they had confidence in their own discipline area they sometimes felt uninclined to constructively inform the programme being developed, for example:

> *'The assessment strategy gave me confidence in being better able to communicate with faculty members and students [regarding programme design] due to understanding the larger system….generally having a better sense of the validation process and its purpose.'* (Participant B)

Upon completion of the assessment and associated peer and tutor feedback, participants reported that they were more proactive in subsequent review and design processes, to the point where they become change catalysts in programme design and review, and ultimately the student learning experience as evidenced in the following sample excerpt:

> *'Due to completing the Assessment and Programme Design module I definitely learned some key points which enabled me to be better able to contribute to the validation process…. I now have a more structured approach. It helped me to see the full picture regarding the entire programme & not just the modules I teach! I am now confident and design a module with the learner and their employment potential as my main priority.'* (Participant C)

In addition, in my role as educational developer I often get the opportunity to work with or review programme submissions for validation. During this process it is noticeable which modules are designed in an informed and considered manner resulting from some form of professional development opportunity. By contrast, whilst discipline expertise is always evident, module leaders who have not engaged in professional development often design a module that is either too demanding, or not challenging enough, for the level and associated ECTS credit/time allocation. Furthermore, this group does not use assessment to underpin and drive learning. This view is corroborated through contributions from Heads of Faculty who are tasked with leading programme design teams. For example, one interviewee stated that during a recent validation process for a programme, it was clear to see the added advantage of pro-

fessional development within that space, particularly in terms of technical concepts related to curriculum development, for example alignment of assessment with outcomes and the necessary underpinning of pedagogy. Another example, which came from the second interview, was where the Head of Faculty noted that where a majority of the programme development team have completed the APD module the discussion tended to focus on big picture issues such as the vision for the programme and needs of the learners.

Where curricula professional development, with underpinning authentic teaching, learning and assessment, is used programmes are robust, academically challenging and engaging. But most of all these considered and reflective programmes offer transformative learning experiences for learners with subsequent positive effects for the wider society and economy. Curricula theorists and writers argue that curricla developed through deep reflection and discourse can have transformative potential. Barnett & Coate (2006, p. 25) say that it is 'Through curricula, ideas of higher education are put into action…values, beliefs, principles in relation to learning, understanding, knowledge, disciplines, individuality and society are realized'. They suggest that discussion at local level, amongst educators involved in curriculum development, is limited to content and structure or technical matters. These sentiments and concerns resonate with others. For example, more locally, Hogan (2010) called for a more imaginative understanding of education that 'cultivates humanity's maturity' rather than 'matching the functional requirements of a globalized age'. In doing this he argued the learner will have '…a shared awareness that they are active and responsible participants in their own learning', where '…it becomes natural for them to ask more searching questions'. He continues by saying learning environments that 'cultivate humanity's maturity' will be industrious with a unique and self-navigated order of things (Hogan, 2010, p. 154). This requires, what Barnett (2013) calls for - reimagining the university by finding space and time for reflection and discourse. Professional development opportunities driven by authentic assessment strategies can offer this space and time.

Conclusion

Whilst it is evident that the authentic assessment used in the module discussed in this chapter has significant impact on programme development, problems remain. Firstly, there remains the challenge of engaging all educators, especially busy academics who are often tasked with leading programme development teams. Often it is the busiest academic that finds it most difficulty to allocate time for professional development. Recent research (O'Riordan, 2015) found that there are two key stimulants required to change this – senior management commitment, including allocation of resources, to the process of programme development; and a more realistic lead timescale of 12 months for programme design or redesign. The other difficulty is engagement of graduates from the SPA with continued professional development (CPD) beyond the programme. Currently QQI are introducing new validation policies and procedures that will change the process. Graduates from this SPA prior to 2016-17 will not be acquainted with the impact of these changes unless they engage with CPD and authentic assessment opportunities. Worthy of further investigation is the notion of a CPD programme, driven by an authentic teaching learning and assessment strategy. This programme could be part of a badging system attached to the new national framework for professional development.

Despite these concerns, it is clear that professional development opportunities with underpinning authentic assessment can have profound impact on curriculum development. Curric-

ulum effects and affects the broader society and economy. Students are the catalyst and curriculum is the vehicle, thus curricula development is a great responsibility and privilege, and one that must be taken very seriously.

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2. Exploring the impact of small-scale accredited professional development

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Introduction

The purposes of an evaluation are many and varied and might, as Chelimsky (1997) suggests, relate to accountability, educational development, and deeper understanding of practice. Interpretations of impact are notoriously contested but it is generally acknowledged that the full impact of a learning intervention is difficult to measure. This is particularly true for academic development initiatives where outcomes are often subtle, less directly attributable to a single act, take time to develop, and take multiple forms (Jones, Lygo-Baker, Markless, Rienties & Di Napoli, 2016).

Because the evidence of impact on teaching practice is seldom clear cut, academic developers tend not to make simplistic 'cause and effect' assumptions about the impact of professional development on student learning outcomes (Jones *et al*., 2016). However this creates a difficulty when it comes to demonstrating the value of our work and how it contributes to teaching and learning. Bamber and Stefani (2015) ask "*How do we demonstrate, for example, that we have helped to instil a culture of reflection? Or that the longer term effects of lecturer development programmes are as important as the short term gains*?" (p. 243). Without a clear indication of the contribution of academic development initiatives to the advancement of the institution, such efforts risk being underfunded and overlooked.

At the same time, the need for professional development (PD) in higher education appears greater than ever. According to the 2015 NMC Technology Outlook for Education in Ireland, academics are increasingly being challenged to rethink their role as educators. For example, they are being asked to become adept at new forms of content and technology, enhance learner interaction and assessment, and collaborate with other lecturers (Johnson, Adams Becker, Cummins, Estrada & Freeman, 2015). Assuming such transformation in behaviour is desirable, how can such dramatic changes in practice be encouraged or brought about? What can PD offer in this respect? And do the good practices that we may be aware of in relation to feedback and assessment with students 'translate' to situations where the academic becomes the learner?

No matter what the age or context of the learner, the modus operandi of assessment would seem critical. To quote Biggs and Tang (2011, p. 221), *"Assessment is the senior partner in learning and teaching. Get it wrong and the rest collapses*." In proposing a "*preferred future*" for assessment, Earl (2003) has written about the need to think beyond the pervasive practice of marks-based summative assessment of learning to consider assessment for learning and ideally assessment of learning. Assessment for learning focuses on the ongoing formative assessment that the teacher provides to students to highlight strengths and weaknesses and help them develop their knowledge (Lee, 2007). Assessment as learning focuses on the student acting as assessor, sometimes for themselves (by reflecting on their own learning) and sometimes for others (in the form of peer feedback). A study carried out by Li, Liu and Steckelberg (2010) confirms that students who were actively involved in a peer assessment process facilitated their own learning and improved their own performance as a result. What would teaching professionals have to say about such activities if given the chance to experience them for themselves?

To explore these questions, we decided to conduct an evaluation approach that would enable us to explore a range of potential impacts that might accrue from professional development participation over a period of time. As part of our remit to continually improve our PD offerings, we also wanted to explore existing assessment elements to see if or how they contributed to the learning of our participants. We wanted to gather data from different sources that would tell a story beyond the sometimes superficial descriptions contained in module 'smile sheets'. Following some introductory background, what follows is a description of the process that was undertaken and our initial findings.

Background

DCU runs a number of accredited professional development modules for teaching and relevant support staff working in higher education. This chapter will discuss the impact of two modules in particular: LI501 Online Teaching and LI502 Assessment & Feedback. First devised, developed, and funded by the Dublin Region Higher Education Alliance (DRHEA), these modules have been running at DCU since 2011. These modules are characterised as small-scale in the sense that each is worth 5 ECTS credits and they are standalone modules that are not part of an overall accredited programme of teaching and learning. The specific learning outcomes for each of the modules can be viewed here: LI501 and LI502 Learning Outcomes at http://goo.gl/yYZyEU

Briefly, the combined overall objectives are to:

- enable participants to evaluate and integrate appropriate technology into teaching in a pedagogically-informed way,
- equip participants with knowledge and skills to evaluate and integrate suitable assessment and feedback approaches in teaching,
- provide participants with a flexible and structured learning environment that enables course participation in an authentic online learning mode.

Since 2012, approximately 160 participants (including staff from national and international HE institutions) have completed both courses. The modules are delivered primarily online: apart from an initial face-to-face session and 1-2 optional sessions, all other core learning activities take place online. The modules are typically run over a 14-16 week period and have been co-ordinated and taught by a number of individuals over the years. Both modules employ

socio-constructivist approaches, with activities planned to enable social learning (with and from peers) and experiential learning (with opportunities to experience, observe, interpret, and experiment). Reflective practice is also a key element of the learning process whereby participants engage in reflection on the self, reflection through students' eyes, colleagues' experiences, and with reference to theoretical literature (Brookfield, 1995; Moon, 2004).

Both of the modules identified for exploration employ distinctive assessment strategies. As well as the typical summative assessment of learning, there are a number of ways in which assessment for learning (Earl, 2003) has been designed into curriculum activities. Student-teacher interactions and formative discussions take place through:

- Pre-course information meetings to discuss potential participants' goals,
- Feedback on each participant's reflections in written, audio, and video formats,
- Frequent probing questions throughout discussion forum and webinar learning activities,
- Observation and feedback relating to online group activities,
- Feedback on proposed strategies for implementing changes to assessment and/or other forms of teaching.

Furthermore, both modules utilise elements that reflect the ideals of assessment as learning:

- Reflective activities encourage participants to make personal sense of the information they are presented with, ask reflective questions, and consider diverse approaches,
- Peer critique and peer marking exercises enable participants to draw on peers' experience, problematising proposals in greater depth,
- Self-assessment exercises are designed to help participants to self-monitor their learning progress, enabling them to become more self-directed in their learning journey.

To date, however, the evidence of course impact on practice has been largely anecdotal. While module evaluation sheets have provided some insights into various components, such as the 'usefulness' of particular learning activities, such forms of data are created soon after course completion and do not allow for retrospective analysis. Therefore we, the current teachers of the modules, conducted exploratory research to investigate a range of potential impacts and experiences in greater depth and over a longer period of time.

Methodology

A qualitative approach was undertaken. A focus group - which according to Robson (2011, p. 294) is an "*open-ended group discussion which the researcher guides*" - was selected as the primary data source because of the potential richness of data that can emerge when a group of individuals with a shared interest and experience participate in a facilitated discussion. Ethical clearance was sought for a low-risk project and approval was granted in early July 2016.

Based on available records, 146 past participants of the LI501/2 modules were invited by email to participate in a focus group on August 9th, 2016. Participants from the 2012-2016 cohorts of both modules were invited (8 cohorts in total) including staff from DCU and other institutions. Seven respondents volunteered to take part in the focus group and a further five responded to say that they were unavailable on the designated date, but were willing

to contribute in some other way. Two more respondents provided immediate feedback via email, leading to an overall response rate of 9.6% from the sample contacted. The authors were satisfied that this was a reasonable response rate given the timing during the summer months when many potential participants would be on holidays.

To address the research question, the questions for the focus group were modelled on the Ako Aotearoa Impact Evaluation Framework (IEF), described in Thomson (2015). This exploratory framework, initiated by a national funding organisation for teaching excellence in New Zealand, has been developed to encourage changes in teaching that lead to enhanced benefits for learners. According to Coolbear and Hinton (2013), the framework is designed to evaluate evidence-based change projects with a high potential to benefit learners. The framework focuses on four specific measures of impact as shown in Figure 1 below:

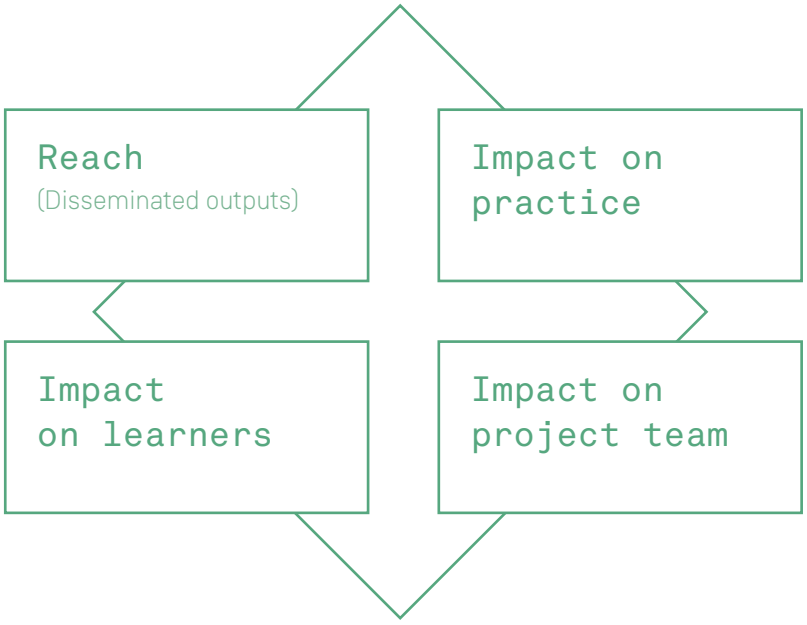

Figure 1
The Four Dimensions of the Ako Aotearoa Impact Evaluation Framework (IEF)

In attempting to explore impact through a range of perspectives, the questions for the focus group session focused primarily on these four areas, although the order and language of the framework was modified for the focus group and the Irish context. Since we were curious to identify if the final capstone-style Technology-enhanced Learning (TEL) or Assessment strategies had been implemented upon module completion, a separate specific question on this was included. The list of questions that formed the basis of the focus group discussion can be viewed here: https://goo.gl/oRt3wt

The focus group session was recorded and was subsequently transcribed and shared among the three authors. Following this, a process of thematic analysis was undertaken. Drawing on the "Cutting and Sorting" technique to identify themes as described by Ryan and Bernard (2003), and cognisant of the limited word count available, we agreed to independently formulate a short list of key themes. These initial themes were subsequently reviewed and discussed at a meeting where we reached agreement on those that were most significant. This phased approach is similar to that described in Braun and Clarke (2006), and we agree

with the authors' contention that a certain degree of "*researcher judgement*" (p. 82) was necessary to determine what a theme was and which were most significant.

To cross-check and potentially extend the data set, these themes were forwarded to the respondents who were unable to attend the original focus group. They were asked to respond via questionnaire as to whether they agreed/disagreed with each theme, and invited to identify any missing items. Email feedback received from two respondents who did not attend the focus group or respond to the questionnaire, was also reviewed.

Study Limitations

As with all studies of this nature, a number of limitations should be borne in mind when interpreting the data that emerged:

1. **Inconsistency in module teacher** - due to changes in staffing, the modules have been led by six different teachers since 2012. Although the module learning outcomes did not change, and the same broad topics have been included, there is undoubtedly going to be a different emphasis and style when different teachers run any given module. Furthermore, because educational technology changes so quickly, and access to current research informs much of the teaching, the module content has been reviewed and updated for every iteration. While this ensures currency, it does introduce an additional layer of variability when analysing comments from different cohorts.

2. **Limited timeframe for data collection** - for a variety of reasons, the research needed to be completed over the summer months. It is difficult to predict if availability would have been any better during term-time. If time and numbers had allowed, we may have conducted an additional focus group to ensure saturation had been reached regarding new information.

3. **Recent graduates had less time to respond to questions about strategy implementation** - because 2015/2016 participants only completed the course shortly before the focus group, they were not yet in a position to talk about how they implemented it. Therefore some of those comments were more predictive in nature.

Findings

The findings are presented in accordance with the four dimensions of the Impact Evaluation Framework (IEF) described above. Comments are labelled in relation to the data source (Focus Group (FG) or Questionnaire (Q)). Pseudonyms are used.

Impact on Teaching Practice

There was substantial evidence that participants on these modules had already made or intended to make significant changes to their teaching practice:

> "*For me the course is making a significant difference to how I will implement a particular module, and that is not a change that I would have made on my own*." Neil - Q

Amongst the specific changes to teaching that were mentioned were:

- A review and change to feedback processes in lab-based teaching that led to increased contact time with students,
- Implementation of peer feedback and peer marking approaches for the first time,
- Greater use of social media in teaching resulting in visible improvements in student participation in class,
- Use of online discussion tools to foster more informed and deeper learning in students,
- Use of audience response systems live in the lecture theatre,
- Deeper critical analysis of practice based on a better awareness of the potential of various pedagogies and technologies.

Focusing specifically on how the modules' assessment approaches impacted practice, a number of comments came to the fore. Somewhat surprisingly to us, several of the participants emphasised the value of the reflective activities and in fact, there were no negative comments about the reflective assignment components. Two of the respondents also mentioned the usefulness of the reflection rubric as a model for their own rubrics into the future. It was particularly noteworthy that one of the respondents (from a Science discipline) started out with very negative feelings towards the whole notion of reflection but the course succeeded in changing her ideas about its potential:

> "*I hated the concept of reflection. I'm quite allergic to it and I didn't buy into it at all at the start. But in spite of that, and myself, I found it incredibly useful. I found it really helped me to properly accept what I was doing and what was needed for improvement.....I'm not sure that I will necessarily be introducing them [reflections] in my own module in the coming year but I will think about how they might be introduced*." Barbara - FG

In the discussion around assessment, the respondents specifically mentioned the value of peer critique and peer marking and discussed how interesting it might be to implement those assessment strategies, albeit with careful planning.

> *"This was my first time using peer feedback. It was great to experience as a learner and definitely something I'd be open to do with students in future."* Claire - FG

> "*LI501 certainly encouraged me to be more open to peer feedback as a method of encouraging reflection and learning. I use online forums more frequently, particularly as a way of encouraging students to prepare properly for tutorials and seminars. This, I should say, involves a considerable extra workload for me as a teacher but I do find it worthwhile.*" Robert - Q

As well as exploring a range of previously unknown possibilities for assessment and feedback, participants appeared to make greater use of rubrics in their practice upon course completion:

> "*I learnt a lot in LI502. I liked that we had to apply rubrics to our actual modules and I've used what I've learnt in my modules since*." Martha - Q

> "*I thought the reflection rubric was very good. It's hard to do the reflective journalling, to help people to understand what it's all about. So it was good to see a real rubric…it gave good ideas for your own rubrics in the future, too*." Derek - FG

> "*It was certainly the first time that I came across assessment of participation in a forum, or assessment of a reflection*." Neil - Q

The key assessment item for both modules involved the research and design of a final TEL or Assessment Strategy. During the focus group participants were asked about whether they had been able to implement their strategies in their teaching practice. The point was made that there are multiple (external) factors that influence whether or not a chosen strategy comes to fruition and common inhibitors include lack of time, lack of organisational priority, and technological restrictions. Feedback from the module teacher was also mentioned as an important influencing factor:

> "I*t works really well because the feedback I got from X, who was giving me feedback on it at the time, really helped the implementation of it going forward*." Barbara - FG

Impact on Learners

This particular project did not set out to identify if academic outcomes for students had improved as a result of teacher participation on these modules. However participants observed that they had made a number of significant changes to enhance the learning environment, the learning experience, and/or improve learning resources for the benefit of students. Several examples of specific learner impacts are described below.

> "*We went from giving oral feedback, to our students in labs, to having a structure whereby they got written feedback they had a record of. Whereas before giving feedback involved marathon 9-hour sessions of 20 minutes per student. You were just shattered at the end, and they still didn't hear what you're saying*." Barbara - FG

> "*I'm now delivering feedback to queries in a more transparent and inclusive way; with a historical benefit as the trajectory of [student] queries is visible on the system.*" Fiona - email

> "*I use Google Forms to ask students questions and they provide responses live in the lecture theatre. The student response to this simple development is very positive. It is an excellent form of assessment*." Aileen - Q

> *"Having discussion forums running concurrently with your classes and assessing them in such a way that you're rewarding critical thinking and informed opinion: this means that engagement with the material amongst the students is more informed than if you're asking them questions in class and they're just forming opinions off the cuff*." Derek - FG

> *"I use the Graduate Attributes with the students very early in the module and I'm always surprised to see how little they know about it… Also I have edited and written an e-book and at the back of every one of the chapters is a learning template, which is based on some of the stuff I did in the module. The students use that as well.*" Patricia - FG

> "*I did an online resource on CVs because we are always getting asked questions about that. It was broken down into sections, so whatever section they wanted, they could go to what they were interested in. Or they could listen to the whole talk. That's just been really useful to signpost students to.*" Claire - FG

> "*Some Masters and Business students of mine were working together in a team and communicating virtually. One of the feedback items they had was that that would be really useful for when they work with teams in the workplace.*" Derek - FG

Impact on Project Team

There were several ways in which participants developed relationships and/or their reputation in their particular field following module participation. In addition to disseminating the scholarly outputs described in the section below, professional networks were developed in a variety of formal and informal ways. As one participant said:

> "*My Head of School has asked me, at our next school meeting, to give a presentation of what we're doing with feedback in labs, because he'd like to see it rolled out further." Barbara - FG*

Another respondent described how the paper that they wrote jointly with another module participant won an award at a professional conference. The paper won best paper (track and overall conference paper) at the Irish Academy of Management Conference 2014.

Impact on Reach

A variety of scholarly outputs were created following participation in the module(s). Participants described how they had written (and intended to write) education-oriented research papers and case studies for peer-reviewed publications. Six publications were specifically mentioned as emanating from the learning on these modules including:

- Barry, A. and Gillmor, D.A. (2014). Children as genealogists: exploring possibilities for primary classroom practice. *Geographical Viewpoint,* 41, 25-39.
- Gillmor, D. and Barry, A. (2012). Family histories and geographies: Interrelationships between genealogy and geography. *Geographical Viewpoint,* 40, 15-23.
- Kelliher, F. and Roche, C. (2016). Engaging students in a higher education virtual learning community: A multi-sensory approach, (Currently in Review).

- Kennedy M.A., Hannah, K.J., Hussey, P. and Ball, M. J. (2015). *Introduction to nursing informatics*. London, Springer.
- Sweeney MR., Kirwan A., Kelly M., Corbally, M., O'Neill, S., Kirwan, M., Hourican, S., Matthews, A. and Hussey P. (2016). Transition to blended learning: experiences from the first year of our blended learning Bachelor of Nursing Studies programme. *Contemporary Nurse*, http://dx.doi.org/10.1080/10376178.2016.1197781
- White, B. (2016). Case Study on Lab Feedback Experience, (Currently in Review).

Information was also disseminated at a variety of scholarly events such as 'spring school' conferences and in the form of presentations to other institutions. Posters were also created as a means of knowledge sharing.

However, publication was not a core motivator for all participants, judging by the questionnaire response of one participant who responded that although the scholarship of teaching was encouraged on the module, it was not an immediate ambition for them at this stage of their career.

Discussion

Weir (2014) writes that the four key dimensions of the IEF provide the basis for a series of formative evaluative conversations after a project has been completed. These conversations are eventually summarised into case studies and 'stories' that act as a comprehensive account of the impact of a project over two years after work has been completed. While our research draws on the IEF as a guide for focus group questions and as a structure for our initial findings, we cannot claim to have yet developed the narrative depth that a full-scale implementation of this framework would allow.

However, on the basis of this piece of research, there is evidence that the PD modules described above have had an impact on several counts: participants on these modules described how they have learned about and tried out new assessment approaches, thereby expanding their repertoire of potential assessment and feedback modes. There is also convincing evidence that the module(s) helped academics to make significant changes to their existing practice based on the knowledge and experience gained. We are therefore hopeful that as a result of implementing such changes, there are likely to be significant associated benefits for learners.

Furthermore, it also seems clear that the principles underlying Assessment *for* Learning and Assessment *as* Learning have contributed to the positive effects described. According to Hattie & Timperley (2007), to be effective, feedback needs to be clear, purposeful, meaningful, compatible with students' prior knowledge, and provide logical connections to help them learn. The feedback provided at multiple points through the various assignments (i.e. reflections, online discussions, final TEL or Assessment strategies) provided an opportunity for participants to strengthen their understanding over the duration of the course. As one participant said:

> "*I found the advice I got with the iterations of it [the final strategy] really helped. Advice like 'there's too much in it, focus it down, make it what **you** want' made it more implementable*." Barbara - FG

This type of approach is validated in a recent synthesis of the literature conducted by the Y1 Feedback National Forum Project Team (2016) that found an increased emphasis on feedback as a dialogic process. Furthermore, endorsements of peer feedback, peer marking, and reflection *as* learning tools were prevalent in the data. These assessment strategies, which in most cases were completely new to those experiencing them, seemed to give participants a rare opportunity to stand back and critically evaluate their overall practice as a teacher.

So returning to the title of this chapter, our experience confirms that small-scale professional development activity can work - to some extent at least. Having the time, space, and encouragement to discuss and try out new assessment/feedback approaches, alongside regular interactions and assignments that use such methods, seemed to encourage adoption. Combined with the flexibility and authenticity that the online format offers, the model appears to encourage revitalised thinking and practice to some degree.

But yet, there is a problem. The fact is that despite the enthusiasm of many of the participants we talked to, once they have completed both modules, there are no further teaching-related accredited learning opportunities available at DCU. The modules abruptly end and this limits ongoing dialogue which seems like a lost opportunity to continue learning about critical aspects of teaching, including assessment. As one participant commented:

> "*Post the course we have a set of people who have a shared experience and perspective, notwithstanding their disparate disciplines, and can take up a conversation about needs, opportunities or technologies without an extended preamble to explore what is their common ground. I think it would be no harm to encourage or further 'prime' this activity as it has the potential to be a further valuable outcome of the course*." Neil - Q

While there is certainly an element of community building that happens in every cohort, it is difficult to sustain that longer-term because such communities take time to develop and grow. While many participants talked about informal sharing of ideas 'over coffee', Eraut (2004) writes that a group climate for learning is something that has to be created, sustained and re-created at regular intervals. Indeed Gourlay (2011) questions the 'myth' that communities of practice automatically exist in academic departments in a form that facilitate ready sharing of practice. PD in a longer-term form might help to facilitate and continue those practice-sharing conversations.

The relative brevity of the modules is also a problem in the sense of restricting what we can do to support the academic community. If more time and resources were available, there is much more we could offer to support practice in areas such as reflective practice, peer observation, and learning design. In our view, the data supports the idea of developing an accredited programme of teaching and learning that would include, extend, and complement the modules currently offered. The feasibility of such a programme at DCU will be the subject of further research.

Conclusion

Knight, as cited in Edwards (2000), made the frequently-cited point that "*what we choose to assess and how shows quite starkly what we value*" (p. 210). We value optimal student learning and optimal teaching practices. The types of assessment featured on the modules would seem to serve those ideals.

However we believe there are gains to be made in progressing from small-scale to longer-term forms of PD. Jones *et al*. (2016) suggest that "*Change, in particular changed thinking and practice regarding teaching and learning, is the notion that seems to be the most important when evaluating an academic development intervention…Impact can then be viewed as a long-term process that enables academics to interrogate their teaching, to explore the justifications for their practice, and to question the underpinnings of what they do and how that shapes the ways in which students learn*." (p. 9).

We fully endorse this interpretation of impact and would add that those of us working to support academics are similarly open to analysis, change, and long-term thinking in enhancing the professional development opportunities we provide.

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3. Growing a garden from a single seed: enhancing Graduate Teaching Assistant's learning and teaching skills through an evolved bespoke training course.

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I first started my accredited CPD journey by completing the *PGDip in Third Level Teaching and Learning* when I began my lecturing role. I felt I needed to upskill myself in order to best facilitate my student's learning. It was during the PGDip that I discovered technology facilitated learning and this led me to complete an *MSc in Applied eLearning*. Both these CPD programmes enhanced my technical skills from pedagogical and technological perspectives. At that point in my personal development journey I felt I needed to develop my pedagogical research skill set and the *MA in Higher Education* offered a route to achieve this, whilst simultaneously developing and evaluating a support module for graduate teaching assistants (GTAs) within my Institute. My professional development as an educator has had a profound impact on both my practice and me personally. However, this chapter will focus on exploring the impact on the GTA participants of the accredited short course that I developed as part of my MA in Higher Education.

Literature Review

Doctoral students who teach; a distinctive tribe with a key role.

Research and knowledge creation remain a cornerstone of most Higher Education Institutes (HEIs) and the role of the doctoral student is key within the HEI's research sphere. The core role of a postgraduate research student is to carry out specialised research in order to "*systematically acquire and understand a substantial body of knowledge which is at the forefront of a field of learning*" (DIT, 2011; p. 20).

In addition to this key position in the research landscape, the doctoral researcher holds another pivotal, yet sometimes unrecognised, teaching role in the higher education system. Unfortunately, these postgraduates who teach are often thought of as the '*forgotten tribe*', or worse, casual '*slave labour*' within the higher education model (McCready & Vecsey, 2013, p. 105). Within Science, Technology, Engineering and Maths (STEM), the GTA plays a pivotal role

in supporting undergraduate learning; particularly in the laboratory (LGTA). Indeed, the LGTA often has more contact time with undergraduate students than permanent academic staff. For example, at some international research-intensive universities almost all undergraduate basic sciences laboratory instruction is provided by the LGTA, in some cases as high as 88% (chemistry) and 91% (biology) (DeChenne, Enochs & Needham, 2012). This trend is likely to be maintained, if not exaggerated further, by the increasing massification of higher-level education predicted both nationally and internationally (O'Connor, 2013). The doctoral student thus maintains a key role, not only in the development of the new knowledge, but also in the education of the large cohorts of undergraduate students.

Centralising and celebrating the teaching doctoral student

In Ireland the important teaching role of the doctoral student in higher education teaching is noted in the Department of Education and Skills (DES, 2011, p. 54) *National Strategy for Higher Education to 2030* Report (referred to as the Hunt Report from this point onwards), which recommends: "*a culture of enquiry and engaged scholarship should permeate the work of all higher education institutions*". The doctoral student researcher is central to the development and maintenance of this culture of enquiry. As active researchers and novice educators, the doctoral student holds a pivotal place at the interface of research and learning (IUQB, 2009). Hunt (DES, 2011, p. 77) recommends that all learning should be "*informed by up-to-date research*" and facilitated by "*open knowledge flows*", and thus the doctoral student becomes a central player. The Hunt Report also outlines the need for a researcher career pathway, in which researchers are provided with opportunities to develop critical and lifelong skills that will enhance the researcher and the hosting higher education institute (IUA, 2014). Hunt (DES, 2011; p. 16) clearly recommends the provision of appropriate opportunities for doctoral students to develop their pedagogical skills, as "*researchers should, where possible, be afforded opportunities to participate in teaching such as laboratory supervision and tutorials*". Enacting Hunt's recommendations could result in the benefits extending beyond the doctoral student, to the undergraduate student population and ultimately to the hosting higher education institute. The doctoral student, in the role of the GTA, should be celebrated as being a member of a '*distinctive tribe*' with much to offer (McKiggan-Fee, Walsh, Hacking, & Ballantyne 2013, p. 171). The unique skill set offered by the GTA should be harnessed in undergraduate teaching, particularly in the teaching laboratory.

Supporting the teaching doctoral student

However, to fully harness the potential of the GTA as an important part of the higher education fabric, suitable support and training must be provided. This training would allow the GTA to become familiar with appropriate approaches to teaching, learning and assessment. These are the common areas that most GTAs feel they require additional support before they commence teaching (Cho, Kim, Svinicki, & Decker, 2011). The European Association for Quality Assurance in Higher Education (ENQA, 2005, p. 14) simultaneously recommends the fostering of "*vibrant intellectual and educational achievement"* facilitated by *"qualified and competent staff"*. The role of quality assurance in higher education has increased in importance in recent years as HEIs seek to transparently demonstrate, for example, the standards of teaching (Lichtenberger, 2013). In order to maintain an acceptable level of teaching in all member HEIs, the ENQA recommend that staff involved in teaching should hold a minimum level of competence and, furthermore, staff should be afforded opportunities to develop and extend their teaching capacities (ENQA, 2005).

Integrating pedagogical training into to a structured doctoral model

As GTAs are not permanent, academic staff, they fall into a grey area; they play important roles in the education of undergraduates, but they do not have to hold a teaching qualification. How can the need to train GTAs, from a broad discipline background, in the fundamentals of pedagogy align to 'basic' research ambitions of most PhD students? Most PhD students attend HEIs to research on their topic of choice; teaching is a secondary by-product that may result in the post-doctoral researcher choosing an academic career path. Not all doctoral researchers will choose an academic lecturing role. This may be through personal choice or the current poor employment prospects in this sector. This seemingly contradictory scenario: the need to train in pedagogy to assure quality in their teaching duties during their PhD, but the non-universal requirement for direct pedagogical skills in their postdoctoral careers, can alienate PhD students and reduce their effectiveness as GTAs.

The structured PhD offers a suitable compromise between structured training and the common master/apprentice model in doctoral education. In the Irish context, the structured PhD is a relatively new development; the IUA (Irish Universities Association) outlined the context of an Irish structured PhD programme as recently as 2009. Development of lifelong and employability skills was central to the Irish structured PhD, with the guideline that the "*development of the students' research, generic and transferable skills*" should be carried out "*through a formalised and integrated programme of activities*" (as cited in DIT, 2011, p. 4). Providing students with structured training in the pedagogical fundamentals will not only enhance the GTAs' ability to carry out their role as teachers but it will also improve the undergraduate learning experience. GTAs provided with pedagogical training can use their new 'pedagogical' skills in many aspects of their post-doctoral career, including those GTAs that do not progress into an academic life. Skills and characteristics developed during their structured GTA pedagogical training and GTA teaching duties that are used in their postdoctoral career include improved communication skills, use of reflective practices and the development of self-confidence (Park, 2004). These are the very generic and transferable skills outlined as key learning outcomes in doctoral education in general and this research more specifically.

Scope and Research Rationale

In an attempt to address a deficiency in personal development opportunities for GTAs at an Irish HEI, and to integrate pedagogical enhancement within a structured PhD programme, the following research was executed. This encompassed the inception, design, development, evaluation and sustainable delivery of a bespoke pedagogical training course for Level 10 doctoral students.

Implementation

Underpinning Research Question(s)

The research described here began as an initial intrinsic case study; however, this methodology holistically evolved into an action research methodology following continued development and enhancement of the training course detailed within. Over the course of the entire research, the stem of the underpinning research question remained the same:

> *How can the Graduate Teaching Assistant be supported in developing appropriate pedagogical skills?*

In the initial case study the research question concluded with a focus on LGTAs and, as such, this research question was:

> *How can the Graduate Teaching Assistant be supported in developing appropriate pedagogical skills for undergraduate scientific laboratories?*

The focus here will be on the impact of the bespoke training course on (L)GTAs in their teaching and learning practice.

Implementation Overview (Part 1): Intrinsic Case Study

The initial, intrinsic case study focused on how to support the LGTA in developing the key pedagogical skills that will assist them in demonstrating undergraduate teaching labs. Aligned to this primary research question, the research also aimed to investigate what pedagogical skills are considered key to assisting GTAs in the teaching lab and how can these skills be developed and enhanced through suitable training. These aims were achieved by developing, executing and evaluating a short, bespoke pedagogical training course for all postgraduate demonstrators in the School of Food Science and Environmental Health, within the College of Sciences and Health, in Dublin Institute of Technology. Given the multidisciplinary nature of the undergraduate programmes offered within the School (Nutraceuticals, Food Innovation, Food Science and Management, Pharmaceutical Healthcare and Pharmacy Technician), GTAs assist in the teaching and demonstrating of key lab skills over a range of scientific disciplines and this was considered during the development and delivery of the bespoke training course.

Initial identification of the key pedagogical skills required by the GTA utilised thematic gap analysis. This approach indicated an overall shortcoming in GTA support in developing appropriate pedagogical skills, characterised by a lack of GTA confidence in their ability to effectively teach and demonstrate. The under-supported pedagogical skills areas were mapped onto sub-themes of engagement, communication, grading and providing feedback. A bespoke training course to assist and underpin the GTAs development as novice academics was delivered following a socially constructed, 'just-in-time' pedagogy. Eight weekly, student-centred workshops were supplemented by asynchronous and contextualised learning activities in which the students implemented skills developed in the workshop in their pedagogical practice (Ryan, 2016).

Implementation Overview (Part 2): Action Research: Cycles Two and Three.

Following successful validation of the bespoke training course as a structured PhD module, systematic and continual gap analysis was carried out and additional key themes were identified as beneficial to a more varied GTA cohort (not just LGTAs). These pedagogical skills were mapped onto sub-themes of interacting with students, technology-enhanced learning and assessment, and autonomous teaching practices. As part of the redevelopment of the training course, and to address the assessment requirement of a structured PhD module, participants documented their implementation of their new skills and reflected on their experience through blogs hosted on a personalised ePortfolio of practice. The ePortfolio was used throughout the training course as a scaffolded approach to student learning and assessment. Concurrently, the ePortfolio developed into an online community of practice across a diverse discipline range, where GTAs supported each other in their pedagogical development journey.

Evaluation Methodology Synopsis

Following each delivery (n=3), the impact of this bespoke training course was evaluated through surveys, interviews and focus groups of the (L)GTAs. Qualitative data analysis was carried out and data were coded using several key themes and sub-themes based on researcher interpretation influenced by Strauss and Corbin's (1990) *Method of Constant Comparison* and Braun and Clarke's (2006) *Six Step Approach to Data Analysis*. Interpretation and discussion of the impact of this research were extrapolated and examined in terms of the contemporary literature. This permitted conclusions to be drawn and 'recommendations for practice', both locally within the School of Food Science and Environmental Health, and more generally, to be offered.

Summative findings: Impact of overarching, emergent and cross cutting themes.

Over the three cycles of this research, common, dominant themes emerged; these included, an appreciation of the important role of appropriate learning and teaching practices, the range of pedagogical influence, an increased GTA confidence and teaching practice skill set, and the benefit of a community of practice.

Impact One: Initial positive outcomes and rationale to evolve training course

In the initial intrinsic case study, and before participating in the training programme, the typical LGTA tasks involved facilitating learning through technical demonstration and enforcing health and safety. However, after participating in the training course, the LGTA role correlated with one of increased responsibility, including guided grading and liaising between different groups and the lead academic. The success of the initial training programme, as evaluated through an intrinsic case-study approach, suggested that, with continued training and appropriate support, (L)GTAs could continue to take a more central role in their undergraduate teaching duties. This prompted iterative changes in the content, and the introduction of continual assessment in the training course, and the natural evolution of the evaluation model to action research. This change was holistic and ad hoc; based entirely on the perceived success of the initial training course and the need to expand the reach of the course to all GTAs, not just those that teach/demonstrate in laboratories.

Impact Two: A focus on how to teach, not what to teach

Typically GTA training in general, and LGTA specifically, has been noted to focus on technical skills training, to the detriment of pedagogical training (Luft, Kurdziel, Roehrig & Turner, 2004). However, in this study, pedagogical training formed the basis of the course, with no technical training carried out. This approach permitted easier evolution of the course beyond LGTAs to GTAs in general. The provision of pedagogical training has been shown to have a hugely positive effect on academics at all levels (Gallego, 2014; Jensen, 2011; Postareff, Lindblom-Yanne & Nevgi, 2008) and in the initial intrinsic case study, a similar trend was evidenced:

> (GTA3_Intrinsic Case Study):
> *"I feel better equipped, rather than just winging it. I feel more organised and prepared in my mind. I felt I became more structured after seeing example approaches and speaking to other GTAs in class* [training workshop]".

(GTA4_Intrinsic Case Study):
"*I really enhanced my communication skills and this helped me to connect with my students. I am also more structured and organised. I developed my own pedagogical ideas. It is useful to study the different pedagogical ideas".*

Aligned to Jensen and colleagues' (2005) philosophy of focussing on how to teach, not what to teach, the training course developed the (L)GTAs pedagogical skills across a number of key areas, as identified by the (L)GTAs' themselves. A social constructivist model was adopted in the training course and this allowed a community of practice to grow between the (L)GTAs. Ultimately, the (L)GTAs felt a greater sense of self-worth, increased confidence in their teaching abilities and they became more central players in undergraduate learning. Sample participant statements include:

(GTA5_Action Research Cohort):
"*It* [training course] *has definitely made me contemplate my approach* [to teaching]; *I now feel that a blanket approach will not suit every group".*

(GTA2_Intrinsic Case Study)
"*I found more confidence in myself; I took on more responsibilities, such as marking, because I felt confident in myself".*

Impact Three: Increased GTA Confidence

The largest perceived change in all cohorts, but particularly evident by the LGTAs, was an increase in personal confidence in their own teaching skills (Ryan, 2016). Improved self-confidence was evaluated and quantified based on Boman's (2013) *Teaching Assistant Self Efficiency Scale*, with the majority of responses indicating that GTAs would be very confident or extremely confident in carrying out typical teaching duties (see Table 1), echoing findings from similar contemporary programmes (Dragisich, Keller & Zhao, 2016). Interestingly, one area that all participants did not feel confident in after the training course related to teacher-student interactions involving conflict or disruptive behaviour. This is an area that requires further development in future iterations of the programmes. Previous studies in this area have noted the benefits of peer discussion to support GTAs and novice academics and this approach could integrate with the online community of practice developed during the training course (Dotger, 2011). Furthermore, suggestions for change, based on low alumni confidence, include a focus on teaching to a multi-cultural cohort and blended learning approaches to facilitate student engagement.

	Not confident	Somewhat confident	Confident	Very confident	Completely confident
Give a teaching demonstration	0	5	26	32	37
State goals and objectives clearly for teaching session	0	0	26	32	42
Motivate student interest in the curriculum	0	5	32	47	16
Encourage class participation	0	5	21	42	32
Communicate at a level that matches students' ability to comprehend	0	16	21	42	21
Respond to students' questions during the teaching session	0	11	16	47	26
Respond to students' answers during the teaching session	0	5	16	63	16
Plan an organized teaching session	0	5	32	26	37
Plan constructive feedback on assignments and reports	0	11	16	37	37
Show respect for student ideas and abilities	0	0	16	37	47
Assign grades to students' assignments or reports based on a grading rubric	0	11	26	21	42
Manage student disagreements with you	0	16	37	21	26
Model problem solving goals for students	0	11	42	26	21
Teach students from different cultural backgrounds	0	5	16	37	42
Ask open, stimulating questions	0	11	16	42	32
Refer students with personal problems or learning difficulties to appropriate institute centres	0	16	11	42	32
Respond to students' academic problems during a teaching session	0	5	16	42	37
Handle disruptive behaviour by students during a class	0	21	32	32	16
Use student evaluations to improve your teaching	0	5	16	37	42
Think about your own teaching and make necessary changes to improve it	0	0	5	42	53
Overall, how confident are you in your ability to carry out your responsibilities as a GTA	0	5	11	47	37

Table 1
A summative heat map plot of PGD responses to Boman's (2013) modified Attitudes Towards Teaching (ATT) survey (n=19); comprising initial intrinsic case study [n=7] and action research iteration one [n=4] and two [n=8]). The percentage response is noted within each cell and the darker the colour, the higher the percentage agreement.

Impact Four: An enhanced awareness of pedagogical norms

Another positive and tangible impact of the GTA training course was the increased awareness amongst GTAs in relation to the important role learning and teaching pedagogies play in undergraduate teaching (see Figure 1). Exposing the GTA to alternative and innovative pedagogical practices at an early point in their doctoral studies will allow the GTA to build their own best pedagogical practice, supported by the online (and face-to-face) community of practice developed during the training course. Alumni of the course cited how they became more adaptive, reflective and inclusive in their teaching practice. This change in teaching practice was based on personal realisation and an empathetic appreciation of the students they teach. GTAs noted how they adopted enabling pedagogies in their teaching after completing the training programme. This personal development was ongoing; alumni looked to the literature as a sustainable source of guidance for pedagogical innovation and best practice.

(GTA1_Action Research Cohort):
"*My awareness has much improved, I am more positive, inclusive and possibly kinder as a result*".

(GTA12_ Action Research Cohort):
"*I am much more conscious of different teaching styles and I am improving my own teaching by experimenting with alternative teaching styles*".

(GTA13_ Action Research Cohort):
"*Reading & engaging with literature in the field of pedagogy has been of immense help in shaping my approach to pedagogical practice*".

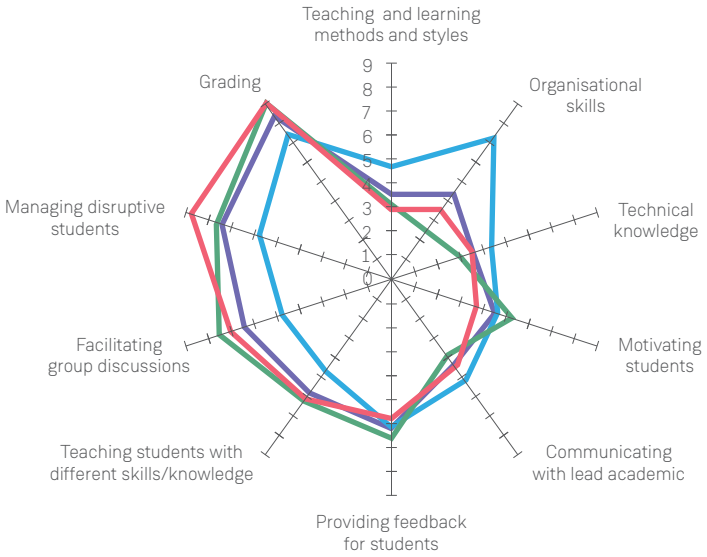

Figure 1
Schematic representation of the most important areas for PGD training as assigned by PGDs (initial intrinsic case study n=10, blue line; Action Research round one n=4, red line; Action Research round two n= 8, green line and overall average n= 22, purple line). The weighted rank was calculated as: (sum of (position * count) for each choice / total responses) + 1. Using this weighted ranking the lower the value, the higher the priority. The data presented were collected using an online survey.

Impact Five: Development of a sustained community of practice

The participants noted how attending the course and participating in the online community of practice had benefits for all GTAs regardless of their level of experience or lack of prior training. Initially the community of practice developed during face-to-face workshop sessions; however, the community evolved and grew through the online reflective space, which supported and scaffolded GTA learning.

(GTA2_Action Research Cohort):
"It [the online community of practice] *was interesting and informative to see other people's interpretations particularly those who work in a different field".*

The face-to-face community of practice was noted by participants as being most impactful on their daily practice; with insight being gleaned from peer interaction and discussion. Many GTAs, particularly from the Action Research cohort, noted an ongoing connection with their community of practice with 85% (n=13) regularly discussing pedagogical developments with course alumni. These conversations typically took place between alumni within the same faculty; however, there were examples of sustained inter-departmental and even inter-institutional community of practice dialogue. Those that did not stay connected to their community cite time as the biggest barrier; however, the class website did offer a pseudo-community of practice. This aligns with Brooks' (2010) concept of hybrid communities of practice (blended online and face-to-face communities) for academic development.

(GTA13_Action Research Cohort):
"*It has not been possible* [to remain connected with the community of practice] *especially given our very tight and differing work schedules; but I have checked out the website from time to time to continue to learn new skills and learning & teaching methods*".

Impact Six: Assessment via ePortfolio of Practice

As part of the evolution of the module from intrinsic case study, to a sustainable structured PhD module and subsequent action research methodology, assessment of the programme learning outcomes was introduced in the form of an ePortfolio of practice. The cohorts that experienced the assessed version of the module felt challenged by the assessment, with some participants being initially uncomfortable sharing reflective practice with their peers. Others struggled with the time requirements to reflect weekly on their teaching practice.

(GTA5_Action Research Cohort):
"*Honestly, I dreaded the assessment, it just wasn't my cup of tea, but it did force me to take the time to access my capabilities and thoughts".*

All participants cited perceived benefits of the ePortfolio, which echo previous findings in portfolios in teacher/GTA training (Dinham & Scott, 2003; Hoekstra & Crocker, 2015). In this study the perceived benefits included: a dedicated time and space to reflect and re-consider practice, development of the ability to relate theory to practice and encouraged consolidation of new knowledge.

(GTA1_Action Research Cohort):
"*It helped me develop a personal change toward reflective practice"*

Impact Seven: Ripple impact on students, peers and academic staff

Overall, alumni of the course noted many positive impacts on their personal pedagogical practice; including enhanced preparative traits, inclusion of group-based learning in their classes and teaching through questioning. Additionally, adaptability (e.g. ranging from a blended model of teaching, through adopting appropriate teaching styles to suit differing undergraduate cohorts, to implementing motivational and interactive teaching methods) was a common impact emerging from the course. These impacts were also observed beyond the GTA, for example 70% (n=13) assisted another GTA in developing their practice after the course. Furthermore, 90% (n=13) felt their participation in the course helped the undergraduates that they taught, with enhanced student/GTA interaction a highly cited example. The perceived impact on academics was lower; 46% (n=13) of course alumni felt they had a positive influence on lead academics, with a further 38% (n=13) uncertain of their influence.

Impact Eight: Appreciation and change in (L)GTA role

The provision of this introduction to pedagogy training was appreciated by the PGDs and chimes with Sharpe's (2000, p.132) study where training, when introduced first, was seen as '*something for those thrown in the deep end* [of teaching]'. This appreciation turned into tangible personal development as many GTA evaluations remarked how they developed many of the skills that they felt they needed to develop, with the level of development exceeding their original expectations.

> (GTA3_Intrinsic Case Study):
> *"When I first started the class* [training course] *I felt scared and a bit overwhelmed as I didn't have a clue about things such as 'how would I deal with running a lab or assessing assignments'...but the class brought me through these, and other areas, in a good way".*

Furthermore, the just-in-time model of training delivery was seen as a suitable approach for the busy doctoral student. Participant evaluations noted how GTAs gained immediate value from the training programme. The PGDs noted that they were able to put the skills they were developing in the weekly workshops into practice in their demonstrating duties during the semester, as evidenced in the participants' reflective blogs.

Over half of respondents (54%, n=13) noted a change in their teaching roles as a direct consequence of completing the module. Those that did not see an immediate change in their role still benefited from completing the course. For example, the course was seen to provide a strong underpinning in teaching and showcased the participants' ability to teach:

> (GTA3_Action Research Cohort):
> '*An opportunity has not come in that direction* [to teach], *but my supervisor is negotiating to give me some modules to teach....the* [course] *has convinced her that I can teach at tertiary level.*'

Participation in the course often resulted in a perceptible role change for the GTA; furthermore, it also instigated a perception change surrounding the potential role of a skilled GTA. With this in mind, roles outlined by Cassidy and co-workers (2014), such as lone instructor, mentor for new GTAs, course developer, collaborator and scholar will come within the skill set of the GTA with continued personal development.

Conclusion

In order to assure the quality of teaching and learning, it is critical that the HEIs support their novice academics through specialised learning courses that would dovetail into a structured PhD. This approach will be beneficial to the postgraduate, through the development of lifelong and transferable skills; the undergraduate, as they gain from the trained GTA's experience; and the HEI, as the staff-student ratio would be more favourable. The initial conception, design and development of the training course formed the basis of the author's own personal development within a Masters in Higher Education. The sustained and continued provision of this training course was achieved through integration into the structured PhD course. Centralising the GTA, through appropriate support, allows the undergraduate learning, facilitated by the GTA, to evolve towards a more research-centred model that the GTA can enhance and add value to. Further creative and innovative approaches to the course delivery, informed by best practice and continued stakeholder evaluation, will weave GTA pedagogical training deeper into the fabric of higher education. The model proposed in this research, although not perfect, can centralise this '*forgotten tribe*' of doctoral researcher/GTA and celebrate their skills as key to knowledge development and enhancement.

Recommendations for Practice

Throughout the development of this research, growing from an initial intrinsic case study as part of a MA in Higher Education and into a sustainable, independent action research methodology, a number of recommendations for practice emerged. These recommendations, detailed below, have been aligned to literature examples to broaden the context of these recommendations beyond the research detailed here and focus on tangible impact in GTA continued professional development.

Training and support:

The provision of the correct training before the GTA teaches and support during their teaching duties is paramount. For example, Boman (2013) observed GTAs that were provided with suitable training significantly increased their self-efficiency and teaching effectiveness. Furthermore, those that participated in the training cited an improvement in their public speaking skills. Luft and colleagues (2004) noted the importance training and support specialisation provided to the GTA. For those involved in science teaching the inclusion of appropriate educational research and the process of teaching science was crucial.

Fostering a community of practice:

The provision of a suitable training and support system can lead to the development of a 'community of practice' (CoP) amongst GTAs and this should be encouraged. This eclectic community would allow pedagogical idea transfer and cross-pollination between different stems of wet-lab teaching and beyond, if non-Science disciplines engage with the training course. Communities of practice are observed in other areas of academia and the development of a GTA CoP would provide additional social and pedagogical support (Hiebert, Gallimore & Stigler, 2002).

Less is more:

Allowing the GTA to take a more central role in undergraduate teaching can aid in the use of alternative pedagogies. For example, research-orientated undergraduate laboratories have been noted to enhance undergraduate student learning. Centralising the GTA permits the introduction of this pedagogy without the need for large scale curriculum remodelling. Hughes and Ellefson (2013) observed that appropriate GTA training in inquiry-based learning and minimal curriculum change resulted in improved GTA teaching, undergraduate perception and module scores in an undergraduate biology laboratory.

Involve and inform the undergraduate students:

Traditionally the majority of LGTA teaching takes place in early undergraduate laboratories (Park & Ramos, 2002). Early year undergraduate students are transitioning from dependant (second level) to independent (third level) learners. Many students take time to adapt to taking responsibility for their learning, and introducing research-centred learning can add additional stress. Informing the students of third level education expectations, their role in their learning and involving them in curriculum design can aid in their adoption of this teaching approach.

Blurred lines:

The distinction between 'teaching' and 'research' should be reduced in order to fully integrate research-driven learning in the laboratory or classroom. The interaction between the GTA and the undergraduate should be fluid and 'peer'-like, with the boundary between GTA mentoring and undergraduate research-driven learning becoming blurred (González, 2001).

Near Peer Mentoring:

Many GTAs are doctoral research students who, along with carrying out limited teaching duties, are full time research students. These GTAs are often closer in age and background to the undergraduate students than the tenured academic. In this sense the GTA is a 'near-peer' to the undergraduate student. Near-peer teaching has been shown to be a powerful pedagogical approach with undergraduate peers, separated by one or two years, working effectively together to promote learning (Campolo, Maritz, Thielman & Packel, 2013). Adopting this approach across the undergraduate/graduate divide could further enhance the learning environment.

Academic adoption and facilitation:

Ultimately academic adoption will veto any change in teaching practice and curriculum. Luft and colleagues (2004) suggested that academic staff be encouraged to engage with, and mentor, GTAs. GTAs should be included in the development of the laboratories/tutorials and integrated into the teaching community. At another level, academic staff must fully adopt this new centralised role of the GTA if research driven undergraduate learning is to succeed.

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4. Mentoring and the impact of accredited professional development: a personal reflection.

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Higher level education is key to the development of the knowledge economy in Ireland and Europe. The ways in which higher education contributes to society and the economy is a vital ingredient in the national landscape, whether through the development of new knowledge, the fostering of new skills or the creation of newly qualified professionals in a broad range of fields. All of these contributions serve to feed back into a multi-cultural society and recovering economy: *'higher education institutions... form a nexus of interaction and engagement between a complex range of interests on a local, regional, national and global basis'* (DES, 2011, p. 2). This is also highlighted in another more recent report on higher education which posits that major investment of €1 billion is required over the next fifteen years if higher education is to maintain its social and economic importance and if public access to higher education is to be maintained (Cassells Report, 2016)

Assessing the need for professional development

In higher education, professional development may take the form of structured and unstructured activities, accredited and non-accredited modules or programmes and more informal participation in workshops and conferences. It may also lead to engagement in pedagogical research and publications contributing to the Scholarship of Learning and Teaching (SoTL).

> *While all these activities may be considered professional development, they can have different underlying values about what it means to engage in professional development.'* National Forum (2015a, p.4)

For teachers at higher level, there is a need to engage in some form of on-going professional development throughout their careers, it has been suggested that:

> *excellent teachers are made, not born; they become excellent through investment in their teaching abilities.'* (European Science Foundation, 2012, p.vii).

Such 'investment' can be centred on key practical teaching skills, as well as professional knowledge expansion and developing digital proficiency. The added value resulting from such on-going professional development can result in the teacher being more capable in the classroom, lecture room or laboratory. The increasing massification and diversity of the higher education population provides an incentive for teachers to engage in continuing professional development. Reasons may include increasing their security of tenure, however more importantly their confidence in practice which may also lead to an improvement in student engagement and learning. In addition, the Higher Education Authority (HEA) has devised a future strategy for all higher level teachers to be involved in continuing professional development by 2020. Such a policy will need on-going investment and resourcing but, if implemented, will have a resounding and diverse impact on the landscape of accredited professional development (APD) in higher education.

Assessing the Challenges of undertaking APD

The National Forum (2015b) has identified 5 domains of professional development for teachers in higher education: The Self, Identity, Communication, Knowledge/Skills and Digital Capacity. The intersection between these are complex and challenging and this can make the journey through accredited professional development difficult and daunting. Key to successful professional advancement is the means by which the teacher in higher level education can manage and develop these facets of their professional portfolio while also negotiating the relationship between these five domains in a phased manner moving from new learning to developing through practice to mentoring to leading. Clearly, this is a journey which can and perhaps should last throughout one's teaching career.

Not only does the professional need to comprehend large amounts of knowledge but they must also develop practical skills and competencies including their digital literacy. Key in this journey is the development of self-confidence on both a personal and professional level so that new methods and approaches can be tried and examined without fear of personal failure or loss of professional credibility. In this piece, I draw on my own experiences supporting colleagues as they undertake APD to consider how it achieves a positive impact.

My experience

Since 2010, the Masters in Learning and Teaching (MALT) programme has been delivering accredited professional development in learning and teaching in Dundalk Institute of Technology (DkIT). Delivery is by means of a blended method and areas such as student-centred learning, e-technology and assessment are worked on within a community of learners over a 5-module, 2½ year programme. To date, over 150 internal and external professionals have participated or are currently participating in the programme.

An important element of the programme is the mentoring and coaching which is provided by a 'Personal Academic Tutor' (PAT) who delivers targeted and personal support (both personal and professional) to those undertaking the programme. This is all the more crucial as it is allied to the authentic assessment which is a core element of this, and other APD programmes. With the aid of detailed rubrics, assessment within the programme aims to combine self-reflection with a student-centred approach. Learners are encouraged to configure educational models and theories to devise innovative classroom interventions and use online and/or traditional tools to track and measure their effectiveness in deepening

student learning and engagement. The PAT therefore must ally the skills and behaviours of successful mentors, specifically key communication skills, with face-to-face and online supports. This authentic assessment is key to the impact of the MALT model as it centres on facilitating positive change in the classroom and within practice. Core to this process is the expert support of the tutor colleague which can help build the confidence of the teacher undertaking professional development and can also contribute to the sustainability of such positive change.

In addition, the 'PAT' mentor is an important source of support in terms of developing scholarship and research output in learning and teaching, including collaborative practice and publication. Since 2010, we have seen the establishment and development of a strong community of practice in the scholarship of learning and teaching (SoTL) in DkIT and the MALT programme has had a significant influence on this.

Assessing the Impact of accredited professional development

This approach to professional development, incorporating elements of mentorship and coaching has multiple positive outcomes. Teachers who are investing in their professional portfolios can examine key theories and practices so that they can identify those which will have greatest impact on their teaching practice. Key to this promotion of positive change is the creation of a space for supported self-reflection. This is the means by which teachers can build their knowledge and skills in meaningful ways. In my experience, their resulting confidence allows them to effect their transformations into more student-centred, innovative and dynamic teachers. The on-going mentoring process serves to support the programme participants while leading to the creation of a growing community of teachers and scholars who contribute to the national and international scholarship of learning and teaching. Mentoring has further benefits that extend beyond the programme participants; working closely with colleagues in this way has been enormously beneficial to my own professional development as a teacher and a scholar. It is difficult to support critical self-refection in others without also engaging with it oneself. I have been exposed to new ideas and perspectives, have had my ideas constructively challenged and have had the opportunity to engage collaboratively with scholarship and research in new fields.

The positive outcomes of the programme were recently recognised by the *National Forum* 2015 Teaching Expert Award which was awarded to the core MALT teaching team of myself, Gerry Gallagher and Angela Short and, which included, a Special Commendation for 'Effecting systemic change' within DkIT. Three of our graduates have been recipients of National Forum Teaching Herio Awards. One of these, and two other graduates have also joined the programme team.

Future Developments

In November 2016, a newly-established *National Forum* Expert Group was formed to provide leadership and guidance on the Professional Development Framework. Key within this work is the development of pilot projects which will examine the national framework prior to its release nationally. I have been partially seconded to this group and am currently leading a group of of 20 higher level teachers/researchers (from the IOTI and university sectors) in reflecting on their professional development journeys and preparing their professional PD portfolios. This is a highly rewarding and challenging project which draws on my mentoring and collaborative skills outside the context of APD. It also allows me to contribute to the national PD framework. Such projects are key to ensuring that future developments are carefully but innovatively managed.

Conclusion

In education, the role of professional development is evolving. Accredited professional development offers a supportive space for teachers to make positive changes in their classroom practice and professional development. I contend that mentoring and self-reflection are central to this process of change and it is important for APD programmes to explicitly make space for these.

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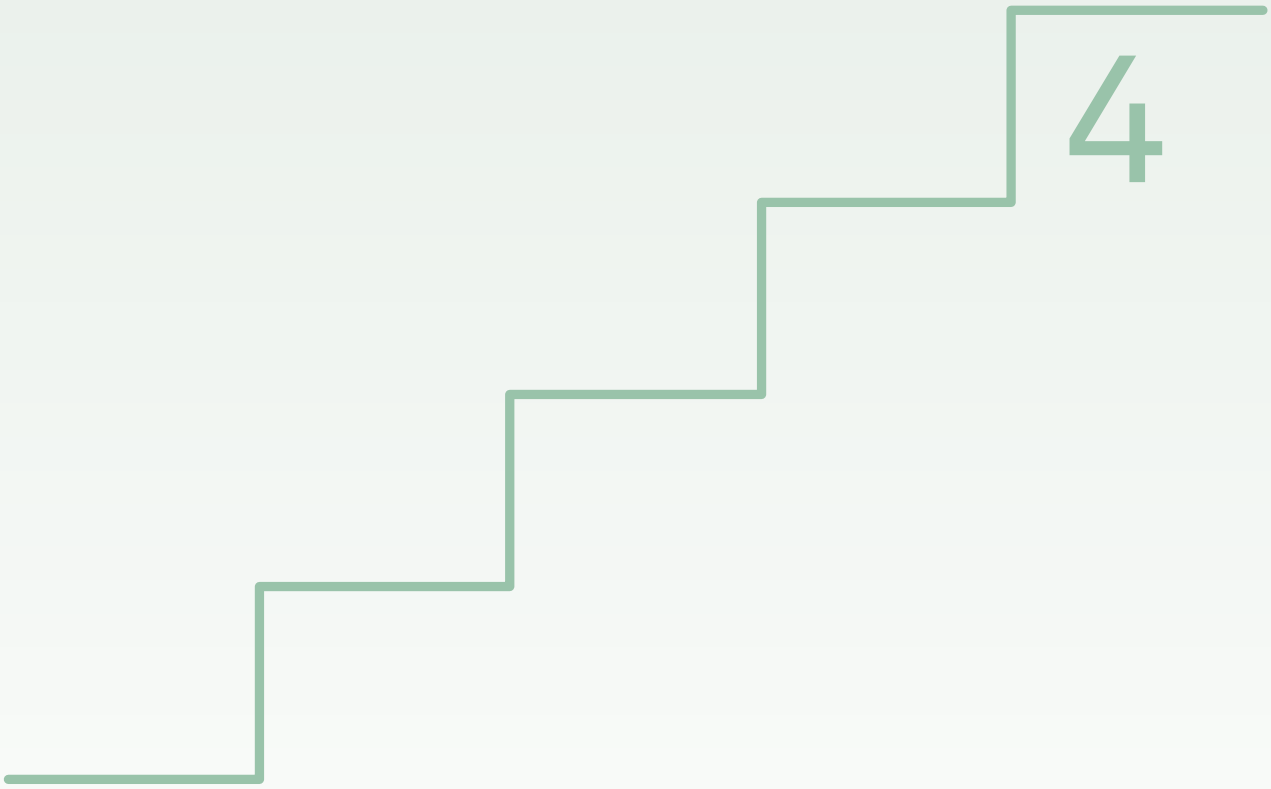
SECTION 4

Responding to Teachers as learners: exploring the impact of accredited professional development on learning and assessment in Irish Higher Education.



1. A stamp of recognition – a license to experiment: accredited courses as an opportunity to develop soundly based, responsive, appropriate and inventive assessment.

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One of the exciting developments arising from an enhanced focus on professional development and the Scholarship of Teaching and Learning (SoTL) in higher education, is that we are more aware of the learning potential enabled by robust assessment. With established and new insights into engagement, student-centredness and a concern for putting students at the heart of higher education systems, curricula are becoming more concerned with enabling students to develop awareness of their own learning achievements and needs, to co-construct new knowledge, and to work with assessment for learning rather than merely as a static finite measure of their achievement. International insights into student learning, teaching, assessment and curriculum are evident in the range of chapters in this collection, which offer rich examples of ways in which academic colleagues, from a range of disciplines, who have benefitted from SoTL and professional development opportunities, interpret and activate their theorised practices about assessment.

I see assessment and feedback as a vital opportunity for dialogue between students and the discipline, and our engagement with their work in a feedback/feedforward (see Race, n.d.) dialogue, to better enable students to create knowledge, as well as to show they understand established interpretations and uses of knowledge (Boud 2007a and b; Rust 2002). One of the opportunities offered by accredited courses for professional development for academic colleagues is that they can actively engage us all in exploring the reality and potential for this kind of learning dialogue in assessment, in our own discipline or between disciplines, in the context of interpretation of the learning outcomes and needs of the discipline, and of an informed basis in the literature of assessment. An effective professional accredited teaching and learning course is a vital structure for such research and experienced-based experimentation, evaluation and articulation. It is, in itself, a contribution to our knowledge

about how assessment works and can work with real students in real instances of practice across a wide range of disciplines, informed by current interpretations of these discipline within our contexts.

The chapters in this publication are testimony to lively, experienced and research-based explorations of engaging students with the assessment of their learning. Developmental and gatekeeping aspects of assessment, and the feedback they receive on their work, are included, so that ideally they are empowered and take ownership of the learning they have created. Thus, assessment has done its job - fostering and enabling learning, not just signalling the ability to repeat or act on what has been told, noted, without active involvement.

These are rich and diverse examples of the ways in which professional higher education academic staff from a wide range of disciplines have engaged with the challenges of assessment in their disciplines. There is immense energy, excitement and focused involvement in the professional practice evident in each one. Each uses established research in HE learning, teaching and assessment, often some discipline-oriented research within the same focus, and theorises, as well as actively evidences, the developments they have trialled with their own students in terms of assessment, the best kind of SoTL. These chapters offer rich examples of the assessment in practice, in the work of practitioners who theorise their own work and use both their disciplinary discourse and that of HE pedagogy, owning the research and professional experience-informed assessment developments and showing how and why they were developed and the experiences they enabled.

SoTL

The scholarship of teaching and learning (SoTL) underpins and informs the work discussed here, because it provides a structure and a theoretical base to the exploration of pedagogical practice in higher education. As it does so, it also enables professional development, as colleagues theorise their work using the discourse and the pedagogical discipline focus which it encourages. It is no mean feat to adapt one's practice to that of the lens of another, and exploring, expressing practice in a variety of disciplines, as in this collection for instance, evidences development. The richly hybrid work which results offers evidence of professional development by showing and theorising new perspectives of practice.

In 2015-6 two commissioned projects in the UK explored the aims and achievements of SoTL, of which accredited professional HE teaching and learning courses are a part. These two recent Higher Education Academy commissioned reports: Fanghanel, Potter, Pritchard and Wisker (2016) and Fung and Gordon (2016) focused on the encouragement, support and recognition of SoTL in universities in the UK. Comments concentrated on theoretical perspectives, teaching, learning, support, reward and recognition, institutional contexts, and assessment. One of our respondents (Fanghanel et al. 2016, p 12) noted of assessment, as a SoTL issue, that:

'the general issues of getting academics to engage or getting them to think about assessment in a particular way or getting them to think about aspects of learning and teaching in a particular way are the same across all institutions .' (Respondent 7)

In our research, engaging in SoTL was seen as a driver for broader cultural change, especially where supported by such professional courses, and then recognised and rewarded. This idea of engagement in SoTL being an enabler for change is evident across all the contributions in this collection.

Courses and how they can change us

Accredited professional development courses are an essential part of the scholarship of learning and teaching in higher education. Many of our colleagues who engage with them are professional practitioners and/or researchers, and often established teachers with years of experience in, for instance, working in the military, working in a biology lab, coaching sports, teaching English, History and so on. Accredited courses offer the opportunity to bring a diverse group of colleagues together to share their understanding of the research and experience base of learning, teaching and assessment in higher education, so that they can make it their own in terms of their own discipline practice, and in terms of the teaching and learning opportunities and the assessment which they offer their students. The courses keep us all up to date with the essential history of, and the current developments in, research and practice within teaching and learning. Some courses are aimed at those early in their teaching careers (e.g. MAs, PGCaps, and PGCerts HE). Others are part of the professional standards framework recognition schemes (like the *National Professional Development Framework* within the Irish HE context). These enable colleagues to reflect on, chart, explore and articulate their previous achievements in learning, teaching, assessment in HE and their contribution to its leadership and management.

Initial teaching and ongoing professional development

Some professional courses, such as MAs in teaching and learning and PGCerts or PGCaps, are mainly aimed at establishing an initial, professionally-informed development for those teaching in HE. Throughout the discussions they offer opportunities to engage with the, often quite new, and established research into why we do what we do in terms of teaching, learning, and assessment. They also enable discipline specialists to see that this too is a specialism, and one related to their HE practice, which they can use to better understand it, enhance it and so enhance the learning of their students. Engagement with the learning outcomes and threshold concepts (Meyer and Land, 2003, 2005) of the disciplines, matched with a concern for the threshold concepts involved in teaching, learning and assessment can enable the essentials of the discipline to be understood, owned and used through the processes of producing research and reflection based work for assessment.

For me, the theories of threshold concepts have been helpful in engaging academic and professional colleagues in owning the ways in which the learning, teaching and assessment practices can enable further learning in their disciplines. Meyer and Land identified threshold concepts in the disciplines in 2003. Research in undergraduate learning and discipline-based work, which uses threshold concepts to theorise and inform practice in learning and teaching and assessment, now has thousands of articles available to underpin our own practices, (see Flanagan, n.d.). Understanding how our disciplines see the world and create knowledge in the world is a good first step to working out how it might be appropriately assessed, so that this knowledge creation is at its heart, and the assessment practice is relevant, appropriate, as well as accessible in a dialogue with the discipline and inter-disciplines at that level. It also then needs to be understandable and structured for the student. Here, the theories of threshold concepts as understanding the essential concepts to initiate and develop learning and knowledge interweave with those of constructive alignment (Biggs & Tang, 2007), so that the actual assessment relates to the learning outcomes, assesses these, and can engage the students in expressing their active learning in an appropriate manner. This means that the assessment causes learning, as well as allowing it to be seen, measured, and commented on to enhance that learning. Threshold concepts, constructive alignment, and learning, teaching and assessment theories, coupled with the structures and possibilities enabled in

professionally accredited programmes, can be a real opportunity for learning, for appropriate assessment which leads to further learning, and for effective change in practice resulting from that learning.

Conclusion

The chapters in this book offer vital, lively and engaged examples of discipline-focussed professionals engaging their students in assessment practices and processes, which are themselves research and experienced-based. They show reflection, exploration, and also respect for the different learners and the learning outcomes essential in the discipline at this level. The successful assessment examples they discuss reveal both the professional attitude and practice of the colleagues involved. This is coupled with the dialogue that has taken place around the assessment and feedback strategies within their own disciplines, which, in turn, has led to greater engagement with and by the students. These are soundly based, effective assessments, which really enable learning, and the colleagues who have developed them know why. This confidence has been cultivated by a mix of professional practice experience and research-based insights – their own – and those of their colleagues who research learning, teaching and assessment and whose work has influenced and enriched their own.

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Contributor Biographies

Dr Dina Brazil has more than 20 years experience as an educator at both undergraduate and postgraduate level. She comes from a science background, with a primary degree in Genetics from TCD and a PhD in Microbiology from NUIG. Following a career as a research scientist that included positions at the University of Geneva, and University College Cork she now is a Senior Lecturer at the Institute of Technology Carlow and a member of the EnviroCore Research Group. Dina is interested in the research teaching nexus. As part of her MA in Teaching and learning she has explored how of to embed research activities within the undergraduate curriculum. In addition, Dina is a member of the Network for Educational Action Research in Ireland (NEARI) and is also proponent of Technology Enhanced Learning and Assessment Methods.

Dr Ronan Bree is a biochemist lecturing in Dundalk Institute of Technology (DkIT), possessing a strong research background in both the genetics of embryo development and DNA damage/cancer. Recently the recipient of an MA in Learning and Teaching, his current research centres on enhancing the format and assessment of science undergraduate practical sessions. Ronan is the DkIT Academic Lead on the national TEAM project (funded by The National Forum for the Enhancement of Teaching and Learning in Higher Education) and acts as a peer-reviewer for several academic journals. He serves on local and national higher education committees.

Dr Bernadette Brereton is a Personal Academic Tutor (PAT) on the MA in Learning and Teaching (MALT) in the Centre for Excellence in Learning and Teaching (CELT) in Dundalk Institute of Technology. In 2015, with Angela Short and Gerry Gallagher, Bernadette was awarded a *National Teaching Expert Award* with Special Commendation for 'facilitating systemic cultural change' from the National Forum for the Enhancement of Teaching and Learning in Higher Education. She is currently partially seconded to the National Forum's Continuing Professional Development (CPD) Expert Group, the ongoing work of which will implement the initial roll-out of the *National Professional Development Framework*.

Dr Pip Bruce Ferguson has worked in staff development in a wide variety of tertiary contexts since the mid 1980s. An avid self-developer, Pip obtained her PhD in 1999 using action research to develop the research culture of the institution where she worked. She is a compulsive collaborator who enjoys working alongside teachers, learning from their practice and sharing hers. Her LinkedIn profile can be seen at https://www.linkedin.com/in/pip-bruce-ferguson-b4281b13/. She enjoys family life with her extended family; extending her knowledge of other cultures; and is currently enjoying a 'new life' here in Ireland, with all it has to offer, on a three-year contract.

Dr Martina Crehan joined RCSI in 2012, having been the coordinator of the Postgraduate Diploma in Teaching & Learning at Dublin Institute of Technology. Martina's role focuses on pedagogical support for curriculum design/redesign and course development, specifically in relation to the constructive alignment of curricula. She is co-ordinator of the RCSI Postgraduate Diploma in Health Professions Education. Her areas of expertise include teaching and learning in higher education, student engagement and retention, formative assessment and feedback, and reflective practice. She is a committee member of the Educational Developers in Ireland Network (EDIN), and a panel member on the Shannon Consortium panel for their regional teaching excellence award.

Dr Roisin Donnelly is currently on a year's secondment as a Project Manager in the National Forum for the Enhancement of Teaching and Learning in HE; her role there is to guide the development, management and evaluation of the pilot phase of the implementation of the national Professional Development Framework for those who teach in higher education. As part of the team in the LTTC in the Dublin Institute of Technology, where she has worked for 17 years as an Academic Developer, she was Programme Chair for the suite of accredited Postgraduate Programmes for the professional development of academic staff and industry consultants. During this time, she has developed extensive experience of academic professional development and research from within Ireland and abroad, and has presented and published widely [https://roisindonnellyresearch.wordpress.com/dr-roisin-donnelly-publications/]. She holds a Doctorate in Education from Queen's University Belfast, and is a Fellow of both the Higher Education Academy (FHEA), and the Staff and Educational Development Association (FSEDA).

Clare Gormley is a member of the Teaching Enhancement Unit at Dublin City University (DCU) who has worked in the development of technology-enhanced learning (in both academic and corporate contexts) since 1996. She has an MSc in Applied eLearning and has engaged with faculty from software engineering, science, and humanities disciplines to create pedagogically-sound courses for online learners. Her core interests include learning design, academic professional development, multimedia scripting/development, and online facilitation. Clare teaches an accredited Online Teaching professional development module at DCU and thoroughly enjoys working with university staff to explore effective ways of leveraging technology in practice.

Nuala Harding is the Learning and Teaching Coordinator in the Athlone Institute of Technology (AIT). She is a member of the Learning and Teaching Unit which works collaboratively in the support and advancement of learning and teaching in the institute. Nuala is programme coordinator for the LIN - AIT Postgraduate Diploma in Learning, Teaching and Assessment. She has been the AIT representative on the Learning Innovation Network since 2007. She is also a member of AISHE and has co-authored AISHE-J publications. Her current educational research, teaching and publishing interests include the development of academic practice, student engagement and technology enhanced learning. Nuala is a PhD candidate on the Higher Education Research, Evaluation and Enhancement programme with Lancaster University.

Dr Jen Harvey joined Dublin Institute of Technology (DIT) in 1999 and is the Head of the DIT Learning, Teaching and Technology Centre (LTTC). Before moving to Dublin, she worked in a number of academic development roles in various Scottish Universities. She is currently involved in coordinating a number of postgraduate LTTC CPD short courses, including 'Assessment and Feedback to support student learning' as well as teaching and supervising on all the LTTC programmes. She chairs the institutional Learning, Teaching and Assessment Strategies committee. Research interests relate to student assessment strategies, practitioner based evaluations and student transition into Higher Education.

Dr Jane Holland is Senior Lecturer in Anatomy at RCSI, Dublin. Following initial training as a Registrar in General Surgery (MD, MRCSI), she joined RCSI in 2005 (PhD, PgDipEd, FAS). She contributes to a large number of courses from first year undergraduates to RCSI's Postgraduate Diploma in Health Professions Education and the Surgical Membership (MRCSI) examinations. Jane has twice received the RCSI President's prize for teaching (2011 and 2015), and was nominated for the NAIRTL National Award for Excellence in Teaching in 2012. She is on the Education Committee of the Anatomical Society, and an Assessor for their Anatomy Training Programme. Research interests include: anatomy, technology enhanced learning, assessment.

Dr Daithí Kearney - ethnomusicologist, geographer and performer - is a lecturer in music and co-director of the Centre for Creative Arts Research at Dundalk Institute of Technology (DkIT). His research is primarily focused on Irish traditional music but extends to include performance studies, community music and music education. He graduated with a MA Learning and Teaching from DkIT in 2015. Daithí tours regularly as a musician, singer and dancer and recordings include *Midleton Rare* (2012) with accordion player John Cronin. Publications include contributions to the *Companion to Irish Traditional Music* (ed. Vallely, 2012), and the *Encyclopaedia of Music in Ireland* (ed. White and Boydell, 2013).

Professor Clive Lee is Professor of Anatomy in RCSI and the Royal Hibernian Academy (RHA) and Visiting Professor of Biomechanics in Trinity College Dublin. After initial qualification and surgical training, he became a Fellow of both the Dublin and Edinburgh Royal Colleges of Surgeons in 1989, when he then joined RCSI. In 2003, he was awarded the Fullbright Medal and, in 2010, the Samuel Haughton Silver Medal and his ScD for published work. In December 2013, he was elected President of the Anatomical Society, having previously served as Honorary Secretary. His research interests are primarily in bone microdamage and remodelling, and functional anatomy.

Dr Claire McAvinia is a Learning Development Officer at the Learning, Teaching and Technology Centre (LTTC) in Dublin Institute of Technology (DIT). Her current role involves teaching on the LTTC's accredited programmes and CPD modules, contributing to academic development workshops, curriculum development, research, and supervision of Master's and doctoral students. Claire has worked as an educational technologist and academic developer in Ireland and the UK since 1998, gaining extensive experience in the integration of new technologies in teaching and learning in a wide range of settings. She has published on e-learning and academic development since 2000, most recently completing a book based on her doctoral research, *Online Learning and its Users: Lessons for Higher Education*.

Dr Claire McDonnell has been a lecturer in chemistry at Dublin Institute of Technology (DIT) since 2000. She joined the DIT Learning, Teaching and Technology Centre team in September 2013 on a three year secondment during which she was programme coordinator for the MA in Higher Education and contributed to the other programmes and workshops offered. She has particular interests in context and problem-based learning, community based learning, the application of online tools to support student learning and collaboration, student transition to third level and the integration of teaching and research.

Dr Moira Maguire is Head of Learning and Teaching at Dundalk Institute of Technology. She is responsible for, and contributes to, the MA Learning and Teaching there. Moira is President of the All Ireland Society for Higher Education (AISHE) and is also a member of the Learning Innovation Network (LIN). She is a Co-Editor for the *Journal of Learning Development in Higher Education* and a member of the editorial team for the *All Ireland Journal of Higher Education* (AISHE-J). She has a strong interest in supporting students' in their academic writing and the development of assessment literacy.

Gina Noonan is the Head of the Teaching and Learning Centre in the Institute of Technology Carlow (IT Carlow). She is programme director for the MA in Teaching and Learning and facilitates on many of its modules. She also supervises postgraduate dissertations and is a member of the Teaching, Learning and Student Services sub-committee of Academic Council. In addition, she is a member of the Learning Innovation Network (LIN) committee. Gina has over twenty years' experience working within higher education in Ireland, as a lecturer, programme designer/coordinator and external examiner. Gina is currently a candidate on the Doctorate in Higher and Adult Education programme in Maynooth University.

Dr Tamara O'Connor is an educational psychologist working in Student Learning Development in Trinity College Dublin where she helps students develop skills and competencies to improve their academic performance and complete their studies. She has a keen interest in student learning in higher education and believes teaching is inextricably linked to student learning and the student experience – teaching strategies and learning strategies are 'flip sides of the same coin'. Tamara's research interests include self-regulated learning and transition to higher education, and she actively examines her own practice. She is a member of the *All Ireland Society for Higher Education* Executive Committee.

Dr Muireann O'Keeffe has worked in academic development and educational research for over 10 years. Currently she leads the Assessment & Feedback in the Online Environment module at the Teaching Enhancement Unit at Dublin City University. She pursued her Doctorate with the Institute of Education, UCL where she researched how professionals used Twitter for informal professional learning. Previously she held positions as lecturer and learning development manager with the Royal College of Surgeons in Ireland. Prior to that she coordinated and lectured on academic development programs at Dublin Institute of Technology specialising in technology enhanced learning in higher education. Her current research interests relate to the development of academic practice, assessment design, communities of practice, and digital literacies.

Dr Fiona O'Riordan (BABS; MBS; M.Ed; Ed.D) is Head of the Centre for Promoting Academic Excellence in Griffith College. She is also Programme Director for the MA in Training and Education, PG Dip in Training and Education and Special Purpose Certificate in Training and Education. Fiona is a founding member and conference committee member for the International Conference for Engaging Pedagogy (ICEP); Co-Chair of EDIN (Educational Developers in Ireland Network); Associate Member of the National Forum for the Enhancement of Teaching and Learning in Higher Education; and HECA (Higher Education Colleges Association) Teaching and Learning Committee member. She has recently been appointed to the Professional Development Expert Advisory Group by the National Forum. Her research areas include engaging pedagogy; internationalization of higher education; the voice of educators; and curriculum development.

Dr Marion Palmer has recently retired from IADT where she was Head of the Department of Technology and Psychology at IADT and chair of the Institute's Teaching and Learning Committee. She chaired the Learning Innovation Network (LIN) 2010-2015 and was a National Forum for the Enhancement of Learning and Teaching Board member 2013-2016. She also chaired Women in Science and Technology (WITS) 2012-2014. Marion's research interests are teaching, assessment and technology enhanced learning and she researched teaching in Irish Institutes of Technology for her EdD. Marion was a NAIRTL Award of Teaching Excellence winner for 2011. Prior to joining IADT, Marion was a science teacher for twenty years and taught in schools in London and Dublin. She also worked in curriculum development for the NCCA.

Professor Teresa Pawlikowska is Director of RCSI's Health Professions Education Centre and is an experienced medical educator and researcher, having previously held posts in the UK. She has designed and delivered a variety of medical education programmes in diverse environments abroad as part of EU and World Bank projects. She has also devised and developed research methods in medical education courses at Master's and PhD levels. Teresa has taught and researched (and practiced) the medical consultation throughout her career, which was the subject of her PhD. Areas of expertise: curriculum development, reform and alignment, assessment, reflective practice, inter-professional education, cultural sensitivity, integrated consultation and communication skills, and research methodology.

Dr Barry Ryan is a research active applied biochemist with a deep interest in practitioner use of alternative research-based pedagogies in modern higher education settings. His research interests are diverse, but broadly fall into two strands: pedagogical and scientific. These strands are aligned under the overarching theme of research informed STEM education. His lab based research informs and maintains the currency of his undergraduate and postgraduate teaching; whilst pedagogic research ensures the most appropriate approaches to teaching and learning are adopted to support all learners.

Professor Gina Wisker is Head of University Brighton's Centre for Learning & Teaching**,** Professor of Higher Education & Contemporary Literature and teaches and researches in learning, teaching, postgraduate study and supervision. Her publications include *The Postgraduate Research Handbook* (2001, 2008), *The Good Supervisor* (2005, 2012,) and *Getting Published* (2015). She has also published in the areas of twentieth-century women's writing, postcolonial, Gothic and popular fiction: *Key Concepts in Postcolonial Writing* (2007), *Horror* (2005), *Margaret Atwood, an Introduction to Critical Views of Her Fiction* (2012), and *Contemporary Women's Gothic Fiction* (2016). Gina has chaired the Heads of Education Development Group, the SEDA Scholarship & Research committee and edits the SEDA journal *Innovations in Education and Teaching International*. Gina is an HEA Principal Fellow, National Teaching Fellow & Senior Fellow of SEDA.

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