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Building Transdisciplinary SoTL: Creating a Culture and Language of Listening and Learning for Understanding

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Abstract
This paper explores a range of metaphors and methods (Shulman, 2012) that have impacted the development of SoTL across the disciplines at our university. Given that faculty are spread across approximately 60 disciplines and four Colleges at UCC, it is important to figure out how we can communicate effectively about how we teach and how our students learn. A number of research questions are central to the paper: How can faculty talk about teaching and learning effectively across the disciplines if the latter work primarily in specific ways? How can we find an overarching language that facilitates transdisciplinary dialogue, communication and critique? Some of Shulman's questions are also central regarding the nature of the discourse on teaching and learning, how it has changed and how it challenges the discipline.

SoTL does not develop accidentally, overnight. We have trod a SoTL pathway for over 20 years and can identify certain methods and metaphors that have led the way. The latter provide historical and cultural clues that beget a scholarly approach. SoTL itself provides methods that are at once processes of documentation and investigation, found in its portfolio genres, for example. The paper will explore these research methods, as well as the pedagogical methods central to Teaching for Understanding and Disciplinary Understanding on which we have drawn in our professional development accredited programs over many years. Our findings suggest that it is possible to develop a robust language of theory and practice across the disciplines that advances teaching and learning within and beyond the disciplines.

Keywords
transdisciplinary SoTL, the course portfolio, documentation, investigation, teaching for understanding (TfU), disciplinary understanding, language, theory and practice

Pretext

In his foreword to *Disciplinary Styles in the Scholarship of Teaching and Learning*, Lee Shulman (2002) highlights the central and surprising finding of a medical research project on the diagnostic strategies of physicians: There was "no evidence of generalizable diagnostic expertise" (p. vi); rather, "medical diagnostic competence was domain specific" (p. vi), highlighting "the importance of *content* and *context* [emphasis added] in medical problem solving" (p. vi). A decade later, Shulman (2002) reiterated the point in relation to teaching and learning settings: much depends on *disciplinary content and context*, pertinent, therefore, to the current article which seeks to explore transdisciplinary SoTL. Hence, some emergent questions guiding this article are:

1. How can faculty talk about teaching and learning to each other across the disciplines, if the latter works primarily in specific and particular ways?
2. How can we find an overarching language that facilitates transdisciplinary dialogue, communication, and critique?

This paper will attempt to address these questions and will also draw on some of Shulman's (2002) questions, which are still relevant to SoTL and its transdisciplinary base today: "What is the nature of the discourse on teaching and learning? How has it changed in recent years? Where do the conversations take place? Who takes part in the discussions? In what ways does this discourse challenge the discipline?" (p. vi).

Shulman (2002) does point a way forward to reconcile the tensions between the generalizable and the particular in the disciplines, which will be a useful lever in this paper: "At the heart of these differences among the disciplines lie two key concepts that are central to understanding how inquiry proceeds in any discipline: *method* and *metaphor* [emphasis added]**"** (*ibid*). This article will explore some metaphors to provide the *content and context* that have framed teaching and learning for over twenty years at our university and that have enabled the Scholarship of Teaching and Learning (SoTL) to survive and, indeed, thrive. There are several such representations and their narratives that enabled transdisciplinary SoTL and that continue to provide its cultural, historical, and institutional framing. It is important to provide a context and background note to clarify how teaching and learning as scholarship took root at our university and how we evolved into a teaching and learning centre, with satellite communities of learning emergent through our accredited programmes and our diverse seminar series offerings.

Context

My exploration of metaphor and method in this article takes place within the context of a busy teaching and learning centre that I have co-founded and seen grow for more than a quarter of a century. Since I have written elsewhere in more depth about its emergence and culture (McCarthy, 2021a; McCarthy, 2021b), I will focus here on the key moments of the centre's development to inform the audience of professional developers reading this journal. Founded in 1845, our university is now close to two hundred years old. Its motto, discussed below, testifies to the teaching and learning focus at the heart of the institution. The university was also the first in the country to establish a Teaching Development Unit. Though the latter was based more on the traditional training model, which petered out by the mid-1990s, it did create a culture of discussion

around teaching and learning and paved the way for the development of our current investigative approach, emergent in the late 1990s.

The Irish Universities Act of 1997 (Government of Ireland, 1997) called for the systematic Quality Review of departments and units in all universities and was particularly instrumental in stimulating the renewed interest in teaching and learning throughout the higher education sector. Such a focus gave rise to incentives from the Higher Education Authority, in the form of *Targeted Initiatives* and *Training of Trainers* funding, to enable faculty to develop and research their teaching. Our institution took full advantage of these to stimulate interest in research projects about teaching and learning. Other such initiatives in our university, such as the development of a President's Awards programme for teaching—still thriving today—and the introduction of a teaching and learning portfolio as an essential requirement for promotion, as well as top-down support from our Vice President, all helped to create a culture and language of teaching and learning and research in our setting.

By September 2002 there was a ground swell of energy and enthusiasm about teaching and learning, with staff interested in sharing their considerable experience. A call for interest by the Vice President produced a core of experienced staff willing to convene a variety of seminars. Thus grew a coordinated programme entitled "Support for Teaching and Learning," which also necessitated the formation of a Teaching and Learning Team, composed of interested and invited faculty. In May 2003, a successful conference with 120 delegates entitled *Advancing the Scholarship of Teaching* was held at our university. Eighteen staff from several faculties presented the results of research into their teaching practice. Such a conference, with Mary Huber from the Carnegie Institute as the keynote speaker, gave staff confidence and direction to find their own voice and continue to develop their SoTL work.

Our lunchtime seminars, co-ordinated by my colleague who ran our virtual centre with me, had grown in attendance and scope from 2001 and staff became keen to have an accredited programme that would validate their commitment and research. Hence, by the academic year 2003-2004, the time was right for such a programme; our Human Resources Staff Orientation groups, the Support for Teaching and Learning Seminar Series, and President's Award Schemes, provided the groundwork, emergent culture, and interest for such a development. The Accredited Programme in Teaching and Learning in Higher Education was again inspired by our vice president, and the Postgraduate Certificate in Teaching and Learning emerged for the first time in the 2003-2004 Book of Modules. This was a milestone on our journey and I was privileged to become its co-ordinator and director from 2006-2018. There was a huge interest in the programme, over 50 faculty completing it in the first year. The accredited programme consists of a postgraduate certificate (30 credits/ECTS), postgraduate diploma (30 ECTS), and Master's degree (60 ECTS), in teaching and learning in higher education, all of which are at Level 9 of our National Qualifications Framework (NQF), subject to external examination and validated by the National University of Ireland (NUI). To encourage staff to engage with their teaching and their students' learning, a SoTL focus informs the learning outcomes of each module and programme. For example, the programme learning outcomes for the postgraduate certificate read:

- On successful completion of this programme, students should be able to:
- Recognise teaching as a valid form of research and scholarship.
- Participate in discussions on teaching, learning and assessment as a community of scholars.

- Design modules based on principles of student-centred learning.
- Critique planning and teaching practice in the light of student learning/feedback.
- Engage with a diverse, multi-cultural student population.
- Hold a professional commitment to teaching and student learning.

In this way, we have kept SoTL to the fore for twenty years. In the face-to-face iteration of the programme, from 2003–2015, each module consisted of 24 direct contact hours, which took place over six 2-hour lunchtime sessions (12 hours) and three Saturday sessions of 4 hours per term/semester (12 hours total). Hence, the substantial, year-long commitment of staff to their professional development. Such a time-span also gave faculty the luxury of time to re-examine and redesign their teaching and to engage deeply with student learning. The programme continued to thrive throughout those first years, begetting a deeply-embedded culture of debate and critique about teaching and learning, enhanced by the growing scholarship of participants who wrote portfolios about their innovations. Though there were only two members of staff at the virtual centre, one full and one part time, the work was well supported by champions and teaching fellows, drawn from across the disciplines, who helped to review assignments and teach some sessions. To date, over 53% of faculty, approximately 1,200 faculty, have participated in, and successfully passed, at least one of the accredited programmes. And hundreds of staff and faculty still participate in a variety of teaching and learning seminars and digital learning sessions annually.

Due to the embedded nature and gradual development of a teaching and learning movement at our university over time, a community of learning approach is well established. Given that several faculty members from each of the four colleges of the university take one of the accredited programmes annually, there is a groundswell of communities of learning and of practice developing across the academy on a consistent and sustained basis. Our four colleges include disciplines spanning the arts and social sciences, business and law, science, engineering and food science, and medicine and health. With such bottom-up and top-down support, it was possible to create a culture of learning and of listening and understanding over time, and to capitalise on the metaphors and methods that Shulman (2002) detects as central in reaching across the disciplines. We will now explore a range of these metaphors and methods as touchstones that continue to characterize and shape our university's culture and language of teaching, learning, and understanding.

Metaphors and Narratives that Enable SoTL at Our University

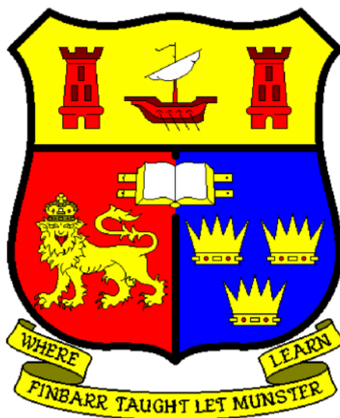
The first metaphor that frames teaching and learning at our university is the college crest and motto, "Where Finbarr Taught, Let Munster Learn," pictured in Figure 1.

This clarion call has numerous representations around the university, subliminal reminders that teaching and learning are symbiotically intertwined as if integral to our DNA. Regardless of the disciplinary field in question, the motto literally heralds a call to learn; it's an invitation, "Let Munster Learn," more than an order, and has become our SoTL imperative. I use the crest and motto in all my introductory SoTL sessions annually, throughout the accredited programme, to draw attention to the fact that we have the only university motto in the country where the words teaching and learning appear together in the one sentence—a constant reminder that we cannot think about teaching without its compelling evidence, student learning. This is precisely the focus of SoTL: to look for the evidence of student learning and to work out the complex relationships

between teaching and learning in their many guises across the disciplines, through talking about our teaching, through sharing our research about student learning and through peer reviewing, critiquing, and learning from our exchanges. Indeed, Shulman (1993) reminds us that teaching is not private, but community property. Nurturing and developing that sense of community, however, takes time and effort and such metaphors facilitate that transition. The crest is a reminder that there is never a perfect time to begin a SoTL journey since it dates to Famine times in our country.

Figure 1

The original crest and motto of University College Cork



In bringing faculty on this SoTL journey annually, I draw attention to the images on the crest, beginning with the open book of learning at its centre. I would invite faculty to discuss why the page was left open and blank. Responses usually related to access and diversity and the invitation to all to learn and to leave their own mark on that page, speaking to diversity and inclusion. I would ask why the city's coat of arms framed the crest. The former has its own Latin motto: "Statio Bene Fide Carinis," signposting the city as a safe harbour and framing the university, therefore, as a safe place to learn. I would then draw attention to the royal lion in the lower left of the crest, symbolic of our British and Oxbridge heritage, which has informed our disciplinary research and teaching models. Finally, in the lower right of the crest, I would relate to the three crowns of Munster, our province, now at once local and global, given the international profile of our staff and students.

It took us over a quarter of a century to embed teaching as scholarship at our institution. We needed time to feel at home among a myriad of disciplines, even if all were sharing the one teaching and learning classroom on an accredited course; we needed even more time to learn to trust each other with our classroom secrets, our mistakes, and our triumphs. The idea of teaching as community property also presupposes a common language of understanding that will enable us to hear each other, and to listen and learn from each other. We have already begun to answer our opening research questions, therefore: The disciplines may work in specific ways, but the crest and motto of the university and the history, resilience, and narratives they evoke, already act as a unifying force that begets a subliminal or meta- communication system, a universal identity into which we can tap. Add to that the consolidation of a regular seminar series and an accredited programme

that is attended by faculty and staff from across the disciplines over several years, and you have the making of a solid foundation for transdisciplinary SoTL.

The second metaphor that frames teaching and student learning at our university relates to the sculpture of the Salmon of Knowledge, entitled *Fantailed on the Falls*, sculpted in 1995 by Conor Tallon, which was donated by the architect of the student building and is displayed on the back wall of Aras na MacLéinn, The Student Centre, overlooking the President's Garden (See Figure 2).

Figure 2

Fantailed on the Falls by Conor Tallon (1995)

According to the Irish legend of the Salmon of Knowledge, whoever ate of the salmon acquired wisdom and would be all-knowing. Fionn, the young student apprenticed to Finnegas, deemed the wisest man in the land, was never meant to eat the salmon; he was meant only to cook it and then present it to his master who would become omniscient upon eating it. However, in burning his finger while removing the salmon from the spit, Fionn inadvertently put his finger to his mouth, thus touching the flesh of the salmon. From then on, Fionn, rather than his master, became the wise one, the seer. When I presented this image to faculty of the Postgraduate Certificate programme, I would focus on the messages it held for us as lecturers and supervisors. Faculty were quick to grasp the message that we cannot possess the knowledge for the students, nor keep it from them, nor make them learn as we see fit. Our discussions would centre around the idea that we could only provide the tools for students to do the learning, and scaffold that process for them. Several would write a portfolio entry on the meaning the legend had for them and how they scaffolded, but not dictated, student learning. The Salmon of Knowledge legend spoke clearly to the performance view of learning for understanding (Perkins, 1998), a hallmark of the Teaching for Understanding (TfU) approach, where the student must own knowledge rather than represent the views of others. Faculty would discuss how Finnegas wanted to possess the knowledge for himself, feeling that only he had the key to wisdom and, arrogantly, could hold the secret of knowledge for himself. The lesson was not lost on those who were supervising PhD students! Though Fionn's coming to know was accidental— as indeed are so many great discoveries—it is significant in pointing out that each student must make the journey to understanding and wisdom for themselves. It also makes the point that knowledge is gratuitous; knowledge is given freely, and no teacher has the right to expect anything in return for the knowledge shared.

Returning to one of Shulman's (2002) questions above, "What is the nature of the discourse on teaching and learning?," it is clear from the legend of the salmon that the relationship between student and teacher has not always been one of mutual respect and trust. Communication has been one-sided and hierarchical, excluding the student, which also begs another of Shulman's questions regarding who takes part in the discussions. The legend serves to sound a cautionary note for all in the professoriate: We need to partner with the student in learning and to find ways to be inclusive and diverse. Hence, this metaphor resonates daily across the university in every teaching and learning situation and is also a reminder that the salmon must make an arduous journey upstream, as does the student in pursuit of knowledge.

Another metaphor that permeates SoTL across the disciplines at our university relates to the artistic and aesthetic space of the Glucksman Gallery, a place where faculty can be playful and begin again to learn and unlearn (See Figure 3). The Glucksman Gallery was completed in 2005 by the architects Sheila O' Donnell and John Tuomey. It is named after the philanthropist Lewis Glucksman who made substantial donations to the university. The gallery conjures up the image of a tree house, investing it with the magic of childhood. It is also reminiscent of a mother ship when one stands beneath it. The architects were inspired by Seamus Heaney's (1991) poem *Lightenings viii,* which referred to such a ship.

Figure 3

The Glucksman Gallery by O'Donnell and Tuomey Architects (2005)

On regular visits to the Glucksman with faculty, I usually spend a few minutes examining the building before we enter it. I ask them what it reminds them of and if they have ever seen any structure like it. I am always delighted to hear that it reminds some of them of a tree house! When I ask what they associate a tree house with, they respond 'playing' and 'hiding.' I think that sums it up perfectly: The Glucksman is a playful space in which we hide away from the world in order to play with it and re-examine and critique it. In the light of my earlier research questions, visiting the Glucksman enables faculty to talk to each other across the disciplines in a new and neutral space. In the presence of such a creative space and its art works, it is possible to listen anew and to begin to forge a new tentative language about what it is like to see a work of art for the first time and to name the feelings and thoughts that it evokes. It also conjures up new ways to talk about a learning experience. For some, standing beneath the building before entering it conjures up images of the hull of a ship—which is exactly what the architects wanted to convey as captured in the

inspirational Heaney poem. The Glucksman can be our tree house or our mother ship in the academy. We can anchor there; we can be safe there to begin again and to hypothesise again through the magic of 'what if,' which the arts reveal.

As an integral part of our accredited programmes, faculty spend at least a two-hour session down at the Glucksman annually. Since our programmes are now primarily online, we have also developed a virtual version of this experience. The Glucksman visit is modelled on the MUSE approach integral to the work of Project Zero and is based on Gardner's Entry Points to Learning approach (Gardner, 1999a; Gardner, 1999b) which provides a range of visual thinking strategies, originally based on the application of multiple intelligences theory (Gardner, 1999a). The idea behind the visits is at least three-fold: to place faculty in front of a work of art they have never seen before and give them the opportunity to enjoy and appreciate it; equally, the aim is to remove them from the normal comfort zone of their disciplinary home, inviting them to identify with their own students and the challenge of what it is like not to know or understand. The experience also demands that each faculty member is part of a group which must function as one, inviting each to listen, as well as to share and contribute opinions about this work which they are experiencing for the first time. Such an approach certainly challenges the discourse of the disciplines that faculty bring with them. In the world of the arts, the certainties of the sciences don't work; historical fact may no longer be relevant and commercial value is trumped by artistic merit. The world is turned upside down in the gallery and classical discourses find themselves contested and fragmented. In short, we are ready to learn again. Thus, the gallery setting also provides some answers to our research questions: We can talk to each other across the disciplines, despite their specificity, if we can gather in a new space that stimulates conversations and questions about a world beyond our disciplines which intrigues us—in this case the world of art and how we learn in that setting and the implications of the latter for teaching and learning. The gallery setting also provides an answer to Shulman's question about where conversations take place: they do so beyond, as well as within the academy, and are the richer for it. Real conversations need a setting and purpose and we have found the Glucksman space ideal for generating conversation and the trust and presence needed to hear each other out and to be open to new ideas. The Glucksman further embeds and extends the community of learning which faculty create and experience through the accredited programme. Another metaphor that captures our SoTL vision and grows out of our sense of place and space is the Tetrapod Trackway at the geopark in Valentia Island in County Kerry (See Figure 4).

Figure 4

The Tetrapod Trackway at Valentia Island, Co. Kerry, Ireland

I took this picture in 2006, the year that I co-founded the Teaching and Learning Centre, with my colleague, who is a geologist and strong SoTL advocate. Our centre was originally known as 'Ionad Bairre,' an Irish name, literally meaning the 'Place of Finbarr,' taken from our motto, previously discussed in my opening metaphor. It is now called the Centre for the Integration of Research, Teaching and Learning (CIRTL). In those early days, we took off to Kerry together for a week to think and talk about how we would shape Ionad Bairre, and to look for inspiration. The latter came to me literally in a blinding flash when I took this shot while on a tour of Valentia Island with my colleague. She explained that 385 million years ago a tetrapod walked across this space and, due to natural forces beyond my expertise, left his tracks in the sands and rock of time. I immediately thought of the image as a perfect representation of SoTL and its call for us to make our teaching visible and leave our tracks for future generations of teachers, students, and scholars. I return to these perennial questions at every opportunity: What will be left of our teaching in 385 million years? How will we track it? How will we capture, measure, and celebrate it? My belief is that, unless we have a SoTL compass to guide us, we have little chance of finding the rich pathways and nooks and crannies of learning. Without SoTL, we will end up in cul de sacs of remedial and deficit thinking and have to repeatedly start over again. Because it has a focus on integrating research, teaching, and learning, SoTL gives us a trackway to follow and points us in the direction of giants on whose shoulders we can survey the terrain and make our own mark. The glinting rain, on the left in the background of the picture, for example, is never lost on my audience. Most talk of light at the end of the tunnel and of the importance of reflection in becoming SoTL practitioners and scholars.

Returning to our overarching questions, it is interesting that our metaphorical take on teaching and learning yields new ways of looking, of listening, of learning, and of speaking. Metaphor brings us to a different range and landscape and to a different discourse. We are no longer only in the tried and tested range of the discipline, cocooned in its signature pedagogies; rather, we are in the range of the symbolic, the metaphysical, and the mythical whose laws of thought and action work differently. In his foreword, Shulman (2002) asks how the discourse has changed. An answer to his questions lies in the metaphors common to all disciplines which take on a life of their own and open new ways of engaging and communicating. By definition, metaphors beget a new language of being and becoming. They unleash the affective and the figurative, the open-hearted and the open-minded. They redefine what is possible and prise open new horizons and vistas.

The Course Portfolio as Research Methodology and SoTL Lever

Returning to the introductory discussion and Shulman's (2002) assertion that all disciplines have *method* and *metaphor* in common, it is now important to consider *method* in defining the content and context of each discipline. His definition of *method* is twofold, relating to *research method* and to *teaching method*. The *research method* central to this chapter relates to the SoTL portfolio genres as research methodologies used to scaffold teaching and learning research and reflections across the disciplines. SoTL literature (Cerbin, 1994; Cerbin, 1996, Cerbin, 2000; Hutchings, 1998) highlights the nature of such portfolios as being, simultaneously, methods of documentation and of investigation; hence, their usefulness in providing faculty with the means to research their teaching. The focus here will be on the course portfolio as a research method, as an act of inquiry, on a par with traditional methods of research (Shulman, 1998, pp. 5–12). Hutchings (1998) reiterates William Cerbin's idea of a course, which defined the original idea of the course portfolio as a genre:

> (a course is) a kind of laboratory; not as a truly controlled experiment, of course, but as a setting in which you start out with goals, then you adopt teaching practices that you think will accomplish these, and along the way you watch and see if your practices are helping to accomplish your goals, collecting evidence about effects and impact. (p. 15–16)

We invite faculty then, during the second year of the accredited programme, to create a course portfolio, to focus on one course they are teaching and make it more inclusive and student friendly. Using the Hutchings (1998) model, the course portfolio method requires staff to critique their course from the perspective of its (i) *Design* (how constructed), its (ii) *Enactment* (its teaching interventions), and (iii) its *Results* (student learning). Such triangulation is powerful in foregrounding the connection and alignment at all levels of the course, placing the ultimate focus on student learning as its organising principle. In our model, the three portfolio entries are further supported by a rubric using Teaching for Understanding (TfU) and Universal Design for Learning (UDL) prompts to enable a variety of approaches to enhance student learning. An early example of a course portfolio rubric from the programme is provided in Appendix 1.

The course portfolio model has served us well to track faculty development and enhance SoTL at our university. Several recent publications (for example, McCarthy & Butler, 2019; McCarthy & Butler, 2022; McCarthy & Butler, 2023) examine case studies and examples of the course portfolio, particularly in the context of TfU and UDL pedagogy. Our findings over the past decade support the idea that the course portfolio genre has done much to develop and advance a robust language of teaching and learning in our institution. Whether in face-to-face or online settings, or at conferences or seminars, faculty from a wide range of disciplines can present, discuss, and critique their teaching and their students' learning in a scholarly way. The course portfolio gives them a language of theory and practice and a grammar to critique and advance it. Returning to my overarching question as to how faculty can talk about teaching and learning, given the singular nature of each discipline, the answer lies in providing faculty with a universal language of teaching and learning which will allow them to find a common denominator with all who teach. The SoTL imperative, which looks for the evidence of student learning, has provided us with that common thread and with research methods that are highly effective in researching, as well as documenting, practice. The course portfolio is a prime example of such a method and has transformed how faculty now design, teach, and assess student learning. It has been well supported by a pedagogy of understanding to which we now turn.

Teaching for Understanding

Teaching for Understanding (TfU) is a pedagogical and disciplinary framework (Wiske, 1998; Wiske, 2005) which emerged from the *Project Zero Classroom* approach at the Harvard Graduate School of Education in the mid 1990s and was a collaborative project between researchers and first- and second-level teachers in the Boston and Cambridge areas. It is grounded in the work of Howard Gardner and David Perkins who served as co-directors of Project Zero research projects. TfU is conducive to a SoTL approach in its investigative thrust, enabling staff to design, document, and pursue student understanding and its evidence. A TfU approach has the advantage of providing staff with two lenses, pedagogical and disciplinary, thus equipping them with a grammar and language of theory and practice to make teaching and learning in the discipline visible and to enhance it. It is particularly suited to third level contexts, given its disciplinary lens, though it is

not widely practised in the university sector to date. TfU has been a central tenet of our professional development at our Teaching and Learning Centre for over 20 years. It has served the test of time in providing faculty with pedagogical and disciplinary frameworks to enable SoTL and enhance teaching and learning (McCarthy, 2008a; McCarthy, 2008b; McCarthy, 2014; McCarthy & Butler, 2019; McCarthy & Butler, 2022; McCarthy & Butler, 2023). For the purposes of this article, I will focus only on the dimensions of disciplinary understanding, since, by definition, they relate directly to the transdisciplinary and can be used by faculty across all disciplines. The references provided above will showcase several examples of the pedagogical elements of TfU in action across several disciplines.

Teaching for Understanding: A Disciplinary Perspective

Shulman (2002) points out that there are two kinds of *method* that pervade each discipline, a *research method* and a *teaching method.* We now turn to the second of these to complete our analysis. The *teaching method* at the heart of the paper relates to the Teaching for Understanding model (TfU) (Wiske, 1998; Wiske, 2005) central to the work of Project Zero and to the work of our centre. TfU provides a robust pedagogical structure that speaks to curriculum design, its enactment and assessment of teaching and learning on the one hand, but also to the disciplinary dimensions of understanding that inform that teaching (Boix Mansilla, 2000; Boix Mansilla & Gardner, 1998). In the context of higher education, this latter focus cannot be underestimated in providing a way of facilitating communication and critique across the disciplines. The dimensions of disciplinary understanding are, in themselves, a transdisciplinary framework, drawing attention to the common denominators of disciplinary understanding across all disciplines, hence their central role in this paper. They provide us with a common language and purpose which enables us to listen to each other and to talk meaningfully about our teaching to colleagues from any discipline. In the context of professional development, it is important to remember that the academic identity of each faculty member lies primarily in their disciplinary home. Hence, the importance of embracing the dimensions framework as a way of moving beyond disciplinary silos and signatures. The dimensions are like a lingua franca, providing a grammar and language of theory and practice that enables faculty to name the parts of teaching and learning emergent in each discipline and to communicate and share insights with colleagues to improve student learning and advance research in the discipline and the classroom.

The disciplinary lens emerged in the Project Zero research in the mid 1990s when teachers and researchers began to think about their subjects and course content, as well as their pedagogy, uncovering four dimensions of understanding that undergird that pedagogy (Wiske, 1998; Wiske, 2005). At the university level, we are teaching the disciplines and our pedagogical decisions need to grow out of our disciplinary expertise and need to model good disciplinary practice if we are to engage our students as expert learners. The four dimensions of disciplinary understanding that were identified and are common to all disciplines are knowledge, methods, purposes, and forms. (Hetland & Veenema, 1999; Perkins & Blythe, 1994; Veenema et al., 1997; Wiske, 1998).

Knowledge. The 'what' of learning which relates to the key questions that the disciplinary expert/teacher is asking. We need to be conscious that students come from different backgrounds and some knowledge they carry may conflict with the knowledge of the discipline. Knowledge needs, therefore, to be modelled and provided if a student is to perform with the authentic knowledge of the discipline.

Methods. The ‘how’ of learning which relates to how the disciplinary expert finds out and how this is modelled for the student who needs to be a partner in the learning. The *Methods* dimension addresses the discussion and testing of knowledge in a systematic way and maps on to the method of the pedagogy which takes its lead from identifying tasks in the discipline with which students can authentically engage.

Purposes. The ‘why’ of learning which relates to the central importance of any aspect of the discipline and the expert’s rationale. Purpose invokes the ethical dimension of an investigation and the moral imperative that such knowledge is used for the good of all. The *Purposes* dimension is important to all students as it demonstrates how knowledge can be applied to the world around us. This encourages a student to see how knowledge is created, how to take ownership of knowledge, and how to apply it in a practical way to real world issues.

Forms. This dimension relates to the various ways and genres through which knowledge is expressed and presented by the expert. UDL principles, for example, remind us that as lecturers we need to provide multiple forms of action and expression to harness student learning. Thus, an awareness of the variety of *Forms* used in the discipline strengthens authentic assessment and performance where students own their learning and can express it to take context, audience, and register into account. The danger is that forms can become calcified and certain forms are overused, for example, those that facilitate the written word such as the exam script.

The dimensions of understanding remind faculty that each discipline has four pillars which are equally important if it is to flourish and sustain itself and fully impact student learning. An anecdote relating to the professor of General Practice at our university, and his use of the dimensions to critique a new course he was devising relating to Graduate Entry into Medicine (known as the GEM), will serve to highlight how the dimensions can be used to steer the discipline in the right direction. The problem with the *Knowledge* dimension is that it can easily be reduced to a set type of rote learning, which is supported by the traditional examination system. Hence, the medical student may be very familiar with the parts of the body but not understand how to assess these in light of an ill patient. Again, the *Methods* dimension becomes more complex when the opportunities to think like a doctor are curtailed to the confines of an exam paper and a very tightly scheduled academic year. The *Purposes* dimension is confined when the student doctor does not have access to real patients. Finally, the *Forms* dimension is impacted when the trainee doctor is confined to set scripts and formulas. In reflecting on the dimensions, the GEM professor realised that the course was skewed in the direction of *Knowledge* and *Forms*. In short, there was ample opportunity for students to demonstrate their book knowledge in set examinations and to demonstrate their knowledge of procedures in formulaic settings. However, in critiquing his course, he realised that *Methods* and *Purposes* fell short. Yet, these were the disciplinary areas where students learned to think and act like doctors. His ‘eureka moment’ was in recognising this discrepancy. His solution was to change the whole focus on the new GEM programme and ensure that medical students were given a much longer placement with real general practitioners in the community and increased opportunity to engage with and cater for real patients in real community settings. The ethical imperative was also uppermost in his mind: Doctors are there to serve patients and not only to study medicine. Hence, his renewed focus on the reality of implementing the Hippocratic oath. Shulman would approve of the professor’s strategy and of such interventions that change how we think about teaching and learning to enhance the latter, but also to make the world a better place.

Conclusion

Returning to my overarching questions regarding how we can communicate and listen to each other and learn from each other across the disciplines, we can conclude that we build up a language of theory and practice over time that invites us to problematise our teaching and our students' learning. Our metaphors and methods provide a grammar and language of theory and practice that has a general application, regardless of the discipline. Because we can name something, we can begin to know it and to examine and critique it. Learning a language that defines pedagogy and that also names the understanding axis in each discipline enables us to reflect on and develop our teaching to advance student learning and the discipline itself. Through the course of a quarter of a century, developing such a language becomes ingrained in the culture until it is a way of being, as well as a way of knowing. That is the story at our university.

Returning to Shulman's (2002) final question, "In what ways does the discourse challenge the discipline?," the answer highlights the key role of discourse. The discourse of teaching and learning is a key lever by which any discipline survives. The language of teaching and learning, and its dynamic and interactive nature, challenges the discipline to be open to new ways of working, new ways of reaching students which, in turn, beget new ways of assessment and of action. A discipline is sustainable not only if it constantly engages with current research questions and with the world, but if it also engages wholeheartedly with the questions and concerns of its students. After all, they are the future of the discipline and with them lies the hope of more inspired and visionary thinking and understanding. With them also lies the possibility of a better world where the disciplines have a moral imperative and impact beyond their academic and intellectual remit. The discourse of teaching and learning should be ever dynamic and changing if we are teaching well and challenging ourselves as teachers and disciplinarians. In its inbuilt mechanism to question and critique, SoTL invites and allows us to re-invent the discourse to take account of new directions, new technologies and new findings about student learning. The discourse of teaching and learning will constantly challenge the discipline, and our safety valve lies in our remaining open-minded, wholehearted, and responsible. Hence, we are back with Dewey (1933) and, ultimately, with the words of Ralph Waldo Emerson (2008) that "character is more important than intellect" (p. 70). In short, our students are also our citizens who go on learning long after their college days are over and who are ultimately called to action for the good of society. And therein lies the daily challenge for every discipline and every act of teaching and learning.

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Appendix 1

Centre for the Integration of Research, Teaching and Learning

PGDTLHE Course Portfolio Feedback Sheet.

Postgraduate Diploma in Teaching and Learning in Higher Education **Module TL 6006**

Submit a hard and electronic copy by Thursday 21 April, 2016 at 1 pm

Name:__________________________ Department: ______________________

Critical Friend:___________________ Department:_______________________

Criteria	**Well Achieved**	**Achieved**	**Nearly There!**	**Not Achieved**
Introduction 5 February Draft – share in class	I have clearly provided and discussed a detailed context and rationale for my reasons for examining this module.	I have provided a context, and identified a research focus and rationale for my reasons for examining this module.	I may not have considered all elements of this Introduction.	I have not addressed the elements of this introduction in any meaningful way.
Entry 1. Design 13 February Share draft entry in class	I have contextualised the course and focused on its history and design. I have critiqued the course in the light of TfU & UDL and	I have contextualised the course and focused on its history and design. I have reviewed the course in the light of TfU & UDL and	I have contextualised the course and focused on its history and design. I have not sufficiently used TfU and/or UDL as	I have not engaged with TfU/UDL to critique this course. The evidence is

+ follow up review	included a Graphic Organiser. My evidence has been discussed and embedded in my entry.	included a Graphic Organiser. I have supported my claims with appropriate evidence.	a critical lens to review this course. I have not used my evidence well to support my claims.	patchy and unfiltered.
Entry 2. Teaching 5 March Share draft entry in class + follow up review	I have focused on a session(s) in which I involve the students in a key Performance of Understanding. I have analysed and critiqued the strategy utilised to involve the students in the light of TfU/UDL. My evidence is coherent and embedded in TfU.	I have focused on a session(s) in which I involve the students in a key Performance of Understanding. I have analysed the strategy utilised to involve the students in the light of TfU/UDL. I have provided and analysed appropriate evidence.	My session is built around a series of activities rather than Performances. It focuses on what I am doing rather than what the students are doing. I have not analysed the strategy with student learning in mind. I must provide appropriate evidence.	My teaching is not focused on student learning nor on TFU/UDL principles.
Entry 3. Student Learning 5 April Share entry – reviewed by critical friend	I have critiqued what students learned during the session/ course and analysed the formative, on-going assessment methods, utilising a TfU/UDL approach. I have embedded the evidence of the student voice in my teaching.	I have focused on what students learned during the session/ course and discussed the formative, on-going assessment methods, utilising a TfU/UDL approach. I have analysed the evidence of the student voice in my teaching.	I need more emphasis on student learning in the light of TfU/UDL perspectives. I need to work more on developing formative assessment approaches. I must work on providing evidence of the	Student learning is not at the heart of this entry.

			student voice in my teaching.	
Conclusion Submit with portfolio April 21	I have reflected in depth on what I have learned about teaching/ student learning using the TfU/UDL approach. I have drawn the evidence together coherently and seamlessly and I have highlighted the implications for future practice and research.	I have reflected on what I have learned about teaching/ student learning using the TfU/UDL approach. I have drawn on all the strands of evidence from this portfolio. I have considered possible improvements to my teaching and implications for future inquiry.	I have not reflected sufficiently on what I have learned about teaching/ student learning from using the TfU/UDL approach throughout this portfolio process. I must identify improvements to my teaching and implications for inquiry.	I have not reflected on my learning nor drawn together any strands of evidence from this portfolio.

I have conducted a Self-Assessment of my work, highlighted the appropriate categories of the Rubric and attached a copy of same ☐

I have also conducted a peer review analysis of each entry with my critical friend ☐

I have proof-read my work ☐ I have included a Bibliography ☐

Signature of Student: ________________________ Date:__________

Comment:____

____

Well Achieved ☐ **Achieved** ☐ **Nearly Ther**☐ **Not Achiev**☐

First Reader _____________ Second Reader:_____________Date: _______