# Enhancing Student Learning through Transdisciplinary and Collaborative Inquiry

Penny L. Humby<sup>1,2</sup>, Jake Rowan Byrne<sup>2</sup>, Michael A. Wride<sup>3</sup> <sup>1</sup>School of Natural Sciences, <sup>2</sup>School of Education, <sup>3</sup>Academic Practice and eLearning (CAPSL)



**Trinity College Dublin** 



What I feel I gained from the TIN course was an appreciation of interdisciplinary dialogue, from hearing perspectives based on vast amounts of information in areas completely different to my own. Working as part of a team structure where we all were trained in contrasting disciplines taught me a huge amount about effective communication and collaboration, and approaching problems in a new light has really benefited how I approach my own degree. Participating student

# Outcome

## Student-centred Approach

Each student was asked to identify three key topics they would like to investigate. Groups were selected based on common interests, while ensuring each disciplinary category (Figure 1, C) was represented in each group. Current global issues, issues in the news and personal concerns were the types of topics selected and could be classified into four broad categories: Sustainability, Politics and the Media, Globalisation (including human rights, global economy and access to education) and Climate change. Impact

Students were asked to fill in questionnaires at the beginning of workshop 1 and workshop 5. Survey Instruments consisted of modified Interdisciplinary Education Perception Scale (IEPS)<sup>8</sup> and modified Readiness for Interprofessional Learning Scale (RIPLS)<sup>9</sup>. They reflected on each workshop and participated in final focus group.

Overall shifts in confidence for particular skills were noted, including: having a global perspective, conducting independent research and dealing with ambiguity.

I think as well it was really hopeful 'cause we are dealing with these issues that are wicked problems and you try to create a solution and you get another problem, and sometimes talking about this can be really frustrating but I came out of it feeling really hopeful, really open to the idea rather than frustrated.



Figure 2: Positive shift in confidence when dealing with ambiguity after participating.

What I learned in [the workshops] is you don't have to know everything about a topic in order to contribute and in order to discuss it, you can know very little and you can still be of value. It's that kind of opening up to learning and to not be afraid to contribute even with the little knowledge that you think you have, it can be of value.

Students became more empowered, reflective. selfaware and confident

I felt like you don't need to have a solution, like your own solution coming from one discipline; other people ... have their knowledge that they want to contribute, so together, not separate, but together you can come to a conclusion.

Students gained skills and understanding in collaboration and team work

This experience had a lasting impact

I participated in the Transdisciplinary Innovation workshops and had a wonderful experience. So much so that I plan to pursue further study that is transdisciplinary and focuses on innovation. I'm very interested to follow it as it has had a big impact on my thinking.

### Summary

A student-centred, transdisciplinary approach was used in these workshops and even with only 10 hours of contact time, significant changes in students' attitude and approaches with regard to cross-disciplinary graduate attributes can be observed. This type of learning environment would be beneficial in any curriculum. A student summed it up best in the exit focus group discussion:

"I would just like to thank you guys for opening up a space where we could discuss with other disciplines, problems that are very current and that I think we all come across in some aspect of our disciplines but, ...there isn't that many spaces where people want to tackle these issues and talk about them... So it was really nice to have a space for two hours once a week.. to be able to talk about them, to discuss them, to be open to hearing everyone's opinion from all the different disciplines, it was really nice, I find it really beneficial as well going forward."

#### References

Neterences
J. Songca, R. (2006). Intern Jof African Renaissance Studies, 1(2), 221-232.
Drake, S. M., & Burns, R. C. (2004). ASCD
Beane, J.A. (1995). The Phi Delta Kappan, 76(8), 616-622.
Orake, S. M., & Reid, J. (2010). What works, 28, 1-4.
Dyer, J. A. (2003). Nursing Ed Perspectives, 24(4), 186-188.
Mendermol. (2020). Tearwork invitation of the Construction of the Constr

6. Nicolescu, B. (2010). Transdisciplinary J of Eng & Sci 1(1), 19-38.

Connell, G. et al. (2016). CBE-Life Sciences Education, 15, 1-15.
Luecht et al., (1990). J of Allied Health, 19(2), 181 – 191.
Parsell, G. and Bligh, J. (1999). Medical Ed, 33(2), 95-100.

This project was possible through the TCD Senior Lecturer. Trinity Teaching Innovation Grant.

We ran an undergraduate extra-curricular series of workshops (Transdisciplinary Design and Innovation) for Trinity College, Dublin in Feb -March 2017. The idea was to engage students in collaborative learning within a cross-disciplinary environment with the goal of having them develop skills in dialogue and design thinking while gaining confidence in approaching complex, real-world problems in a transdisciplinary way. It was designed to foster an open, creative and collaborative spirit in problemsolving and incorporated the pedagogical practices of student-centred learning and transdisciplinarity, and, unlike subject-based approaches focussed on changing people's perceptions, exploration of self and the discovery or creation of new knowledge"1. This module was student-led and not prescribed<sup>2</sup> and stemmed from real-life problems or issues raised by students<sup>3</sup>.

#### Rationale

21st Century skills development involves a holistic approach to thinking and problem-solving and includes elements such as; collaboration, citizenship, creativity, communication, higher order thinking and global mindedness<sup>4</sup>. Many of these attributes do not fall within discipline boundaries and an integrated approach to teaching and learning is necessary.

Transdisciplinarity works at a level beyond disciplines and its goal is the understanding of the present world<sup>5,6</sup> thus it is an effective way to teach these skills. Student-centred learning has also been shown to be beneficial for developing skills and engaging students<sup>7</sup>.

# Who participated?

All year levels and most programmes were represented by the students who participated.



Figure 1: Demographics of participating students. N=20 A: Gender. B: Year of programme. C: Programme type.

#### Module Design

Table 1: Transdisciplinary Design and Innovation Module overview: 5, 2 hr session; 10 hours contact time , plus a final presentation event where students presented posters on their work (Trinity Week).

	Workshop 1 – Café	Workshop 2	Workshop 3	Workshops 4 & 5
Theme	Identify	Develop	Understand	Act
Key aim	Introduce students to each other.	Understand and experience effective communication	Recognize 'wicked problems'	Digital skills – coggle.it, Poster design skills Develop collaborative learning skills
Theory	Brief overview - Empathy activity	Dialogue & Communication Design thinking	Creativity, Complexity Wicked Problems Transdisciplinarity	Facilitate thinking process, can the groups get to a transdisciplinary approach?
Plenary and Break- out groups	World Café° Students rotate after each round to mix up groups.	Assign groups. Using a mind map: - Solidify topic - Identify stakeholders	Role play as stakeholder Identify dichotomies and tensions within the issue	Move towards an action that addresses the tension around a dichotomy within the issue Plenary: Groups to share their ideas and get feedback from other groups

Café questions

Q1: Identify and discuss a positive learning experience and/or a challenge you have had as a student. Q2: Do you think your course should be addressing 'real world' problems? Why/why not

If so, how can this be accomplished?

Q3: What are some real-world problems YOU are interested in? why?

