

Ollscoil Mhá Nuad  
Maynooth University

An tIonad Teagaisc agus Foghlama  
Centre for Teaching and Learning



**Maynooth  
University**  
National University  
of Ireland Maynooth



**Teaching and Learning  
Fellowships 2022–23**

How to cite this document: Centre for  
Teaching and Learning (2024). *Teaching and  
Learning Fellowships 2022- 23 Report*.  
Maynooth: Maynooth University CTL.

This publication is dedicated to our colleague  
Professor Dónal O'Neill,  
Department of Economics

## Contents

Foreword	3
Teaching and Learning Fellowships	4
1. Do students read the feedback we give them? An analysis using non-obtrusive eye-tracking technology	4
2. Building a neurodiverse community in higher education	10
3. Developing collaborative module and course evaluation tools	16
4. Participatory Development and Piloting of a Pedagogical Toolkit aimed at Supporting and Enhancing Neurodivergent Students in the area of Teaching and Learning	22
5. Computational thinking module for primary and secondary pre-service teachers	26
6. Maynooth University teaching and the Sustainable Development Goals	32
7. Eco-journaling: climate engaged learning through literature	38
8. A Digital Skills Passport: an instrument to promote student success by helping them identify and link their competencies through sign posting key opportunities for attainment of employability skills embedded in the chemistry laboratory curriculum	42
9. Virtual exchanges with native speakers in the Spanish-speaking world: Integrating language and culture	48
10. Pod learning: using student-created podcasts for assessment and feedback in undergraduate teaching	52

## Foreword

Colleagues,

It’s an honour to introduce this publication, which shares the reports of the Teaching & Learning Fellowship projects for 2022–23.

The Teaching and Learning Fellowships form part of CTL’s Scholarship of Teaching and Learning (SoTL) programme and are a key part of how we demonstrate our ongoing commitment to inspiring, enhancing, and supporting teaching excellence and student success at Maynooth University.

The Fellowships open possibilities for staff and students to work collaboratively to explore and advance teaching and learning approaches, address common challenges, and to learn from disciplinary knowledge and strengths.

The theme for the T&L Fellowships 2022–23 was ‘Enabling Student Success through collaboration and partnership’. It is particularly heartening in this report to see the strong collaboration across faculties, academic and professional departments, the embedding of co-participatory and student partnership approaches, and a keen focus on developing inclusive and sustainable educational practices.

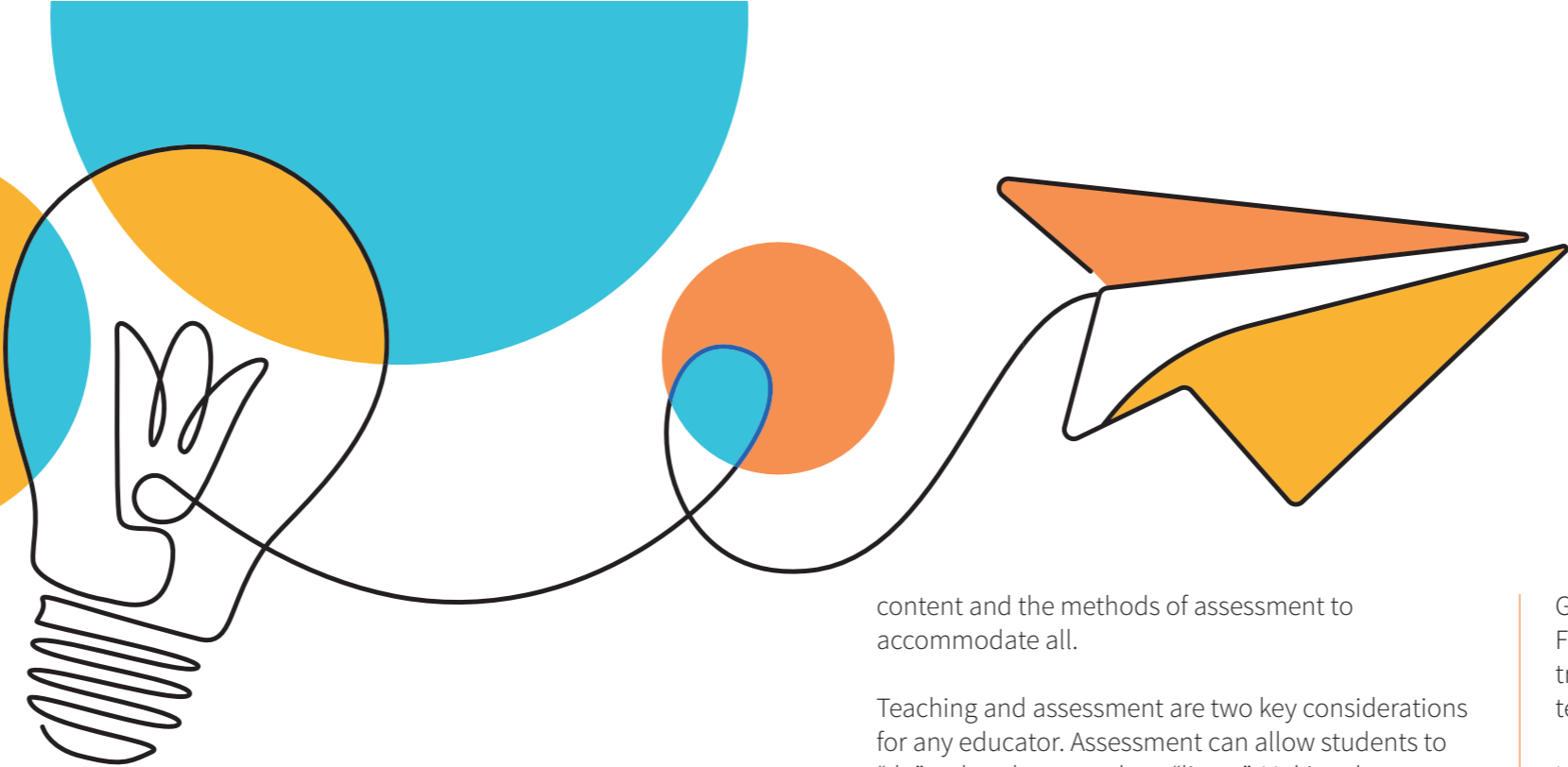
I would like to acknowledge the Fellows for their exceptional commitment to research-informed pedagogical development to enhance student learning and congratulate them on their fellowship project achievements and learnings.

I encourage colleagues to engage with these 2022–23 Fellowship project reports and to follow-up with colleagues should they wish learn more.

**Lisa O’Regan**  
Head of Centre for Teaching and Learning  
Maynooth University

# 1

## Do students read the feedback we give them? An analysis using non-obtrusive eye-tracking technology



### Lead and team members

- Aidan Mooney (lead)
- Tracey Ní Mhaonaigh
- Mark Noone
- Hope Boyle

### Departments

- Computer Science
- Nua-Ghaeilge

### Abstract

This project considered the theme “Assessment and feedback practices that support student success.” Specifically, we wanted to explore how students engage with assessments and if they read the feedback that we give to them. To do this we undertook an analysis using eye-tracking technology, a well-established domain in Psychology and in reading analysis, across two distinct subjects. Based on the findings of this work it can be suggested from the analysis carried out that students are not fully engaging with the work and/or feedback that they are given. When the students do engage with the feedback, it is usually only high-level attention, with a focus on grades over the written feedback.

### Project outline

On the Maynooth University website there is a section related to Inclusive Teaching and Learning which highlights that inclusive teaching means recognising, accommodating, and meeting the learning needs of all students. This intention around inclusive education highlights how the teaching or assessment style can inadvertently exclude some people and suggests that alterations can be made to both the delivery of course

content and the methods of assessment to accommodate all.

Teaching and assessment are two key considerations for any educator. Assessment can allow students to “do” rather than merely to “listen”. Making these assessments engaging, thought-provoking and beneficial to every student is critical. Regular feedback allows students to adjust their practice and to achieve better results. However, do students read the feedback provided?

This project attempted to answer this question by using non-obtrusive eye-tracking glasses which students were asked to wear when presented with feedback. We were then able to monitor what the student looked at, for how long they looked at it, and in what sequence to help us to analyse what students do with feedback. This cross-disciplinary project involved students in both Computer Science and Nua-

Ghaeilge as they received feedback in assessments. Feedback was given both digitally and in more traditional paper format, and both with and without a template.

Using collaborative student input, we designed assessment templates to use when monitoring student gaze as they received feedback, thereby working with these students to test our experiments. We also expanded the project to include assignment completion as well as feedback.

Eye-tracking is a popular tool that allows us to track what a user looks at in real-time. It is a form of sensor technology (Tobii, 2022). By using eye-tracking technology, the resulting data can give us a deeper understanding of human behavioural patterns and cognitive processes (Tobii, 2022). The eye-tracking glasses used were Tobii Pro 2 glasses<sup>1</sup> with a recording rate of up to 100Hz. These are non-obtrusive

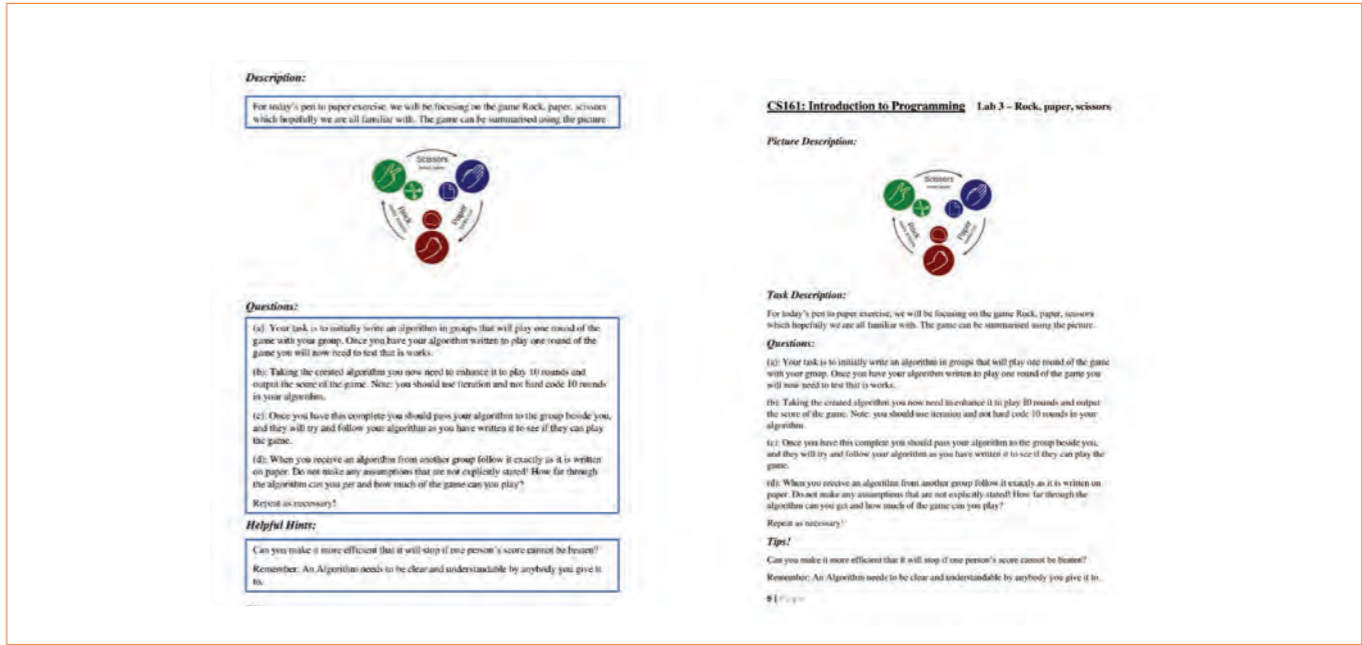


Figure 1: Sample CS (Computer Science) template with boxes, and Sample CS template without boxes.

1 <https://www.tobii.com/products/discontinued/tobii-pro-glasses-2>

technology which allow for real-world type experiments to take place.

# Findings

## Template Development

The first part of this project involved the creation of assessment templates. Over 20 different templates were created for first-year Computer Science labs, both digital and paper. These templates were created by using old lab assessments. These old templates were analysed and converted into two templates that were given to random students during their weekly labs and tutorials. We could see which template students engage with best by having two different ones. The templates for the Computer Science labs were assessment-focused rather than feedback-focused. First, the templates needed to be straightforward and easy to read, with a font that was readable to all students and a colour scheme that would be accessible by all students (people with colour blindness, for example). For one of the weekly templates, boxes were used to structure the tasks into sections. This would allow students to see the structure of the question clearly. The other template would have the same exercise but with no boxes, as shown in Figure 1.

The Nua-Ghaeilge templates focused on assessments and feedback, resulting in a different structure to the Computer Science templates. Sample templates can be seen in Figure 2.

## Implementation

In September 2022, the templates were used as part of the weekly lab assessment in Computer Science. Students attended their lab session at their usual time and were asked if they would like to participate in a project where they would do an exercise while wearing eye-tracking glasses providing their name (optional), age, date, and time when they were doing the exercise. No time limit was given as there was no need for additional stress to be placed on the students. The student would work on the exercise for as long as they wanted or as little as they wanted. While they worked, the glasses recorded their eye movement, which would be used in the analysis stage. In the Computer Science department, 38 students participated in the project.

For the Nua-Ghaeilge department, the implementation process was similar. Students came to a tutorial-based setting and were given an exercise or feedback. While doing their work, they wore the eye-tracking glasses, having consented to do so, and

the recordings were analysed later. In the Nua-Ghaeilge department, 22 students participated in the project. This resulted in a total of 60 students taking part in the project.

## Data Analysis

A cohort of 60 students ensured there was a large amount of data to analyse for the project. The analysis began of all the recordings and snapshots taken in the labs and tutorials in semester one. For the Computer Science department, there were 2 different templates created for each lab; see Figure 3. These figures show heatmaps for the eye movement in each case. The darker the colour in these figures, the longer the periods gazing at a particular area of the screen. These templates were given to different students, and then they were analysed; it was noted that the engagement was vastly different for both.

We can see, in Figure 3(a), that the student paid particular attention to the centre of the page. The assessment is divided into sections with the use of boxes. The box structure, dividing the assessment into parts, seems to help with the student’s overall engagement with it. The student had an elevated level of attention for the first two parts of the exercise, which were the most important. Overall, the student engaged well with this exercise.

In Figure 3(b), the student’s engagement with the overall exercise was low. A small portion of the heat

map is red, but this high attention was not focused on the exercise at all. It could be from the lack of structure, with no boxes or that they did not understand the exercise.

For the Nua-Ghaeilge department, we had both feedback templates and assessment templates. When it came to students completing an exercise, Figure 4 demonstrates how the student focused on the first few questions, but after a while, they began to lose focus. It could be because the exercise became difficult, they became distracted, or how the question was laid out did not suit them.

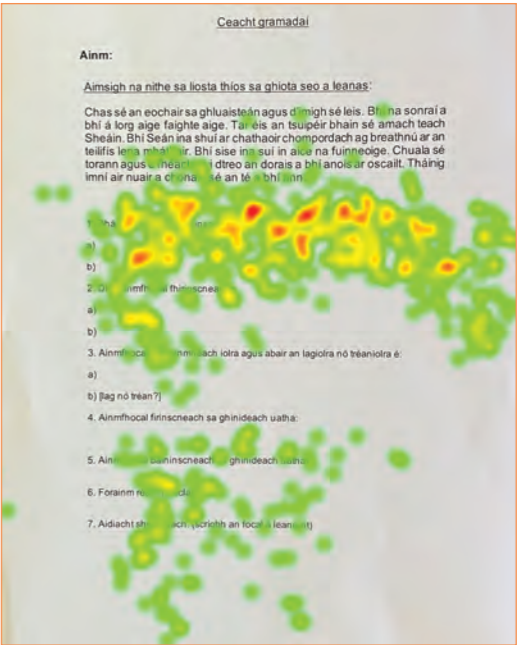


Figure 4: Focus during reading of questions.

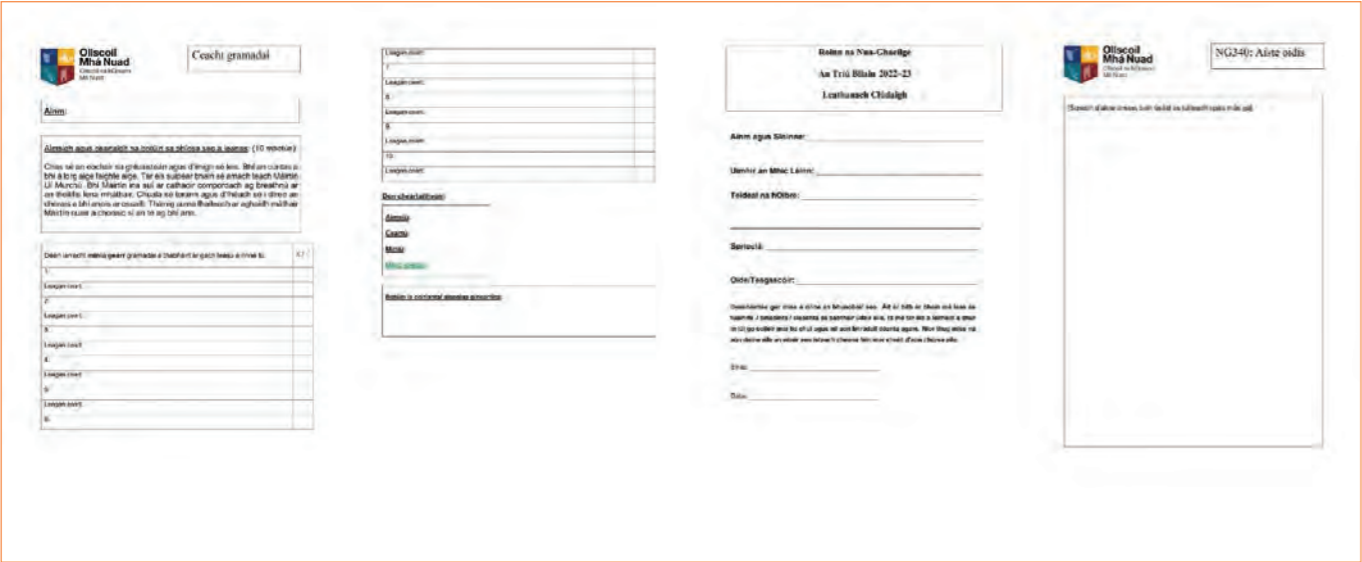


Figure 2 (a): Sample NG Template, (b): Sample NG Template.

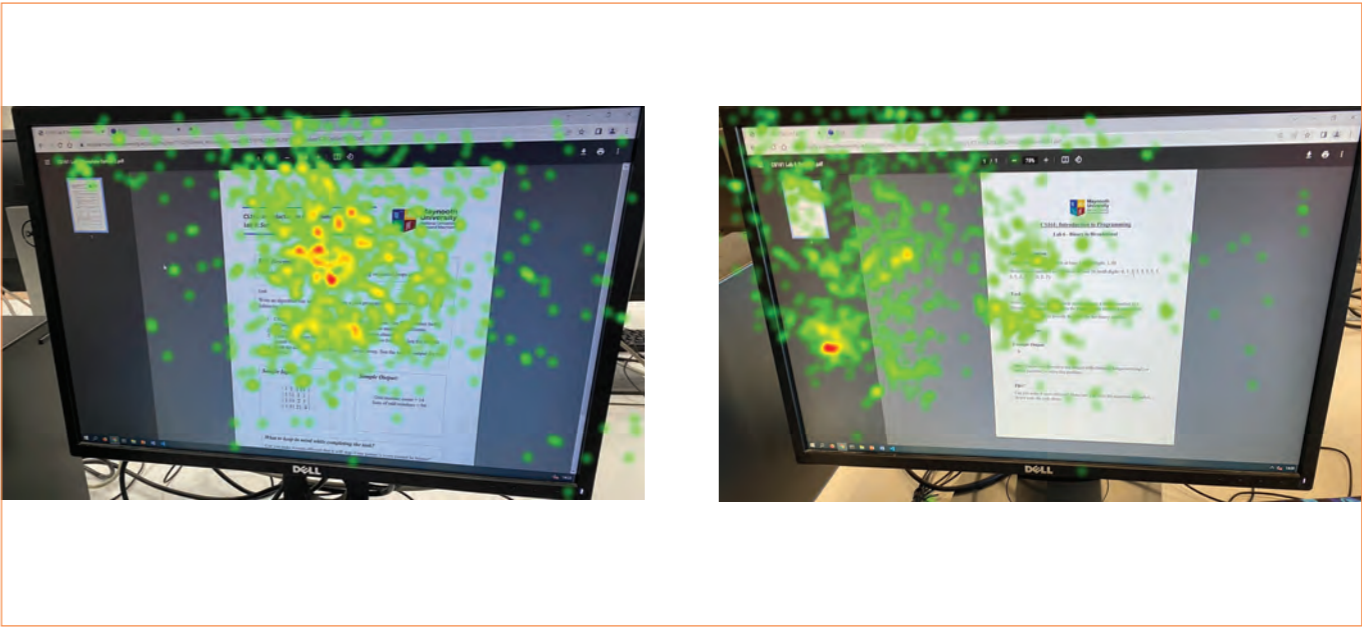


Figure 3: Heatmaps of sample gazes (a): with a box structure and (b): without a box structure.

When it came to students receiving feedback on an assignment, there was an elevated level of attention at the start of the page, which can be seen in Figure 5(a). As the feedback goes on, the student’s attention becomes less. Figure 5(b) shows that the student did not look at all at the written feedback they got but looked straight at the grade awarded.

## Key reflections

It can be suggested from the analysis carried out that students are not fully engaging with the work and/or feedback they are given. When they do engage with the feedback, it is usually only high attention for the top of the page for Nua-Ghaeilge or the middle of the page when it comes to Computer Science.

One idea would be to grade the submitted work, give feedback, and ask the student to complete the assessment again to see if they are engaging with the feedback that they were given previously.

With Nua-Ghaeilge, they looked at some of the feedback but then rushed to the overall result, missing core information about why they got said grade. It would be worthwhile asking students why that is.

With regards to future research, it would be interesting to give the students assessments and provide them with live feedback. This would allow greater insights into their overall engagement with that assessment and the module. Running focus groups would also allow an opportunity to get more feedback as to why the students engaged with the template for that assessment.

Another interesting avenue of research would be to involve neurodiverse students and enquire from them how engaging templates could be made for them and subsequently test those changes, with new templates and analysis, for all students.

## Recommendations

The Tobii glasses allow for authentic real-world eye-tracking data collection. These glasses can be used in any setting and allow for a large amount of data to be gathered in a short amount of time. Being unintrusive, once in place, means that students will carry on as normal with the task at hand, allowing for authentic data collection. We would therefore strongly recommend using this technology to collect and analyse relevant data.

## References

Tobii. (2022) What is eye tracking? Available at: <https://www.tobii.com/learn-and-support/get-started/what-is-eye-tracking>

## Find out more

To find out more about this fellowship project, please contact Dr Aidan Mooney, Computer Science Department, [aidan.mooney@mu.ie](mailto:aidan.mooney@mu.ie)

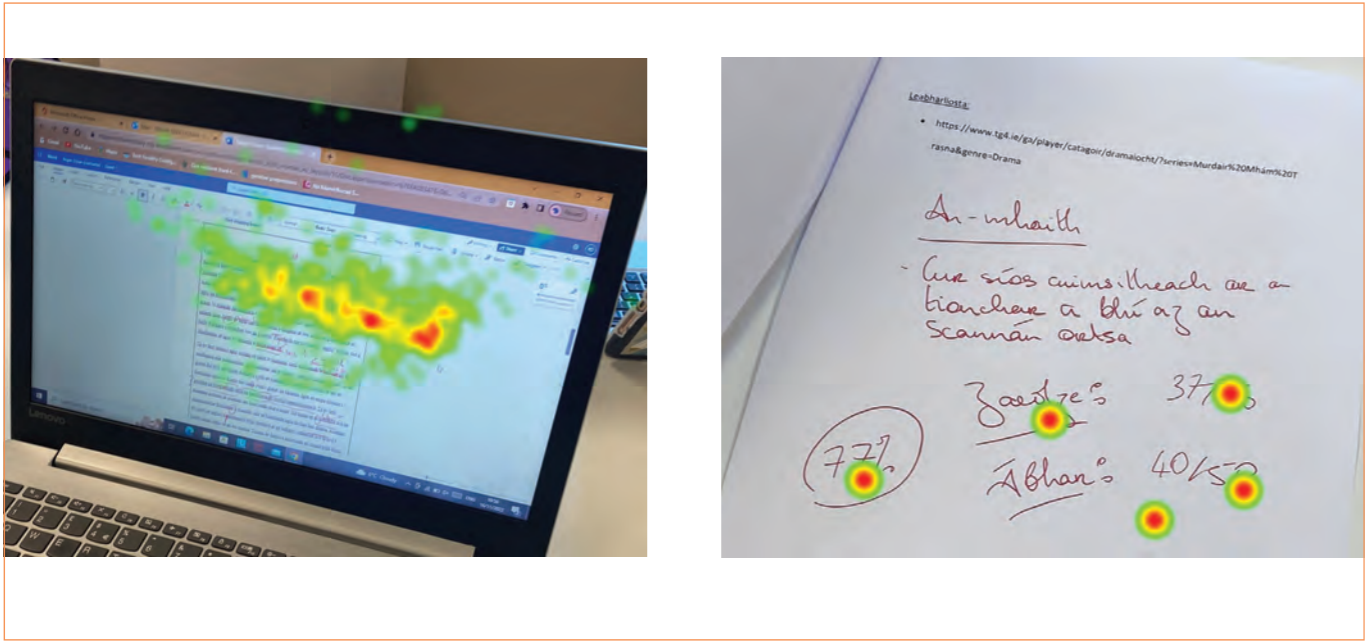


Figure 5 (a): Heatmap for NG with digital template, (b): heatmap for NG with paper template.

# 2

## Building a neurodiverse community in higher education

### Lead

- Deirdre Forde

### Department

- Froebel Department of Primary and Early Childhood Education

### Abstract

This study explored the impact of neuro-affirmative training in initial teacher education (ITE). Student teachers (primary) engaged in this module. As a lecturer in Inclusive Education and MAP liaison advisor, I have noticed that autistic students in initial teacher education (primary) are afraid to disclose their neurodiversity to placement schools or their peers due to the stigma attached to the ‘label’ and fear of it affecting their future employability. In fact, the findings of a study investigating the experiences of autistic teachers, highlight that their experiences in schools are impacted by stigma and negative biases (O’Neill et al. 2024). The introduction of the neurodiverse paradigm (to a module which educates student teachers about autism), underpinned by a co-participatory approach, sought to mobilise more positive narratives about autism. By adopting a strengths-based neurodiverse perspective, the initiative aimed to enhance awareness, understanding, and acceptance of neurodivergent individuals, with a particular focus on autistic children and individuals. Utilising Bronfenbrenner’s ecological systems theory as a guiding theoretical framework offered a clear conceptualisation of the interconnection between student teachers and their environments. New understandings gleaned from neuro-affirmative training can have a multiplier effect,

shaping more meaningful relationships with neurodivergent children and staff in their schools, neurodivergent peers and staff in the University as well as with other neurodivergent individuals in their communities. This approach illuminates the potential for these new understandings to foster more neurodiverse friendly environments. The neuro-affirmative events included in this module also extended their reach to audiences within the University and the broader environs, thereby laying the groundwork for cultivating a neurodiverse community in Maynooth University.

### Background and context

The attribution of unfavourable stereotypes to the label ‘autism’ is key to the development of stigma. Status loss and discrimination can be understood as behavioural manifestations of stigma, stemming from being labelled, classified as other, and associated with undesirable characteristics. At the core of the inequality encountered by stigmatised individuals is the experience of status diminishment and discrimination, which leads to adverse treatment at both personal and structural levels (Turnock et al. 2020). It discredits an individual leading them to feel less valuable than the rest of society.

Research, emanating from traditional academic disciplines can have a significant psychological impact on neurodivergent individuals. Stigma can affect the wellbeing of autistic individuals and this can be very apparent in higher education. The exponential coverage given to autism by academic researchers and professionals can make us think we know autism thoroughly – what it entails, how it feels, and what support autistic individuals require. Nonetheless, a significant portion of the research maintains a medical orientation, seeking cures or interventions, and is predominantly conducted by non-autistic academics (Gillespie-Lynch et al. 2017). Autistic individuals, and advocates have highlighted

the issue of dehumanising rhetoric frequently occurring in autism research, and report feeling alienated by it (Botha 2021).

Once a practising child and educational psychologist and now an academic psychologist/educator researching in an Education Dept., I have been inspired by critical disability studies, critical psychology and co-participatory approaches to engage with difference differently, challenging the presence of stigma and ableism in society. My personal experience of having worked with so many autistic children, youth and adults drives my dedication to promoting their inclusion across educational settings. While the the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, 2013) holds its position as the primary and most current tool for diagnosing autism, I became increasingly aware of the importance of drawing on transformative definitions of autism provided by the neurodiverse paradigm to counteract the definitions that are grounded in a medical perspective. A co-participatory approach was core in this research to ensure the module content was autistic friendly and to ensure the voice of those with situated lived expertise was centred.

### Project outline

1. Module Content: The content of the module explored autism from different models of disability i.e. the medical model of disability and the social model of disability. The neurodiverse paradigm was introduced and it offered the opportunity to counteract the pathologising language underpinning the definitions of autism in the DSM-5. Monotropism and Double Empathy theories provided alternative ways of looking at the ‘triad of impairments’, which are thought to be the main reason why autistic people are regarded as having difficulties in communicating with others. The module content was reviewed by the autistic co-

participants to ensure that the content and language was sensitive to the autistic community.

2. Neurodivergent Professionals: Autistic/ ADHD teachers brought a unique perspective to the field, highlighting how their personal lived experiences informed the use of transformative approaches to support autistic children to thrive. Student teachers were encouraged to identify, develop and use children’s strengths to inform inclusive educational strategies in the classroom so that children are empowered to unlock their inherent skills, qualities, and talents, setting the groundwork for a more fulfilling and happier life. They were also encouraged to look at differences (rather than deficits) and how their difference might best be supported.
3. Neurodiverse friendly events, to raise awareness, understanding and acceptance of neurodiversity, were organised across the University. Students in Initial Teacher Education attended at least two of these events.
4. Neurodivergent students in higher education were invited to speak to the students about their personal experiences of navigating the education system.
5. Principles of Universal Design for Learning (UDL) were adhered to, to ensure accessibility and flexibility for all students/attendees. Multiple means of representation, action and expression, and engagement (as much as was possible) were provided to accommodate diverse learning styles and preferences.
6. Students were asked to reflect on their learning and give feedback on the module through the use of an anonymous questionnaire and a reflective assignment.
7. Attendees were invited to give feedback after the neurodiverse events.

# Findings

The following are a sample of the main themes that emerged:

## Myths were dispelled:

It is evident that many of the negative myths, biases or stereotypes that were held, were challenged:

*“It is really good to know that just because an autistic child presents as intelligent and capable in school – that does not mean that they do not need support”.*

*“I didn’t think someone with autism could have such a great sense of humour”.*

*“I never realised that girls with autism could be hypersensitive to feelings. I thought in fact it was the opposite”.*

## Deep appreciation for neuroaffirmative approaches

There was a sense of deep appreciation for this module and for the neurodiverse friendly events. This was conveyed through sentiments expressed, in particular, by autistic individuals or family members of neurodivergent individuals who attended the neuroaffirmative events:

*“This is the first time I have ever heard anything positive about autism. This module has prompted me to reflect on my identity as an autistic trainee teacher and how much I have to offer so many children in my future career. I have lots to offer as their role model in terms of empowering all children, but especially autistic children, to reach their full potential and flourish in their school environment”.*

*“This module helped me make connections with my autistic/ADHD brother. I now know how powerful it can be to tap into his way of communicating and to capitalise on his strengths, interests and abilities. I know that this will be so beneficial to me in my classroom professional practice as a SET (Special Education Teacher)”.*

A parent of an adolescent girl who attended a neuro-affirmative event communicated:

*“This is the first time X has been in a room where she feels like it’s ok to be autistic. X has never experienced anything like this before – did you see her taking pictures of the slides? We need more of these types of talks”.*

## Teachers as dismantlers of oppressive deficit - based approaches

One recurring theme throughout the feedback from students was the impact the module had on their identity as teachers. Not only did they recognise the value of the neurodiverse paradigm but they also began to view themselves as agents of change, striving for equality in education.

*“I believe that I, as a teacher and educator, have a responsibility to break down the barriers to inclusion and equality and not place the ‘problem’ with the child. I see myself as an advocate for neurodivergent children”.*

*“I cannot believe how much I took for granted. I was on placement and there was a child with autism and ODD (oppositional defiant disorder) and I think all I heard on placement were all the things he couldn’t or wouldn’t do. The focus was on weaknesses and issues. I would love to go back to that school and start with what the child can and likes doing and build from there. It’s not about making them fit our expectations”.*

# Reflections

Divisions will be perpetuated, and perceptions of difference confirmed, where school cultures maintain stereotypical knowledge about autism, entrenching feelings of difference for autistic individuals. The co-participatory approaches, at the core of the development of this module, foregrounded personal accounts of neurodivergent individuals and surfaced marginalised understandings of autism, and challenged the misconceptions that many people held about what it means to be autistic. Autistic led theories of autism in the neurodiversity paradigm provided student teachers with new ways of understanding autistic children’s preferences, social presentation and experiences and this in turn, laid the foundation for positive relationships with their autistic

students and more autistic friendly school cultures. In addition, their identity was impacted in the sense that trainee teachers began to see themselves as agents of change to dismantle oppressive practices and cultures, striving to create the necessary conditions for equity for all in education and society. Through the introduction of the neurodiverse paradigm, students began to see that there is collective value in diversity, thus shifting the focus away from deficit constructions that position autistic children (and individuals) as having inherently pathological neurological conditions. From an ecological systems perspective, neuro-affirmative diversity training in ITE has the propensity to mobilise more positive narratives about neurodiversity in our educational environments and communities, thus creating social change.

The neurodiverse events were attended by staff in the university and members of the wider community. Feedback from attendees indicated that there was immense appreciation for the neuro-affirmative approaches which underpinned these events. Many attendees expressed gratitude for having their identity (or their child’s identity) affirmed, which was deeply meaningful to them. The events also helped to cultivate closer connections between the community and the University, facilitating ongoing collaboration with Maynooth Autism Friendly Towns. A Neurodiverse staff forum has been co-founded and a neurodivergent autistic community is beginning to grow.

## Recommendations for developing a neurodiverse friendly module

Developing a module on neurodiversity in higher education requires thoughtful and inclusive approaches. The following are some suggestions:

1. Engage Stakeholders: Involve diverse stakeholders, including neurodivergent individuals, neurodivergent professionals and students in the development process. Their input provides valuable insights into the needs, preferences, and experiences of neurodivergent learners.
2. Promote Universal Design: Design the module using principles of universal design for learning (UDL) to ensure accessibility and flexibility for all students. Provide multiple means of representation, action and expression, and

engagement to accommodate diverse learning styles and preferences.

3. Offer Diverse Perspectives: Incorporate diverse perspectives on neurodiversity, including academic research, personal narratives, and lived experiences. Highlight the strengths, talents, and contributions of neurodivergent individuals across various domains.
4. Foster Interactive and Engaging Activities: Use a variety of interactive and engaging teaching methods, such as case studies, group discussions, role-playing exercises and multimedia presentations, to promote active learning and student engagement. Provide opportunities for students to reflect on their own attitudes and beliefs about neurodiversity.
5. Encourage Self-Advocacy and Reflection: Encourage reflective practice by prompting students to consider how they can apply their learning to real-world contexts and advocate for neurodiversity in their personal and professional lives.
6. Evaluate and Iterate: Continuously evaluate the effectiveness of the module through student feedback, assessments, and reflection. Use this feedback to make improvements and revisions to the module content, structure, and delivery methods.

## References

American Psychiatric Association (2013) *Diagnostic and Statistical Manual of Mental Disorders (5th ed.)*. Arlington, VA: American Psychiatric Publishing.

Botha M. (2021) “Academic, Activist, or Advocate? Angry, Entangled, and Emerging: A Critical Reflection on Autism Knowledge Production”. *Frontiers in Psychology*, 12:727542. <https://doi.org/10.3389/fpsyg.2021.727542>

Bronfenbrenner, U. (1979). *The Ecology of Human Development*. Harvard University Press.

Gillespie-Lynch, K., Kapp S. K., Brooks P. J., Pickens J., & Schwartzman, B. (2017) “Whose Expertise is It? Evidence for Autistic Adults as Critical Autism Experts”. *Frontiers in Psychology* 8(438) <https://doi.org/https://doi.org/10.3389/fpsyg.2017.00438>.

O’Neill, C., & Kenny, N. (2024) “I saw things from a different lens... : An Interpretative Phenomenological Study of the Experiences of Autistic Teachers in the Irish Education System”. *Education Sciences*. 13(7), 670-686. <https://doi.org/10.3390/educsci13070670>

Turnock, A., Langley, K., & Jones, C. R. G. (2022). “Understanding Stigma in Autism: A Narrative Review and Theoretical Model”. *Autism in adulthood: challenges and management*, 4(1), 76–91. <https://doi.org/10.1089/aut.2021.0005>

## Find out more

To find out more about this fellowship project, please contact Dr Deirdre Forde, Froebel Department of Primary and Early Childhood Education, [deirdre.forde@mu.ie](mailto:deirdre.forde@mu.ie)

# 3

## Developing collaborative module and course evaluation tools

### Lead and team members

- EL Putnam (lead)
- Chloe Eaton

### Department

- Media Studies

### Abstract

The aims of this project were to: develop collaborative module and course evaluation tools; enable students and academic staff to design effective methods for collecting, reviewing, and acting on student feedback on Media Studies modules; enhance ‘course evaluation literacy’ for staff and students so that all stakeholders are aware of best practices related to (and limitations of) module and course evaluation data. Three prototypes for gathering student feedback on modules were developed and refined based on interviews with staff and students. It was found that gathering feedback during the semester using bespoke methods with emphasis on student self-reflection of learning proved most effective in gathering meaningful data and encouraging student engagement.

### Project outline

The aims of this project were to: develop collaborative module and course evaluation tools; enable students and academic staff to design effective methods for collecting, reviewing, and acting on student feedback on Media Studies modules; enhance ‘course evaluation literacy’ for staff and students so that all stakeholders are aware of best practices related to

(and limitations of) module and course evaluation data.

After reviewing existing literature pertaining to student led module feedback (SLMF), staff and students were interviewed to determine the role that SLMF plays in module design and implementation, the aims of gathering this data and potential uses for such, and affiliated concerns. Through meetings with staff and students, prototypes were developed and implemented with undergraduate students.

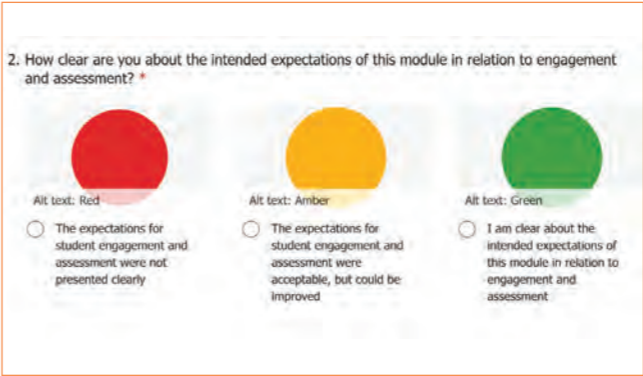


Figure 1: Sample question from Traffic Light Survey.

With each prototype test, students were asked to respond to the method of delivery. Staff also reflected on the delivery method and the type of feedback that was collected. Findings from research were presented to Media Studies teaching staff, who co-developed a module evaluation policy for the department.

### Findings

There is a range of significant research that explores SLMF. The overall aim of feedback is module improvement, though methods of gathering feedback can also provide an opportunity to improve communication between staff and students while also enabling students to reflect on their learning. Feedback methods can be divided into quantitative and qualitative. The ‘feedback loop’ can be utilised to increase participation; this refers to collecting feedback and then reacting to the feedback (Keane and Curran, 2021:7/8). This process can aid the evaluation process as students feel that the feedback is valued, and therefore they give longer and more

	Module type	Type of questions	Medium	Other comments
Model 1	First year, practice module	Four long answer questions with focus on student self-reflection on learning	Padlet	Responses to this survey were presented publicly as it was being implemented with the lecturer present in the room
Model 2	Second year, theory module	Quantitative survey using traffic light model with seven questions and one long answer	Microsoft forms	Responses were not made visible to students and only visible to lecturer after delivery
Model 3	Third year, practice module	Qualitative survey with seven long answer questions	Microsoft forms	Responses were not made visible to students and only visible to lecturers after delivery

Table 1: Overview of module feedback prototypes.

thoughtful responses to the questions (Asghar, 2016; Treischl and Wolbring, 2017). This is supported by Curran (2020:6/7), who argues that setting aside class time for gathering feedback increases the response rates. Interviews with Media Studies teaching staff and students also emphasised the significance of setting aside class time for gathering feedback. In addition, it was observed that collecting feedback mid-semester, rather than at the end of teaching, facilitates the closing of the feedback loop while addressing any significant issues that may arise during module delivery.

A number of concerns were raised in relation to SLMF from both staff and students during interviews. In general, interviews presented inconsistencies between how staff and students understood the aims and purpose of module evaluations, including discrepancies between student expectations for a module and a module's learning outcomes, which may contribute to antagonism in the classroom. In addition, the processes for collecting and analysing feedback creates additional administrative work for staff, which can be seen as a burden on them given their heavy workload, a finding supported in existing literature (Bovill et al., 2015:5). Media Studies students raised concerns regarding survey fatigue and additional work without clear benefits for the learning experience.

Another concern raised by teaching staff, which is supported in the literature (Hattie and Yates, 2014; Miller and Seldin, 2014; Shah et al., 2017), is the extent to which student satisfaction determines module delivery. Staff noted that the rationale behind a particular aspect of module delivery may not become evident until after a module or course is completed, and therefore may not fare well in module feedback. Such concerns pertaining to too much focus on student satisfaction become pressing if module feedback is used for staff promotion and performance reviews (Shah et al., 2017), thereby having significant impacts on the capacity to progress professionally.

As a result, prototype development shifted to increase communication between staff and students, to create methods of gathering feedback that could be well integrated into module delivery with clear relevance and enhancing benefits to students by emphasising reflection of learning. Great attention was placed on

the wording of questions with input from teaching staff and students.

The following findings were gathered from students in response to prototype delivery: students emphasised the significance of gathering feedback during class time and making benefits to their learning clear through questions that are specific to modules. Students expressed a desire to have input on what they are learning and how they are assessed, perceiving module feedback to be a primary means of making this known. Some students who took the longer qualitative survey (model 3) expressed a desire to provide quantitative responses. However, some who took the quantitative survey (model 2) found such an approach too simplistic.

From the staff perspective, qualitative surveys were found more useful in presenting relevant data for module improvement. However, much depends on the phrasing of questions. It was found that the questions on model 1 were too general, as student answers tended to be too vague to provide useful feedback. As a result, it is important to clarify the purpose of evaluations and what constitutes an appropriate response, which can be integrated into the delivery of the evaluation and was implemented with models 2 and 3. Delivering surveys with the lecturer present and results made visible, as with model 1, was found to be ineffective as it did not provide sufficient time and space for the lecturer to reflect and respond accordingly. This may have to do with the level of student experience with providing feedback (first year) and the size of the class (over 60), as using this method may prove more productive when it instigates conversations between staff and students, which could benefit a smaller class with strong student engagement.

## Key reflections

It is evident from the literature review, interviews with teaching staff and students, and testing of prototypes that there is no “one-size-fits-all” method of gathering student feedback in Media Studies modules. While uniform feedback forms can facilitate gathering data from an administrative perspective and enable easy comparison across modules and courses, such universal approaches neglect the particular needs and modes of module delivery, such as the differences between theory and practice-based modules found in Media Studies. Too much uniformity also leads to survey fatigue reducing student engagement. Different methods of delivery that encourage student reflection on learning proved to be most effective in providing meaningful data for staff while providing benefits to students as a means of understanding the intentions and design of a module. Erikson et al. (2018) highlight that open ended questions allow the students to self-reflect on their own responsibilities, which helps the whole process to be less judgemental of the teaching staff. Self-reflection can be useful for allowing the students to understand their responsibilities and help to alleviate the ‘adversarial’ role feedback can take. This approach moves away from a satisfaction model that focuses on judging the performance of the lecturer to a more relevant approach of reviewing success in meeting learning outcomes, enables students to develop appropriate expectations for the module and to draw connections to other modules, and encourages dialogue between staff and students.

## Recommendations

Media Studies is now implementing the following departmental policy as a result of this research:

- Every module should have an established mode of gathering data on the student experience.
- Module co-ordinators are responsible for the development, implementation, and analysis of data in a manner that is suited to the module.
- Feedback should be gathered during the semester to enable ample time for closing the feedback loop, addressing any issues as they arise.
- If a member of the teaching staff is interested in support in reviewing and responding to student feedback, they can reach out to a departmental peer, head of discipline, or the Centre for Teaching and Learning.

The Media Studies staff also agreed collectively for year co-ordinators to meet with students mid-semester in order to address any major issues of concern, especially if these issues can be found across multiple modules or the course generally, as this could help reduce outstanding issues from impacting module feedback.

## References

Asghar, M. (2016). Staff and student experiences of dialogue days, a student engagement activity. *Innovations in Education and Teaching International*, 54(4), 435-444.

Bovill, C. et al. (2016) Addressing potential challenges in co-creating learning and teaching: overcoming resistance, navigating institutional norms and ensuring inclusivity in student–staff partnerships. *Higher Education*, 71(2), 195-208.

Curran, J. (2020) *Maynooth University Student Feedback and Teaching Evaluation Initiative: Literature Review*. Maynooth: Maynooth University.

Erikson, M., Erikson M. G. and Punzi, E. (2018) A single-question qualitative bachelor’s programme evaluation. *Assessment & Evaluation in Higher Education*, 43(6), 969-978.

Hattie, J., and Yates, G. (2014) *Visible learning and the science of how we learn*. New York: Routledge.

Keane, M. and Curran, J. (2021) *Maynooth University Student Feedback and Teaching Evaluation Initiative: Guide to Validating Student Feedback – Teaching Evaluation*. Maynooth: Maynooth University.

Miller, J. E., and Seldin, P. (2014) *Changing practices in faculty evaluation*. Washington: American Association of University Professors.

Shah, M., Cheng, M., and Fitzgerald, R. (2017) Closing the loop on student feedback: the case of Australian and Scottish universities. *Higher Education*, 74(1), 115-129.

Treischl, E. and Wolbring, T. (2017) The causal effect of survey mode on students’ evaluations of teaching: empirical evidence from three field experiments. *Research in Higher Education*, 58(8), 904-921.

Tschirhart, C. and Pratt-Adams, S. (2019) Closing the Loop: An Evaluation of Student-Led Module Feedback at one UK Higher Education Institution. *International Journal for Students as Partners*, 3(2), 79-90.

## Find out more

To find out more about this fellowship project, please contact Dr EL Putnam, Department of Media Studies, [el.putnam@mu.ie](mailto:el.putnam@mu.ie)

## 4

## Participatory Development and Piloting of a Pedagogical Toolkit aimed at Supporting and Enhancing Neurodivergent Students in the area of Teaching and Learning

### Lead and team members

- Etain Quigley (lead)
- Martha Brandes
- Molly Brenda O’Hanlon
- Rowan Kennedy
- Emma McLoughlin

### Departments

- Law and Criminology
- MAP Office

### Abstract

There has been a notable change in how third-level institutions perceive and interact with students who do not meet historically typical expectations regarding education. This is evidenced by an increased emphasis on equality, diversity, and inclusion in terms of access and retention across the sector. However, research suggests a gap between rhetoric and reality concerning neurodiversity at the third level, with many students’ lived experiences being reported as challenging. This is despite the value of neurodiversity in terms of individual contribution being recognised and attempts at developing a supportive environment within the education sector growing. This project utilised the Global Café method of data collection to explore the above phenomenon from a participatory lived experience perspective. The overall project aim was to collect lived experience data and identify gaps in third-level staff and institutional knowledge in the area of neurodiversity, with the objective of designing a pedagogical toolkit to address these shortcomings. The project found that, despite the increase in focus by universities in the area of neurodiversity, this cohort is still disadvantaged in areas such as access to supports, accommodations and pedagogical design, when compared to their neurotypical peers. The results suggest that further advances are required to

ensure that neurodiverse students have equity of opportunity once in the higher education system, and not just when accessing it.

### Project outline

Neurodiversity has become a key area of interest in both academia and popular culture over the past decade. There is no settled definition related to the term, largely as a result of there being tension between the predominantly biological characterisation which foregrounds innate deficits and the social constructivist model (Dwyer, 2022; Green 2023). However, there is an increasing move towards combining both the biological and social aspects, recognising the biological presentation while also challenging social barriers to inclusion and assumptions related to ability (ibid). The concept is typically used as an umbrella term to describe various neuro-differences, such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), intellectual disability (ID), developmental language disorder (DLD), and dyslexia, among others.

There has been a notable change in how third-level institutions perceive and interact with students who do not meet historically typical expectations regarding education (Wolbring & Lilywhite, 2021). This is evidenced by an increased emphasis on equality, diversity, and inclusion in terms of access and retention across the sector, the United Nations Convention on the Rights of Persons with Disabilities (Buckley & Quinlivan, 2023), and the Athena SWAN charter (Wolbring & Lilywhite, 2021). Indeed, a quick Google search highlights that most third-level institutions across Anglophone countries have numerous committees at the department/school level, faculty level, and campus level whose role is to ensure equality, diversity, and inclusion across all areas of college life. Approaches to widening participation for under-represented students in higher education can take different forms. In the past decade,

the Irish higher education sector has undertaken efforts to adapt to a more diverse student population, making strides toward inclusive learning environments and increased educational opportunities for historically under-represented groups. Strategies in this regard include quantitative targets, specific supports such as specialised entry routes, designated student advisors, academic, financial and learning supports, and improvements to the built and learning environments to be more inclusive (Byrne et al., 2014).

This study was designed to support the ‘nothing about us without us’ concept. The project adopted a co-designed participatory approach whereby the concept of the study itself was developed in a participatory way in line with neurodiversity principles. The project adopted the neuromixed academic pathway put forward by Bertilsdotter (2016) meaning its framework stemmed from a cross-neurotype collaboration ethos aimed at facilitating the development of cross-community integration (Bertilsdotter et al, 2016).

It is acknowledged that terminology within the area of neurodiversity is not settled. As a result, the terminology used in this project was decided by those involved with the project with agreement settled on neurodiverse/neurodiversity. Neurodivergent was discussed but it was perceived as exclusionary as a result of suggesting distinct divergence from a ‘norm’ rather than a spectrum of diversity.

Neurominority was also discussed, however this was perceived as distinguishing between a majority and a minority, again not capturing the diverse lived experience of those who see themselves as represented under the neurodiversity umbrella. For this project, neurodiversity was selected as best representing the lived experience of those involved with the project, however, all accepted that this is a fluid area and individuals are free to utilise terms that best represent their understanding of self.

This project utilised the Global Café method of data collection. The Global Café method is a participatory approach that allows participants to shape and develop the project, limiting researcher bias and prescription. This method facilitates data collection meaningful to stakeholders, aligning more with advancing areas of study in line with the lived experience and voice of stakeholders. It operates by providing a safe space and breaking a larger group into smaller groups that work on a topic/idea. The smaller groups' findings are then brought back to the room, allowing for further critical engagement with the topics/ideas. This facilitates discussion and shared knowledge generation, removing the researcher-led approach while promoting a stakeholder-led approach.

## Findings and recommendations

This study highlights a number of issues faced by students in third-level institutions. In line with previous research, findings suggest that, despite increased efforts and resource allocation to access offices, the lived experience of neurodiverse students has many challenges that detract from them reaching their full academic potential, in line with their neurotypical peers. A number of key findings were made by the study collaborators, and it is suggested that access offices consider these when advancing policy and practice in the area of neurodiverse student inclusion at third-level.

Firstly, terminology is subjective, but care should be taken to ensure that it is not exclusionary. The term “neurodiversity” is a useful umbrella term to reduce long descriptive discussions about different presentations. However, it can cause stress as different terms are used for different audiences, and when using this term the student is unaware of the type of response, positive or negative, that they may receive.

In terms of the strength-based model<sup>1</sup>, a gap between the theory and the lived experience was discussed, whereby the collaborators in this study reported feeling excluded from the strength-based model. The model was discussed in terms of having a narrow

definition of success, leading to exclusion and discrimination. The collaborators discussed this leading to them doubly masking, whereby they masked to hide the neurodiversity and then masked again to present as a ‘good neurodiverse’ person who fits within the strength-based model, when in actual fact feeling excluded.

In relation to teaching and institutional supports, it was suggested that there be greater awareness among third-level staff, both academic and beyond. This would reduce misunderstandings and incorrect labelling of neurodiverse students, which was reported as causing great distress and sometimes limiting the seeking of supports when needed. It was also reported that having to make numerous contacts with multiple persons across a third-level institution was difficult and time-consuming, taking away from study time, thus leaving neurodiverse students at a disadvantage compared to their neurotypical peers who did not have the burden of making such repeated contacts. A single point of contact in support services is a practice common in most Irish third-level institutions, including the institution in this study. Despite institutions assigning students who are supported by a dedicated contact person or student advisor, the study reveals variations in the support's effectiveness. Factors like student awareness and the strength of advisor-student relationships may influence this variability.

Accommodations for students was also raised as a key concern. The threshold related to accessing accommodations and problems around securing a diagnosis in the first place, as a result of the huge backlog in health services, were highlighted as core problems in terms of meaningful engagement and retention in third-level education. As numbers increase, universities need to explore new ways of accommodating students without the necessity of diagnosis. This is particularly important if third-level institutions are to avoid diagnostic privilege which tends to favour those with more resources and access to private healthcare. Further research is required to establish good data on the various accommodations that are helpful to different student needs. Currently, the extant data is weak in quality and vague in its interpretation as applied to individual students. There is a clear need for ‘bespoke’ accommodations that reflect an individualised understanding of a student’s

needs. This approach is currently limited by the lack of good quality data to inform practice. It is recommended that third-level institutions reduce their reliance on formal diagnoses for supporting neurodiverse students. Acknowledging strides in this direction, national funding has been allocated to Irish third-level institutions to strengthen Universal Design for Learning (UDL) initiatives (HEA, 2022). Key practices involve integrating flexible assessments, varied learning resources, and fostering a supportive learning environment. While concepts such as Universal Design cater in general terms for additional needs, they do not sufficiently address very real individual needs. The gap between perceived need and accommodations provided is a source of frustration for students and in some cases leads to disillusionment with the entire process of linking with support services.

Having additional low-stimuli study environments within universities was suggested. It was accepted that there were some moves in this space, and many universities provided such spaces. However, it was felt that there was an increase in neurodiverse students being accepted into universities, and therefore there was an onus on universities to provide more spaces to accommodate the higher numbers.

Finally, those working on this project recommend a specialist career guidance programme for neurodiverse students to assist with the transition from education to employment. Initiatives such as neurodiverse alumni mentoring, details on neurodiverse-friendly companies, and greater preparation for the daily life of the work environment were strongly recommended.

## Key reflections

This project has highlighted that, despite the increase in focus by universities in the area of neurodiversity, this cohort is still disadvantaged when compared to their neurotypical peers, and further advances are required to ensure that neurodiverse students have equity of opportunity once in the higher education system, and not just when accessing it.

## References

- Bertilsdotter Rosqvist, H., Botha, M., Hens, K., O’Donoghue, S., Pearson, A. and Stenning, A., 2023. Cutting our own keys: New possibilities of neurodivergent storytelling in research. *Autism*, 27(5), pp.1235–1244.
- Buckley, L.A. and Quinlivan, S., 2023. Inclusive learning in Ireland: A case study. *International Journal of Discrimination and the Law*, 23(1–2), pp.103–125.
- Byrne, D, Doris, A., Sweetman, O., Casey, R., and Raffae, D. 2014. An Evaluation of the HEAR and DARE Supplementary Admission Routes to Higher Education. Technical Report. Dublin: DARE/HEAR Strategic Development Group.
- Dwyer, P., 2022. The neurodiversity approach (es): What are they and what do they mean for researchers? *Human Development*, 66(2), pp.73–92.
- Green, J., 2022. Autism as emergent and transactional. *Frontiers in Psychiatry*, 13, p.988755.
- Wolbring, G. and Lillywhite, A., 2021. Equity/equality, diversity, and inclusion (EDI) in universities: the case of disabled people. *Societies*, 11(2), p.49.

## Find out more

To find out more about this fellowship project, please contact Dr Etain Quigley, School of Law and Criminology, [etain.quigley@mu.ie](mailto:etain.quigley@mu.ie)

<sup>1</sup> The strength-based model is a new approach to understanding neurodiversity. Rather than perceiving neurodiversity in a negative manner and through a deficit lens, the strength-based model recognises and champions the strengths that neurodiverse individuals possess. This shift from a deficit to a strength-based approach in terms of understanding and perceiving neurodiversity has been described as a paradigm shift in the area.

## 5

## Computational thinking module for primary and secondary pre-service teachers

### Lead and team members

- **Kevin Casey<sup>a</sup>** (lead)
- Thomas Naughton<sup>a</sup>
- Rosemary Monahan<sup>a</sup>
- Taina Lehtimäki<sup>a</sup>
- Aidan Mooney<sup>a</sup>
- Majella Dempsey<sup>b</sup>
- Thomas Delahunty<sup>b</sup>
- Zerrin Doğança Küçük<sup>b</sup>
- Niamh Fortune<sup>c</sup>
- Eddie Costello<sup>c</sup>

### Departments

- Department of Computer Science
- Department of Education
- Froebel Department of Primary and Early Childhood Education

### Abstract

At its core, computer science (CS) is a science of problem solving, reinforcing the scientific method necessary to support other subjects in the STEM family. Universities in Ireland have recently recognised Leaving Certificate CS as a science subject for entry into third level. This implicitly recognises the value of CS as a STEM subject which helps to teach students logical thinking and the scientific method in general. Computational Thinking (CT) can be defined as the problem-solving skills unique to computer science, that recently have become widely applicable because computers have become such an integral part of everyday lives.

Our interactions with teachers in Ireland (more details below) have shown that there is significant interest in obtaining basic skills in CT by pre-service and in-service teachers. This is true for secondary school teachers from the full range of STEM subjects, and beyond (for example, language teachers). It is true also for primary school teachers of all age groups, who saw problem-solving as a skill that they needed to integrate into many parts of their teaching, even before the National Council for Curriculum and Assessment (NCCA) highlighted CT.

To serve student teachers in Maynooth University (Froebel primary pre-service teachers and BSc with Education secondary pre-service teachers), we designed a 5-credit module on how to bring CT into the classroom. We co-developed this module and lesson plans with Education experts and CS experts working collaboratively.

### Project outline

CT4T – Our new Computational Thinking for Teachers module allows us to share best practice of teaching CT in the classroom with the next generation of primary and secondary teachers. Against a backdrop of the teaching community realising the importance of CT in the classroom and it being recognised formally as part of the curriculum<sup>1,2</sup>, we have a responsibility to give teachers the tools they need.

This module adapts Bebras-style tasks to teach CT strategies. Bebras tasks have been carefully developed over the past 14 years by an international team of 100+ established CS educators. These problems have proven to be remarkably inclusive, across gender and culture. They are the perfect tool for teachers to engage pupils of all ages with CT. The PACT (Programming + Algorithms ≈ Computational Thinking) group at Maynooth have a history of engaging with primary and secondary teachers in CT education<sup>3,4,5,6</sup>, so we are ideally placed to design and deliver this module.

To date, we have delivered two iterations of this module. The module itself consists of eight lessons delivered over three in-person workshops. It runs as one full Saturday (10:00-16:30) followed by three three-hour workshop sessions (17:00-20:00) over subsequent weeks. It ran during Spring 2023 (13 participants) and again during Autumn 2023 (15 participants). The profile of attendees was: 16 MU Education Department pre-service teachers, six Froebel Department pre-service teachers, four secondary school in-service teachers, one primary

school in-service teacher, and one in-service teacher from the Further Education sector (former MU graduate).

As part of the workshops, the participants developed lesson plans in pairs, and they were encouraged to use the lesson plans with their class in the following weeks. At the beginning of each workshop, the participants reported to their peers on how the delivery of CT content went when they tried it in the classroom (e.g. what cohort they were delivered to, what went well, what went less well).

Over the course of the module, participants collaborated to build new lesson plans based on the CT material we teach. For the continuous assessment component of the module, the participants took these lesson plans, wrote them up fully and used the modified lesson plans in the classroom. They then reflected/evaluated their work and refined the lesson plans based on what they learned during the delivery in the classroom.

We support the on-going collaboration with teachers who have completed CT4T via our online portal. There, teachers can access up-to-date resources including our highly popular seasonal tasks (e.g. Valentine's, Easter, Summer, Halloween, Christmas).

### Findings

Prior to the delivery of the CT4T module, we had gathered feedback on the CT resources used during CT4T. We ran an online CPD workshop for TY teachers who had used our previously developed CT module with their TY classes<sup>4</sup>. During this CPD workshop, feedback from teachers who had used our CT module was gathered. One MU pre-service teacher who worked with us as CT Ambassador ran a series of four CT lessons and provided valuable feedback.

During the CT4T module we evaluated our CT resources, lessons delivery, and teamwork aspect with in-service teachers and with pre-service teachers (Department of Education and Froebel Department in MU) through feedback forms, observations, and interviews. This was done through the total of 12-hours of teacher workshops.

## Scheduling

For both Froebel and Education, we ran information sessions prior to the start of the CT4T module. In all cases, there was considerable interest, but this did not convert to large number of participants. Given the voluntary nature of the module, and the Saturday/evening scheduling, this is not a complete surprise. We saw a significant drop-off rate (50%) from sign up to first attendance. However, once we got participants in the door for their first lesson, attendance rate was close to 100% for the rest of the module.

## Continuous assessment

The CT4T module contains some independent work. This work centres around lesson plan development, content-delivery, reflection, and refinement. The general principle is sound, however in the first iteration of the module, we tried to get participants to refine each other's lesson plans. This did not work in practice and was changed for the second iteration so that each participant focused their work on their own lesson plans.

## Feedback

Based on feedback from participants over the two iterations of CT4T we learned:

- Hardly any participants had exposure to CT material before.
- All participants planned to use the materials in the classroom in the future.
- All participants identified where they could fit the material we taught into the existing curriculum.

- All felt the module enhanced their teaching skills.
- Participants enjoyed the module, found it beneficial and engaging, and they learned new problem-solving skills.
- We were able to use feedback on the relative difficulty of different topics to refine our delivery for the next iteration (see Figure 2).

## Key reflections

**Continuous assessment** requires care in an optional module. It needs to be sufficiently engaging and relevant so that participants are motivated to complete it. We are always looking for opportunities to create more engaging CA. For example, our next iteration of CT4T is likely to include a component on CT boardgames where participants can choose games from our popular curated boardgame library and evaluate them for imparting CT skills, and their suitability and customisability for different cohorts.

**Scheduling** is also a potential issue in optional modules. Currently we are limited to Saturdays and weekday evenings (at least outside summer) which

makes it difficult for participants to commit their time. However, once we can get people to attend the first session, they stay. One minor strategy that may help is to timetable the module well in advance and provide a sample first session at multiple times.

**Balancing of participant effort.** The module is broken up into workshops on specific topics. Many of the participants have never encountered CT before and it is difficult to predict how they perceive and react to the content. Through feedback (such as presented in Figure 2 above), we have found which topics require more care/further refinement on our part. This feedback is built into the iterative process of developing CT4T.

## Recommendations

**Link participant feedback into module design.** This is not always suitable e.g. for established content, but for new modules with new audiences it is advisable.

**Motivating participants to turn up.** If we can get participants to attend once, they tend to continue attending. Prioritise getting participants to attend once.

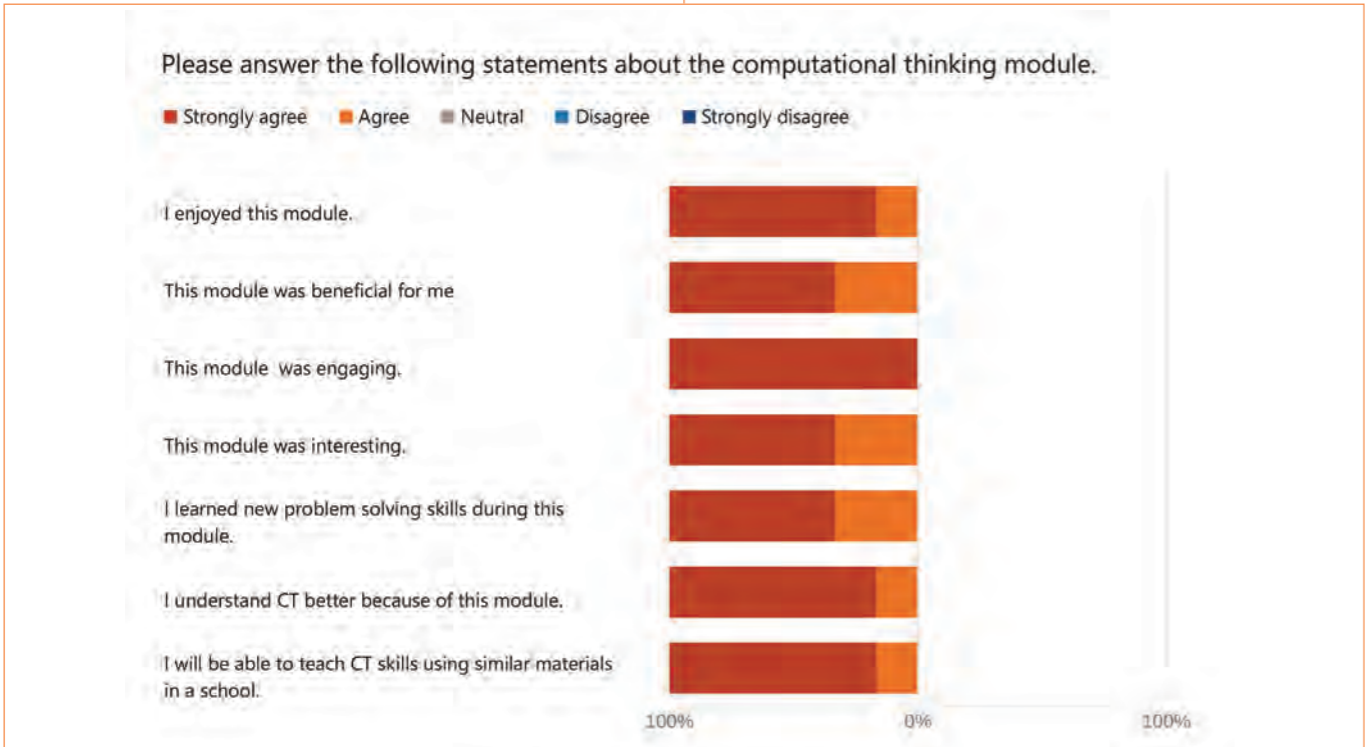


Figure 1: General Feedback from the Spring 2023 CT4T module participants (n=5).



Figure 2: Relative difficulty of lessons on Spring 2023 CT4T (n=5).

**Trust the participants.** Our participants are motivated, very familiar with the curriculum and know where CT can fit. We teach what we are good at, and we let them do what they are good at.

## Future work

We have now gathered actionable feedback on the CT4T module materials and delivery with both in-service and pre-service teachers. We plan to continue developing this module and to run an improved version of the CT4T module in the first semester of the 2024-2025 academic year.

## References

1. *Draft Science, Technology and Engineering Education Specification For primary and special schools*, National Council for Curriculum and Assessment (2024), [https://ncca.ie/media/2vvcabyb/draft\\_ste\\_specification\\_2024.pdf](https://ncca.ie/media/2vvcabyb/draft_ste_specification_2024.pdf)
2. *Primary Mathematics Curriculum For Primary and Special Schools*, National Council for Curriculum and Assessment (2023), [https://www.curriculumonline.ie/getmedia/484d888b-21d4-424d-9a5c-3d849b0159a1/PrimaryMathematicsCurriculum\\_EN.pdf](https://www.curriculumonline.ie/getmedia/484d888b-21d4-424d-9a5c-3d849b0159a1/PrimaryMathematicsCurriculum_EN.pdf)
3. Bebras-inspired computational thinking primary school resources co-created by computer science academics and teachers. By Taina Lehtimäki, Rosemary Monahan, Aidan Mooney, Kevin Casey, and Thomas J. Naughton. 2022. In Proceedings of the 27th ACM Conference on Innovation and Technology in Computer Science Education Vol. 1 (ITiCSE '22). Association for Computing Machinery, New York, NY, USA, pp. 207–213. DOI:10.1145/3502718.3524804

4. *A computational thinking module for secondary students and pre-service teachers using Bebras-style tasks*. By Taina Lehtimäki, James Hamm, Aidan Mooney, Kevin Casey, Rosemary Monahan, and Thomas J. Naughton. 2022. In Proceedings of the 2022 Conference on United Kingdom & Ireland Computing Education Research (UKICER '22). Association for Computing Machinery, New York, NY, USA, Article No. 19, p. 1. DOI:10.1145/3555009.3555030
5. *Developing a computational thinking test using Bebras problems*. By James Lockwood and Aidan Mooney. (2018). In Joint Proceedings of the CC-TEL 2018 and TACKLE 2018 Workshops, co-located with 13th European Conference on Technology Enhanced Learning (EC-TEL 2018), Leeds, UK, Article No. 1, pp. 1–12.
6. *PACT: An initiative to introduce computational thinking to second-level education in Ireland*. By Aidan Mooney, Joseph Duffin, Thomas Naughton, Rosemary Monahan, James Power, and Phil Maguire. (2014). Irish Conference on Engaging Pedagogy (ICEP 2014). Athlone Institute of Technology, Ireland, pp. 1–14.

## Find out more

To find out more about this fellowship project, please contact Dr Kevin Casey, Computer Science Dept, [kevin.casey@mu.ie](mailto:kevin.casey@mu.ie)

# 6

## Maynooth University teaching and the Sustainable Development Goals

### Lead and team members

- **Patricia Kennon<sup>a</sup>** (lead)
- Susan Gottlöber<sup>b</sup>
- Rebecca Maguire<sup>c</sup>
- James Carolan<sup>c</sup>
- Joost Slingerland<sup>c</sup>

### Faculties

- Faculty of Social Sciences Teaching and Learning Committee
- Faculty of Arts, Celtic Studies and Philosophy Teaching and Learning Committee
- Faculty of Science and Engineering Teaching and Learning Committee

### Abstract

This project aimed to support and enhance Maynooth University teaching's engagement with the United Nations Sustainable Development Goals (SDGs). The project involved the first transfaculty and transdisciplinary collaborative initiative by the three Maynooth University Faculty Teaching and Learning Committees and the first university-wide engaged research on university teaching and the SDGs. During 2020/21, the three Committees had collaborated to design and conduct a university-wide survey to map which SDGs are most relevant to different Maynooth University Departments, Centres, Schools, and Institutes and to highlight Maynooth University teaching and teaching-related partnerships engaging with SDGs. Building upon the 2021 project's Inaugural Report, the three Committees extended their collaborative action research during 2022/23 through this Maynooth University Teaching and Learning Fellowship project, 'Maynooth University Teaching and the Sustainable Development Goals' to further investigate ways to support and enhance the university's teaching and learning engagement with the SDGs. The Fellowship project involved engaged research during September 2022 and March 2023 and comprised: a literature review on university teaching and the SDGs; further analysis of the Inaugural Report data and findings; and focus-group discussions with

university faculty members and Maynooth Student Union officers to identify opportunities and challenges in teaching and learning for addressing and advancing the SDGs. Based on the responses of the focus-group participants and informed by good practice in the literature, a Report was created with recommendations and suggested further reading to help support curriculum planning and enhance teaching engagement with the SDGs at Department/School level and for individual faculty members.

### Project overview

There is an increasing demand for teaching at university level to engage with sustainability and the Sustainable Development Goals (SDGs). Respondents in the 2021 international Students Organizing for Sustainability International (SOS) 'Students, Sustainability and Education' survey of nearly 7,000 students indicated that: 92% agree that all universities should actively incorporate and promote sustainable development; 85% say the concept is something they want to learn more about; and 73% want to see it covered by all university courses. A collection of 17 interlinked global Goals to achieve a better and more sustainable future for all, the SDGs are part of the United Nations 2030 Agenda for Sustainable Development and were agreed by 193 countries in September 2015. The SDGs emphasise the interconnected environmental, social and economic aspects of sustainable development and each of the 17 interlinked Goals strives for the universal reduction of climate change and poverty and the improvement of education, health, and economic growth. Education is critical for enabling the achievement of the Goals and universities play an essential role in creating spaces and opportunities for collective knowledge generation, exchange, and solutions regarding SDG-related challenges. While different disciplines and programmes can interact with particular SDGs that are relevant to their content and concerns, Goals such as

'Quality Education' (the 4th SDG) and 'Gender Equality' (the 5th Goal) directly involve all disciplines and teaching contexts in the call for inclusive, equitable and quality education for everyone. Progressing and advancing the SDGs aligns with and supports Maynooth University's vision to offer an 'outstanding university education... which challenges and supports all students to achieve their full potential, and prepares them for life, work and citizenship, and for complexity, diversity and change'.

This Fellowship project arose in response to the strong student expectation and interest regarding teaching and modules engaging with SDGs which students expressed in a 2019/2020 Maynooth Student Union survey. Following discussions with the Maynooth University Teaching and Learning Committee, Faculty Deans, Dean of Teaching and Learning, and Green Campus committee, the three university Faculty Teaching and Learning Committees collaborated during 2020/2021 to design and conduct a university-wide survey. The survey's aims involved: determining the SDGs that are most important to individual Maynooth University Departments, Centres, Schools, and Institutes; highlighting teaching engaging with SDGs in university Departments, Centres, Schools, and Institutes; mapping the university's local and global partnerships in teaching that progress achievement of achievement; and investigating how to support university Departments, Centres, Schools, and Institutes to more successfully integrate SDGs in their teaching and aspects of research relating to teaching and learning. The Inaugural Report on MU Teaching & Learning's Engagement with Sustainability and the SDGs arising from the study was published on the university website in November 2021. The findings demonstrated a significant engagement by the majority of Maynooth University Departments, Centres, Schools, and Institutes in teaching and learning addressing SDGs, as well as substantial offerings of programmes, modules, and activities that engage with SDGs.

During 2022/23, the three Faculty Teaching and Learning Committees extended their collaborative project through this Teaching and Learning Fellowship project, ‘Maynooth University Teaching and the Sustainable Development Goals’, to further investigate ways to support and enhance the university’s teaching and learning’s engagement with the SDGs and to create a Report as a pedagogical and planning resource for the University teaching and learning community. Different disciplines, programmes and contexts will have different extents of engagement with different SDGs and the project was committed to affirming the diversity and different interests and needs of different Departments, Schools, and faculty members.

## Project outline

The project involved qualitative, engaged research during September 2022 and March 2023 and comprised: a literature review on university teaching and the SDGs; further analysis of the Inaugural Report data and findings; and focus-group discussions with university faculty members and Maynooth Student Union officers. Mindful of a range of career stages, levels of experience with teaching and the SDGs, and gender balance, 18 faculty members from 9 university Departments and Schools (Adult & Community Education, Applied Social Studies, Biology, Design Innovation, Education, Froebel Department of Primary and Early Childhood Education, Geography, International Development, and Philosophy) were recruited to participate in the faculty-member discussions. The participants in the Maynooth Student Union officer focus group involved the President, VP Education & Deputy President, VP Welfare & Equality, and VP Student Life. The discussions explored challenges and opportunities for supporting and enhancing Maynooth University teaching and learning relating to the SDGs and how Maynooth University teaching might align with the SDGs to ensure that learners acquire relevant knowledge, skills, dispositions, and values to promote and advance the SDGs. The Fellowship team created a draft Report document which includes recommendations and suggestions for further reading and circulated this in March 2023 for feedback and comments to the three Faculty Teaching and Learning Committees, including the student representatives on these Committees. This Report was finalised during April 2023 and presented for discussion at the three Maynooth University Faculty meetings in May 2023.

The Fellowship project team and the three Maynooth University Faculty Teaching and Learning Committees sincerely thank all the Maynooth University faculty members and Student Union Officers who generously gave their time to participate in the focus group discussions for this project.

## Findings

The findings are organised and presented as recommendations for Maynooth University teaching, assessment, and curriculum design at two levels (collective and individual): ways that Departments and Schools could support and enhance their teaching engagement with the SDGs; and ways that faculty members could support and enhance their teaching engagement with the SDGs. A university-wide approach and disciplinary as well as transdisciplinary and interdisciplinary approaches are key for optimising student learning, enabling student success, engaging with contemporary problems, and equipping students and graduates to creatively and innovatively find solutions. The Report included a list of suggestions for disciplinary-specific as well as interdisciplinary and transdisciplinary further reading regarding SDGs, pedagogy, curriculum design, and higher education which we hope will support and enhance the range and richness of how university teaching can engage with SDGs. The findings were also presented at three conference events during 2023: a presentation at the Maynooth University Teaching and Learning Fellowship Sharing Event in February 2023; a showcase lecture at the Maynooth University workshop, ‘Sustainability in Teaching and Learning’ in June 2023; and a presentation at the national conference, ‘Action Research for a Sustainable Future’ in June 2023.

### Ways that Maynooth University departments and schools could support and enhance their teaching engagement with the Sustainable Development Goals

#### Reflect on how teaching, learning, and assessment in your Department or School might link with relevant SDGs

- Programme teams and module teams could review their respective curricula to identify and explore potential for incorporating or enhancing links with the Sustainable Development Goals which are relevant for their respective discipline, sector, learning outcomes, student cohort, and context.
- Consider potential links, as relevant, for your Department or School modules and programmes to build upon with the new Climate Action and Sustainable Development Leaving Certificate subject which will begin on a trial basis in schools in September 2024.
- Departmental and School faculty and teaching staff could list the particular SDGs that link with their teaching in the biographical and teaching sections of their university online profiles to help promote their SDG-related teaching and to develop student awareness of their offerings.

#### Map teaching and learning in your Department’s or School’s programmes and modules to relevant SDGs

- These links and relevant SDGs could be named in the module, elective, or programme overview in the university Coursefinder and in the programme handbooks to help current and potential students identify offerings which engage with SDGs and to help raise awareness.
- When seeking feedback on modules or programmes, ask students to reflect on the extent to which these engage with SDGs relevant to your sector, discipline, and learning outcomes.

### Refine current teaching links to relevant SDGs and create teaching links with relevant SDGs

- Review the assessment in your programmes and modules for potential to engage with relevant SDGs at a local as well as global level.
- Incorporate or further embed action-oriented pedagogies that promote active, participatory, and inquiry-based methods towards enabling learners to act in real-life authentic situations relating to relevant SDGs. Some practice-based examples of this in various disciplines include: developing a plan in Law for ensuring workplace compliance with accessibility laws; creating a travel guide to a country where a Modern Foreign Language being studied is spoken and integrating as many sustainable tourism activities as possible; creating works of inclusive design in Engineering for enabling all uses to participate equally, confidently, and independently in everyday activities.
- Embed advocates, experts, and stakeholders with lived experiences for Departmental and School guest speakers and event facilitators to explore and raise awareness around local and global sustainable-development challenges relevant to your discipline and learning objectives. Examples could include investigating and analysing: impacts of conscious and unconscious biases regarding barriers for gender equity in Sociology; public policies and their impacts on mobility and migration in International Development; digital rights and digital safety in Education; colonialism and land sovereignty in History; greenwashing and green consumerism in Media Studies; sustainability of minority languages in Education; and climate change and mental health in Psychology.

### Foster opportunities for experiential learning relating to relevant SDGs

- Consider how placements and experiential learning in your programmes and modules might develop students' awareness, attitudes, and competencies regarding relevant SDGs e.g. immersive virtual field courses in Ancient Classics, field-based teaching and learning in Physics, interpretive trails to local historical and cultural sites in Celtic Studies.
- Create new partnerships and develop existing Departmental and School partnerships for service-based learning with community groups in order to support students' learning regarding discipline-linked needs and collaborative knowledge sharing relating to relevant SDGs.

### Ways that Maynooth University faculty and teaching staff could support and enhance their teaching engagement with the Sustainable Development Goals

#### Reflect on how your teaching, curriculum design, and assessment might link with relevant SDGs

- Reflect on links between your pedagogy and the Sustainable Development Goals and identify any particular Goals that resonate with your discipline, context, sector, and teaching interests.
- Reflect on the core competencies you aim to develop in relation to relevant SDGs. Review the curricular content in your courses and consider potential for incorporating or enhancing links with SDGs which are relevant for your discipline, learning outcomes, student cohort, and context.
- Review the reading lists and syllabi for your modules and electives and ensure that a range of voices and perspectives are represented e.g. theorists from the Global South, researchers from indigenous and marginalised groups.
- Review the assessments for your modules and electives for potential to engage with problem-posing, debates, projects, experiential learning, and analyses relating to relevant SDGs.

- Consider students as partners during these processes to help build co-ownership, community, and belonging and collective action for achieving SDG-related solutions and change.

### Foster opportunities for your students to engage with relevant SDGs

- Incorporate research activities relating to relevant SDGs for your students to identify more sustainable alternatives for current systems e.g. causes of food loss and wastage in their locality in Geography; designing a low-cost, community-based system responding to a SDG challenge in Computer Science; the successes and failures of global partnerships for preventing child labour in national and international contexts in Economics; health inequalities and their causes and impacts in Philosophy; the successes and failures of global partnerships regarding conservation in International Development; thinking critically regarding Chemistry-related SDGs about possible futures and the role of industry, innovation, and infrastructure in creating these.
- Identify and incorporate case-studies which engage with relevant SDG issues and challenges in your discipline and sector. Case studies can enable students to investigate local and global challenges, to work with relevant NGOs, community groups, or private enterprises, and to work together in finding solutions e.g. systems to find, interpret, and present data measuring progress towards a relevant SDG in Mathematics such as statistics on girls' access to education in different national settings.
- To deepen criticality, ask students to identify and analyse gaps in Sustainable Development Goals which are relevant to their discipline and sector. What might the Goals leave out? For example, challenge students to identify and propose a new SDG relevant for their discipline.
- Use a wide range of stories, media, artefacts, news reporting, and texts from around the world to illuminate and analyse issues linked to relevant SDGs e.g. identify contemporary stereotyping, opinions, bias, and facts relating to gender equality movements in different national and international historical moments in History, Education, and Media Studies.

- Invite students to think about the extent to which fiction and nonfiction texts relevant to their discipline and sector (e.g. novels, public policy, curriculum, legislation) represent or do not represent non-human perspectives and non-human environmental agencies e.g. exploring in Biology the growing field of more-than-human-centred design which accounts for non-human actors in interdependent design processes such as animals, plants, microbes, and autonomous technologies.

### Develop your opportunities for collaboration and knowledge exchange in teaching and learning

- Talk with other academics and teaching-staff in your Department or School and relevant Departments and Schools about exploring ways to share your teaching practice and integrating and/or enhancing your teaching engagement with relevant SDGs.
- Join the UNESCO Education for Sustainable Development for 2030 Global Network free platform for sharing SDG-related teaching practices: <https://mailchi.mp/unesco.org/esd-subscribe>.

## Key reflections

It has been a personal and professional pleasure as well as an inspiring experience to have been involved in this collaborative engaged research. The faculty and Student Union participants in the focus-group discussions shared a rich range of ways in which Maynooth University curricula, modules, teaching activities, teaching resources, pedagogical methodologies, assessments, and placements engage with various Sustainable Development Goals as well as ways in which SDGs might be further incorporated and embedded in university teaching and learning.

Key values of this Fellowship project involved the importance of reflective practice as well as collaborative enquiry and these strongly resonated with both the focus-group discussions and the literature. These values powerfully aligned with the aims and values of the Sustainable Development Goals. Moreover, this Fellowship project provided a valuable and timely opportunity to explore and to affirm the importance of universities for enabling, supporting, and leading knowledge-exchange, dialogue, collective problem-posing, and collaborative action towards advancing the Goals and co-creating solutions to global challenges.

## Find out more

To find out more about this fellowship project, please contact Dr Patricia Kennon, [patricia.kennon@mu.ie](mailto:patricia.kennon@mu.ie)

# 7

## Eco-journaling: climate engaged learning through literature

### Lead and team members

- Stephen O’Neill (lead)
- Pat Palmer
- Evan Bourke
- Kevin Treacy
- Alan Waldron

### Department

- English

### Abstract

“Eco-Journaling: Climate-Engaged Learning through Literature” explores innovative and experiential learning and assessment methods on a final year module, “Lost Worlds: Reading a Fragile Planet” on the MU English degree. The module gives students unique opportunities to approach early modern writing eco-critically, through the climate crisis. Learners’ engagement with the early modern texts is facilitated using an eco-journal, which is both the students’ entryway into the early modern text and their engagement with the environment. On one page, students extrapolate the text’s environmental content and context. On the facing page, they respond with critical and creative observations that bring texts into dialogue with nature and the threats besetting it. This combination transforms how students read early modern material. It leads them to understand this period as inaugurating present crises of extraction and ecocide and, more broadly, to appreciate how literature negotiates the climate challenge. Mobilising students’ imaginations, eco-journaling models a move from reading to active, eco-awareness.

### Project outline

The project aims were to (i) create hybrid assignment modes, with learners using hard copy journals and subsequently, developing digital journals; (ii) found a campus tree-trail; (iii) with students, curate an eco-journal exhibition; (iv) organise a symposium; (v) conduct surveys identifying levels of learner success, including summative assessment achievement, and disseminate findings in an article submitted to an interdisciplinary, environmental humanities Teaching and Learning journal. We realised our major aims, with each student supplied with their own journal (designed by Badly Made books, Cork), which they were encouraged to bring to each tutorial. We organised an artist workshop for each tutorial group with our visual artist Susan Leen who facilitated the students in a range of design ideas for their journals. We developed peer learning, with students allocated into groups to devise a group presentation, delivered via Padlet, in class. These proved highly effective not only in building collaboration but also creating reflection points for students on their learning that they could then apply to their final essay.



Figure 1: Exemplary student eco-journaling.

We conducted in-class surveys on the learning experience, gaining excellent qualitative data that revealed elevated levels of student engagement with the module and genuine excitement

and a sense of pride about the eco-journals. While we did not realise plans for a symposium, the project and the eco-journals were showcased at the international “Tudor Stuart Ireland” conference (hosted at MU in August 2023). Dr O’Neill and a former student on the module, Lauren Ashmore, presented the project to early modern scholars and teachers who expressed interest in using the assessment as a model for their own courses. The team is working on an article on the project for a teaching and learning journal.

### Findings

The main findings of the project were around (i) literature and culture as modes of engagement with environmental crisis; (ii) learner efficacy and confidence; (iii) broadening of student skills; (iv) and creating networks in climate engaged learning at Maynooth and beyond.

- (i) We adapted Lynne Bruckner’s eco-critical Shakespeare pedagogy, which encourages students to keep observational learning journals that take their learning beyond the classroom (Bruckner 2016: 262). Email correspondence with Brucker enabled us to develop the assessment to our learning outcomes. Engaging with scholarship on teaching and learning, primarily in the domain of climate change education (Verlie 2020), provided us with a framework in communicating assessment to the students. It further helped to convey to learners the importance of integrating environmental concerns into the classroom to reflect how the climate crisis is part of all of our embodied, affective lives (Hayden 2011; Perkins 2018). Engaging with ecocriticism, a significant field in literary studies, further helped us to deliver the module and develop the assessment by communicating research on early modern literature’s own environmental contexts (Borlik 2023; 2011) as well as regarding the early modern period as the origin story of our present ecological

emergency (Crane 2014). We discovered that for our students – and indeed ourselves as teachers – developing eco-literacy through the encounter with literature and through the reflective journal became a step towards climate responsibility and mitigation against climate despair and anxiety.

- (ii) We discovered that the study of literature and culture through climate crisis presents significant frameworks for learners to apprehend, process and reflect on this immense societal challenge. Students in the 22/23 cohort responded positively and enthusiastically to eco-journaling. Exemplifying this response, one student commented: ‘I loved doing the eco-journal, I don’t have any other classes where I can be creative and connect my degree to my actual life. It allowed me (forced me) to engage with the texts in depth and think towards my final essay’ (Anonymous Feedback Survey, 6 December 2022).
- (iii) We found that eco-journaling took students beyond their literary study into new modes of expression and peer interaction through which they improved their communication, interpersonal, and presentation skills. Additionally, by using digital tools like Padlet to design and deliver group presentations, learners developed transferable skills in ICT.
- (iv) The project created significant opportunities to share practice and approach with MU colleagues, with Dr O’Neill and Dr Bourke presenting at the Teaching Fellowship Sharing Practice session (11 May 2023); Dr O’Neill presenting “Literature Sparks Sustainability: Developing Eco-Journaling” at the Sustainability in Teaching and Learning symposium (12 June 2023) and also “Climate Crisis and the Literary Imagination” as part of MU’s Social Justice Week (24 March 2022).

## Key reflections

The project proved reflective, creative, energizing, and collaborative. It created reflection points in the learning and the teaching – we were all actively thinking about process as we co-created knowledge. Eco-journaling is at its heart, creative and haptic – a sense of working closely with the material but also creating. Our students went above and beyond, even creating Spotify playlists to accompany their eco-journals. This sense of creativity has carried on into the module: there continues to be a “buzz” about the eco-journals and a sense of pride in them in students and lecturers alike. The fellowship proved energizing for the teaching team – creating close collaboration and ongoing discussion about assessment.

## Recommendations

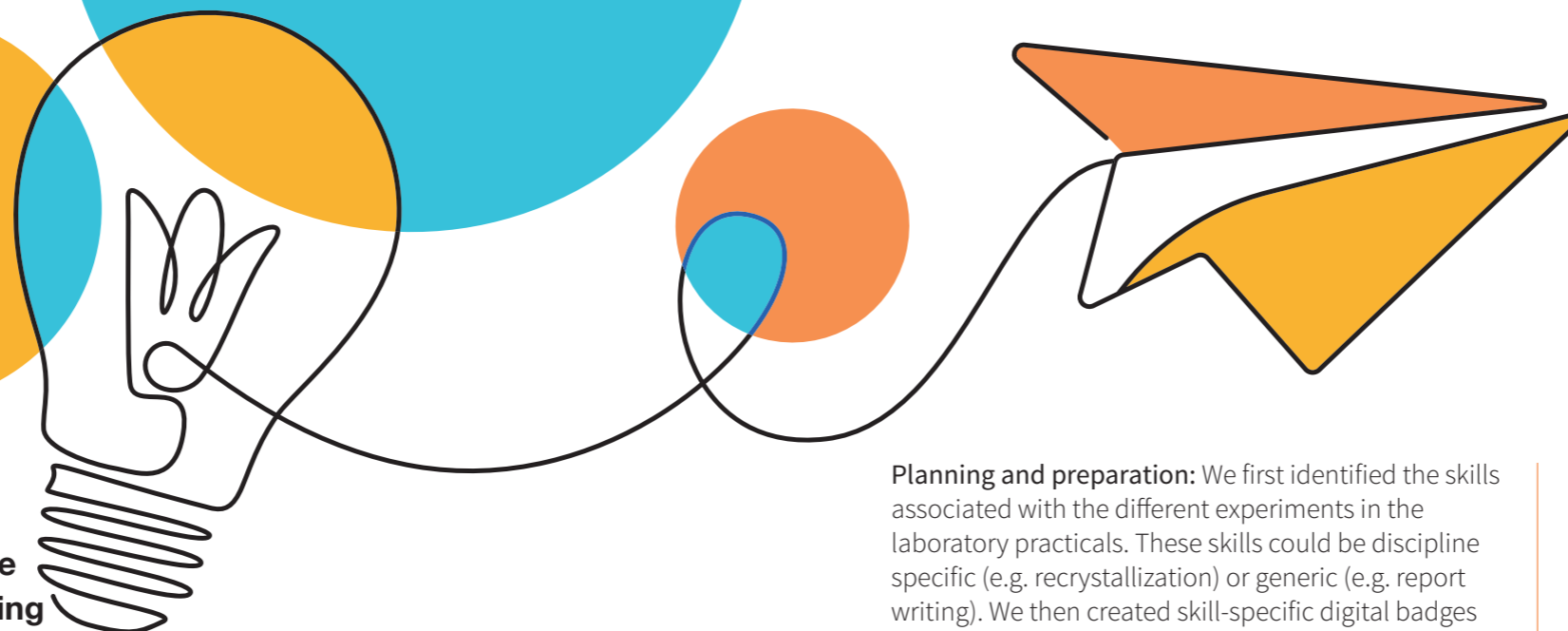
- Climate Change and the Curriculum: Develop further climate change education across the MU curriculum, with an emphasis on cross-disciplinary collaboration.
- Undergraduate Collaborative Learning: Create opportunities for intra and inter disciplinary collaboration among undergraduate students, e.g. by pairing final year Biology students with English literature students to develop different approaches to ecological crisis.
- Building Recognition: create MU Climate Ambassadors, modelled on SPUR scheme, to foster and recognize climate engagement and advocacy in learners.
- Maynooth Green Campus: utilise the campus as a learning environment for students through tree trails that connect with ways of reading nature and the environment in different disciplines.

## References

- Borlik, T. 2023, *Shakespeare Beyond the Green World: Drama and Ecopolitics in Jacobean Britain*. Oxford: Oxford UP.
- Borlik, T. (2011), *Ecocriticism and early modern English literature: Green pastures*. London: Routledge.
- Bruckner, Lynne, (2011), ‘Teaching Shakespeare in the Ecotone’, *Ecocritical Shakespeare*, London: Routledge, 247-262.
- Crane, M. (2014), *Losing Touch with Nature: Literature and the New Science in Sixteenth-century England*. Baltimore: Johns Hopkins UP.
- Hayden, Margaret, (2011), ‘Pedagogies of empowerment in the face of climate change uncertainty’, *Journal for Activist Science and Technology Education* 3 (1): 119-30.
- Perkins, Krystal M, et al, (2018), ‘International perspectives on the pedagogy of climate change’, *Journal of Cleaner Production*, 200: 1043-52.
- Verlie, Blanche, (2020), ‘From action to intra-action? Agency, identity, and “goals” in a relational approach to climate change education’, *Environmental Education Research* 26 (9-10): 1266-1280.

## Find out more

To find out more about this fellowship project, please contact Dr Stephen O’Neill, Department of English, [stephen.oneill@mu.ie](mailto:stephen.oneill@mu.ie)



**Planning and preparation:** We first identified the skills associated with the different experiments in the laboratory practicals. These skills could be discipline specific (e.g. recrystallization) or generic (e.g. report writing). We then created skill-specific digital badges

## Lead and team members

- **Trinidad Velasco Torrijos** (lead)
- Frances Heaney
- Robert Elmes
- John Stephens
- Ria Collery Walsh
- Anne Cleary
- Orla Joyce
- Denise Rooney

## Department

- Chemistry

## Abstract

Enhancing employability by skill development is perceived as key to student success. We aimed to signpost skills acquired by 2nd and 3rd year students during organic chemistry laboratory practicals: to achieve this, we have digital tools such as badges integrated in Moodle and virtual laboratory simulations. This has provided a framework so that students can generate a Digital Skills Passport that highlights discipline specific and transferable competencies.

## Project outline

The project aimed to empower students so they can identify their learning achievements, in particular by the acquisition of key technical and generic skills as markers of success independent of end of year results.

To achieve this, we decided to pilot our approach on the organic chemistry laboratory practicals for 2nd and 3rd year students, which are part of the learning activities for modules CH201, CH301 and CH326. Importantly, Digital Badges had just become available in Moodle at the onset of the project (June 2022), which we used in place of the digital stamps originally proposed. The project consisted of 3 phases:

**Planning and preparation:** We first identified the skills associated with the different experiments in the laboratory practicals. These skills could be discipline specific (e.g. recrystallization) or generic (e.g. report writing). We then created skill-specific digital badges by aligning each skill with assessment criteria. The criteria, also included virtual laboratory resources and simulations (developed by LearnSci and available to students as part of the Virtual Lab project, funded by HCI P3 initiative and currently ongoing in the Department of Chemistry).<sup>1</sup> We then investigated the generation of a digital passport by “back-packing” the Moodle badges using online platform Badgr.<sup>2</sup>

In addition, the laboratory manuals were modified with “signposts” (Figure 1a) to highlight at what point in the experiment the specific skills were practiced.

For this part of the project, we were greatly assisted by Fanahan Barry and Dave Martin (MU Centre for Teaching & Learning). In addition Eoghan Beaumont

(summer intern) was instrumental in the badge design (Figure 1b), testing the digital badges award in Moodle and generating the Digital Passport through Badgr. In addition, ethical approval regarding surveying of the students seeking feedback on the project was sought and granted.

**Implementation:** Documentation to explain the purpose of the project and the awarding of the digital badges was clearly posted through Moodle and instructions to generate the Digital Passport through Badgr were prepared and circulated to the students at the start of the laboratory sessions. In addition, a drop-in tutor was arranged to further support the implementation into the 3rd year laboratory practicals.

**Feedback and analysis:** At the end of the module, the students' feedback on the project was sought through an on-line survey.<sup>3</sup> A Padlet wall was also available throughout the project so that students could leave

### Procedure for Preparation & Purification of 3-Methylbutyl ethanoate

#### Additional Technical Notes in General Section

**Synthesis:** Follow the approach used in the pre-lab simulations/lab video to assemble your apparatus for heating at reflux. In a dry 100 cm<sup>3</sup> round bottomed flask place glacial acetic acid (0.3 mol), and 3-methylbutan-1-ol (0.15 mol). Dropwise, with gentle swirling add concentrated sulfuric acid (1 cm<sup>3</sup>) – *critical thinking opportunity* – note and explain any changes! Swirl gently for a further 1 minute to ensure that the reactants are mixed completely. **NOTE:** if the conc. H<sub>2</sub>SO<sub>4</sub> is allowed to sit as a separate layer at the bottom of the flask the mixture will char when it is heated *[critical thinking opportunity - why does c-H<sub>2</sub>SO<sub>4</sub> fall to the bottom of the flask]*. Add two boiling stones and **heat under reflux** for 30 minutes. Remove from the heating mantle and allow to cool to room temperature.

**Reaction work-up:** Following the approach used in the lab video **use a separating funnel** to wash the reaction mixture, firstly with deionised water (50 cm<sup>3</sup>) *critical thinking opportunity – why?* and then with two portions of saturated sodium bicarbonate solution (2 x 10 cm<sup>3</sup>) *critical thinking opportunity - why this wash, what is a saturated solution of sodium bicarbonate?* **NOTE:** The contents of the separating funnel must be gently swirled before inserting the stopper since there can be a build-up of gas which is liberated during washing with sodium bicarbonate *[critical thinking opportunity - what is this gas? why is it produced?]*

**Drying a Liquid Product:** Following the approach used in the pre-lab simulations/lab video dry the crude liquid product with anhydrous magnesium **sulfate** (found on the shelves above the bench), gravity filter through fluted filter paper into a **dry** 100 cm<sup>3</sup> round bottomed flask.

**Purification by Distillation:** Follow the approach used in the pre-lab simulations/lab video to assemble your distillation apparatus. Distil the crude ester to obtain pure 3-methylbutyl ethanoate. Record the boiling point range. When the distillation is completed, and the apparatus has cooled record your yield and transfer the purified product to a sample vial.

**Sample Labelling and Submission:** Label your sample and leave it on your bench. Copy the details from your sample label into your notes.

**Figure 1 a):** Signposting the lab manual for relevant skills. **b):** Example of badge design for technical skill “heating under reflux”.

any comments or questions. The results of the surveys were then analysed for the 2nd and 3rd year cohorts.

## Findings

The students were asked to provide feedback on the impact that the project had on their learning experience in the laboratory (Figure 2): a total of 42 (22%) and 27 (18%) students from the 2nd and 3rd year cohorts, respectively, responded to the online survey. We found that over 80% of students, both in 2nd and 3rd year, strongly agreed/agreed that participation had enhanced their experience of, and improved their engagement with laboratory work; however, there were a significant number of respondents (approx. 30%) who did not agree that

participation enhanced their performance. Importantly, most of the students in both cohorts (85–95%) strongly agreed/agreed that participation in the project helped them recognise valuable technical and transferable skills and to become more aware that skills acquired in the laboratory can improve their employability.

Similarly, the majority of students (80–90%) found the use of badges and signposting in the laboratory manual an effective way to recognise skill development opportunities (Figure 3). Interestingly, in both cohorts only 60–65% of the students found that the use of badges motivated them to achieve their goals, while 85–95% strongly agreed/agreed that the use of badges was a positive feature of the module. We believe these findings are not in contradiction,

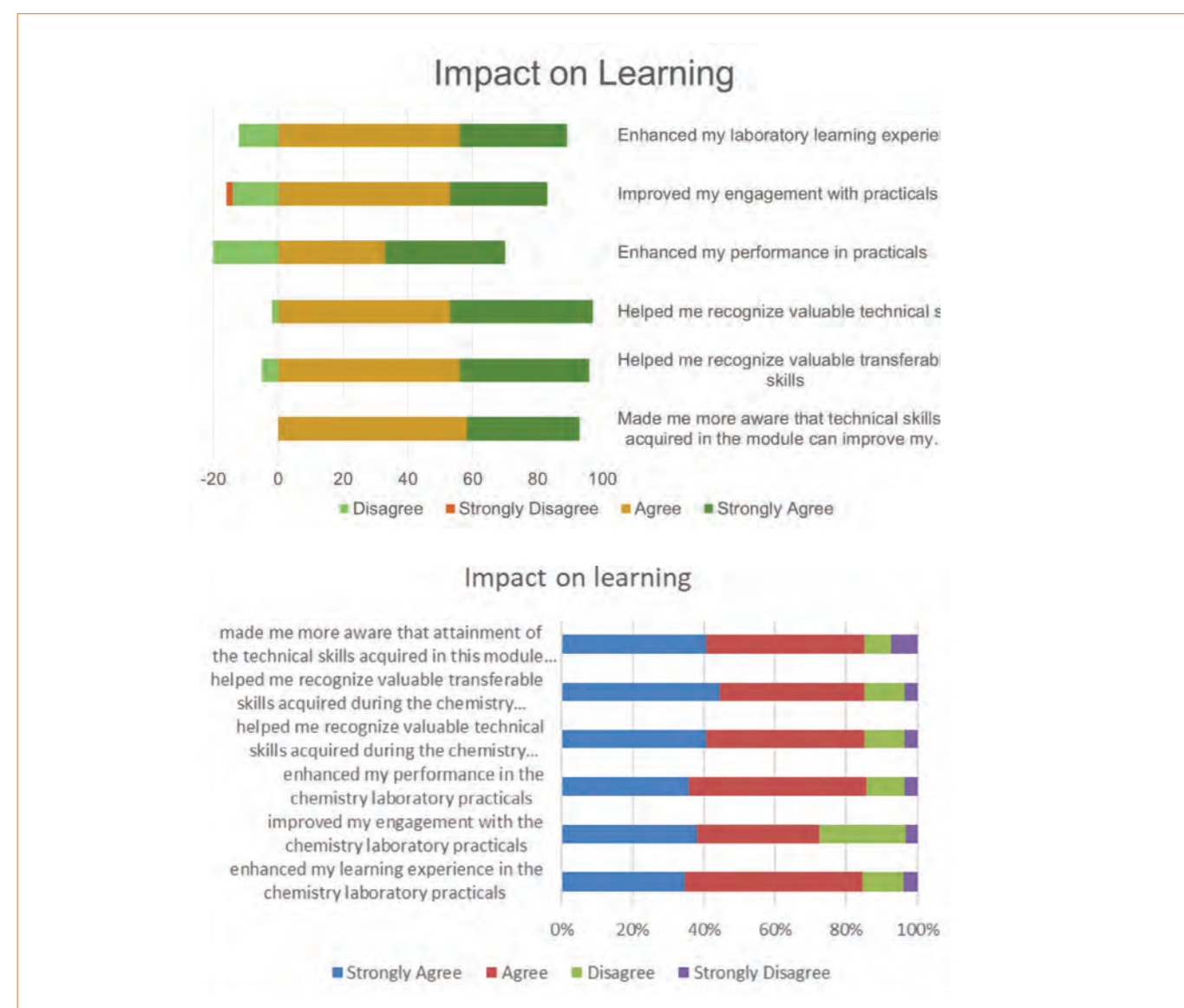
rather we understand these views to mean the students valued the purpose of the project but were not extrinsically motivated by the badges themselves. Indeed, it has been suggested that the overuse of extrinsic motivators such as badges can shift attention away from the intended outcome.<sup>4</sup>

## Key reflections

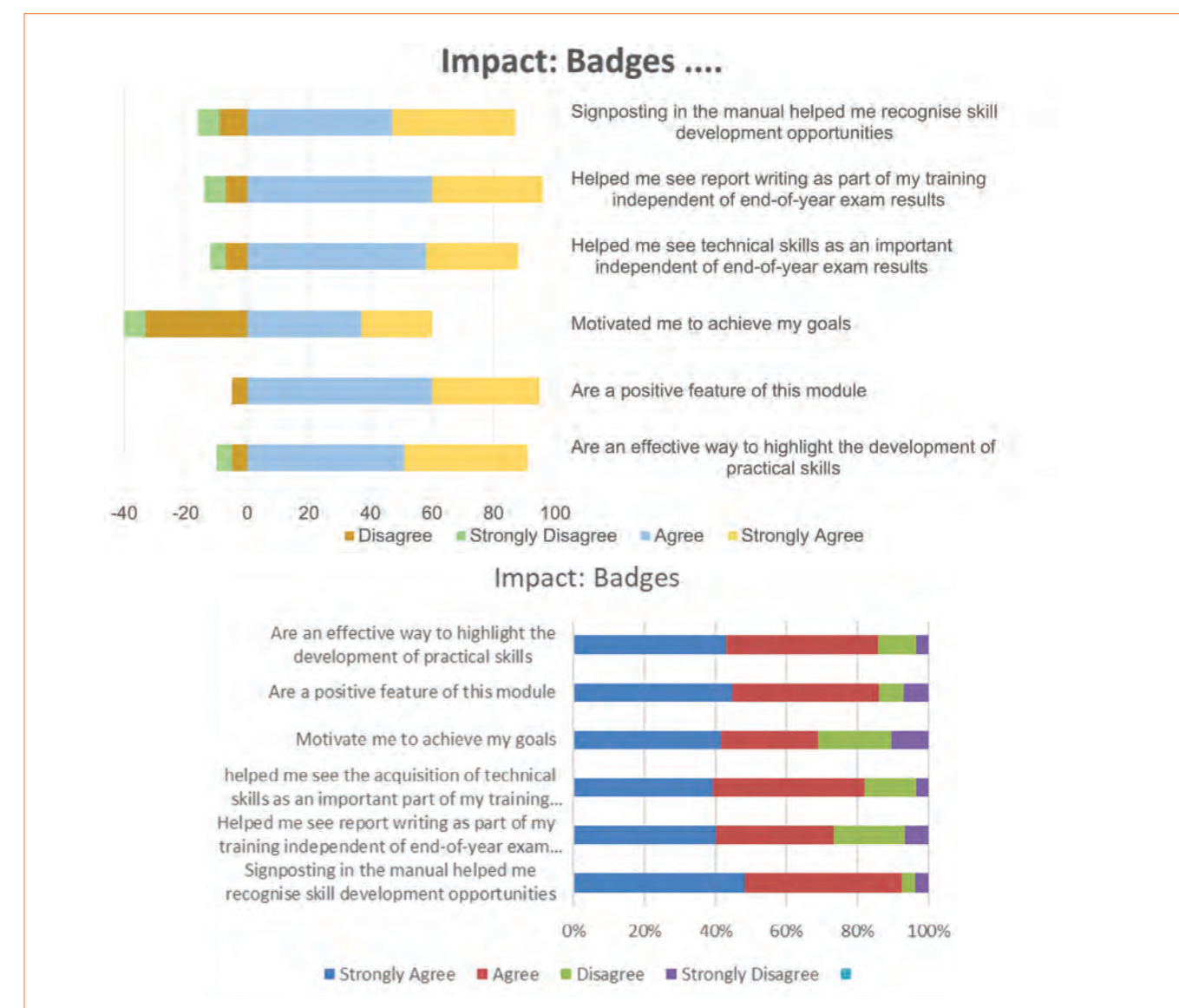
Our findings indicate that digital tools, such as digital badges embedded in the virtual learning environment (Moodle) and virtual laboratory resources and simulations have enabled effective signposting and recognition of skill development opportunities in the organic chemistry laboratory. In fact, this project won a LearnSci Teaching Innovation Award 2022<sup>5</sup> and has

served as the basis for a LearnSci case study.<sup>6</sup> Our findings have also been presented at Horizons in STEM Higher Education Conference (Swansea University, 2023, oral presentation) and at the EDEN Annual Conference 2023 (Dublin).<sup>7</sup>

In addition, the project was also featured in an entry in a Teaching and Learning blog from Universidad de Castell-La Mancha (Spain)<sup>8</sup> and we are currently finalising the preparation of a manuscript for academic publication.



**Figure 2:** Student perception regarding the impact that participation on the project had on their learning. a): 2nd year cohort, b): 3rd year cohort.



**Figure 3:** Student perception re. the use of badges. a): 2nd year cohort, b): 3rd year cohort.

## Recommendations

In this project, we have successfully availed of enabling digital tools for effective skill signposting, and increased student awareness of training and development opportunities. The project has produced a framework that is not limited to the signposting of technical skills in Chemistry or other experimental subjects, but can be implemented in other disciplines and diverse skills. Our findings show that students find this approach enhances their teaching and learning experience and we plan to continue to employ it in the organic chemistry laboratory.

## References

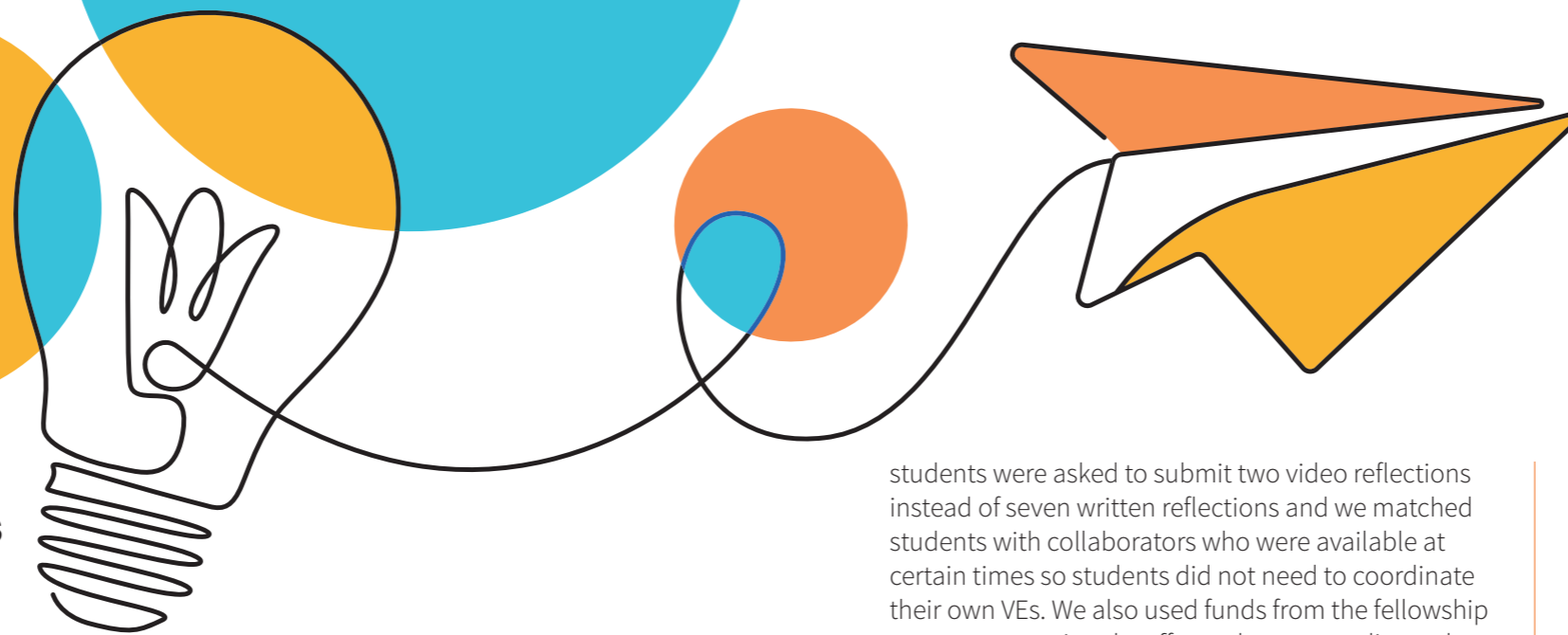
1. <https://www.maynoothuniversity.ie/mu/chemistry/virtual-labs-hci-p3-initiative>
2. <https://docs.moodle.org/403/en/Badges>
3. <https://onlinesurveys.jisc.ac.uk/>
4. Cross S., Whitelock D. and Galley R., (2014), The use, role and reception of open badges as a method for formative and summative reward in two Massive Open Online Courses, IJEA, 4.
5. <https://www.learnsci.com/tia-applicants/2022-maynooth-university-frances-heaney>
6. Case Study: “Maynooth University’s Chemistry Department increases students’ awareness of their skills, improving competency for employment”  
<https://www.learnsci.com/case-studies/maynooth-university-chemistry-skills-badging-employment>
7. <https://eden-europe.eu/event/eden-2023-annual-conference-in-dublin>
8. [https://www.uclm.es/ciudad-real/quimicas/Transferencia\\_Visibilidad/InnovaDocente/3ideas](https://www.uclm.es/ciudad-real/quimicas/Transferencia_Visibilidad/InnovaDocente/3ideas)

## Find out more

To find out more about this fellowship project, please contact Dr Trinidad Velasco Torrijos, [trinidad.velascotorrijos@mu.ie](mailto:trinidad.velascotorrijos@mu.ie) or Professor Frances Heaney, [frances.heaney@mu.ie](mailto:frances.heaney@mu.ie)

## 9

## Virtual exchanges with native speakers in the Spanish-speaking world: Integrating language and culture



### Lead and team members

- Ana de Prada Pérez (lead)
- David García León
- Antonia Flores
- Anna Laribal
- Carolina Valles
- Erin Doarbes
- Kyle Murphy
- Breda O'Toole

### Department

- Spanish and Latin American Studies (School of Modern Languages, Literatures and Cultures – SMLLC)

### Abstract

This project aimed to create materials for and organize virtual exchanges (VEs) with native speakers of Spanish for our second-year students in their core language module. Weekly online meetings between two Maynooth University (MU) students and one Colombian telecollaborator (PG students in degrees for teaching Spanish as a second/foreign language) took place during the first year, with a total of seven sessions in Semester 1 and seven sessions in Semester 2. Student and staff members collaborated in the selection of topics and the creation of guides for students. These guides gave students directions for preparing for the meeting, what to do during the meeting, and a reflection. Participation in the meetings and submission of a reflection contributed toward their overall module mark. Student feedback was obtained via a Moodle module evaluation questionnaire at the end of Semester 1 and Semester 2. Students' numeric and open-ended responses indicated VEs improved their language skills and Spanish and Latin American cultural knowledge. From student and staff feedback, we identified the following challenges: students reported difficulty scheduling VEs and completing so many reflections; staff noticed increased administrative workload, as well as difficulty recruiting students as research participants. To address these challenges, during the second year,

students were asked to submit two video reflections instead of seven written reflections and we matched students with collaborators who were available at certain times so students did not need to coordinate their own VEs. We also used funds from the fellowship to pay an occasional staff member to coordinate these VEs and to answer student queries. These changes have helped run the VEs more efficiently. We plan to continue providing VEs for our students.

### Project outline

The following aims were achieved.

**Curricular development:** formalize telecollaborations with Universities abroad (Del1), organize virtual exchanges (VE) (Del 2), and create assessment materials (Del 3).

- **Assessment and feedback:** The change in assessment of oral skills (adding a low stakes CA) supports student success (National Forum 2019 report) through Assessment of/for/as learning and the use of authentic assessment (Swaffield, 2011), in line with 3.1 and 3.2 of the University Strategic Plan (USP).
- **Equality, diversity and inclusion:** This project will diversify and possibly decolonize our curriculum, aligning with the SMLLC mission (points 2 & 5) and USP (5.1, 5.2, 5.3; 6.1, 6.3) through internationalization at home and better preparing students for their year abroad.
- **Teaching and learning enhancement:** These exchanges will facilitate using Spanish in natural conversation leading to improved language skills and intercultural competence, in line with the SMLLC mission (points 1, 4, 6) and USP (3.1 [1, 3, 4] and 3.2; 7.1 [4]).

- **Blended and online learning:** One of the outcomes of VE is enhanced digital competence for instructors and students, in line with USP (7.1 [3]; 10.1 [4 & 6]).
- **Students as partners in curriculum and enquiry:** Students were involved in a previous pilot study (SPARK), this proposal, and will continue to collaborate with us in material creation and evaluation, in line with USP (4.1).

- **Experiential learning and learning beyond the university:** using the language for real-world communication.

**Teaching staff training and development:** Intention to use funds to support staff members to get training (Del 4) and develop teaching strategies during the summer, in line with the USP (9.1, 9.2; 10.1 [4, 6]); all staff members completed and received a certificate for UNICollaboration Trainee in the Basics of Virtual Exchange.

**Innovation evaluation and research:** We intended to measure possible improvements in language skills, attitudes towards learning, and intercultural competence at the beginning of the year and at the end of the academic year and present results at national and international conferences (Del 5) and publish them in book chapters/journal articles (Del 6), in line with SMLLC mission (point 3) and USP (5.2; 7.1.1; 9.1, 9.2). We fulfilled this intention by presented the results of the evaluation of the program locally but we did not obtain enough data to proceed with the research project. We do have a PhD student currently designing and piloting a project to test the effect of VEs on the acquisition of Spanish pronunciation.

## Findings

Students reflected on their language skills (1), their language learning (2), their knowledge of Colombian culture (3), and their own culture (4):

1. “I also realised that I have become so used to using the phrase “¿cuántos años tienes?” that when Henry said “¿qué edad tienes?” it threw me off. This refreshed my knowledge of different phrases and reminded me that what we use in class isn’t always what is used in day-to-day life” (S9).
2. “Similar to last week I feel like I was very confident when communicating with the telecollaborator. I felt that the conversation was very natural, and I have noticed an obvious improvement in my spoken Spanish [...] My comprehension of what the telecollaborator is talking about has increased a lot since I first started the virtual exchanges (S4).
3. I learned about the Colombian cuisine empanadas which is very similar to Nigerians meat pie and how Nigerians and Colombians love plantains very much. I learned about a sport called ‘Tejo’ which is also known as ‘Turmequé’. The game uses a small ball with a little amount of explosive in it. I also learned about ‘El Día de la Raza’ that takes place in the 12th of October to celebrate the diversity of Colombia and the Indigenous people of Colombia (S1).
4. “It is surprising that myself and XXX [other student] we had different views of Ireland as I am from XXX [place in Ireland], one of the most excluded parts of Ireland and I thought it was difficult to get work whereas she lives in Dublin, and she said it’s easy. Not only am I learning about Colombia through Spanish but Ireland too” (S7).

Strong agreement was reported in the end of semester module evaluation questions on the VEs, where 100% of students (26 respondents) (totally) agreed with the statement “So far, I find the virtual exchanges greatly beneficial for my oral skill” and 84% (totally) agreed with the statment “So far, I find the oral virtual exchanges greatly beneficial for my Spanish and Latin American cultural knowledge”. Some of the responses to the question “What aspects of the Virtual Exchanges do you appreciate most?” were:

- “The fact that you are having the chats and you learn spontaneously and the fact that it is difficult because you learn the most when you get put on the spot.”
- “I liked learning about their culture and my partner was very kind and helpful.”
- “The aspect of speaking to somebody on the other side of the world and find out what we had in common with each other and what differences we had. While also improving my Spanish, as well as my confidence when speaking to others in Spanish.”

The main challenges reported were scheduling meetings with the time difference between Colombia and Ireland and the workload of submitting seven written reflections per semester, which we addressed on the second year of the fellowship.

## Key reflections

Students and staff were, in general, satisfied with the VEs, even though they reported some challenges. Students reported gaining proficiency in spoken Spanish and knowledge of Spanish and Latin American culture. We tried to respond to the challenges and are hopeful that we can continue to provide VEs for our students.

The additional staff workload was easier to manage once all the materials were created and only required revision and the occasional staff member was able to provide administrative support. We also have more capacity to focus on the research component of the project next year, as a PhD student is carrying out research on this topic for her dissertation.

Students’ workload was also easier to manage once they were not involved in organizing VEs and finding compatible times with their telecollaborator and they were only asked to submit two brief video-reflections on these exchanges.

## Recommendations

- Consider staff and student workload. Start with fewer VEs and fewer assignments. If possible, have a staff member in charge of responding to student queries and offering administrative support.
- Prepare materials (topic selection and guides) in advance of starting the semester.

## References

Maynooth University, (2023), *Maynooth University Strategic Plan 2023–2028*. Accessible at: <https://www.maynoothuniversity.ie/presidents-office/maynooth-university-strategic-plan-2023-2028>

Maynooth University School of Modern Languages, Literatures and Cultures. Accessible at <https://www.maynoothuniversity.ie/school-modern-languages>

O’Farrell, L. (2019). *Understanding and Enabling Student Success in Irish Higher Education*. Dublin: National Forum for the Enhancement of Teaching and Learning in Higher Education. Accessible at <https://hub.teachingandlearning.ie/wp-content/uploads/2021/06/NF-2019-Student-Success-report-web-ready.pdf>

Swaffield, S. (2011) ‘Getting to the heart of authentic Assessment for Learning’, *Assessment in Education: Principles, Policy & Practice*, 18(4), pp. 433–449. doi: 10.1080/0969594X.2011.582838

## Find out more

To find out more about this fellowship project, please contact Dr Ana de Prada Pérez, [ana.depradaperez@mu.ie](mailto:ana.depradaperez@mu.ie)

# 10

## Pod learning: using student-created podcasts for assessment and feedback in undergraduate teaching

### Lead and team members

- Olive Sweetman (lead)

- Donal O'Neill
- Aedin Doris
- Irene Mosca

### Department

- Economics

### Abstract

Research on the use of podcasts indicates that student engagement and enjoyment increase when podcasts are used as instructional elements of a module. However, less is known about student-generated podcasts as a form of assessment. Through our fellowship, we integrated student-generated podcasts into the feedback and assessment component of three undergraduate economics modules. Our conclusion is that student-generated podcasts can allow students to showcase their understanding of economic concepts, as well as their analytical and creative tools.

### Project outline

Research on the use of podcasts indicates that student engagement and enjoyment increase when podcasts are used as instructional elements of a module (Peden and Domask 2011; Moryl and Jiang 2013; Choi et al. 2015). However, less is known about student-generated podcasts as a form of assessment. Lee et al. (2008) suggest that student-generated podcasts provide an opportunity for students to conceptualize discipline-specific content and expand understanding.

This fellowship aimed to integrate student-generated podcasts into the feedback and assessment component of three undergraduate economics modules. The project consisted of two phases, as illustrated below.

*Phase one: implementation in small-size first-year module*

The podcast was first introduced into the assessment component of a small-size first-year module in the academic year 2022/23. This was EC112 Exploring Economics and 12 students were enrolled in the module.

Students were asked to pick a research topic for their podcast. They were given a list of topics – which were introduced by the lecturer in the first five weeks of term – but could also choose their own topic. They had to write a short background document which acted as a basis for their podcast. They were given feedback on the first draft and had the opportunity to revise. They also had an oral presentation in class and were given feedback.

Students were asked to record their podcast with the software Audacity. Audacity is freely available to MU students through AppsAnywhere. It can also be downloaded for free from the Audacity website. We created online tutorials which were posted on Moodle showing how to create and edit podcasts using Audacity. Students were taught how to use the hardware, microphones, h6 recorder etc. during class. Students were then required to create two short podcasts (individual podcast and group podcast).

Although students were encouraged to record the final podcast (10-15 minutes) with another student from their trial-podcast group, only 17% of students availed of this option. The remaining 83% submitted an individual podcast.

*Phase two: implementation in middle-size second-year modules*

The podcast was introduced into the assessment component of two second-year mid-size modules in the academic years 2022/23 and 2024/25. These were EC220 The Economics of Human Resource Management and EC229 Health Economics and Policy. A total of 28 and 49 students were enrolled in the modules, respectively.

Students in EC220 were required to write a report on a newspaper article that was relevant to any topics covered in EC220. Students were offered the option of producing a group podcast based on their individual reports. They were advised to ask each other questions in the podcast so it would be like a Saturday/Sunday morning radio program where people talk about what was in the newspapers that week. The suggested time for the podcast was 3 to 5 minutes per student.

The podcast was worth 15% of their final grade if students chose to do it. If not, the weight would go to the final exam. 18% of students opted to do the podcast. The students were shown how to use the hardware and software and had to produce a trial podcast to make sure they could use Audacity.

Turning to E229, the continuous assessment component of the module was two-fold. The first component was a written assignment, which required students to review two or three academic articles on a specific topic covered in class (i.e. the relationship between socio-economic status and health). Students could choose whether to submit an individual assignment or a group assignment.

The second component was a group podcast. Each group consisted of two or three students and in total 20 groups were formed. Students were asked to critically discuss the findings of their written assignment in the podcast and were encouraged to ask each other questions. They were required to use Audacity. Online tutorials on how to create podcasts using Audacity were posted on Moodle. Students were given the option to record their podcast in a dedicated room in the Department of Economics. A total of 6 groups (30%) availed of this option.

## Findings

All podcasts were submitted on Moodle on time and were audible. In both EC220 and EC229, all groups engaged in some form of critical discussion, with variation in both the depth of the discussion and the level of interaction among students.

A question that asked students to rate how helpful the podcast assignment was to engage with the module [on a scale from 1 (not helpful) to 5 (very helpful)] was included in the end-of-term evaluation questionnaires in EC112 and EC229 modules. A total of 2 first-year students (17%) and 5 second-year students (10%) answered this question. As Figure 1 shows, 50% of first-year students gave a score of 3 and 50% gave a score of 4. 20% of second-year students gave a score of 3 and 80% gave a score of 5. The average rating was 3.5 among first-year students and 4.6 among second-year students.

Students were also given the option to provide qualitative feedback in an open-ended question. The feedback received is reported below:

“I enjoyed doing the podcast and preferred it to a written assignment” (first-year student).

“Perhaps a written final assignment would allow more in-depth analysis of the selected issues” (first-year student).

“It was difficult to explore an entire topical economic issue as the source for the final assignment. Perhaps this type of final assignment (critical podcast) would be better suited to an older/more experienced year group” (first-year student).

“I would have preferred to do it in pairs/groups” (first-year student).

“The essay and podcast combination was good to engage with the module and my other classmates” (second-year student).

“Having an example podcast for students to listen to & get a sense of the structure next year may be beneficial. But I very much enjoyed the assignment and the lessons! Thanks” (second-year student).

## Key reflections

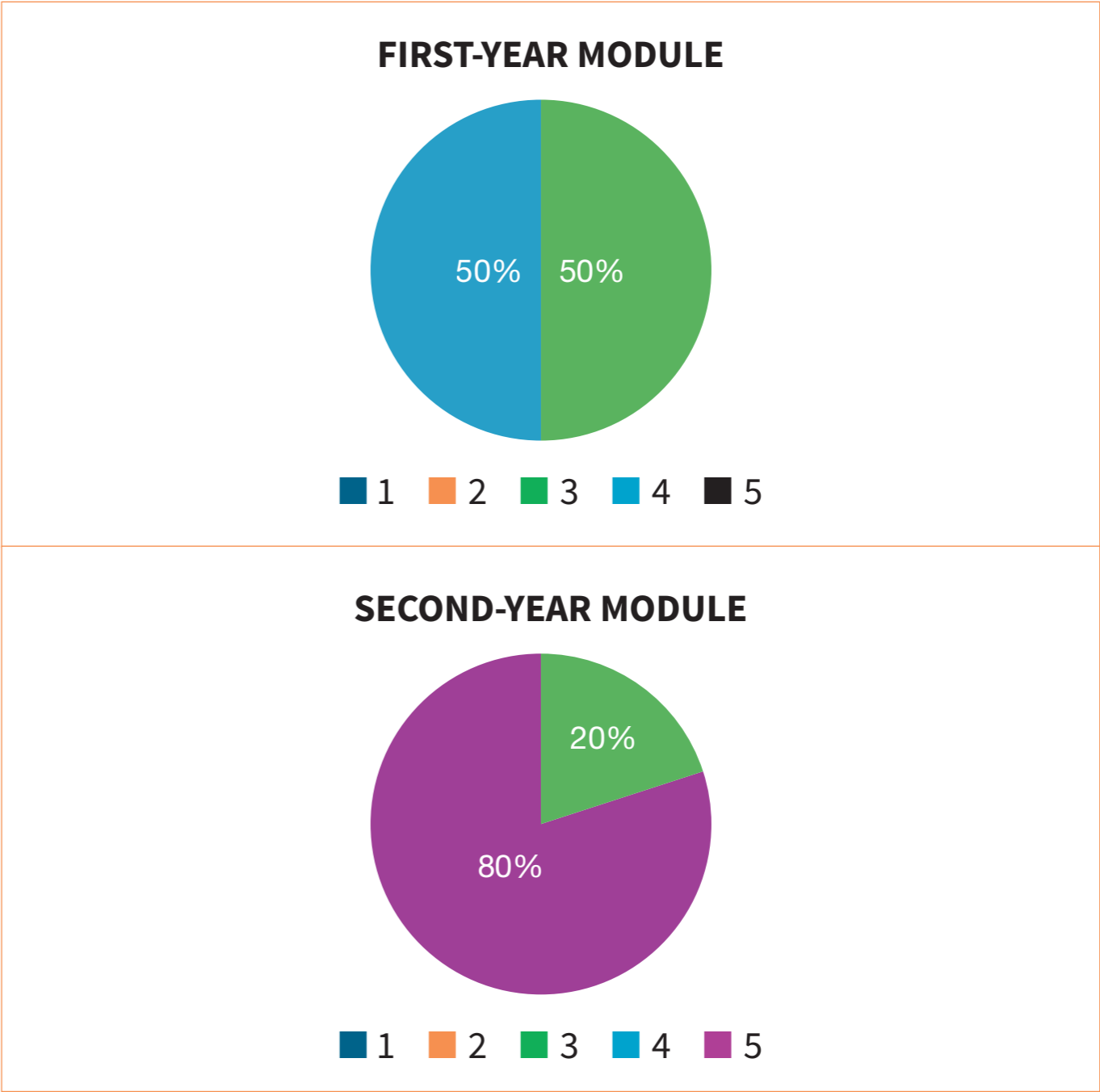
Our conclusion is that student-generated podcasts can allow students to showcase their understanding of economic concepts, as well as their analytical and creative tools. However, this form of assessment: (i) might be better suited to second-year students (or more senior cohorts) as opposed to first-year students; and (ii) might be more effective if used as a form of group assessment.

Student-generated audio-only podcasts have a benefit over student-generated videos because of the lower technological and software requirements. Technical issues such as proper lighting and camera angles are not a consideration in the audio-only format and this allows students to learn a new technology and communication tool, while remaining focused on the economic content being discussed. Additionally, the smaller size of audio files makes them more compatible with popular course management software, such as Moodle.

However, two technical issues arose. The first is that Apple Mac users could not use Audacity through Appsanywhere. The second is that there were some issues with compatibility between the version of Audacity that is downloaded from Audacity website and the one accessed via AppsAnywhere. Students were therefore asked to choose either one or the other (not both) to avoid compatibility issues.

## Recommendations

- This project has the potential to be transferred to a range of settings. As only Audacity and Moodle are needed to support student-generated podcasts, it is possible to apply and tailor a similar approach to other modules in the University.
- We recommend that student-generated podcasts are used as a form of assessment among second-year students (or more senior cohorts) as opposed to first-year students.
- We recommend that student-generated podcasts are used as a form of group assessment.



**Figure 1:** Student responses to “On a scale from 1 (not helpful) to 5 (very helpful) rate how helpful the podcast assignment was to engage with the module” in end-of-module evaluation questionnaire by year

## References

Choi, S. K., C. Dowell, D. Duncan, and G. Hoyt. 2015. The efficacy of podcast use in the economics classroom. Paper presented at the American Economic Association 2015 Annual Meeting. Boston, January 4.

Lee, M. J. W., C. McLoughlin, and A. Chan. 2008. Talk the talk: Learner-generated podcasts as catalysts for knowledge creation. *British Journal of Educational Technology* 39 (3): 501–21.

Moryl, R. L., and S. Jiang. 2016. Pod learning: Student groups create podcasts to achieve economics learning goals, *The Journal of Economic Education*, 47:1, 64-70

Peden, B. F., and B. Z. Domask. 2011. Do podcasts engage and educate college students? *Promoting Student Engagement* 1:170.



