Ollscoil Mhá Nuad
Maynooth University

Maynooth University
National University of Ireland Maynooth

SPARK
Initiative Report

Change One Thing and Do It Well

Foreword

This SPARK Initiative Report shares individual reports from teaching staff, and collaborating students, from across Maynooth University, who were in receipt of funding for small-scale teaching and learning initiatives through the Centre for Teaching and Learning.

The aim of the initiative was to support teaching staff engaged in any aspect of teaching across the University in implementing small-scale teaching and learning projects from between €250 and €1,000. Recipients of funding responded to an application process that encouraged the participation of students in project design and implementation which is evident in many of the projects outlined in this report.

The theme for the SPARK Initiative was 'Change one thing and do it well' and the idea was that projects would be narrow in focus and aim to make a small change to a teaching, learning or assessment approach that would be informed by literature or recognised good practice and demonstrate how the initiative would impact teaching and learning practice. Project participants showcased their findings and impact of projects in an online event in May 2021. This report presents detailed outcomes and impact of each initiative and offers innovative approaches to teaching and learning that could be applied across other disciplines or teaching and learning contexts.

Despite the additional challenges and pressures presented by Covid-19, each of the projects outlined in this report is testament to the passion, dedication, and innovation of both staff and students involved in enhancing the teaching and learning experience.

Thanks is extended to all those involved for not only seeing projects to fruition during difficult times but also for the many sustainable ways that they outline to continue what they initiated and extend opportunities for future development through the initial 'sparks' created by this funding.

The SPARK Initiative was funded through the Strategic Alignment of Teaching and Learning Funding (SATLE) in Higher Education 2019 call and thanks is extended to the National Forum for the Enhancement of Teaching and Learning in Higher Education and the Higher Education Authority. The initiative also supports Maynooth University's strategic goal to "...offer sector-leading support to staff in the continued development of their teaching and learning practice." (Maynooth University Strategic Plan 2018-22, p48).

Margaret Keane
Centre for Teaching and Learning
Maynooth University
June 2021

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T&L NATIONAL FORUM
FOR THE ENHANCEMENT OF TEACHING AND LEARNING IN HIGHER EDUCATION

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AN tÚDARÁS um ARD-OIDEACHAS

Contents

Initiative Title:

Native Speaker Exchanges

Initiative Lead:

Ana de Prada Pérez

Department:

Spanish and Latin American Studies

Aim of the initiative

The aim of the initiative was to offer scholarships to final-year Spanish students. The scholarship covered organized weekly 30-minute virtual exchanges with native speakers of Spanish through LinguaMeeting (https://www.linguameeting.com/index).

The incentive aimed to facilitate students' interactions with native speakers to (i) allow for real-world interaction with native speakers to talk about topics covered in class, which should result in better linguistic competence with respect to oral skills (listening and speaking) and (ii) enhance student intercultural competence.

In particular, students were able to participate in virtual exchanges through LinguaMeeting, which organizes meetings between a native speaker language coach and a student. The native speaker language coach prepares materials for their 30-minute weekly meetings based on the syllabus/course program and the guide shared with the coaches. During meetings, coaches lead a discussion where they talked about their own culture and engaged in a comparison of cultures with the students. The meetings were videorecorded and students were able to rewatch. The guides included guidelines for preparation and what to do during the meeting, and a reflection activity.

Reason for undertaking the initiative

Even though developing oral skills and intercultural competence are common objectives in the second language classroom, priority is given to covering grammar and vocabulary. It is often the case that students who fail the core language module fail because they did not pass the oral exam. This year there was the additional challenge of having a double cohort in final year (those in their fourth year of study, who came back from the year abroad, and those in their third year, who could not go on the year abroad), which resulted in larger classes and teaching online, where student interaction is diminished.

The initiative was applied to students in a final year module. Nonetheless, the idea is to be able to organize similar exchanges in the future with students in other years. We have been limited in the students we can send abroad because our partner universities require a level of Spanish that some of our students have not achieved yet. Adding exchanges with native speakers to our learners from the first year can aid with their proficiency and motivation. Also, having previous knowledge of the culture can facilitate their integration in the host university during study abroad.

Research on study abroad benefits have returned mixed results with respect to the learner's linguistic and cultural gains. Exchanges with native speakers from the first year can better prepare them for the experience and, thus, result in greater gains.

In addition to helping this group of students, the initiative would be useful to see how to set up exchanges with native speakers in a more sustainable way. This program is paid per student per semester. We have connections in universities abroad and we could organize telecollaborations that will be more sustainable.

Intended project outcomes

- To test if students are receptive to having weekly exchanges with native speakers.
- To test if students benefit from these exchanges in their linguistic competence.
- To test if students benefit from these exchanges in their cultural competence.

To test the reception of students of such an initiative, the linguistic and cultural gains, a research project was conducted around this initiative. Students were interviewed and completed a survey before the meetings with the native speakers started and after the meetings ended.

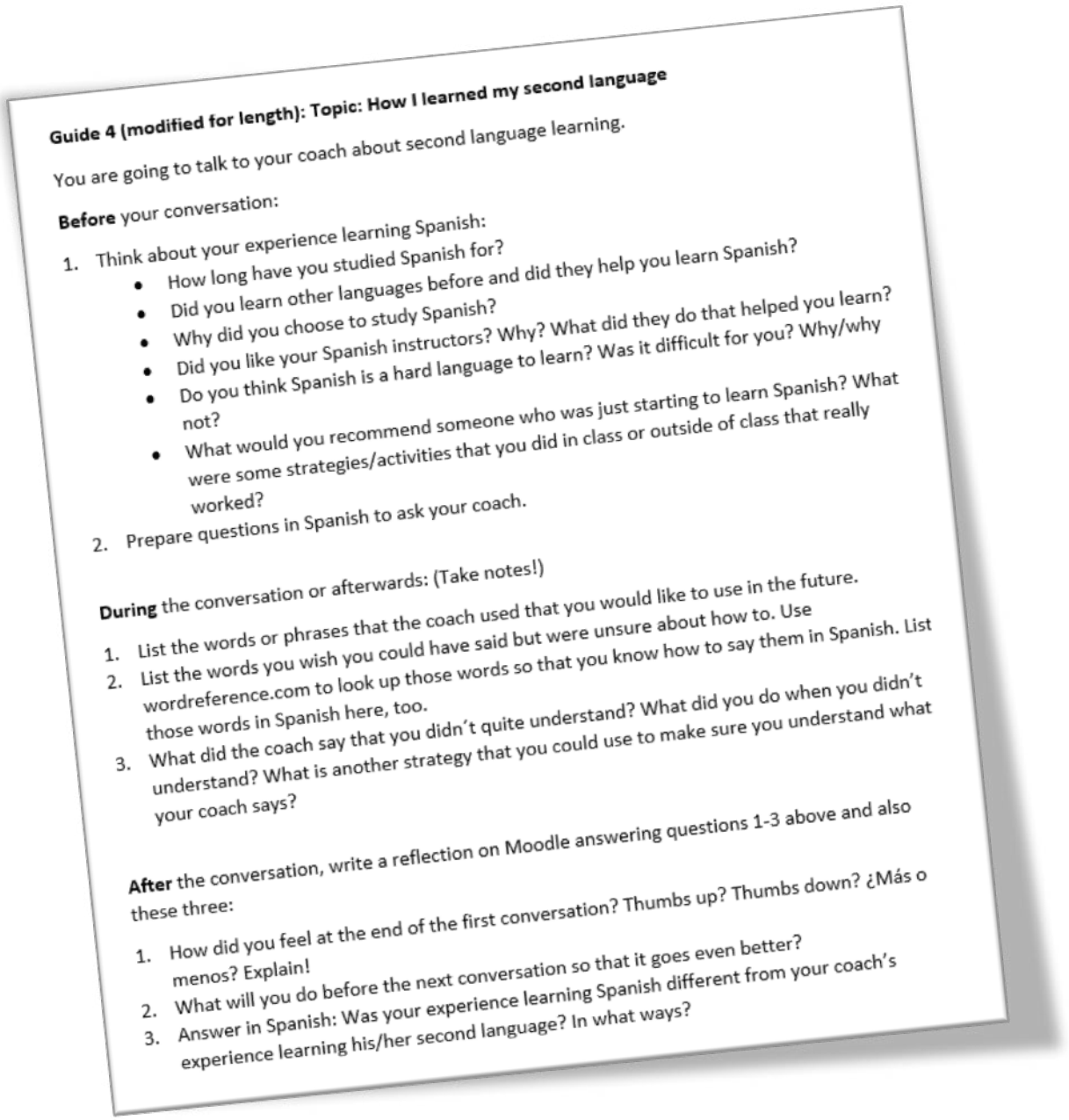
This data would be analysed to extract information on students' perception of the usefulness of the program, their linguistic gains, and their cultural competence.

Description of project process and outcomes

Process

Students in SPA351 were registered with Linguameeting. They were instructed to meet with a Spanish native speaker coach for 30 minutes each week, for 7 weeks. Attending these meetings and making an effort to communicate would account for 10% of their mark. I prepared a guide with instructions for the meetings as shown in the image.

Prior to their meetings, I interviewed students individually for an hour and repeated a similar interview, which included debriefing on the program, after they had completed the exchanges with native speakers. They were also offered the opportunity to participate in a research project. To participate, they were asked to sign a consent form, complete a language background questionnaire for participant profiling, and complete a survey at the beginning and at the end of the treatment, to test their improvement on two grammar points (subject pronoun expression and past tense expression).



Guide 4 (modified for length): Topic: How I learned my second language

You are going to talk to your coach about second language learning.

Before your conversation:

1. Think about your experience learning Spanish:
   - How long have you studied Spanish for?
   - Did you learn other languages before and did they help you learn Spanish?
   - Why did you choose to study Spanish?
   - Did you like your Spanish instructors? Why? What did they do that helped you learn?
   - Do you think Spanish is a hard language to learn? Was it difficult for you? Why/why not?
   - What would you recommend someone who was just starting to learn Spanish? What were some strategies/activities that you did in class or outside of class that really worked?
2. Prepare questions in Spanish to ask your coach.

During the conversation or afterwards: (Take notes!)

1. List the words or phrases that the coach used that you would like to use in the future.
2. List the words you wish you could have said but were unsure about how to. Use wordreference.com to look up those words so that you know how to say them in Spanish. List those words in Spanish here, too.
3. What did the coach say that you didn't quite understand? What did you do when you didn't understand? What is another strategy that you could use to make sure you understand what your coach says?

After the conversation, write a reflection on Moodle answering questions 1-3 above and also these three:

1. How did you feel at the end of the first conversation? Thumbs up? Thumbs down? ¿Más o menos? Explain!
2. What will you do before the next conversation so that it goes even better?
3. Answer in Spanish: Was your experience learning Spanish different from your coach's experience learning his/her second language? In what ways?

Outcomes

Increased confidence and engagement in language speaking

Students were expected to feel nervous initially but ease into the meetings with time. At the last interview, all of them reported feeling great after the meetings and gaining a lot of confidence. Several of them mentioned they gained the confidence to participate more actively orally in other modules.

Some also mentioned how important it was to make mistakes while trying to 'speak to learn'. They all said they would recommend the program to others. One mentioned having lost his interest in Spanish this year with online teaching but being able to communicate with someone from Peru reminded him how much he enjoys learning and speaking Spanish. With respect to the drawbacks, they only mentioned that the sessions were too short and they wanted to continue speaking, or that they wanted to have more than one session per week.

One participant mentioned that the rule that they need 32 hour advance notice to change the time or date of their meeting was not flexible enough.

Intercultural competence

Students were expected to gain in intercultural competence. All the coaches were from Peru. Students were very interested in Spain at the beginning of the module but knew little about Peru. In the second interview, at the end of the semester, it was evident that they had learned quite a bit about Peru, and were able to talk about similarities and differences with their coaches and between Ireland and Peru. They were also able to talk about Peru and its diversity, environmental issues in Peru, how the lockdown was being handled there vs. in Ireland, etc. One student mentioned buying a map of Peru and they all mentioned wanted to travel to Peru. One student mentioned realizing they did not know enough about Ireland, meaning that they were learning to look at their own country and culture through the eyes of others.

Linguistic gains

There is no previous research on linguistic gains in these meetings, but we anticipated speaking to a native speaker for 30-minutes per week, students would show improvement. We have not been able to analyse all the interviews. Nonetheless, students were less tired after the one-hour interview, seemed to be more fluent and more target-like in their verb conjugations. Communication was more fluid and there was not as much need for repetition of questions.

Humanistic aspect of teaching and learning

One of the outcomes that we did not expect was the enhanced humanistic aspect in the teaching and learning process. All the students mentioned struggling with motivation and stress during the year and the Linguameeting sessions were something they looked forward to. It made learning something that relaxed them and made them feel good. It also helped them with the isolation they have been feeling this year, as a consequence of remote learning during Covid-19 restrictions.

Overall, incorporating exchanges with native speakers into our teaching, even once we can go back to face-to-face teaching, seems to be the best option to improve our students' oral skills. Although using Linguameeting might not be feasible (fees per student per semester), this experience has prepared me to initiate telecollaborations with partner universities next year. For example, students in MAs on Teaching Spanish as a foreign language require students to do placements. After the positive experience with Linguameeting, I want to start a collaboration with partner universities to organize these exchanges as placements for their students and practice for our students.

Impact on current Teaching and learning

Our students do not tend to participate very actively in class orally, especially in the online environment. They can be afraid of openly making mistakes and this can deter them from participating. Adding a low-stakes opportunity to engage in exchanges with native speakers was successful in improving their confidence, which in turn motivated them to seek other opportunities to speak in the target language in class and potentially to enhance their intercultural knowledge and fluency (to be confirmed). The analysis for linguistic gains has not been completed. It is possible that gains are not obvious after just 7 sessions, however, the potential for gains by including these sessions as part of their core language classes during their course is a reasonable hypothesis. Exchanges with native speakers will enhance the cultural understanding of our students, a key aspect of our internationalisation strategy.

This approach is based on previous research on telecollaboration, more specifically research on exchanges with native speakers, showing important gains in confidence and intercultural competence. With the associated research project, we are hoping to further clarify contributions to linguistic gains.

For the students, this was an opportunity to meet someone from Peru and learn about their culture, history, traditions, gastronomy, etc. It made an otherwise isolating experience quite positive. It helped us humanize our online learning and teaching.

Future impact

While using the current format of Linguameeting may not be sustainable, as it prized per session per student, I intend to look for opportunities for telecollaboration with MA programs in partner institutions that focus on Teaching Spanish as a foreign language, so that their students can serve as native speaker coaches to our students as part of their placement for the degrees.

Initiative Title:

Playing and learning: involving the haptic, visual, and auditory learning among students for entrepreneurial topics

Initiative Lead:

Dr José Aldo Valencia Hernández

Department:

Design Innovation

Aim of the initiative

This initiative involved students in a Design, Entrepreneurship and Innovation elective module (PD218) for 2nd-year students from across the university. The objective of the module is that students apply to several entrepreneurial competitions. This initiative aimed to facilitate business, creativity, and innovation training for different University disciplines in an online context by using LEGO SERIOUS PLAY, a facilitated meeting, communication and problem-solving process in which participants are led through a series of questions, probing deeper and deeper into a subject.

Visual and haptic elements in the online classroom can increase imagination and creativity, making the sessions more engaging for the student, particularly in the online environment. Students can benefit from the approach both individually and through interaction in group work while studying remotely.

Reason for undertaking the initiative

In visions of the future often depicted by tech giants such as Huawei and Microsoft, we see a reality full of screens, displays and “click points” rather than touchpoints. In these realities, people could be overwhelmed with data that is ubiquitous. Data would be continuously displayed on surfaces such as kitchen tables, the wall of a lift, on office or aeroplane windows. While this vision may have been appealing to many of us before the pandemic, the need for continuous engagement with technology and screens during the pandemic restrictions leads to questions as to the value of such a reality and the whether the fact that the capability to create such realities means we should.

According to the Design Council (2021), design can be described by a Three H model. In this model, H stands for head, referring to design problem-solving ability, which taps into the visualization and conceptualization of intangible elements. H also stands for heart – placing people at the centre, building empathetic solutions collaboratively. H also stands for hands – thinking through making, turning invisible into visible and turning complex into understandable with the power of making skills.

This last element of the H model has not been present in many of the academic fields since the pandemic broke out. I propose that H can also stand for haptics.

In March 2020, universities managed to pivot face-to-face teaching to online. However, the University experience for the student and for staff goes beyond the academic process of teaching and learning. Part of the learning experience in university is the involvement of students with all the multiple 'touchpoints' universities have to offer. We are currently experiencing how these touchpoints were replaced by 'click-points', and omitting the benefit of haptics to make sense of new concepts. The main reason for this project was to bring in the haptic element into online learning and see how it can benefit students to make sense of new concepts.

Haptic learning, pioneered by Seymour Papert (1991) relates to constructionism (not to be confused with constructivism) and takes a hands-on approach to teaching and learning. Students use external objects to learn theory and concepts. The method has its foundations in mathematics and educational-technology using constructionist methodology. However, the group activities using the Lego bricks and discussion elements in the online virtual classroom also bring a social constructivist element, particularly important in the current fully online context where the need for students to interact with peers has been highlighted.

New product development (NPD) and new venture creation (NVC) strategies demand the use of a high number of concepts, statistics, and information about the user and the market and the specificities of the product or service. On top of that, social skills are required to manage the team. Therefore, there is a clear need to make the strategy visual to reduce the cognitive load and engage the students to co-create the business case required of them with their hands.

Intended project outcomes

- Students experience more creative ways of engaging with the module and the entrepreneurial competitions.
- Pilot the use of haptic approaches to enhance teaching and learning
- Promote engagement for students from different faculty in the online space

Description of project process and outcomes

Research Methodology

This study used two approaches; social constructivism and social constructionism. Social constructivism posits that knowledge is constructed through participants' active interaction with others (Schreiber & Valle, 2013. Social constructionism focuses on the idea of learning by making. According to Papert and Harel (2002, pp.8), "some people prefer ways of thinking that keeps them close to physical things, while others use abstract and formal means to distance themselves from concrete material […] both of these aspects are very relevant to the idea of constructionism". Business innovation methodologies such as Lego serious play (1996) and Playmobile Pro (2015) are based on the ideals of constructionism.

According to Dorney (2005), sensory learning is divided into visual, tactile/kinaesthetic and auditory learning. This study taps into these three sensory learning styles in the delivery of four workshop sessions from March 15th to April 12th, 2021.

Implementation

This initiative involved students in a Design, Entrepreneurship and Innovation elective module (PD218) for 2nd-year students from across the university. The module was made up of 40 students enrolled from Arts, Entrepreneurship, Business, International Business, Marketing, Law and Social Sciences departments. The objective of the module is that students apply to several entrepreneurial competitions. The initiative involved three main steps: Tangible delivery and preparation, Digital workshop delivery, and Results.

Tangible delivery and preparation

To increase the outreach of this project, we collaborated with Mi:lab, an innovation lab at Maynooth University. Each student was sent a Lego package to their home containing: 1 Lego serious play kit, 1 Play-doh plasticine, five stickers, one poster, one postcard, one tote bag, one notebook and one kitchen timer.

Fig. 1. Lego package sent to students

Online workshop Delivery

We delivered four online workshops on Microsoft Teams using the Lego bricks, the playdoh and the kitchen timer. Each session lasted four hours, two of which were required individual work. The other two hours were divided into 10 minutes of theory, 1.5 hours of activities, 15 minutes for reflections and 5 minutes to explain the homework. Figure 3 gives an example of a workshop slide outlining one of the activities required.

Activity #2: Creation of new scenarios

It's time to create new scenarios for your business model. 3-4 hrs

Replicate the lean business canvas areas on your desk (as seen on the image).

Get the card deck of the ten types of innovation on the table.

With the help of your teammates, build your original business model in three dimensions.

Each member must work on a specific section.

The most important sections are:

1. Personas
2. Problem
3. Solution
4. Value proposition
5. Cost/Revenue structure

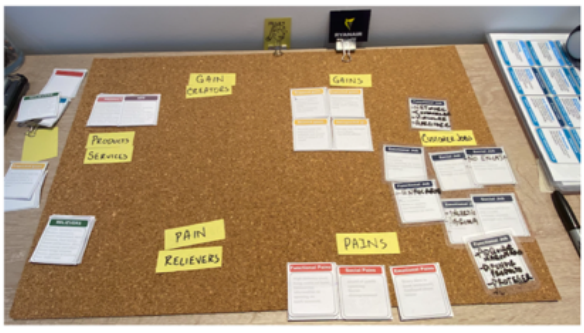


Figure 2. Sample slide from a workshop delivered using Microsoft teams.

In each session, we implemented a multimodal activity. The use of haptic elements in online Higher Education adds another dimension to visual and auditory communication. The activities planned for this study focused on the emergence of tangible metaphors to spark creative thinking among members of each team as shown in the example in figure 3. The Design thinking principle of Show it- don´t tell was the critical element to integrate, engage and stimulate their shared language among the remote team members.

Figure 3 shows a student´s metaphor to answer the question of "How did it feel like being a student now?". His answer was, "I feel trapped; I can´t move, even though I´m able to go out for a jog, I always have this feeling [sic]."

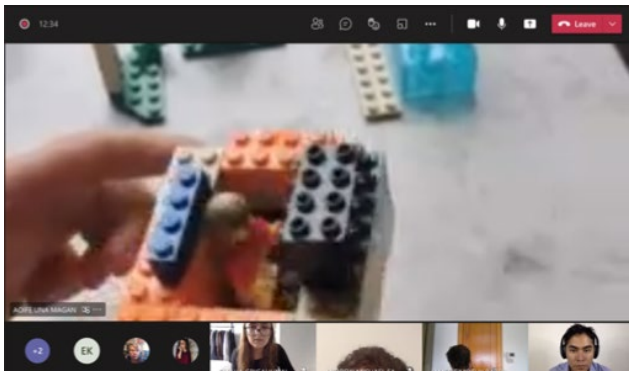


Figure 3. Tangible metaphors.

Results

The main objective of the PD218 module is to encourage students to participate in multiple entrepreneurial competitions across Ireland. The most important part of the application process in any of the entrepreneurial competitions is understanding the problem-solution fit, problem-market fit, and business model fit. Each one of the sessions was built to clarify these fits. Students had to submit a time-lapse video of each session and a picture of the final model as demonstrated in Figure 4. These 3D models facilitated the interaction among team members.

Figure 4. Team work happening in each session.

Impact on current Teaching and learning

I collected the impressions of the students before and after the workshop. During the semester, students learned how human-centred design is optimised for the creation of new businesses. Before the workshops, the interaction among students was scarce. Most of the students had not previously met as they come from different programmes/faculty.

In terms of engagement, I could observe how building activities and the use of tangible metaphors enhanced engagement and allowed students to understand each other's perspectives and understanding of concepts. More evidently, in terms of the objective of the module, four teams from the module were shortlisted in two entrepreneurial competitions. One team got shortlisted on the national Varsity Entrepreneurial competition and raised more than €2,000: InfoSafe team; Andrew Fahey, James Barry, Sarah Chifor and Killian Larkin.

This initiative also made us realise that the discussion around learning had also shifted from the universities´ official channels to social media as students promoted their work on platforms such as TikTok, with one student obtaining over 70,000 views, 8,000 likes, 126 comments and 211 re-shares.

Future impact

The incorporation of the tactile proved to be advantageous to the learning in an online teaching environment. The introduction of new concepts such as NPD and NVC are not easy for students to understand with no previous references. Second-year students have been exposed to basic knowledge on these but not on how they can interact. Tactile learning can bring a new dimension to online learning, assisting the lecturer in delivering new content that requires reflexivity to consolidate the knowledge. We intend to continue exploring and using this approach in future teaching and learning.

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Initiative Title:

Building Spaces – Re-designing a blended learning module to broaden access for institution-wide beginners learners of German as a foreign language

Initiative Lead:

Dr Clive W. Earls

Department:

German Studies/ SMLLC

Project Team:

Ms Ciana Curley, Mr Niall Carney

Aim of the initiative

This SPARK initiative aimed to re-design modules that had been previously developed in alignment with the CEFR (Common European Framework of Reference for Languages) in order to deliver them successfully following best practices in blended learning. By adapting existing Open Education Resources (OERs) and developing online asynchronous resources specifically tailored to the aims of the module, students from across the institution would be in a position to receive the requisite levels of input, output, and interactivity necessary in the *Beginners stage* of language learning while also allowing the 5-ECTS module to be delivered following the standard institutional practice of 2 face-to-face contact hours per week. This would also allow a higher number of interested students to pursue the module without the timetable clashes previously associated with a face-to-face classroom delivery.

Reason for undertaking the initiative

The initiative focuses on Beginners German modules (GN260 and GN261) initially developed using seed funding from the university to make language learning accessible to as many students as possible across the institution. They ran for 3 years and were subsequently discontinued due to their unsustainability in terms of resourcing and timetabling conflicts. By re-designing the modules into a blended learning offering, and taking advantage of online resources and flexible delivery options arising from the Covid19 context, it would be possible to reintroduce them and meet recognised student needs.

The importance of language learning at university level, and specifically institution-wide language offerings, is set out in the government's national language strategy 'Language Connects 2017-2026'.

As a language educator and language-in-education policy scholar, I recognised the opportunity to respond to the clear demand for such modules, through high initial registration figures, by reinstating the Beginners German modules as a blended offering. My recent gains in knowledge and skills, through participation in an accredited Digital Skills module in the university, also allowed me to identify ways to engage students in greater technology use as part of their language studies. The re-design of modules GN260 and GN261 is seen as a starting point and pilot for potential positive changes in other modules at undergraduate and postgraduate levels.

The initiative held a secondary opportunity to give two German Studies graduates, currently pursuing postgraduate education at Maynooth University, the opportunity to hone their digital skills in the context of language teaching and to give them experience of developing online language materials as future language educators.

Intended project outcomes

The key outcome would be the development of a range of online resources to support face-to-face classroom learning and activities:

- Development of narrated grammar tutorials via PowerPoint
- Adaptation of OERs relevant to the curriculum of the modules
- Application of grammatical knowledge through targeted quizzes and flashcards,
- Development of interactive textual analysis exercises incl. free writing,
- Facilitation of cultural learning through interactive videos available on open access,
- Support for vocabulary learning through text analysis, videos and quizzes,
- Support for aural skill development through the utilisation of authentic materials available on an open-access basis online

Description of initiative process and outcomes

Two graduates of German Studies at Maynooth University were recruited as collaborators on the initiative, one in the MA Applied Linguistics & Intercultural Studies and one in Professional Masters of Education. As a team we agreed to meet bi-weekly initially to keep each other apprised of progress and challenges. An initial team meeting was convened to discuss a plan for each module to be re-designed and the timeframe in mind and both student collaborators provided significant input into the final plan which was implemented within the agreed timeframe.

The first agreed step was a scoping exercise to identify the highest quality and more reliable OERs for the CEFR levels in question (A1.1 and A1.2). This involved using supplementary online materials to the coursebooks that are followed within the modules currently, in addition to an array of language learning websites including Deutsche Welle, LearnGerman and the Goethe Institut. This scoping process enabled the team to clarify what OERs were fit-for-purpose for inclusion in the blended modules and where gaps existed requiring new digital content. The result of this process was the creation of bespoke digital content in the form of targeted grammar videos, flashcards, quizzes and worksheets made available on the modules' Moodle courses, using H5P functionality to add active learning to video resources created using Panopto for screencasts.

An advantage of the student collaboration was that both students were able to draw on their own experiences as language learners which helped to optimise the accessibility of the digital content developed by ensuring the appropriate balance of target-language use with English to scaffold beginner students' learning.

It was decided that the visual interface on Moodle would use a tile format with image integration to make for a more user-friendly interface. It was piloted by four language learners who provided very positive feedback on the visuals. The 'start here' tile provides students with an introduction to the Moodle course and guides students on how to approach using the content under the direction of the lecturer. A 'support' tile reminds students of the various supports available to them (general student services, accessibility support and support for digital teaching and learning). Under each tile (aligned to each chapter of the core textbook used in the module), following a trial and error and discussion process, it was decided that the digital content would be subdivided into the key categories of 'grammar', 'listening', 'reading/watching and writing', 'speaking' and 'test yourself' in addition to a 'more resources' section to aid students in navigating the content. Given that it is a blended learning initiative, it is expected that the lecturer would provide clear instructions to students on which resources to use week-to-week in preparation for class, and which resources can be used for additional practice. Flashcards and quizzes for grammar topics and vocabulary emanating from each book chapter's theme were also developed under each tile for students to test themselves regularly. H5P was used to embed additional information, where required, and to link students to activities related to the video content.

It was also decided to balance video content with texts for students to read and analyse with accompanying comprehension questions. In order to develop these in the absence of such online, manuscripts of some OER video content were taken and adapted into a text format. All video content was embedded in Moodle in order to improve the user experience.

Impact on current Teaching and learning

The re-designed blended-learning modules require students to weekly attend 2 hours face-to-face teaching in addition to completing asynchronous online content amounting to approximately 2 hours equivalent in the classroom setting. The face-to-face and asynchronous online contact hours will run in unison with requisite self-directed/independent study hours as required of a 5-ECTS module. The re-design allows for wider and more flexible access to the modules for students across the university interested in participating, fulfilling a key objective of the government's Languages Connect Strategy 2017-2026.

This evaluation has altered my view of using and developing digital resources and OERs in my teaching and learning practice and I now view it as a time and labour-efficient way of delivering content and freeing up space within the curriculum for more creativity around student-centred engagement.

The resources created within this initiative can also be independently used in the delivery of existing core-language modules at Beginners Level (GN101 and GN102) providing added value to current practices and resources available to lecturers and students.

An additional impact is the enhanced digital skills, awareness and confidence gained by the two student collaborators in the initiative as both have teaching German as a foreign language as clear professional goals on completion of their studies. Involvement in this initiative will have a positive impact on their profile, knowledge and experience as foreign language educators.

Future impact

This initiative may also serve as an impetus for the development of similar blended-learning Beginners modules in other units of the School of Modern Languages, Literatures and Cultures. This is particularly pertinent in light of the decision in Spanish and Latin American Studies to also discontinue their institution-wide Beginners language module due to the same logistical challenges. There is potential for the re-design of these modules on a blended basis to allow them to be re-offered on a more sustainable basis.

In the process of developing the blended modules, I have established that there is a wide variety of high quality OERs which could be utilised in the delivery of all core language modules in German Studies across all years of study, allowing lecturers to devote precious time devising in-class student-centred activities based on OERs.

I have been able to apply much of the blended approach undertaken in this SPARK initiative to develop targeted online resources to teach grammar in a flipped classroom approach in my pivot to online teaching during COVID-19 which has been effective in enabling live classes to be devoted to the application of learning and this will be maintained into the future.

Initiative Title:

Using Padlet to develop an open dialogue space in online Ecology teaching

Initiative Lead:

Dr Conor Meade

Department:

Biology

Aim of the initiative

The aim of this initiative was to pilot the use of Padlet as an online tool to boost overall student engagement in the online setting for a third year Ecology module (BI303). The aim for this module was to include non-academic engagement in terms of both teacher-student interaction and peer-to-peer interaction. The overall objective was to create a positive, user-friendly setting, where students would feel comfortable to 'step in' to their online classroom.

Reason for undertaking the initiative

Feedback from academic year 2019-2020 identified that many students were feeling isolated in the online setting, quite removed from the college campus, the classroom environment, and their peers as demonstrated in the class Menti word cloud created from feedback from BI303 students at the beginning of Semester one, academic year 20/21 and in response to the question: '*What are your thoughts on the year ahead*?'

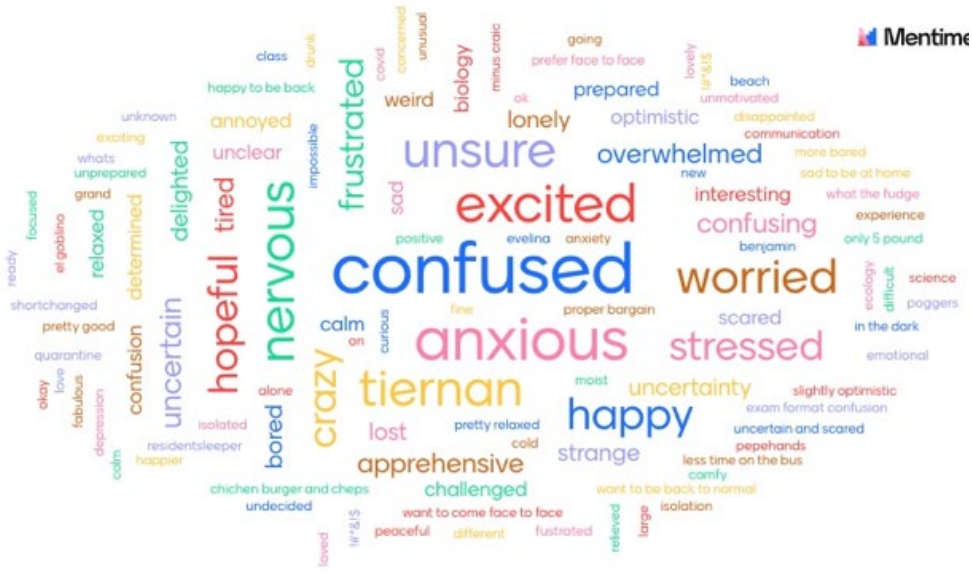

Figure 1. Mentimeter Wordcloud demonstrating student feedback at start of Semester I

To respond to this, this initiative focussed on setting up Padlet online feedback boards for the class, which was one of a number of new initiatives to be undertaken in the BI303 Ecology module, including a 5K Challenge reflective exercise, a well-resourced online field work practical, and a more responsive teaching strategy using in-class activities, active learning, and student-teacher interaction.

Intended project outcomes

There were two intended outcomes for this initiative arising from the use of Padlet in the module:

- To boost student engagement in the online environment
- To introduce new forms of communication to nurture a positive learning environment

Description of project process and outcomes

As part of BI303 three Padlet boards were created for students to engage in at various points across the semester. (A third board was also created for a different module, BI435 Molecular Ecology and Biogeography, which will be discussed later). When the module was completed, students in the class participated in both quantitative and qualitative feedback on their reaction to using the Padlet boards.

The first two boards were designed to encourage general conversations about the natural world, in parallel with the formal narrative of the module. These were presented informally and allowed for anonymous posts in any format, such as adding stories, news items, images, videos, urls - any item that students felt captured an interesting perspective on nature.

This informal nature of the first two Padlet boards did not yield the level of engagement expected and in the qualitative feedback students identified the open-ended, vague nature of the instructions was a disincentive to participate. This learning led to a more focused approach to the third Padlet created which was opened for the 30 Science Education Students as part of the larger class of 190 students.

The focus of the third Padlet board was on a specific issue relevant to students related to online educational resources for Ecology teaching in Secondary Schools. For this board, participation was greater, with 12 students (40%) contributing their ideas. In the qualitative feedback students indicated this was a more inviting format, but pointed out that without a regular reminder, they quickly forgot about it when faced with other ongoing tasks in the module. In addition, users felt they remained more engaged with this Padlet where they saw active participation from others on an ongoing basis, indicating that ‘activity’ was ongoing. The learning point here was the need for clearer communication of instruction for students on the purpose and value of the Padlet activity, and regular, pro-active curation of the resource.

As mentioned earlier, due to time constraints regarding experimental use of Padlet in the BI303 module, I carried the piloting of the tool forward into another module, BI435 Molecular Ecology and Biogeography which was delivered in Semester two. Building on the experience of BI303, I devised a new Padlet for this class. As an icebreaker, and a means of introducing the global perspective of the module, I set up a Padlet using the global map format and invited students to contribute (anonymously) pictures of special natural places they had visited. By making participation enjoyable, easy, interesting and relevant, class participation was again positive (20 students, or 30%, of the class of 60).

Some aspects of this Pilot study did not proceed as planned. An initial priority was to use the Padlet boards in a live class setting, however due to time constraints this was not achieved. In particular, the technical workload of the online field trip was significant, and this limited the capacity for development of appropriate class teaching plans. In addition, the move from Panopto to Teams/ Turning Point required an extended period of adjustment.

Overall, the Padlet experiments succeeded in achieving the two intended project outcomes, though not exactly in the way envisaged at the outset of the project.

Impact on current Teaching and learning

For Biology students Padlet can be a dynamic platform for enhancing engagement, however there are provisos. In a large live online classroom, moving students from the live Microsoft Teams space over to Padlet can bring technical challenges and it can be difficult to monitor connectivity and activity. In terms of using Padlet as an organic space where students can exchange and engage over time, this does work, but it is clear that the Padlet boards need to be set up with clear instruction and clear purpose and value to them. Students will 'step in' to these spaces when it is clear they have something to gain. Sharing helpful tips with peers and personal storytelling are the two activities that worked best in this initiative.

While Padlet was not directly used for other initiatives in the module, the anonymous posting format of it was used in the approach to the '5k Challenge' reflective activity undertaken by students in place of the usual field trip to Bull Island in Co. Dublin. Student feedback identified the lack of field work as a big loss for the academic year as a result of Covid-19 restrictions.

Following a discussion with Margaret Keane in the Centre for Teaching and Learning I devised the '5K challenge', that invited students to complete a reflective photographic piece about a natural place within 5K of their home (the Covid-19 travel limit at the time) and submit to a class forum. Rather than use the Padlet format, I created a video showcase of the student submissions (96 participants, or just over 50% of the class of 190). Quantitative and Qualitative feedback indicated this activity was a highpoint of the module for many students and I have plans to incorporate Padlet into this activity in the future using the map-based Padlet board to allow students to place their anonymous reflective pieces in a geographic setting.

Future impact

The anonymous user-friendly format of Padlet is very appealing to students and has potential for many uses across modules. While it was not fully effective during my piloting of it in the live online classroom this year, I intend to work it into my class teaching plans for academic year 2021/22. I will continue using Padlet in the Moodle virtual learning space for these modules to enhance student engagement.

Initiative Title:

2021 Pandemic Conversations: A series of video-podcasts

Initiative Lead:

Dr. David Lederer

Department:

History

Project Team:

Dr David Collins, Dr Anthony Farrell, Dr David Gahan, Dr John Paul Newman, Dr AnneMarie O'Brien, Mr Thomas Appleby

Aim of the initiative

The aim of this initiative was to create an entirely new third-year core-course, newly titled **HY319: A Global History of Pandemics** with immediate reference to the current Covid crises with learning centred around an additional series of five 'Pandemic Conversations', i.e. a series of video-podcast interviews conducted with multi-disciplinary specialists and focusing on events in Ireland and internationally in conjunction with regular lectures recorded using the Panopto online delivery and recording platform.

The course was designed and co-ordinated by the proposer and delivered with the assistance of five colleagues: Dr David Collins, Dr Anthony Farrell, Dr David Gahan, Dr John Paul Newman and Dr AnneMarie O'Brien, and an IT support assistant, Mr Thomas Appleby.

Reason for undertaking the initiative

HY319 is a survey course (a core-course lecture for c. 160 third year undergraduates) entitled 'History and Story' and was originally conceived to contextualise fictional accounts of actual historical events. It consists of weekly lectures (one hour) and tutorials (one hour) and assessment was traditionally based on two 2,000 word tutorial essays on two readings from the course and a final exam.

The new course alters the topic to the A History of Pandemics as experience of working in the medical humanities seems to suggest that putting the current crisis in historical perspective can help students work through it. The introduction of the additional podcast interviews would not only compliment the current context of learning in an online space, but also act as innovative and engaging discussion topics for the small group tutorials held on a weekly basis.

The highly innovative content of this new online core course, set in the new context of medical humanities, would also help students engage in the intended learning of the course more fully. A novel assessment element would also be introduced requiring students to submit their own video-podcast recording in place of the traditional exam. This would align the assessment approach to the new teaching and learning approach and enhance the students digital and critical thinking skills as well as make the process more engaging for them.

Intended project outcomes

- A redesigned online course that would enhance the learning opportunity for students and set it in a current national and global medical history context.
- Creation of reusable video podcasts of 'Pandemic Conversations' with key experts in the field aligned to course learning.
- Introduction of creative assessment approaches as an alternative to the traditional exam.
- Archived video resources that will act as a reference for future research looking back on the pandemic.

Description of project process and outcomes

The initiative process involved 3 main areas; podcast production, new teaching/learning approach and a creative assessment approach.

Podcast production

The initial plan was to have five podcast expert conversations, and we managed to create an opportunity to include two additional recordings. In the first instance each of the 'Pandemic Conversations' were scripted in line with course learning and meetings were held with the intended interviewees to discuss the draft script. These discussions led to rich ideas and revisions that enhanced the final recorded interviews and aligned more fully to the intended learning outcomes. Interview conversations were recorded using Zoom and edited using the editing tools in Panopto. Final recordings were uploaded to the Moodle VLE course for the module to make them accessible to students.

The final podcasts recorded were:

a. Prof. Philip Nolan (President, MU), 'Covid 19 and the National Experience of a Pandemic'

b. Prof. Bernard Mahon (Biology, MU), 'What is a Virus?'

c. Prof. Marian Lyons (History, MU), 'The Bubonic Plague in 17th Century Ireland'

d. Dr. Dympna McLoughlin (History, MU), 'Cholera and the Irish Famine'

e. Dr. Ida Milne (Carlow College), 'The 1918 Spanish Flu in Co. Kildare'

f. Prof. Samuel Cohn (U. of Glasgow), 'Remembrance and Commemoration of Pandemics'

g. Dr. Claudia Stein (U. of Warwick), 'Syphilis and the Columbian Exchange'

New teaching and learning approach

The SPARK initiative facilitated the production of the video podcasts, linked to subjects treated in the core lectures on the medical humanities. These redirected student attention from the global onto the specific impact on Ireland. Both the lecture on the global perspective and the pandemic conversation were posted each week on Moodle and, as one outcome, the two proved mutually reinforcing, strengthening the knowledge transfer. Furthermore, the podcasts became focal points of discussion in tutorials, where students were encouraged to critically review the conversations with experts presented in the podcasts.

Creative assessment approach

Two classic fictional accounts were chosen as the readings for the two essay elements of the course assessment in line with the new focus of the learning: Daniel Defoe's Journal of a Plague Year and Albert Camus' The Plague. For the final assessment element, to align with the new approach to delivery of this novel course, the traditional one-hour exam was replaced with a creative assessment that asked students to research, script and record their own 5–10-minute podcast. Here the student was asked to address the historical significance of the current pandemic in comparison with three former historic pandemics, from the Bible and the Plague of Athens, through the Black Death, smallpox and cholera, to the1918 Spanish Flu and the HIV crisis.

In this regard, the series of pandemic conversations with specialists offered students an exemplary template for their own video-podcasts due at the end of the semester. This final assessment will also provide an alternative template for future core courses.

Impact on current teaching and learning

Engagement is always important for students in their final semester of that all-important third year. However, in our current online environment, students frequently noted how the enhancement of their engagement made a real difference for those experiencing isolation, difficulty concentrating and other forms of grief.

The twin goals, both to supplement the lectures and hone critical skills, were complimented by community building exercises conducted in tutorials through small group exploration of the individual topics in Microsoft Teams breakout groups. Engagement was thereby enhanced not only by the greater accessibility to familiar topics (e.g. matters of Irish interest), but also by a variation of presentation styles (podcast vs. lecture) and the introduction of recognizable outside expertise.

The medical humanities perspective seemed to offer not only a fascinating topic, but also to suggest to students a means for putting our current crisis in historical perspective and helping students work through it – simply put, we as a species have been here before and here is how we came through in the past.

Future impact

While we are still awaiting the outputs from the student submission of their own video-podcasts, the response thus far in relation to their experience of the engaging with the expert 'Pandemic Conversations' as well as their engagement in discussions in the tutorials, has been overwhelmingly positive. As for the future, we are now engaging several undergraduate students to participate in a project to collate, catalogue and archive all the results of the project, including student podcast recordings, to a video-archive for use by future researchers looking at the 2020/21 pandemic. We hope to apply methods already successfully employed by the director Steven Spielberg for his Holocaust Memorial project in this process.

Initiative Title:

Use of GoPro recordings in chemistry laboratory – provision of pre-recorded first-person view material for facilitation of learning [GoPro Chem]

Initiative Lead:

Dr Eithne Dempsey

Department:

Chemistry

Aim of the initiative

The overall research question was: *Does student conceptual understanding improve after a laboratory visualisation exercise*? The key objective was to evaluate the principle of 'first person view' videos as laboratory training materials for chemistry practical sessions and final year research projects in the absence of in situ lab experience. The project utilised GoPro lightweight cameras which can be worn on the laboratory demonstrator's head/chest (with suitable straps) while filming the process of doing an experiment/demonstrating how to use a piece of equipment. As a pilot study, fourth year students reviewed the video material for procedures captured in a research laboratory and gave feedback on the benefits of this visualisation tool. Pre-laboratory videos were also recorded for 1st year chemistry modules with student evaluation.

Reason for undertaking the initiative

- Due to COVID 19 there was a serious dearth of hands-on practical experience during the academic year;
- To attempt to bring the lab into students' homes via suitable technology which facilitates high quality recording in a real and active manner;
- To gain insights into the benefits of using pre-laboratory and pre-project recordings as an aid to learning.

Intended project outcomes

- To equip students with relevant insights and a degree of familiarisation with the experiment prior to completing a report/ project review;
- To establish practical issues around camera operation, positioning, stability to movement, lighting etc.;
- To pilot the use of advanced experimental technique overviews as a support to final year desk based thesis;
- To evaluate the benefits of pre-lab videos and the added benefit of perspective of the demonstrator including view of a person's hands and equipment.

Description of project process and outcomes

An initial trial of the practicalities of the camera usage (best position to wear it, angle, sensitivity to sudden movements etc.) informed best practice in various laboratory settings (fumehood, equipment, benchtop settings).

Advantages of GoPro camera

- ✓ Students see everything from the perspective of the demonstrator including view of a person's hands and equipment;
- ✓ High quality images for detailed visualisation;
- ✓ Good panoramic view of space and perspective;
- ✓ Robust to movement with natural active shots possible particularly during a multi-step procedure.

Disadvantages of GoPro camera

- × Designed for outdoor filming, so there is interference with strip lighting.
- × Need for a phone/ tablet in hand as recording if using head set;
- × View is dependent on height of wearer if using head set.

A pilot study was undertaken to support the experimental knowledge required for desk based final year thesis with the view to compliment theoretical concepts and demonstrate experimental setups through video recordings. This included demonstration of cyclic voltammetry, polishing and preparation of electrodes, working electrode types and electrochemical cell set up. Videos were made available to students and a discussion was held following viewing to capture feedback/suggested benefits and further topics to compliment literature projects.

First year Chemistry pre-recorded videos for laboratory skills and laboratory sessions were developed as part of the on-line delivery of the practical component of the module. Unfortunately, due to delayed delivery of the equipment, we were not able to use the GoPro cameras for these videos which were prepared in advance of the semester. However, the student experience and feedback on this specific aspect was evaluated as part of another Teaching and Learning Feedback Initiative for first year students (see Figure 1 for quantitative data). Students were asked for feedback and evaluation of the impact of the videos on their learning and their confidence rating prior to entering the laboratory.

Impact on current Teaching and learning

Fourth year student evaluation of training videos for electrochemical testing of a redox probe, as an aid to their understanding of the practicalities of electrochemical experimental, was undertaken via individual discussions. Feedback comments included: "*videos were suitable for introductory training like a pre-lab only as need to be there in person for anything more advanced*"; "*interesting to see equipment, electrode cleaning protocol and materials involved in experimental setup*". Students were in favour of building digital resources to tap into at the fourth year stage, enhancing their theoretical knowledge while providing key insights into the research projects ongoing by departmental principal investigators.

Due to the COVID 19 on-line teaching scenario it was not possible to gain insights into any practical benefits on students' observational skills together with analytical/data processing in the real laboratory session. However, this will form part of our continued work in this area building on the teaching and learning benefits of pre-lab videos identified in a student evaluation questionnaire (see below) with positive responses to the questions posed.

10 The on-line laboratory resources provided enough detail for me to be able to write my report independently.

Response	Average	Total
Strongly Agree	17%	7
Agree	60%	25
Disagree	19%	8
Strongly Disagree	5%	2
Total responses to question	100%	42/42

3 Having watched the on-line laboratory videos, I have confidence to perform the experiment in person

Response	Average	Total
Strongly Agree	21%	12
Agree	61%	35
Disagree	16%	9
Strongly Disagree	2%	1
Total responses to question	100%	57/57

5 The resources I use to help me understand chemistry concepts I find difficult are:.

Response	Average	Total
Ebooks	20%	1
Online videos	80%	4
Total responses to question	100%	5/5

Figure 1: Quantitative student feedback data

Future impact

The interactions of content, pedagogy, and technology in relation to this type of video recording will form a more in-depth follow-on research project which can be extended across the undergraduate years and modules. This initial outlay for the GoPro cameras, together with our learning from the pilot study, will allow longer term, more detailed, analysis for different laboratory types (organic vs inorganic vs physical) during subsequent academic years. This SPARK initiative thus seeds an important test bed for continued evaluation of the pedagogical value of the technology. It also aids in the development of a bank of pre-lab videos, and digital library of training resources.

Initiative Title:

Using Virtual Reality technologies as a prototyping tool in Digital Media modules to help students with low spatial abilities and to increase student's motivation

Initiative Lead:

Dr M. Javad Khajavi

Department:

Media Studies

Aim of the initiative

The main goal of this initiative was to improve the learning experience of students and to increase their motivation and engagement by making a small change in the teaching approach and including Virtual Reality (VR) technology in teaching, and in particular for prototyping in one of the modules on the digital media thread of the Media Studies Program.

Reason for undertaking the initiative

As part of the Screen Design module, students work with visual and motion design programs. These programs are equipped with tools for both 2-Dimensional (2D) and 3-dimensionsal (3D) design. Working in 2D is usually a straight-forward process for students as they can easily see and recognize the horizontal (x) and vertical (y) axes in the viewport of the program.

However, when it comes to 3D design, some students (including non-visual learners and those with lower spatial abilities) have difficulty adjusting to the reality that they are working in a 3-dimensional space as they see the 3D field on the flat screen of the computer's display, which is merely a 2D representation of the 3D space. As a result, students with lower spatial abilities face many difficulties in understanding and adjusting to work in the 3-dimensional field of the computer application. Because of the way students see the 3D space on the flat screen, most of the time they find it difficult to create and transform objects in 3D. Similarly, for some students, navigation in 3D space through a 2D representation of it is unintuitive.

In the past few years, new VR tools and technologies have been developed that can help in understanding the foundation of working in a 3D field. There are now a handful of VR applications that can be used for 3D design, animation, and prototyping. These include applications such as Gravity Sketch, Oculus Medium, MasterpieceVR, Google Tilt Brush, Oculus Quill, etc. While wearing a 6DoF[1] VR headset, the students can use these tools and by means of hand controllers they can create and move objects directly inside an immersive 3D virtual space. As Ho et al.

1 A 6 degree of freedom VR headset responds not only to the orientation changes in the view but also to the translational movement along the x, y, and z axes.

(2019) suggest, the benefit of using VR for 3D design is that students with lower spatial abilities will better understand and adjust to the requirements of the 3-dimensional space.

VR technologies have grown rapidly within the last few years with the introduction of affordable headsets such as the Oculus Quest and HTC Cosmos. While such tools and technologies are relatively new, companies and design studios have already started to use them in their production pipelines. Educational programs around the world are also gradually including design for and through VR in their curricula and teaching. For example, the MA program in Virtual Reality at the University of the Arts London which initiated in 2018 includes some of the aforementioned VR tools in its curriculum (MA *Virtual Reality*, n.d.). Similarly, University College London organizes short courses on Virtual Reality that uses prototyping tools such as Tvori (Milligan, 2019). Thus, another goal of this initiative is to assess the inclusion of these tools in the digital media strand of the Media Studies program. This is a first step in introducing these new technologies and approaches to the program.

Intended project outcomes

- To increase students' motivation for digital and interactive media modules and their engagement with module materials and class activities
- To help students who struggle with navigating the 3-dimensional field by using the 6DoF VR equipment and 3D design tools, thus making learning about 3D design more natural and intuitive
- To prepare for the inclusion of 6DoF Virtual Reality tools and technologies in teaching digital and interactive media modules of the Media Studies program
- To increase students' knowledge and skills in the field by introducing cutting-edge approaches and technologies in digital and interactive media design
- To prepare students for the future needs of the job market and the industry

Description of project process and outcomes

Preparation for the initiative started in August 2020 by researching the most suitable Virtual Reality hardware and software for the initiative and by looking into the experience of some other media programs at universities around the world in including virtual reality content.

Figure 1. As part of this project, an Oculus VR headset was bought

Figure 2. Disposable eyepiece covers were used to reduce the risk of the Coronavirus transmission

Colleagues in other universities in the UK, Nordic countries, Australia, and Singapore have been contacted to learn about how they have implemented Virtual Reality and VR tools in their teaching. Obviously, there are some contextual differences between their programs and the Media Studies program at Maynooth. The idea was to be inspired by their experiences rather than replicating their approaches to including VR tools in teaching.

Based on this initial research, we decided to use an Oculus headset and a VR application called Quill. Quill was selected because of its ease of use and its intuitive user interface. Additionally, inspired by other university approaches, we decided to organize a "Design in VR" workshop for students who take the module and provide them with the opportunity to work in the immersive virtual space through some workshop activities.

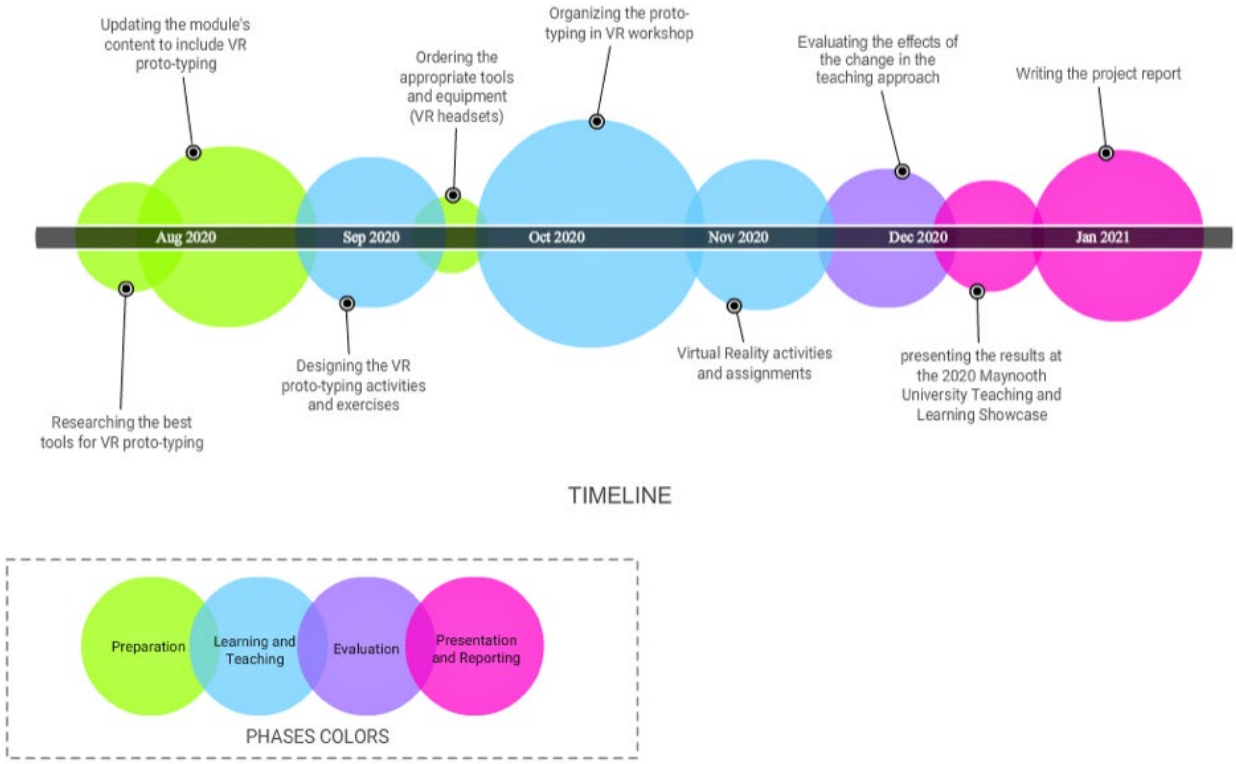

Figure 3. The initiative's timeline

The initial plan was to open the workshop up to all students registered in the module. However, since the Covid-19 restrictions[2] expanded in fall 2020, it was decided to limit the number of participating students to 15.[3]

This decision also made it possible to compare the outcomes of the initiative against the experience of other students who had not participated in the workshop.

2 Considering the risk for the spread of the Covid-19 through sharing equipment, for this initiative, we followed the best hygiene practices as suggested by Maynooth University. Students were asked to thoroughly sanitize their hands using provided hand gels. Moreover, disposable paddings were placed under the eyepiece of the VR headset. My research and the suggestion from colleagues in other universities suggested that using these disposable paddings is the standard method of decreasing the risk of transmission of the virus.
3 It should be mentioned that the defined learning outcomes of the module are not linked or influenced by attending or not-attending the VR workshop.

The 3 hour workshop was held outside class hours at the Mac Lab on the campus. The first half hour was dedicated to demonstration, and the remainder of the workshop was spent on activities in VR. Through demonstration, students became familiar with the VR headset and its handheld controllers and the user interface of the VR application (Quill). During the activities, each student used the VR headset to experience design and creation in the immersive 3D space of the virtual world. The activities ranged from navigating the 3D space in VR to creating and moving objects in Quill's virtual environment.

Figure 4. Students working in virtual reality during the VR workshop

My observation during the workshop was that students were very excited about the experience. The evaluation for this module also reveals that students who attended the workshop were more motivated and were more satisfied with the module.

Two students referred to the VR workshop in their evaluation and described the experience as "fun" and "useful". While the number of students who participated in this initiative was small and cannot give a generalizable research outcome, feedback from student evaluation was in line with the literature in that it suggests that the use of VR 3D design tools positively influences student interest and engagement. Sattar et al. (2019), for example, have shown that immersive VR increases students' motivation and interest in learning 3D design. My observation and student feedback and evaluation for this module supports that proposition.

Ho et al. (2019) refer to how students with low spatial abilities specifically benefit from exploring 3D space in VR using Google Tilt Brush. The outcome of the VR workshop in this module suggests similar results. Based on my observation, the majority of students who attended the workshop did not have any issues working with the 3D interface of the design program used in the module. While students enjoyed the experience of designing and navigating in VR, the activities in the workshop showed that some students needed more time to adjust to the sense of immersion of the VR space. It was initially difficult for these students to navigate the virtual space. However, they gradually became more comfortable at creating and moving objects in the 3D space as the immersive virtual environment became more intuitive for them. This suggests that some students may need to work in VR for a longer duration to achieve the intended goal.[4] This is an observation that will be considered in using the VR workshop in the modules in the future.

4 Obviously, having more virtual reality headsets helps with this as more devices means less waiting time for individuals and longer hands-on experience for each student.

Impact on current Teaching and learning

The results from the student evaluation, along with my observations, suggest that the VR workshop increased student interest and motivation and the overall student satisfaction level of the module in this academic year (2020 -2021) was higher than the previous year. Based on the data from the end of the semester evaluation, the majority of students enjoyed the module with one student writing that "this module was stress free, enjoyable and fun". In the meantime, while it is difficult to assess the impact of the initiative on students' learning, my observations suggest that when compared to the last academic year, fewer students had issues working with the 3D UI of the program after the VR workshop this year. Moreover, students who attended the VR workshop reported that they were satisfied to learn about trending technologies used in the field of Media Design.

Future impact

One of the goals of this initiative was to assess the possibility and the potential of using VR hardware and software in teaching digital and interactive media modules in the Media Studies program. As mentioned earlier, virtual reality is a rapidly developing field and many VR tools and technologies have been and are being developed for use in the field of media and design. The satisfactory results from this initiative based on my observation and student evaluation encourage the development of similar VR-informed teaching approaches on other interactive and digital media modules in the program. The department has recently led an initiative to rethink the practical modules in the program, and as a result some of the modules have been redefined and new modules are being introduced. This SPARK initiative has been helpful in introducing more course content related to VR to the practical modules in the program.

The approach used for including VR tools in this initiative will be applied to other modules in the program such as Animated Storytelling currently being redesigned. It is also hoped that, based on the outcomes of this initiative, we can engage in collaborations with the Media Studies program and the Design Innovation department to introduce cross program modules or workshops.

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Initiative Title:

Introducing Feedforward to Student Evaluations of Teaching & Learning

Initiative Lead:

Dr John Cullen

Department:

School of Business

Project Team:

Tasneem Ahmed, Student collaborator

Aim of the initiative

The initiative aimed to understand and address student interpretations of Teaching Quality by introducing student feedforward to student evaluations of teaching and learning in the hope that it would provide evidence-based insights to raising the response rate in student evaluations and, in doing so, communicate the value of evaluations to students and faculty alike. It also aimed to identify a mechanism for effectively implementing feedforward.

The research stage involved conducting interviews and focus groups with both current students and recent alumni to guauge their understanding of a quality teaching and learning experience. A student research assistant undertook student interviews and focus groups. This data will be collected from a sample of students and recent graduates across all Maynooth faculty to develop the broadest possible picture of student understandings of teaching experiences and will constitute a key element of the final project report.

Reason for undertaking the initiative

The primary reason for undertaking this project was to develop an approach which could overcome low levels of responses to student evaluations of teaching and learning. Response rates to student evaluation of teaching and learning scores have been low for the modules I have delivered in recent years and this is in line with experiences internationally and institutionally.

A bibliographic analysis of the literature on student evaluations of teaching and learning (Cullen et al. 2019) found Spooren et al's (2013) literature review 'On the Validity of Student Evaluation of Teaching: The State of the Art' to be the most frequently cited academic paper on Student Evaluation of Teaching (SET) .This review reported that research on SET found that low completion rates resulted from a student belief that they were often standardised, which gave the impression that their feedback would not influence how courses they were taking would be changed and there are calls for increased usage of richer qualitative data to be incorporated.

Higher levels of correlation have been reported between high SET scores and student attainment which suggests response rates may improve if students see SET as being part of an overall quality assurance initiative that will benefit the teaching they receive. Despite this, research on student evaluations of specific evaluation tools such as survey instruments are frequently developed without any clear theory of effective teaching (Penny and Coe 2004). Researchers have also questioned the extent to which students are equipped to adequately evaluate teaching quality (Beecham 2009) and if students should be the sole evaluators of the quality they have received. SET scores and completion rates are higher when staff and students have agreed on what teaching quality amounts to (Goldstein and Benassi 2006), which has led to calls for the development of 'feedback literacy' amongst students (Carless, 2020).

This initiative aimed to do this through developing insights into how current students and recent graduates understood teaching quality in order to devise a framework for module evaluation that would address the issues above. It was initially planned to have this research completed prior to the undertaking of a first and final year module to ascertain if they (1) improve response rates, (2) increase student engagement and (3) improve feedback literacy amongst students and faculty. Despite difficulties recruiting a student research assistant and participants, it was possible to collect feedforward data from the groups and 'beta-test' it with two undergraduate module groups.

Post-assessment feedback interviews will be undertaken with these groups over the summer months to finalise and development the feedforward approach.

Intended project outcomes

- **Data collection**: Collecting qualitative data from interviews / focus groups with current students and recent alumni on their understanding of what a quality teaching and learning experience is. This is especially important during the current pivot to increased levels of remote teaching and socially distanced learning environments, where student retention will depend on students having a quality and valuable learning experience.

- **Framework development**: The findings of this data collection will be used to develop a draft student feedforward framework which will then be applied to my teaching of a first year and final year business class in Semester 2 of the academic year 2020/2021. Interim response data will be collected before the project completion deadline of March 31 2021 and will be summarised in the project report.

- **Post-teaching development**: Beyond the initiative end date, data would continue to be collected at the end of teaching semester two to provide a complete picture of the implementation of the project and its effectiveness in improving student feedback rates. It is hoped that the project will provide a framework and process for faculty in other disciplines and institutions to practically improve the volume and quality of student evaluations of teaching and learning in the future.

Description of project process and outcomes

The initial project plan required the recruitment of a research assistant, achievement of ethical approval, drafting of an initial literature review, identification of interviewee and focus groups participants and completion of data collection by the end of December 2020.

Funding was approved and ethical approval for focus groups/ interviewing students and graduates was obtained in mid-November 2020 and with the help of the Students Union, a postgraduate student from the Faculty of Social Sciences was recruited as a research assistant and data collection began.

Despite repeated calls for student body participants, it was eventually only possible to recruit two student focus groups, but the quality of data obtained from these groups were very strong. The research assistant arranged the timing and collection of informed consent documentation.

There were two key findings from the **current student focus groups**.

The first was **the need to design teaching and assessment in a way which recognises the different learning styles, and assessment preferences, of various students**. Students highly valued any attempt by lecturers to learn and understand who they were as individual learners. Many mentioned that the social and lower-cohort size in tutorials (across all science, social science and humanities modules) not only facilitated greater socialization, but enhanced learning.

> *'What I always find is the best… is somebody who will try to cater for as many different learning styles as possible, and I can understand from an educator's perspective that it's hard to catch all of them' (Participant in Focus Group 1).*

> *'Extra classes where they [lecturers] answered questions was really useful' (Participant in Focus Group 2).*

> *'Lecturer can be just … giving out the information, but tutorials are kind of an open discussion' (Participant in Focus Group 2).*

The second was **the need to be seen and engaged as individuals and learners who have distinct identities and needs**.

> *'There is more difficulties at the moment because you have the lack of face-to-face interaction and you can definitely see it in some lecturers and some of the tutorial teachers as well that they really want to know you as person. They don't just want you to be somebody who is faceless behind a screen'. (Participant in Focus Group 1).*

> *'One of my lecturers, what he did was record the material, short ten minute videos on the topic and in the tutorial he gives examples of what they are.' (Participant in Focus Group 2).*

Thirteen interviews were conducted over the months of December 2020 and January 2021 with alumni who are currently working in a range of industries in professional positions. All spoke of the strength of teaching quality they experienced during their time in MU. There was, however, a huge degree of variation even amongst this small group as to what they found of most value.

The following learning for practice emerged very clearly across the two data sets:

1. Making lectures as interactive as possible in ways that draw out individual perspectives and opinions helps students feel more 'seen' in their work. The interviewees were very conscious of how the experience of current students might have been negatively impacted by this.

2. Assessments related to career development were highly valued as students could clearly 'purchase' value from them. In particular assignments which would create 'artefacts' that could be used in developing career strategies or used to bolster job applications, interviews and CVs such as presentations, blog posts, or physical objects were identified as being of strong worth to the students.

3. There were differing views as to whether group projects were of value.

'I actually really enjoyed group projects. I found that to be the most challenging but the most rewarding. And you definitely got the most from it because not only were you meeting new people from within your class but you were like really putting in a collective effort to tackle something' (Graduate Interviewee 1).

'If you were in an group, sometimes I don't think they were the best exercises because particularly in your second year and your final year that people had so much on that they would divide them up into different roles, but it could be difficult to see your full role.' (Graduate Interviewee 2).

'Much as I didn't like them [group assessments] looking back on them I think they were the most valuable'. (Graduate Interviewee 3).

Finally, as a way to ensure that current students did not miss out on the draft learnings from the literature review, focus groups with current students and interviews with graduates, two short mini assignments were set for **two undergraduate modules**: one a first-year module with over 200 students, and the second with a large final module with under 700 students. The intention of the project had been not to use these assignments for data collection, but to survey and interview participants following the release of grades. This would be to ask the student opinions on the impact of collecting feedforward, and not any other aspect of their teaching.

The first assignment for both modules (first and final year) included a section where students were briefly asked respondent to describe the 'ideal' learning experience that you would like to have in this module. In particular they were asked: *What would you like to learn about the subject? How would you like it be useful to you in the future?, and; How would you like this knowledge to be assessed?*

At the midpoint in the first-year module, students were set another continuous assessment and asked to address the following: Honestly report whether the module and its assessment has met your understanding of what a quality learning experience is, or should be. How could your opportunity to learn from the module be improved?

Impact on current Teaching and learning

Response rates to all of these were very high, and findings are outlined below.

Firstly, students in both the first and final year modules, were very clear that they appreciated being asked what they felt a quality learning experience consisted of. This was not only stated in responses received, but also in other official fora and in informal communications from students.

A decision was taken not to set examinations for students in these modules over the course of this semester, but to assess all student work via CAs. There was notable mixture of preferences for teaching and assessment modes. First year students were particularly keen on MCQ-type examinations, but final year students (whilst valuing the role of MCQs in sustaining engagement during remote learning) emphasised the need to have relevant, career-facing assessments. There was some initial ambivalence to group projects (but it was notable that students did not object to them in principle); a small number stated that they had concerns how the performance of other students might impact on their own grade.

A noticeable outcome of seeking feedforward at an early stage in the module was that students appeared to feel more 'vocal' in expressing what they wanted from the module. Requests for additional explanations, and expressions of gratitude for engaging in these became more plentiful.

One student from the class of 680 students expressed that they did not see the value of the module, but Business Ethics modules have long been noted for having this effect on students.

External factors (especially the changes in teaching and assessment produced by remote learning) made it difficult to time the introduction of feedforward to these modules, but it resulted in a **clear and immediate impact on my teaching practice which will be developed and sustained as outlined below**.

Future impact

1. Rather than collecting feedforward qualitatively prior to the beginning of the module, responses will be used to develop an in-class survey, with an opportunity for qualitative feedback included, for greater ease of analysis.

2. Data received thus far will be used when designing future Continuous Assessments for students.

3. Mid-term feedback (also survey based) will be used to ascertain student satisfaction of teaching and learning.

4. End-of-semester feedback will be collected in relation to how the attempt to engage with their preferences worked for students.

5. Final year students will be asked if they might be willing in the future to inform the feedforward/feedback cycle post graduation.

The SPARK funding allowed for the initiation of a greater and ongoing project that will invite this year's graduates to also participate in focus groups or interviews following the Summer Examination board.

Ethical approval for this continued process will be sought and it is hoped that this final tranche of data will be used to develop a conference or teaching presentation on the process to share it with the broader SOTL community via an article in a peer-reviewed publication and to contribute to the practice and theory on SET.

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Initiative Title:

Hands on with High Crosses

Initiative Leads:

Dr Eoin Grogan and Dr Mary Leenane

Department:

Irish Cultural Heritage

Project Team:

Ms Saskia Krauss, Ms. Lena Söhne

Aim of the initiative

The 'Hands on with High Crosses' initiative aims to create a layered interactive teaching and learning tool centred on the early medieval High Crosses at Kells, Co. Meath. This initial learning package, featuring these iconic religious artefacts, is designed to augment learning around a specific aspect of the Irish Cultural Heritage programme. Emphasis is placed on the development of flexible and accessible pathways to teaching and learning that can be employed on an on-going basis. Additionally, this will widen access to field experiences for students with physical disabilities, those who are ill or infirm or who cannot participate for other reasons. This collaborative student-lecturer pilot initiative will provide a framework for the creation of related digital themed resources and learning activities for other sites and artefacts.

Reason for undertaking the initiative

Field experiences, including the close examination of various artefacts, underpin interdisciplinary teaching and learning in Irish Cultural Heritage. This includes visits to the so-called 'Royal Sites' of Tara and Emain Macha, the Neolithic passage tombs of Newgrange, Knowth and Dowth and early monastic sites, such as Kells, Clonmacnoise, Monasterboice and Glendalough, while students are also prompted to visit cultural heritage institutions, such as the archaeology branch of the National Museum of Ireland, to engage with its array of fascinating artefacts including bog bodies, bookshrines and brooches etc.

Lecturers speak to the various aspects of the sites and artefacts while lecturer-student dialogue is strongly encouraged underpinning interactive engagement on these field experiences. Student feedback consistently comments on the way in which these visual and hands-on experiences bring teaching and learning to life while enriching their understanding of aspects of early Irish cultural heritage.

However, at least initially, overseas students often struggle to appreciate Ireland's unique landscape and archaeological remains, including religious artefacts such as the high crosses. It is difficult to comprehend the context, scale, craftsmanship and iconographic detail of the crosses in the absence of these kinds of visits. Interestingly, the highly stylised illustrative panels of the crosses were an important interactive teaching and learning resource in monastic communities of the late ninth and tenth centuries and have retained much of this value and relevance. Unfortunately, some of these are damaged and wear and tear has made detailed on-site assessment difficult. Additionally, these iconic sculptures provide a window into many aspects of early Irish society, and thus are central to the Irish cultural heritage programme.

Given the complex nature of these artefacts and their context within monastic communities, there is a need to create interactive learning packages to enhance understanding and knowledge in preparation for (and to follow-up on) site visits. Additionally, with large student numbers (and sometimes limited time), it can be challenging for everyone to hear and see (and engage with) the discussion, and it is not possible to explore all aspects of, for example, the crosses and their context on-site. Other students are precluded from accessing the field trips, owing to mobility issues, timetable clashes etc. These on-going issues were greatly magnified due to Covid-19 when travel restrictions prohibited all field experiences. This accelerated the need to create specific learning resources around core field experiences that would, for some students, replace on-site visits, and more generally to augment the field seminar component of the programme. Given the interactive and visual nature of these experiences, this underpinned the concept to develop a dynamic multi-media teaching and learning package focusing on the iconic early medieval religious sculptures at Kells.

While addressing this immediate concern, the initiative would be designed to develop a new approach to teaching and learning that could be adopted more widely. It is anticipated that this pilot would establish a framework for the creation of similar digital themed resources and learning activities for other sites and artefacts.

Intended project outcomes

The key outcome of the initiative is an interactive teaching and learning resource centred on the High Crosses at Kells, Co. Meath with the following specific outcomes:

- A detailed multi-media experience of the High Crosses at Kells
- Direct engagement /participation of students in developing learning resources
- An accessible, expandable, and interactive archive for teaching, learning, and research
- Access to learning through the provision of attractive learning options for remote or physically disabled learners
- A framework for the creation of related digital-themed resources and learning activities for other sites and artefacts

Description of project process and outcomes

The initial idea was developed through a series of local discussions and a very helpful consultation with Margaret Keane in the Centre for Teaching and Learning. This included liaising with students to secure their participation. We are delighted that Lena Söhne, from the University of Freiburg, and Saskia Krauss, from the Ludwig-Maximilians Universität, both currently studying at Maynooth University, enthusiastically agreed to participate in the project. Cormac Ó Feinneadha provided very helpful administrative support for which we are very grateful.

The project was significantly hampered by the on-going travel restrictions, preventing the initial visits to the site as planned. This served as a timely reminder of the need to create such learning resources, not only for use during times of pandemic, but for students who cannot normally access field experiences. The original plan was modified accordingly, with emphasis initially placed on the creation and collation of supporting text and available imageries concerning the monastic settlement at Kells and its high crosses. These formed the basis of a lecture series, recorded using Panopto, which focuses on the following themes:

- Arrival and development of Christianity in early Ireland
- Organization of the early Irish Church
- Monastic settlements
- Columba, Kells and Iona
- Introduction to the Irish High Crosses
- Understanding High Crosses (e.g., themes, motifs, imageries, influences)
- 'Hands on with High Crosses': The High Crosses of Kells'

Very recently, The Discovery Programme (www.discoveryprogramme.ie) launched an exhibition introducing the high crosses at Kells. This is a very welcome and useful resource, and we have liaised with them regarding collaborations for our pilot project and future endeavours. Their 3D modelling, which appreciates the scale and dimensions of the crosses, is particularly useful as a learning resource.

Hands on engagement with the crosses, their immediate monastic context, and the wider historical landscape around Kells is at the heart of this initiative. To facilitate the visit to Kells for filming and scoping for the resources, travel protocols around Covid-19 were consulted to ensure safety of all participants. There were several practical arrangements put in place, such as date and time of visit, transport, access to the site, safety precautions etc. The weather was also a consideration for creating digital imageries/videos, particular discussion-based engagement.

Close attention was paid to the itinerary including scripting for the on-site discussions, filming etc. This process culminated in the creation of a variety of different information resources including video (with and without discussion), images, and text, that are not limited to use in a single context but can be modified and repurposed for different contexts. This is hugely beneficial as the high crosses are discussed in various levels of detail, and in different contexts, across our Certificate programme and in other teaching situations too (e.g., Maynooth University Summer School, BA Local Studies).

The process promoted a staged and focused engagement with the meaning and significances of the crosses. For example, in Figure 1. Saskia and Lena observe the unfinished East Cross at Kells and make observations in terms of better understanding the way in which the stone masons approached their work. Typically, students ask if the stones are carved before or after they are put in place? This question is explored through a series of digital images, with captions, and through lecturer-student discussion. Figure 2. captures Lena and Saskia at the broken West Cross, giving a sense of the scale of the cross even in its incomplete state. A student led discussion offers a more accessible interaction for those who are new to these types of monuments. It acknowledges the initial sense of awe, wonder, and admiration, prompting a desire for more meaningful engagement with the illustrated panels. This serves as an important platform to entice and build knowledge of the imageries and their layered meanings. Figure 3. presents one of the more well-known panels from the West cross. Initially, it is very difficult for students to make sense of the individual features and figures.This image allows for a fuller understanding of the scene representing the baptism of Christ in the river Jordan. The dress of the two ecclesiastics on the left offer wider insight into concepts of status and mechanisms to express this in early Irish society.

Their mantles adorned with brooches may not be immediately apparent but can be appreciated better through the presentation of layered images along with text. For example, this would include images of a similarly robed Christ from the Book of Kells (32v.) along with an image of a penannular brooch, like the Ballinderry Brooch, that might align with the one envisaged by the craftsman here. A phased approach to teaching and learning, that is supported with different components (text, images, video etc.) offers a flexible pathway to the appreciation of complex monuments.

It is important to acknowledge that the creation of these kinds of resources is quite heavy on time and expertise. However, the SPARK initiative has provided an important platform to carry out this pilot and it has been very useful to establish a framework for related endeavours in the future. It is also noteworthy that, owing to the recent pandemic, there has been a noticeable increase in the number of digitally focused resources and activities pertaining to cultural heritage institutions and heritage sites. These are very important resources that can form part of or be adapted into the teaching and learning approach for Irish cultural heritage in the future.

Impact on current Teaching and learning

Firstly, the process of student-lecturer collaboration has been very helpful, providing a different perspective on the creation of teaching and learning resources. This drew attention to many things that we would have otherwise been unaware of and would have made for a less dynamic and student-centred learning package and framework. For example, as lecturers who are intimately familiar with the artefacts (and their context), we were somewhat guilty of assuming students' existing or prior knowledge or favoured a familiar approach. This initiative has provided an important opportunity to reflect on the teaching and learning environment and how this might be enhanced. It has underlined the value of collaboration with students in our consideration of approaches to teaching and learning, and, particularly, the creation of interactive resources. This has prompted a review of various aspects of the programme to ascertain if these kinds of collaborations could be employed elsewhere. This marks a key shift in our approach to teaching and learning that we will continue to develop.

Owing to the on-going Covid-19 restrictions, it has not been possible to engage in the usual field experiences and so we rely entirely on the learning package to promote understanding of the High Crosses at Kells. The combination of text, lectures, visual and interactive elements, including discussion, has enabled, and greatly supported, the appreciation of these artefacts. Hopefully, with a return to field experiences in the near future, these resources, and the approach used, will continue to augment teaching and learning in this area and elsewhere on the programme.

Future impact

This pilot project will have a very positive impact on teaching and learning in Irish Cultural Heritage in the future. It has demonstrated the benefits of lecturer-student partnership in the creation of multi-media interactive resources, based on key artefacts/sites. Not only has it provided reassurances in taking this kind of approach, but it has also enhanced our own knowledge and understanding of how students develop an appreciation of these kinds of artefacts and the landscape in which they manifest. This insight is not limited to this context, but can be applied to similar subject areas, such as archaeological remains e.g., round towers, brooches. It has provided a platform to build other multi-media learning packages where we bring the student to the fore of the process and we now intend to take this collaborative approach to develop teaching and learning resources for the Neolithic passage tombs of Newgrange, Knowth and Dowth.

Appendix: Images 'Hands on with the High Crosses'

Figure 1. Saskia and Lena observe the unfinished East Cross at Kells

Figure 2. Saskia and Lena getting a sense of the broken West Cross at Kells

Figure 3. Close-up of religious figures from The Baptism of Christ in the River Jordan panel of the West Cross at Kells)

Initiative Title:

ChemVR- The use of virtual reality for interactive teaching in chemistry lectures

Initiative Lead:

Dr. Rob Elmes

Department:

Chemistry

Project Team:

Mr. Luke Brennan

Aim of the initiative

Model kits have been used for students to build and manipulate simple molecular structures since the late 19th century but in recent years an increasing number of computer-based models have been applied to visualize molecular structures and demonstrate chemical concepts. Within this context, there has been an emphasis on using such models as a tool for enhancing practical laboratory experiences. However, it is useful to apply such technologies for exploratory educational activities in the lecture hall. Virtual reality (VR) technology is well-suited to fill this need for chemical education as it provides an enhanced immersive and interactive space that allows for an intuitive understanding of chemical systems.

Our main aim for the initiative was to identify improvements in student understanding of fundamental concepts that are traditionally perceived as difficult by students and to foster a more collaborative approach to lectures.

Reason for undertaking the initiative

The key reason for undertaking this initiative was to substitute a physical model for virtual models to allow seamless transition from ‘in person’ teaching to ‘online’ teaching. The key objective was to evaluate VR as a means to do this and provide a more interactive method of teaching in undergraduate lectures. The initiative made use of a collaborative VR tool, Nanome (https://nanome.ai/nanome/), for visualisation and manipulation of chemicals on the nanoscale. Moreover, with the advent of accessible VR equipment and VR software packages for chemical systems, the technology would provide the opportunity for full immersion, giving physically realistic, dynamic feedback to student interactions. This would allow the lecturer to manipulate matter on the atomic scale and demonstrate both fundamental and more complex topics from a 3-dimensional perspective. Students would have the ability to observe the manipulations in real-time and engage in collaborative dialogue with the lecturer to demonstrate their understanding of what was presented.

During this pilot, the lecturer could manipulate data for students to view. However, it is envisaged that in the longer term, students will also gain access to VR headsets to allow teams to collaboratively solve problems in real time; analysing, visualising and designing solutions in an immersive environment. Given the challenges that have been brought about by Covid-19 restrictions, this tool would be of significant benefit to remote teaching and learning.

Intended project outcomes

- Pivot from a physical molecular model to virtual molecular models.
- Improve student understanding of complex chemical concepts in 3D – not feasible with current physical molecular models.
- Foster a collaborative environment amongst the students to answer questions on the topic – create a talking point. This point also intended to dramatically increase student engagement.
- Freedom of expression in the chemical space – potential for students to design their own molecules in 3D and comment on the 3-dimensional attributes.

Description of project process and outcomes

We expected ChemVR to drive understanding of the benefits of virtual reality teaching in chemistry lectures which would lead to more active learning activities and benefit students who struggle with more fundamental concepts by enhanced visualisation. As part of collaborative sessions, students had the opportunity to learn through creating their own atoms and molecules – learning through play. Also, achievement of learning outcomes in modules that are traditionally seen as ‘difficult’ by students was a key driver where the approach garnered increased student engagement and encouraged critical thinking.

While, the platform was rolled out to just a small cohort of students initially, we envisage that if COVID- 19 restrictions continue, Nanome will allow collaborative sessions with students on campus or online. The initiative process allowed students to grab, rotate, or enlarge molecules with their hands and gave an experimental feel to exercises that would traditionally take place in a laboratory. Problem sessions were also conducted in teams of students working together on a single data set and the students could analyse and interpret the data together; improving their problem-solving skills and gaining experience of data processing that would be encountered in a modern chemical research laboratory.

While not a requirement of this short pilot, Nanome could also be used to facilitate and support those students for whom specific health concerns or disability prevents physical participation, thus building in “design for diversity” within a blended or on-line environment. We see this as one of the major advantages of using a virtual platform.

The overwhelming sense from the pilot was that ChemVR empowered the lecturer to teach students from a new perspective. It increased student engagement significantly and led to a more enriched learning experience for both student and teacher. We created a variety of exercises based on the Nanome content and this was also rolled out to postgraduate students who overwhelmingly felt that use of the technology would be beneficial to their own teaching. This also gives rise to the potential for specialist training for technical officers and academic staff.

Impact on current Teaching and learning

The initial trial of the Nanome software was conducted with a small team of postgraduate students in the Chemistry Department to inform the best format for presenting ChemVR in a lecture environment. Given the COVID-19 restrictions we were able to pivot seamlessly from a physical molecular modelling approach to virtual molecular models. The first impact observed was that the students felt that the software improved their understanding of complex chemical concepts such as secondary orbital overlap in the context of Diels Alder reactions. This particular concept is seen as 'difficult' by students and the feedback form the pilot was overwhelmingly positive. This was particularly pleasing as Nanome allows for more complex concepts to be communicated and it is something that is not feasible with current physical molecular models.

A second major impact was the change of atmosphere in the group. The visual impact fostered a collaborative environment and stimulated a significant amount of discussion around the topic. Use of the virtual tool created a 'talking point' and dramatically increased the level of student engagement.

The third impact of note was also around student engagement where use of VR gave rise to an increase in creativity and expression. The platform allows students to design their own molecules in 3D and comment on the 3-dimensional attributes. This led to collaborative discussions and allowed the lecturer to probe the knowledge and understanding of the cohort more deeply. For example, the students were asked to design their own diene and dienophile where the lecturer could then ask them questions on their design; strengths, weaknesses and design considerations.

Post workshop, the students were surveyed for feedback and all students rated their confidence on the topic as 'high' as a result of participation in the session. It was also clear from the lecturer's own observations that significant learning had occurred during the session.

Future impact

Building on the success of this pilot initiative, we intend to conduct a phase 2 pilot with a slightly larger cohort of undergraduate students (approx. 20). ChemVR will be used as a platform to teach a workshop as part of a chemistry module to second year Pharmaceutical and Biomedical Chemistry students. The proposed workshop is entitled Thinking in 3D: Relating Chemical Structure and Biological Activity. This will provide an ideal pilot scale project to evaluate the value of the ChemVR approach in an undergraduate context. Moreover, the interactions of content, pedagogy, and technology with respect to ChemVR will form a more in-depth, project which we hope will allow the purchase of several VR headsets. Introducing more headsets will increase the opportunity for collaborative problem-solving sessions in an immersive environment. The long-term vision is to roll the approach out to larger undergraduate cohorts. Any findings of note will be the subject of a paper/poster presentation enhancing scholarship and professional development activities within the department.

At the conclusion of the initiative, we believe that the VR activities can be further tailored to many different levels by varying the topics and tasks. In the future, with more affordable hardware and software, and funding, the concept of a virtual classroom is one that is particularly exciting and ChemVR will be the enabling space to allow this to happen.

Initiative Title:

"Snake Cryptography", porting extra credit assignments to Python

Initiative Lead:

Dr. Tom Dowling

Department:

Computer Science

Project Team:

Sutirtha Chakraborty

Aim of the initiative

The aim of the initiative was to enhance student engagement with practical implementation of the ideas presented on the CS416 Cryptography module. In keeping with the "Change one thing and do it well" theme this project aimed to improve student engagement by enhancing an existing implementation-based approach to cryptography by incorporating the Python programming language. Key aims were:

a. To investigate the Python language from a cryptographic implementation point of view.

b. To design a Python friendly set of assignments to reinforce ideas covered in the lectures.

c. To give the students the opportunity to try these assignments.

d. To evaluate the take up, especially to see if more students take up this option than the existing assignment

Reason for undertaking the initiative

Cryptography is traditionally a heavy mathematical content module. It covers a wide range of topics and ideas such as Classical Cryptanalysis, Symmetric Cryptography Cryptographic Hash and MAC Functions, Digital Signatures. The implementation of these ideas has proved difficult for students and I have tried many engagement strategies over the years to improve the situation. I have also tried to align this module to the strengths of the student cohort who take it. These students do not have an extensive mathematical background but do excel at PBL based implementation of mathematical ideas in computer programs. This is the point of the extra credit assignments I have incorporated into the module.

For each topic or idea, I provide examples of solutions in the Perl and Java programming languages. The aim is that students take these examples and play with them to see how they work and how to solve the given problem. They then extend these sample programs to solve extra credit problems I post up.

It is a recurring feature that it is usually only the best students that tend to attempt these problems and various approaches were tried to expand the number of students engaging. The "change one thing" initiative is another approach towards this end. We develop a suite of examples in the Python programming language to enhance engagement as most of the targeted students use Python as their main language.

Intended project outcomes

- Increased and enhanced student engagement
- Improved understanding of the concepts presented on the course.
- Enhanced programming ability.

Description of project process and outcomes

I initially created a library of Java implementations of various problems on the course. Then, together with Sutirtha, developed parallel Python solutions. These were made available to students on the University's VLE Moodle course for the module. The students were asked to play with both suites, the original and the new Python set, and evaluate them based on certain criteria in questionnaire form. They were asked if the suites improved their understanding of the course and enabled them to better approach the extra credit assessment provided throughout the course.

They were also asked their preference of suite. Though responding numbers were small, the results were very positive with affirmative answers to nearly all the questions posed and indications are that Python was preferred over Java. While there is some signal here to the value of the new suite, more data would be required to give a more definitive evaluation.

Impact on current Teaching and learning

As expected, the students who engaged tended to do better on the module than those who did not. The on line open book exam format of final exams tended to favour these students as they had experience problem solving and implementing solutions throughout the course. No one who engaged with the process failed the module. The pool of students who engaged did overflow into the middle ranks of students so this was encouraging. It was a difficult year to attempt this initiative though and an unknown is how many more students would have engaged in a normal year? That said, there are enough positives to merit running the initiative again next year.

Also not every student favoured the Python approach so we will be keeping the Java and Perl options and running them in parallel with Python.

As this module was a semester one module, it provided valuable feedback into how to design and implement assessment strategies for semester two modules. In particular, the Numerical Computation semester two module benefitted significantly. There was substantial student overlap in both modules so students were coming to the assessment strategy with some experience. Again, no student who engaged with the process failed the module (this included students who did not take the cryptography option in semester 1).

Future impact

This initiative was a very small project that allowed us to create an initial suite of problems for students to work on using Python and gave us some indication of the potential value if further implemented. It is our intention to continue to explore further ways to engage students in this process and ways to give students the opportunity to gain extra marks before a final assessment in order to take the pressure off the final assessment. It will be interesting to see how the initiative develops in a post COVID environment.

Initiative Title:

Fake news and disinformation: tools for engaged research and citizenship: A 3-part podcast

Initiative Lead:

Dr Aneta Stepien

Department:

Department of Critical Skills

Project Team:

Dr Gerard Maguire (Dept. of Law), Rachel Seaman and Jack Madden (Students)

Aim of the initiative

The aim of the initiative was to create an accessible, informative and engaging digital resource on the topic of *disinformation and fake news as a threat to critical knowledge, academic community and democracy*. The purpose of the 3-part podcast is to support students' in understanding the mechanisms of fake news and to confidently navigate through online sources and critically evaluate its content. Transitioning from the second to third level education, students become not just consumers but also producers of knowledge thus developing media literacy and critical thinking can significantly improve their research and study skills during their time in university and in their lives beyond it. The podcast builds upon a single class on fake news taught in the MU Critical Skills programme for first year students and the initiative offers an innovative and sustainable set of digital resources, that can also be referenced and used to support teaching, learning and awareness across a range of contexts.

The dedicated web page of podcasts and resources has been made available to all staff and students at Maynooth University and beyond: **podcast website**

Reason for undertaking the initiative

The project was a response to the recent interdisciplinary scholarship on fake news and digital media literacy (Kaufman 2020), which calls to include the topic of fake news into the teaching curricula, finding that many young people are unprepared to encounter misleading news and information online (Lee 2018). The recent increase in anti-scientific attitudes, particularly the Covid19 'infodemic', i.e. the rapid spread of disinformation during the pandemic, have shown that countering disinformation online has become as important as providing medical supplies to health workers (Radu 2020). Developing students' digital media literacy and critical approaches helps them navigate through sources and critically evaluate the content, which informs their research and study.

If left uncritical, the online content may lead students to strengthen their misinformed beliefs and radicalise their views aligning with their ideological predispositions (Butler 2019).

Recent interventions into teaching about fake news send a positive and encouraging message, demonstrating that simple activity such as watching a short video or reading a short text on the subject can make an immediate long-term change of attitudes and improve the ability to spot false information (Lee Bouygues, 2019). When we ask students to consider misinformation, disinformation, and fake news, we not only teach them these concepts but also "encourage them to reflect about the ways that their everyday writing and circulation practices align with broader democratic aspirations" (Ehrenfeld and Barton 2019, p.3). This shows extreme benefits of even brief engagement with the topic, which can strengthen students' research skills while supporting the development of a more engaged citizenship.

Intended project outcomes

The key outcome is a web page that introduced the 3-part podcast series accessible via multiple platforms (e.g. Anchor, Spotify) and open to the public:

- A dedicated web page with 3 podcasts and introductory text
- Additional supporting and topic relevant resources and links
- A Podcast-based student assignment for critical skills module students;
- Evaluation process to measure learning impact;

Description of project process and outcomes

The first phase of the project (September-October 2020) focused on research and technical and software preparation to record the podcasts. Adobe Auditions was used to record and edit an informed, research-based conversation about concepts surrounding fake news and its rise to popularity in contemporary media and life, and its effects on the democratic process. Collaboration with Gerard Maguire from the Department of Law at Maynooth University resulted in a multi-disciplinary approach to content, where, in addition to culture and politics, perspectives from international law could be brought into the discussion. The first episode (23 minute podcast), now titled "Fake or Fact? An Introduction To Combat Misinformation" was produced in October. A title for the series was decided on to align with the aims of the podcast and to highlight the reflective nature of the podcast discussions and the need for the listener to reflect on their own context: *Reflections Podcast on disinformation and fake news*.

Episode 2 (35 min.), "Check the Facts - All of Them", with the same two speakers, was produced in November. It continued with defining fake news, with a focus on the mechanisms of spreading fake news online and introducing essential concepts to analyse online behaviour.

Two undergraduate students, Jack Madden and Rachel Seaman, were invited to collaborate on the project in December 2020 and provided feedback on the first two episodes which were edited using Adobe Auditions software. The students were also asked to record their responses to learning from the podcast, as part of the evaluation of the impact of the podcasts on intended learning.

In January 2021 work focussed on research and preparation for Episode 3, "Don't Get Disinformed! A Conversation About Academic Research", designed to be student-led and was to introduce a student perspective on fake news, particularly in relation to the research process. The collaborating students prepared presentations, researching and reflecting on the following questions:

- How you have experienced fake news and disinformation?
- At what point of the research process is fake news and disinformation most likely to be experienced? - How you might combat this?
- What threat can fake news create to student work and the wider academic community?

Based on the presentations and discussions that followed, an outline of Episode 3 was created collaboratively and it was recorded via Zoom (due to social distancing) at the end of February.

The last phase of the project (March and April 2021) was spent on editing the final podcast, creating the podcast host website and building the web page and content. Much of this work was created by the collaborating students which included designing the **podcast web page** on the Critical Skills web platform and creating a significant amount of its content.

In January 2021, a podcast-based graded assignment was incorporated into the design of two Universal Critical Skills courses delivered in Semester 2, 2020/21. Students were asked to conduct a mini-project on disinformation, with the podcast as their main resource and to conduct further research on the topic, then submit a 500-word Learning Journal.

This reflective assignment was designed to align with the aims of the project – through specific questions included in the Journal's prompt – which also coincided with the learning goals of Critical Skills programme with regard to information literacy, including becoming familiar with the techniques and process of searching, understanding hierarchy of sources and engage in reflection on one's own bias and mechanisms of fake news. Overall, students produced very strong Learning Journals, which indicated a high engagement with the topic sparked by the podcast.

Additionally, in line with good practice, the project considered the European Framework for Digital Competence of Educators (2017), when creating the various online aspects of the initiative. The framework identifies six areas of literacy dispositions and digital competencies that should assist in the development of educator-specific digital competences in Europe. It aligns specifically with "Facilitating Learners' Digital Competence" area, which focuses on information and media literacy and recommends teaching students how to assess the reliability of information and how to identify misinformation and bias.

Impact on current Teaching and Learning

In two Critical Skills classes (35 students in total), the podcast was assigned as primary material for a graded mini-project on disinformation. The positive learning impact was clear through the high quality and creativity demonstrated in the submissions, inclusion of examples, images, infographics and strategies of fighting fake news. In relation to the questions about the major learning points from the podcast, students reported an immediate shift of their perception of online information, developing critical attitude, or a 'suspicion,' towards news encountered online, particularly on social media.

Many students indicated the podcast is the first time they have ever had an opportunity to reflect on fake news, its prevalence and effect on their research process and their lives more broadly. On the question about the value of learning from podcast, the majority welcomed learning from a less formal medium (a change from a pre-recorded lectures and readings), easily accessible anywhere and anytime, with few reporting the audio text helped them to focus better on the content and stimulated reflection on the topic.

Additional to the positive impact mentioned above, some analytics indicate strong access to the podcasts compared to other resources for the module. The audio files could be accessed via a link to a Microsoft 365 OneDrive folder, which provided analytics of student access and engagement. Episode 1 received 121 views, indicating the majority of students (32) accessed the podcast and many more than once. This indicates a positive response to availability of the resource, and compares favourably with similar access to other learning resources such as assigned class texts.

Future impact

Beyond the confines of this initiative, a further study is being conducted to examine the learning outcomes among a cohort of the first-year undergraduate students studying disinformation and fake news through the podcast. The study will analyse students' comments relating to the value of learning from the podcast series and the development of awareness of the impact of disinformation on students' own research and study. The study will contribute to the scholarship about digital resources in teaching, focusing on the benefits of using podcast in teaching in particular, and about disinformation and fake news teaching and learning pedagogies.

The podcasts will be incorporated into future critical skills classes as a resource and its accessibility on the web page and other online platforms, such as **Spotify** and **Anchor**, makes it usable as a resource across institutions and disciplines.

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Initiative Title:

Teaching Statistics Through Music

Initiative Lead:

Dr Rafael de Andrade Moral

Department:

Maths & Stats

Project Team:

Estevão Prado

Aim of the initiative

The aim of this initiative was to provide course material to students in an innovative way, through the use of audio-visual resources, more specifically, parodies of popular songs. I aimed to increase student interest, and to aid them in memorising/learning different statistical concepts, while at the same time attempting to become more relatable to them and increase interactivity. It also aimed to spark an interest in statistics and mathematics particularly for those who have been uncomfortable with it previously to build their confidence and make the learning more engaging and strengthen their retention of key learning concepts.

Reason for undertaking the initiative

The main reason for undertaking this initiative was to improve student engagement, especially as remote learning due to COVID-19 restrictions has made engagement much more difficult. Since March 2020, when teaching face to face was interrupted and teaching and learning moved online, like many other lecturers, I found it particularly difficult to teach a classroom of more than 300 students (ST221) remotely, particularly being unable to see their faces and gauge how well they were understanding and engaging. During MS Teams meetings, while some ask questions, most remain quiet. Having reviewed a short video for a recap on probability concepts I had created for students, I found it to be very uninteresting and likely not useful to solidify the concepts and formulae in their minds. It is then that I experimented with writing a song with these formulae and concepts in the lyrics, with the objective of providing a more enjoyable and effective means of learning and retaining them. The first video recorded was a success and received positive feedback from both students and colleagues. This prompted me to continue with the approach across the semester. The SPARK Initiative created an opportunity to take these productions to the next level, aimed at the Data Science and Analytics students in the second semester. It funded the purchase of professional-grade audio recording software, rather than free software with limited functionality, to record, mix and master the songs, and to edit the videos.

This allowed me to improve the audio quality substantially. Moreover, receiving funding through the SPARK initiative made me feel more confident that my teaching approach was supported by the University and gave me more drive in the level of quality of the content.

Intended project outcomes

- A series of videos containing parodies to known songs, but with lyrics related to Data Science and Analytics. Five videos were initially planned:
- Tidyverse – parody of Coldplay's Paradise
- Simpson's Paradox
- Correlation vs Causation
- Data Privacy and Anonymisation
- Machine Learning and Predictive Analytics
- Questionnaires to evaluate student learning and experience at semester end
- A process/guide for using this approach for other learning contexts

Description of project process and outcomes

Licenses for software, Logic Pro and Melodyne, were purchased and a PhD researcher, Estevão Prado, was invited to collaborate on the project, working on quality check and video captioning. Video editing was carried out with free software, DaVinci Resolve. I also purchased a professional condenser microphone and an audio interface, outside of the funding, to allow for greater recording quality. The process of producing each music video entailed:

1. Defining an underlying theme and selecting an original song to serve as basis for the parody
2. Writing the lyrics of the parody
3. Obtaining/creating backing tracks and re-mastering them (sometimes easily found online, other times I needed to record instrumentals myself)
4. Recording the vocals, editing, mixing, and mastering the audio
5. Writing a storyline for the video
6. Recording the video footage
7. Editing the video (includes audio syncing, clip trimming, adding effects and colour correction)
8. Captioning the video
9. Uploading the video to YouTube and sharing to Moodle/MS Teams and social media (Twitter, Facebook, LinkedIn, Instagram and Reddit).

Table 1 presents the approach in steps and outlines the average time taken on each, as well as the main challenges. The quality check is especially important throughout steps 2, 4 and 7, to ensure all technical concepts are correctly defined and explained, and vocals are audible and logical and the storyline makes sense. Extra props were also purchased (e.g. the elephant costume for the Tidyverse video), to make the video more engaging to students/ audience.

Step	Average time taken to complete	Main challenges
1. Defining theme/original song	1 – 2h	Themes are typically defined in advance; song choice is based on popularity and how well statistics-oriented lyrics could be fitted to it
2. Writing lyrics	1 – 3 h	Sometimes lyrics come naturally; depending on the song, it is difficult to fit exact number of syllables into verses
3. Creating backing track	30 min – 5 h	When high-quality backing tracks are available online, it is much more straightforward; sometimes I have to play every instrument to create a backing track (e.g. It's Exponential)
4. Audio recording/mixing	5 – 10 h	Depending on the style of the song, it takes more time to reproduce all vocal melodies, especially backing vocals; there is a learning curve to audio mixing and mastering
5. Writing storyline	2 – 4 h	Sometimes the storyline is clear; other times it takes a while to script something interesting
6. Video recording	5 – 12 h	Redoing shots until there are no errors; preparing props and animals.
7. Video editing	5 – 10 h	There is time required to learn and use software such as DaVinci Resolve as well as to edit.
8. Video captioning	2 – 4 h	Captioning sometimes requires revision even if there are minor changes to the original video
9. Video upload and dissemination	30 min	It can be difficult to create the best caption to promote the material. Dr Niamh Cahill was a great help here, especially with Twitter posts. Dr Catherine Hurley has been especially helpful disseminating the material to other classes.
Overall	**22 – 50 h**	

Table 1: Average time taken to complete each step of the process, as well as main challenges faced

Throughout the development of the project, the order and themes of songs (outlined in Table 2) had to be revised and a new list produced. This was done so that the material was also of interest to students in the MSc Data Science and Analytics and HDip Data Analytics programmes.

I also produced two music videos linked to COVID-19 awareness, one on exponential growth and the other on vaccination. I recognised an opportunity to reach young adults, and after being invited by the Department of Health to take part in their Science Communication Collective, I decided to produce the videos and disseminate them to the students also.

Theme	Original Song	Release Date	Number of views (as of 6 May 2021)
Tidyverse	Paradise by Coldplay	14/12/2020	4,490
Correlation vs Causation	Watermelon Sugar by Harry Styles	08/02/2021	1,501
Simpson's Paradox	Blinding Lights by The Weeknd	02/03/2021	2,026
Overfitting	Attention by Charlie Puth	06/04/2021	1,032
Exponential Growth	We Are the Champions by Queen	13/04/2021	560
ROC Curves	The Pretender by Foo Fighters	05/05/2021	454

Table 2: Specifications of the material produced in the period Dec/2020 to May/2021

Once I had delivered relevant material for a topic in a module, I would announce in a live lecture that a new music video would be published soon covering supporting the learning of the topic. At the end of the semester, I created questionnaires on Moodle seeking student feedback on the videos.

A summary of the responses is presented in Figure 1 below with qualitative answers depicted as word clouds. Overall, the feedback from students has been positive. Note that for the first-year students, the inclusion of animals in the videos made them more attractive than for the MSc and HDip students.

Looking at the responses to the questionnaires, it is clear that the approach was welcomed by most of the students. The most gratifying feedback has come from those who admit to being afraid or to disliking quantitative subjects stating that this learning approach helped them overcome this fear, at least partly, and made the learning more engaging for them.

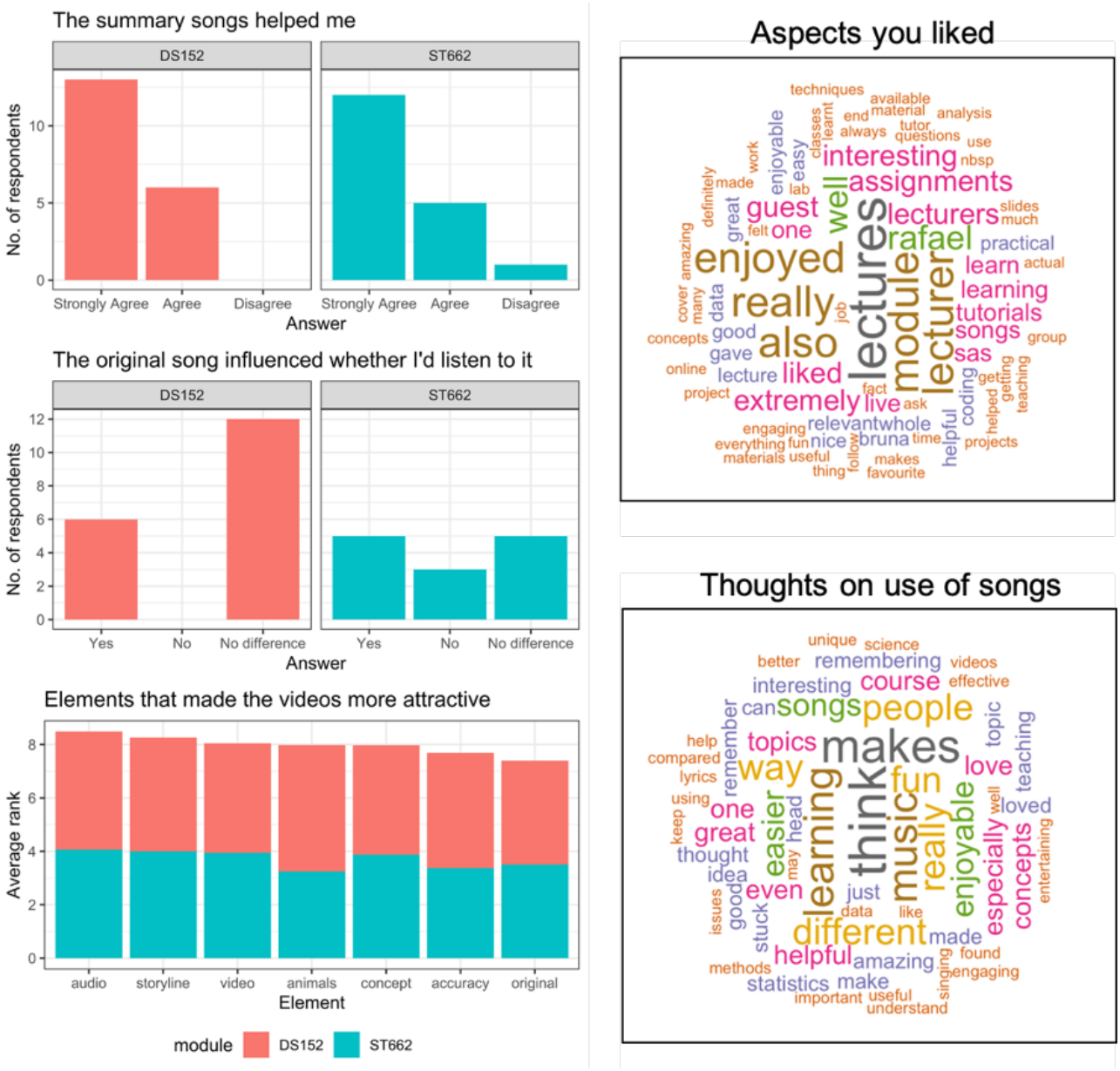

Figure 1: Summary of feedback from student questionnaires

Impact on current Teaching and learning

As well as the positive impact the approach has had on student learning and engagement indicated through the questionnaires there has also been overwhelmingly positive feedback from the academic community. My videos have been used by other lecturers in statistics in Maynooth University, and also lecturers from other Irish Higher Education Institutions.

I have also heard from lecturers in the United States and Brazil who have been using the recordings in their own modules and have received very positive feedback from them, including requests for different themes to be covered in future videos.

I have also delivered talks at different events to promote this approach to teaching and learning and performed some of the songs live (three live YouTube events including a seminar and performance of the songs, and one 50 minutes seminar on "Teaching Statistics Through Music", presented to the Postgraduate Programme in Statistics of the University of São Paulo, Brazil, on 25 March 2021). This has promoted these approaches to teaching and learning, and also Maynooth University. I have acknowledged funding from the SPARK Initiative at all of these events. All music videos are in this YouTube playlist: **https://www.youtube.com/watch?v=lm53uqt-ln0&list=PLZ0e2Vq6gAWLTI8X_rzFgF59uEXFfbSrM**

Future impact

The material is online forever, and therefore can be re-used anytime, anywhere. I believe that the prospects of studying through musical parodies can make students look forward to taking a module that includes songs. I intend to continue using the resources I have created in future lectures, and hopefully when face-to-face teaching resumes, I will be able to perform these songs live to the class. Student feedback indicates this could be a good approach to attract more students to attend, particularly for large classes where attendance tends to drop substantially throughout the semester.

Online recognition of the value of this work has led to an invitation by the Department of Health to take part in their Science Communication Collective initiative which expands the outcomes of this project beyond the scope of teaching statistics to general science communication.

I feel I have also personally gained in my own skills and professional development through my experience producing this type of content and I hope this is seen as evidence that it is possible to deliver coursework in an artistic, professional and technically sound way to enhance the retention of learning, engagement and a love of subject for our students.


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