DigitalEd.ie

Building Digital Teaching and Learning Capabilities in Higher Education

GMIT
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY

IT Sligo
An Institiúid Teicneolaíochta, Sligeach

lyit

DigitalEd.ie

Building Digital Teaching and Learning Capabilities in Higher Education

Please cite as:

Ginty, C., Plunkett, N., Cosgrove, A., Healy, J., Gilsenan, C., Flynn, C., Hayden, I., Ramsey, L., Brennan, P., Cunningham, I., Clohessy, T., Finnegan, M., Cloonan, L., Hannigan, C., Nelson, A., Carey, M., Murray, A., McCabe, E., Skehill, O., Daffy, S., Cunningham, K., Killoran, B., Hoeche, U., O'Leary, A., Kiely, E., English, M., Harren, M., Brady, S., Henry, P., Callaghan, J.J. and Duffy, J. (2021). Building Digital Teaching and Learning Capabilities in Higher Education. Connacht-Ulster Alliance (CUA), Galway-Mayo Institute of Technology (GMIT), IT Sligo, Letterkenny IT. ISBN: 978-1-3999-0964-8. GMIT, Galway.

Table of Contents

Introduction

We are delighted to welcome you to the first DigitalEd book of case studies, sharing a collection of digital teaching, learning and assessment stories, from across the Connacht Ulster Alliance (CUA), including GMIT, IT Sligo and LYIT. This book is being released as we come to the end of another challenging year in higher education, and it provides an opportunity for all of us to celebrate and value teaching and the student learning experience.

In this special publication, colleagues from across the CUA share insights and innovations on their teaching and learning practice over the last 18 months. Many will touch on their experiences of adapting to remote learning and teaching during COVID, and also reflect on lessons learnt and plans for the future.

There are 20 interesting and engaging case studies, that have been prepared by 30+ contributors from across the CUA. The cases will be presented across eight themes including:

Theme 1: Building Digital Teaching and Learning Capabilities

Theme 2: Universal Design for Learning (UDL)

Theme 3: Transforming Assessment

Theme 4: Student Engagement and Technology Enhanced Learning (TEL)

Theme 5: Supporting Students in an Online Learning Environment

Theme 6: Supporting Academics in an Online Teaching Environment

Theme 7: Embedding Employability

Theme 8: Students as Partners and Co-creators

The journey will begin with the story of building digital teaching and learning capabilities in GMIT and the wider CUA with DigitalEd.ie knowledge platform, under the iNOTE project. This will be followed by a case study on developing Universal Design for Learning in IT Sligo and plans to expand a UDL toolkit across the CUA.

Moving on to the theme of assessment, this will cover alternative assessment method experiences during COVID, the value of MS Lens and Socrative Pro for online assessments, a case on an applied visual immersive building regulation assessment, and the wide ranging benefits of ePortfolios as a transformative assessment and learning tool.

Exploring the theme of student engagement, we will learn about technology enhanced learning tools, that are having real impact in the digital classroom and how to foster transformational learning in higher education. One particular case study guides us in scaffolding learners in the online learning environment, and a further case study explores the value of engaging and assessing students through the use of the ABC Learning Design Framework. Interesting insights are shared by LYIT colleagues in the area of video imaging and the challenges of Virtual Learning Environment (VLE) standardisation.

Moving to the theme of student support, we learn about an innovative online course on the English language skills and how this is supporting international students across the CUA. In addition, a new Academic Writing Skills Badge, developed by the iNOTE team in IT Sligo is now beginning to gain traction across CUA programmes of study.

A stand out digital teaching and learning support initiative available to GMIT staff, is called the AMA Clinics (Ask Me Anything!) by the learning technology design team in the Teaching and Learning Office. Since May 2020, 400+ one to one clinics have been delivered. This case study will explore the challenges presented to the learning technology consultants and lessons learned to date.

On the theme of Employability, we will learn about the value of a new online Careers module and embedding employability in GMIT, and how this course will be shared across the CUA through the HigherEd 4.0 project and the new Technological University emerging.

Finally, under the theme of students as partners, two interesting cases will explore digital education initiatives in culinary education and a Power App for interactivity in Maths, supporting STEM online education.

On behalf of the DigitalEd and iNOTE project team, we would like to take this opportunity to express our sincere thanks to all the authors who have shared their teaching and learning experiences in this special DigitalEd book of cases. In addition, many thanks to the National Forum for the Enhancement of Teaching and Learning in Ireland, who have funded this publication, as part of the VIT&L celebration week 2021.

Enjoy all the learning and teaching stories!

Carina Ginty

Dr Carina Ginty
CUA DigitalEd.ie Project Lead + Head Teaching and Learning Office at GMIT

Theme 1:

Building Digital Teaching and Learning Capabilities

Building Digital Teaching and Learning Capabilities

Project Lead/Author	Dr Carina Ginty
Name of Dept. & Institute	GMIT Teaching and Learning Office
Keywords	*Digital Education, Digital Teaching & Learning, Online Teaching, COVID online learning, Student Engagement, Student Success*

Section A: Case Study Summary

Who we are?

Galway-Mayo Institute of Technology (GMIT) includes 5 campuses in the West of Ireland with 7,000+ students including 40 nationalities. At GMIT, we are committed to building digital teaching and learning capabilities. We provide our students with a transformative third level learning experience, empowering our graduates to fully contribute to the social, economic and cultural betterment of society. GMIT is a member of the Connacht-Ulster Alliance (CUA) with IT Sligo and LYIT, and is working towards achieving Technological University (TU) status.

What we did/how we did it?

The GMIT Strategic Plan 2019-2023 outlines thirteen goals that place the student at the centre of everything we do. Digitalisation and the use of technology are a key strategic priority for GMIT. In response to the global pandemic, GMIT invested considerable resources in developing rapid response digital intervention initiatives, to support the learning, teaching and assessment transition, for staff and students. This was made possible due to several initiatives, including the development of the DigitalEd.ie knowledge platform and the creation of the Blended and Online Learning Transformation (BOLT) initiative.

The range of initiatives established, that are building digital teaching and learning capabilities in GMIT include: *the development of a digital champion team representing each academic department; Ask Me Anything (AMA) clinics; digital teaching and learning small group workshops; a digital education webinar series; alternative assessment strategies workshops; show and tell insight sessions on digital technologies; recruitment of graduate student mentors; online PASS leadership sessions to support the first year experience; the digital education development pathway at DigitalEd.ie for academic staff; digital professional practice alternatives; and investment in a remote teaching technology toolkit, for all staff working remotely.*

Impact Achieved

The enormity of what was achieved in GMIT in 2020, in a short space of time, through dedication, collaboration, and innovation in moving teaching, learning and assessment online is presented in this case study. The scale of what was achieved and its alignment to digital transformation strategic objectives, has the potential for transfer of learnings to other higher education institutes in Ireland and internationally.

By May 2021 the impact on staff engagement and the development of digital capabilities was wide ranging and included:

- 300+ Ask Me Anything (AMA) Clinics delivered to academic staff covering digital learning and teaching skills.
- 200+ webinars/workshops delivered online on digital T&L development strategies.
- 7,000+ CUA member registrations across the webinar series.
- 100+ teaching and learning office video demonstration video resources produced and available on the TLO channel.
- 50+ Learning, Teaching and Assessment resources/special guides developed.
- 30 GMIT staff completed an accredited level 9, learning pathway in Technology Enhanced Learning or Digital Teaching and Learning, and 18 graduates became Digital Academic Champions, providing one to one and small group mentoring sessions in their academic departments.
- A further 15+ staff across the CUA signed up in June 2021, for the Digital Teaching and Learning (DTL), L9 (10 ECTS) module award.
- 9,000+ visits have been recorded to the DigitalEd.ie knowledge platform enabling self-directed learning and a range of digital education resources. The DigitalEd.ie platform was widely promoted on social media during the COVID-19 emergency, and as a result further higher education institutes have accessed the platform for support and guidance.
- 10 specialist student remote learning support resources and services have been established to help student's engagement with online learning.
- A one-stop shop (online portal) was set up for students called the 'GMIT Student Hub'. There have been 779,339 visits to the Hub since launching in September 2020. The more popular areas of the hub include *Study Skills, Exams/Online Assessment Guides and My IT*.
- 18 student graduates were recruited in August 2020, to provide mentoring and support to students from first year to final year, and create an online sense of belonging to GMIT.
- Top digital T&L topics where academic colleagues sought support and guidance from T&L rapid response clinics and workshops include: *Assessment Design and Set-up; Moodle; H5P; MS Lens; Breakout Rooms; MS Stream; OneNote; Learning Design Strategies; Class Management; Structuring and Online Lecture; Creating Video; TEL tools; Gradebook; online whiteboard; student engagement strategies.*

What did we learn?

Extraordinary goodwill was demonstrated by those who teach, learn, support and lead in GMIT, and much was learned for the future in our digital transformation development journey. A cycle of continuous improvement in digital education is ongoing in GMIT, through action research studies underway on the initiatives outlined in this case study, and from reflective evidence generated from a wide range of stakeholders. This is critical to our digital transformation journey, which is current today, but it will also be crucial in the post-COVID-19 context, in which the use of blended and online learning is only expected to increase in our new Technological University and across the higher education sector globally.

Section B: Full Case Study

1.   Context/Rationale

In March 2020, the physical closure of our five campuses in GMIT, forced everyone online in a hurry and transitioned our learning, teaching and assessment activities to a new platform. The COVID 19 emergency has fundamentally changed the way we all live and work, and this is having an enormous impact on the teaching and learning experience in GMIT. The transition has been challenging, but it has also presented a number of opportunities for developing digital capabilities among the teaching community and alternative strategies for student engagement.

Transitioning to online teaching and learning in GMIT was made possible due to a number of factors including: the advances in education technology globally in recent years, and the seamless integration of Microsoft Office 365 suite and Moodle; Connacht Ulster Alliance (CUA) engagement with a HEA funded digital education development project called iNOTE, and the development of https://DigitalEd.ie; the Teaching and Learning Office's digital teaching and learning online support resources and rapid response digital education workshops; a suite of flexible online learning development courses; the flexibility and dedication of the teaching community engaging with digital professional development; and the creation of the BOLT steering group for GMIT.

Reflecting on the response by higher education institutes to the challenges involved in the sudden relocation of teaching, learning and assessment away from the traditional campus environment, is presented in a variety of reports, and this has guided the transition and digital transformation journey in GMIT over the last 12 months. Key national reports include: the QQI (2020); the National Forum for the Enhancement of Teaching and Learning (2020); the USI (2020); GMIT's annual report to the HEA on the iNOTE project (2020); a special GMIT Student Opinion Campaign undertaken in partnership with the GMIT Student Union (2020); and an open discussion forum with academic and professional services staff in GMIT, to identify the challenges encountered with remote teaching.

Overall, the reports collectively refer to the enormity of what was achieved through dedication, collaboration and innovation in moving teaching, learning and assessment online. In September 2020, an analysis of the COVID higher education reports, reflecting on the learning, teaching and assessment experience, was prepared by GMIT Teaching and Learning Office and the findings were categorised under eleven themes including: *working and studying at home; teaching and learning; assessment; policies and procedures; college experience; digital skills and academic professional development; communications; health and wellbeing; fees and finance; resources, supports and access; return to campus.* The findings were considered by Academic Council and the Governing Body and have helped pave the way for the next phase of GMIT's digital transformation journey, including managing the COVID-19 remote learning experience.

2. Summary of Impact

This case study will outline the range of initiatives established in 2020, and the impact this is having on building digital teaching and learning capabilities in GMIT. Rapid response interventions included: *the development of a digital champion team representing each academic department; Ask Me Anything (AMA) clinics; digital teaching and learning small group workshops; a digital education webinar series; alternative assessment strategies workshops; show and tell insight sessions on digital technologies; recruitment of graduate student mentors; online PASS leadership sessions to support the first year experience; the digital education development pathway at DigitalEd.ie for academic staff; digital professional practice alternatives; and investment in a remote teaching technology toolkit, for all staff working remotely.* Both staff and students have benefited greatly from the digital teaching and learning support interventions established, and this is evident in staff engagement and their reflections on training and supports provided, and the student feedback gained on their remote learning experience.

3. Details of impact

In June 2019, the Teaching and Learning Office (TLO) team in GMIT commenced a digital capabilities audit across eight campus sites in the CUA institutes, and this was followed by an audit of digital education tools available through various online platforms. In parallel to this activity, GMIT established a partnership with the State University of New York (SUNY) (a network of 60+ campuses in the State of New York delivering online programmes), to learn about their online teaching and learning strategies and approaches in building a student support services model for remote and blended learners. Following the review of SUNY teaching and learning resources for the online teaching community, GMIT TLO began to work on the development of a Digital Education knowledge platform, a Digital Champions programme, an online self-directed course on 'how to teach online' and a level 9, Certificate in Digital Teaching and Learning, aimed at higher education staff.

By October 2019, the national INDEX survey launched, and this examined the digital experience of staff and students in GMIT and higher education institutes throughout Ireland. This audit and evaluation of digital capabilities in GMIT and CUA partner sites, provided a strong foundation for the design of the DigitalEd.ie knowledge platform. The TLO planned to launch the Digital Education platform in quarter 2, 2020. However, when COVID-19 broke out in Ireland in March 2020, this quickly accelerated the TLO plans, and the launch was brought forward by several weeks to support the crisis unfolding. In addition, a suite of specialist online clinics and LTA support services emerged to guide teaching teams and students' engagement with remote learning.

The Teaching and Learning Office in GMIT led out on the design and coordination of a range of rapid response initiatives to support staff and students. In parallel to this, online sessions were opened up to IT Sligo and LYIT as part of the DigitalEd.ie and iNOTE project. During the crisis of March-May 2020, collaborative discipline teams emerged, and a team of Digital Champions supported each other through various online panel sessions, sharing best practice in digital teaching and remote learning. To further support the digital transformation challenges emerging, GMIT Executive Board (EB) established the Blended and Online Learning Transformation (BOLT) initiative, to provide further COVID-19 rapid response supports, that would impact every functional area in the institute. The BOLT steering group was established in April 2020 to develop a plan for remote learning in the 20-21 academic year commencing in September 2020. The steering group included: A Chair, member of the EB; members of various academic departments; academic affairs administration; Teaching and Learning Office; IT Services; and the Student's Union. The rapid response initiatives implemented since March 2020, through BOLT and DigitalEd.ie, that have played an important role in transitioning to teaching, learning and assessment online, are outlined in Table 2 from items 1 to 17.

By December 2020, the impact on staff engagement and the development of digital capabilities was wide ranging and this is outlined in the case summary earlier (see Section A).

In addition, Figure 1 and Table 1 presents overall staff feedback on clinics/webinars provided and how they benefited from the engagement. The majority either agreed or strongly agreed that sessions positively enhanced their knowledge and skills and increased their confidence levels in their ability to teach online or use technology more effectively.

Figure 1: Benefits to attending the DigitalEd development sessions

Further comments are presented in Table 1. The commentary is categorised under the common teaching and learning themes that emerged from the feedback obtained.
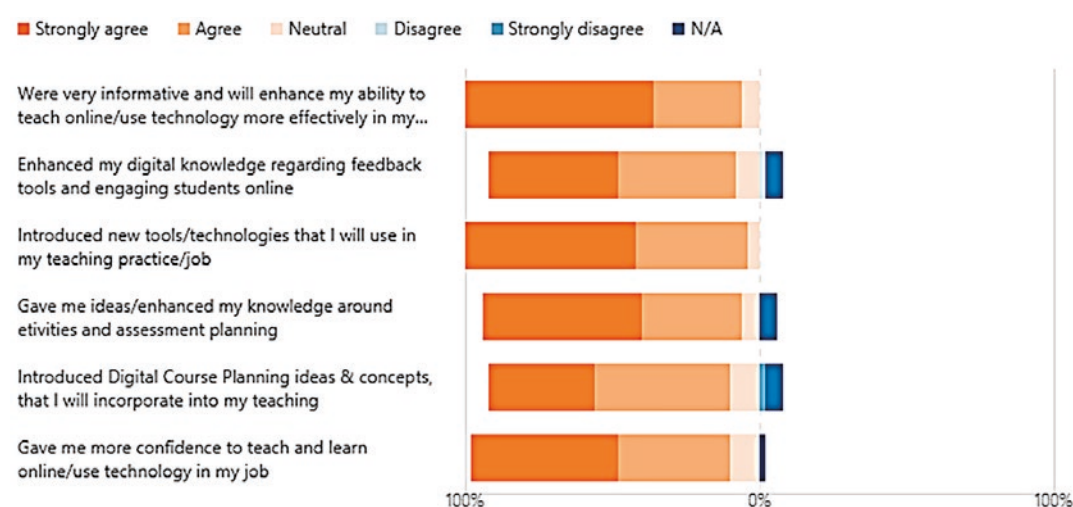
Table 1: Feedback commentary and related teaching and learning theme

Teaching and Learning Theme	Commentary
Student Engagement	"…great variety…atmosphere was very positive and supportive. Some had breakout groups which was great to meet colleagues and discuss…" "It was great to get an opportunity to meet other colleagues online and to share their resources and skills. A lot of ideas and tips were also added to the forum and links shared to extra resources was great too. Having the sessions recorded was a positive so the videos are there to go back over…"
Active Learning Techniques	"…very well presented and knew the content and how to apply it across disciplines. Also, the opportunity to practise the methods e.g., planning blended learning for modules and spend some time with the technology…Having advice on hand and shared experiences from staff was really useful in getting ideas of how you could apply the methods and technology"
Peer Learning	"…highly informative and everyone was very engaged and supportive. I like that nobody felt silly asking the simplest of questions and I hope GMIT continues to host these during 2020/2021 as they are needed" "Very good Teaching and Learning Q&A clinics and saved resources provided for follow-up…one-to-one advice would be most welcome heading into Sept 2020 in adapting what we've learned to our modules and individual practices."
Online Learning	"…remote access was very convenient and excellent. Content was engaging and input from colleagues highlighted the relevance and application of many elements of the technology to teaching. I felt empowered to engage with online learning technologies in the future"
CPD Level Communications	"…well-organised, informative and relevant webinars…there may be value in providing an indication of the level at which each webinar is 'pitched' e.g., level 1, beginner, etc. This might prevent those of us who are just about keeping our heads above water in the digital 'ocean', from that sinking feeling".
COVID impact on time and teaching practice	"even though the courses were fantastic, I found it a bit overwhelming with all the information coming at me from all sides every day. I really wanted to complete all the programs as they became available, but it was an impossible task with everything else that was taking place at the same time; student needs, school meeting; Team meeting etc…"
Supportive Online Learning Community	"Great to be able to partake of sessions via webinar and to have sessions recorded. Very easy to sign up for sessions, presenters were really good…. created a very good sense of community and goodwill. Even by taking a course that was deemed introductory or basic I learned so much. Leads me to believe there is nothing basic. We all learn something."
Value of CPD in Teaching and Learning	"…fantastic to have had the opportunity to uptake so many valuable training sessions. I learned something from each one and really appreciated all the guidance on where to find your level in all this. Also, the obvious sense of community support really felt good! I truly don't know how it was pulled together so quickly…"

Table 2: Rapid Response Initiatives implemented in GMIT in response to COVID-19 under BOLT and DigitalEd.ie

Response Initiative	Description	Who benefited?
1. Digital Teaching & Learning Knowledge Platform	A Digital Teaching and Learning education platform (see Figure 2), providing access to digital learning pathways, a discovery tool, digital stories, a digital resources directory, a digital champions network and a digital education forum. The platform can be accessed at https://DigitalEd.ie	Lecturers in GMIT, IT Sligo and LYIT *It is also accessible to the higher education sector under a Creative Commons Attribution-Non-Commercial-Share Alike 4.0 International Licence.* **5,000+ visitors recorded to date (as at Feb. 2021)**
2. AMA Clinics – Ask Me Anything Clinics	Online One-to-One Clinics with the TLO team of Learning Technologists to troubleshoot online teaching challenges with Moodle, Teams and more and to assist in redesigning of a module or assessment for online delivery.	All Lecturers in GMIT **150+ AMA clinics to date (as at Feb. 2021)**
3. Graduate Student Mentors	Student mentors to assist the students with online engagement and to follow up where there is lack of engagement.	All Students in each academic Dept. in GMIT **18 Graduate Mentors in place supported by BOLT**
4. Digital Academic Champions	A programme developed to allow digital champions, who have undertaken formal training in digital teaching and learning to mentor their colleagues in online delivery in each academic department.	All Lecturers in GMIT + 6 Champions established in IT Sligo and LYIT collaborating and sharing practice. **18 Digital Champions in place as a mentor in their academic department since May 2020.**
5. PASS Student Leadership Programme	Peer Assisted Study Sessions (PASS) are designed to help first year students cope better with all aspects of life at third level and focus on student integration, engagement, support, empowerment, and leadership to help students quickly adjust to third level life. As a response to COVID, PASS moved to online delivery to include an online PASS Leader Training Programme which included more than 60 student leaders trained to deliver weekly online PASS sessions. A PASS Academic Champion team, mentor PASS Leaders across the institute and first year students promoting engagement with first year PASS study sessions in an online learning environment.	First Year Students **60 student leaders leading weekly timetabled online PASS sessions on MS Teams across GMIT.**
6. Student Hub – Online Portal	From Sept. 2020, GMIT established a central student portal 'one stop online shop' where students can gain access to a variety of student supports and information on studying, online assessments, IT services, campus information, health and wellbeing, student life, finances, student rights and responsibilities, and planning for the future.	All Students in GMIT **Supported by the BOLT initiative serving all students.**

Response Initiative	Description	Who benefited?
7. GMIT Healthy Campus	A committee of staff and students established since 2019, to promote health and wellbeing throughout the Institute's mission, strategy, policies, plans and practices wherever possible. As a response to COVID, Healthy Campus launched a series of online services and activities that students and staff can avail of to include virtual staff and student choirs, online fitness classes, mental health training programme for staff, online Smart Consent training programme for students, and various online campaigns and promotions addressing healthy eating, physical health, mental health & wellbeing, and sexual health & identity.	All Students & Staff in GMIT
8. Student Success – Online Learning Support Guides	In response to COVID-19 a range of resources were developed by TLO to support students learning online, and include: A short animation explaining the **steps to success in online learning and student engagement in GMIT**. A short guide for students is also available at this link covering steps to success and some practical advice for GMIT students learning online during COVID-19 (published in March 2020).	All Students in GMIT

Response Initiative	Description	Who benefited?
9. GMIT's Digital Learning Charter	**GMIT's Digital Learning Charter** outlines our mutual responsibilities and provides a framework for managing our communication and behaviour in a digital world. It should be taken as a statement of our shared values rather than as a rule book. It illustrates the way in which members of GMIT staff and students should work collaboratively so that everyone can benefit. GMIT will aim to support all our learning community to engage in a safe and responsible manner when engaging in digital learning. GMIT Digital Charter is available at this link GMIT Digital Communication Principles animation video is available here. **GMIT Digital Communication Principles** 	All GMIT staff and Students **Supported by the BOLT Initiative.**
10. Academic Integrity, GMIT Student Guide	 Student Guide to Academic Integrity in GMIT is available at this public link and here on the Student Hub	All GMIT Students and Staff
11. GMIT Library Online	**The Library developed an online library support service for flexible online learners:** LiveChat implemented since April 2020 Help FAQs implemented since April available 24/7 Communication via generic library email: library@gmit.ie Regular online newsletters Note: The online services are staffed by all library staff across four campuses.	All GMIT Students and Staff
12. Remote Teaching Technology Toolkit	Each member of the academic and professional services community in GMIT was supported through the BOLT initiative with a technology toolkit to enable online teaching and remote working and student engagement.	All GMIT Staff **Supported by the BOLT Initiative.**

Response Initiative	Description	Who benefited?
13. Online Labs/ Practicals access via elabs Eiricom	GMIT have investigated and implemented a solution across all our campuses where our physical laboratories including 55 labs to date and incorporating 1140 PC's are **available for online and remote delivery of teaching and learning through the Eiricom Connect Software platform**. https://elabs.gmit.ie/EricomXml/index.html	All students partaking in lab based practicals – allowed students to access computer labs remotely. **Supported by the BOLT Initiative.**
14. Return to Campus Group	A Committee was established to manage the safe reopening of GMIT to include communicating updates with regard the planning for the next academic year to all staff and students, implementing the 3 Step Process prior to returning to campus, and other works (e.g., extra cleaning, installation of extra hand washing stations, completing risk assessment of each area, modifying some workspaces, signage). The aim is to have a safe working environment for staff and students and to keep GMIT COVID-free.	All GMIT Students and Staff **Supported by the BOLT Initiative.**
15. Online Proctoring Project	In 2019-2020 a pilot of online proctoring with PROCTOREXAM (EU company) took place in GMIT School of Business in collaboration with the TLO. The outputs from this pilot were presented in an experience report and case study and this led the way for the Exams Office in GMIT to establish rapid response solutions to high stakes online assessments/exams during COVID-19	GMIT School of Business in 2019/20 and wider impact rolled out in 2020/21 for GMIT high stakes assessments. **Supported by the DigitalEd.ie project and the BOLT Initiative.**
16. First Year Student Induction Course	Developed by TLO and Student Services, GMIT Students completing this course become familiar with GMIT expectations: **who we are; what we do; and how we can help you throughout your time in college**. This course can be accessed here.	First Year GMIT Students **Supported by the BOLT Initiative.**
17. IT Skills Course for GMIT Students	Developed by IT Services, GMIT students successfully completing this course have the **IT skills required to fully engage with distance education in GMIT over the academic year**. The IT Skills course can be accessed here.	All GMIT Students **Supported by the BOLT Initiative.**

Figure 2: DigitalEd.ie Knowledge Platform
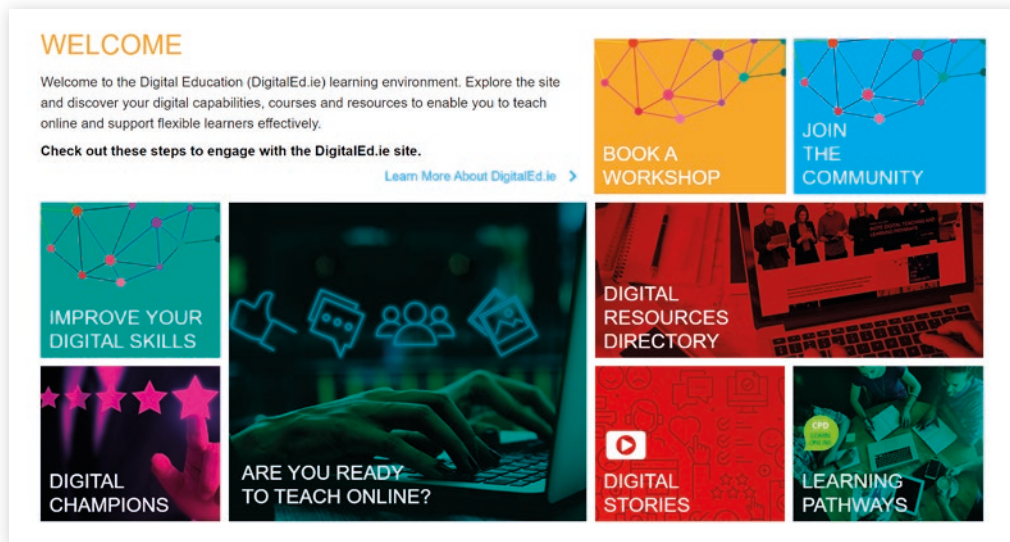
4. Further reading resources related to this case study

A selection of sources and resources created as a result of BOLT and DigitalEd.ie are available online and include:

- TLO News sharing outputs and impact from 2020 relating to rapid response interventions. Available at https://sway.office.com/TYfYaZkFVVSBV4ue?ref=Link
- DigitalEd.ie Knowledge Platform resources, articles, courses and guides developed by GMIT TLO can be accessed at https://DigitalEd.ie
- Online Assessment Guide https://digitaled.ie/library/online-assessment-support-guide/
- Online Teaching Development Pathways. Available at https://www.cpdlearnonline.ie/course/index.php?categoryid=3
- BOLT Teaching Remotely Toolkit available to GMIT staff on the GMIT Moodle virtual learning environment. GMIT staff and associates' access at https://learnonline.gmit.ie/

5. Key Learnings

Extraordinary goodwill was demonstrated by those who teach, learn, support and lead in GMIT, and much was learned for the future in our digital transformation development journey. A cycle of continuous improvement in digital education is ongoing in GMIT, through action research studies underway on the initiatives outlined in this case study, and from reflective evidence generated from a wide range of stakeholders. This is critical to our digital transformation journey, which is current today, but it will also be crucial in the post-COVID-19 context, in which the use of blended and online learning is only expected to increase in GMIT and across the higher education sector globally.

Key learnings from the journey to date include:

1. Undertaking the digital capabilities audit and evaluation in June 2019, proved invaluable to designing a platform for digital education to support higher education staff.
2. Creating a suite of Learning, Teaching and Assessment (LTA) resources for managing the online learning environment, provided much needed support to fill the gaps of knowledge with regards teaching and assessing online.
3. Conducting open clinics and discussion forums with colleagues and gaining feedback on where they needed the most help, informed the development of various guides.

4. Establishing the BOLT steering group, representing a wide range of disciplines and functional areas in GMIT, resulted in the rapid rollout of a range of supports for staff and students.

5. Creating a Digital Champions team co-ordinated by TLO, provided representation across every discipline and 'a mentor' to help navigate the challenges with moving online across 14 academic departments. The network is proving invaluable and has resulted in GMIT gaining a wider reach and increased engagement in building digital capabilities and developing alternative assessment approaches.

6. Feedback from colleagues through various studies in 2020 have provided evidence on the value of 'LTA Showcase Events and Forums', where lecturers show and tell what is working well and what is not working well. This peer learning, collaborative forum facilitated by TLO, has proved to be a supportive and collegial network and has helped build confidence among the academic community in teaching and assessing in the online learning environment.

7. Recruitment of a team of graduate student mentors has been a great success and each Head of Department (HoD), the teaching teams and the students have benefited from their involvement. Graduate student mentors have played a key role in creating a sense of belonging and retaining students in the online campus. They acted as 'trouble shooters' working with HoD's and student groups from first year to final year.

8. Providing for self-directed and directed accredited digital teaching development courses provided 'choice' and 'options' for colleagues and enabled lecturers to engage with learning over the summer months (see Figure 3 & 4).

9. Providing for a monthly TLO timetable of workshops and drop-in clinics (200+ workshops and 400+ AMA clinics to date) has been warmly received by the academic community, and this has led to the development of a 'TLO services module design model' that provides support from concept, right through to the build, design, and implementation stage (see Figure 5).

Figure 3: Self-Directed Digital Development Pathway

Figure 4: Accredited Digital Development Pathway

Figure 5: TLO Module/Programme Development Services
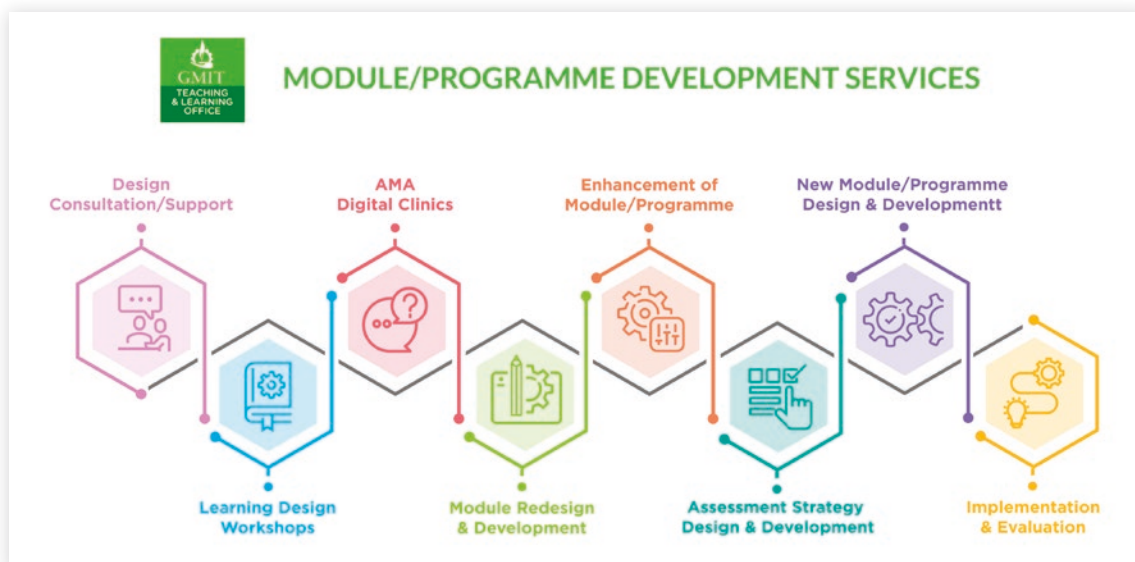
For further information on the case study, please contact Dr Carina Ginty (Head, Teaching and Learning Office, GMIT).

The findings presented in this case study, are also published in a special issue of the All-Ireland Society for Higher Education (AISHE) Journal, covering COVID-19 rapid response initiatives in higher education institutes in Ireland. Available at https://ojs.aishe.org/index.php/aishe-j/article/view/559

Figure 6: Graphic Illustration of the DigitalEd.ie Development Story (2019-2021)
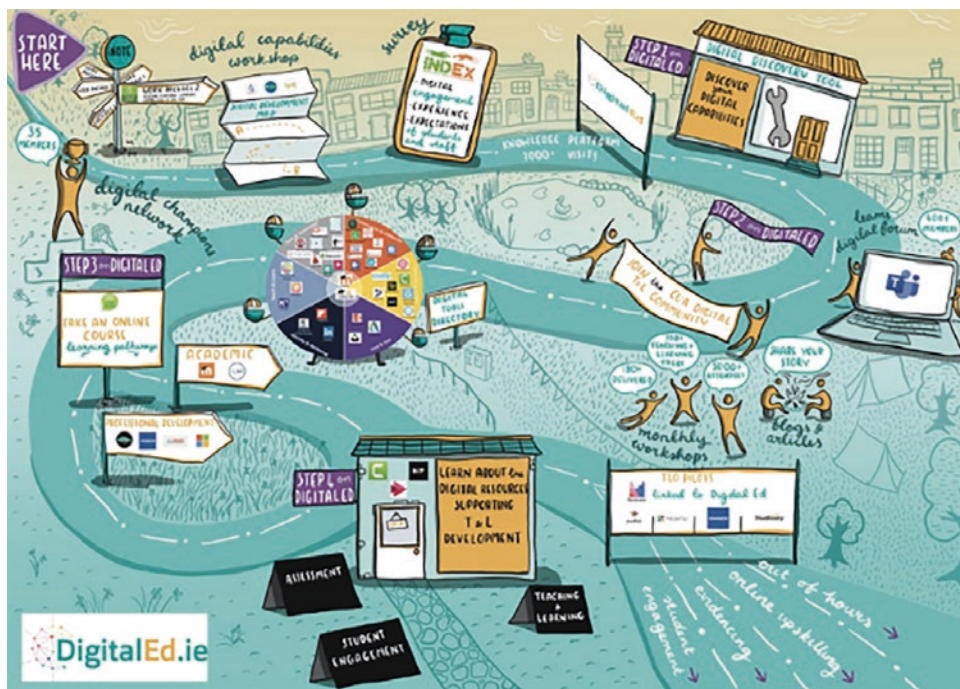
References

- Ginty, C. (2021), Building digital teaching and learning capabilities in response to the global pandemic with DigitalEd. ie. *The All Ireland Journal of Teaching and Learning in Higher Education (AISHE-J)*. Special COVID-19 higher education response edition. Available at https://ojs.aishe.org/index.php/aishe-j/article/view/559

- GMIT, (2020), Remote Learning at GMIT. OpinionX Study, June 2020.

- GMIT, (2020), iNOTE Project, HEA Collaborator Annual Report, August 2020.

- National Forum, (2020), Reflecting and Learning: The move to remote/online teaching and learning in Irish higher education. Available at https://shorturl.at/nyAX7

- QQI, (2020), The Impact of COVID-19 Modifications to Teaching, Learning and Assessment in Irish Further Education and Training and Higher Education. Available to access at https://shorturl.at/szBMQ

- USI, (2020), National Report on Students and COVID-19. Available at https://usi.ie/wp-content/uploads/2020/07/COVID_RESEARCH_FINAL.pdf

Submitted by: Dr Carina Ginty

Theme 2:
Universal Design for Learning (UDL)

An Institutional Approach on Universal Design for Learning

Project Team	Dr Niamh Plunkett; Maureen Haran; Dr Ellen McCabe; Dr Shelly Brady
Name of Dept. and School/ Faculty and Institute	UDL Working Group, Centre for Enhancement in Teaching & Learning (IT Sligo)
Keywords	*Inclusive, Universal Design for Learning (UDL), accessibility, collaborative, teaching and learning, module manager, module audits, digital inclusion, Connacht Ulster Alliance (CUA)*

Section A: Case Study Summary

1. What we did/how we did it + team involved

UDL - IT Sligo

Climbing the UDL Ladder: Building a Culture of Inclusion in Higher Education

The Institute of Technology Sligo (IT Sligo) sets out a series of objectives in its Strategic Plan 2017-2022 to ensure that the Institute continues to produce high quality graduates of value in the competitive employment market. Two of the Institute's Strategic Plan high level objectives being (i.) Our Students: Develop the ability to navigate their futures in a complex world. (ii.) Learning & Teaching: Support the continuous professional development of all staff.

The Centre for the Enhancement of Learning & Teaching (CELT) was established in 2018. Under the remit of CELT, a Universal Design for Learning (UDL) Working group was established in 2019 with academic and professional services staff from all three Faculties and functional areas across IT Sligo with a common goal to create an inclusive culture in teaching, learning and assessment. The working group members are: Dr. Niamh Plunkett (CELT), Maureen Haran (Lecturer – UDL Institute Lead), Mairead McCann (Lecturer), Cathy O'Kelly (Lecturer), Dr. Geraldine Dowling (Lecturer), Dr. Shelley Brady (Disability Officer), and Dr. Ellen McCabe (Instructional Designer). The UDL Working Group are from CELT, three Faculties; Instructional Designer; and Disability Officer.

Prior to the establishment of CELT there was limited evidence of UDL awareness among staff and CELT provided an opportunity to support the introduction and establishment of a UDL Teaching and Learning Framework. It was apparent from strategic plan actions that management and leadership understood the importance of embedding UDL across programmes, however, there was little involvement with staff from an operational perspective. Rather than mandating the inclusion of UDL across modules and programmes the approach taken differs from that to other HEIs in so far as UDL is considered from a bottom up as well as top-down perspective (i.e. while UDL was deemed important by Senior Management, getting staff involved at operational level through establishment of a UDL Working Group increased collaboration, increased motivation and hence faster innovation). This has proven to be a more holistic and systems approach that has resonance with staff and a relevance to improving the learning environment for students.

2. Outputs and impact achieved

Early adoption of UDL at IT Sligo has been managed by a top down/bottom-up leadership approach. Strong buy-in was achieved through seminars, workshops, UDL digital badge attainment, and active engagement with UDL related projects and research demonstrating the benefits of UDL for all learners, rather than focusing solely on disability. Ensuring the technique is explicit, demonstrating the positive impact for students resulted in rapid adoption by staff and curricula modifications – for both new programmes underpinned with UDL and existing programmes through programmatic review. Designing systems for ease of use and understanding for staff is paramount to early adoption.

Together the UDL Working Group plan and actively promote UDL across the Institute through a variety of communication tools: workshops, UDL digital badge attainment, and active engagement with UDL related projects and research.

In summary:

- 143 staff have attended workshops/seminars related to understanding UDL (2018-2020)
- 79 staff who have attained a National Forum Digital Badge (NFDB) in UDL or demonstrated evidence through curriculum changes (2019-2020)
- 31 lectures took part in a significant UDL project supported through the National Forum for the Enhancement of Teaching & Learning SALTE funding (2019-2021) The curriculum management software Module Manager has been adapted in order that the principles of UDL are automatically embedded during programme construction in the following 3 areas. (i) Learning Outcomes, (ii) Teaching & Learning Approaches, and (iii) Assessment Strategies. Blackboard Ally (an accessibility tool) has been integrated in Moodle (Virtual Learning Environment) to improve the overall student experience through availability of improved accessibility formats of content.

3. What did we learn?

Academic staff are receptive to making changes to their practice to improve the student experience. As with all change processes the Institute worked with those receptive to this change initially in order to assist with the change management process required to roll out the adoption of the principles of UDL across the institute. The next stage is to implement UDL across programmes within a full Teaching and Learning Framework. IT Sligo is working with their UD CUA partners GMIT and LyIT to start the process of planning for the embedding of the principles of UDL in the upcoming TU. Currently, IT Sligo is driving UDL across the Connacht Ulster Alliance (CUA) with the goal to adopt this wider social model, creating a more inclusive approach to teaching and learning across all three institutes.

Section B: Full Case Study

1. Context/Rationale

Inclusion of UDL as an action in the Institute Strategic Plan 2017-2022 demonstrates commitment to adopting a more inclusive curriculum design to suit the diverse needs of ALL learners.

A review of awareness of UDL among academic staff identified that (i) majority of staff did not understand UDL (ii) concept was viewed with scepticism (iii) it was considered to be only related to students with disabilities/accessibility issues (iv) there was lack of time to consider how lecturers might include UDL in curriculum design. The overarching challenge identified was the lack of personnel with expertise and lack of resources to support staff understanding and ensure effective implementation.

Driving this forward needed careful planning to generate buy-in, ensuring excellent guest speakers to engender a sense of possibilities and benefits. This transformational approach to change was in effect giving power to those at the coalface of teaching so that they developed a desire to ensure their teaching approaches were the most effective for all students regardless of age, ability, or disability. This approach highlights the importance of individuals in driving UDL – i.e. the importance of identifying UDL champions. Limited resources, which was perceived as a barrier, was addressed through supporting Institute champions to facilitate maximum positive impact.

One member of IT Sligo's UDL working group is completing a PhD in Education with a focus on inclusive educational practice in Ireland's HEIs, using UDL as an effective teaching and learning framework. This research has evolved into an in-depth review of inclusive educational practices across HE and FE sectors of education to explore their disconnect. The direction this research has taken will continue to inform the initiatives of the IT Sligo UDL Working Group.

IT Sligo has over 65% of students in receipt of the Susi Grant. Of the 3,305 fulltime students, 260 (8%) students are currently registered with learning support. In 2019, 89 students availed of AT services. In 2019 of the 653 1st year students who undertook the computerised assessment test (Quick Scan™), to determine any learning difficulties, 170 students (26%) were identified as requiring additional maths support; 257 (39%) academic writing support and 161 (24%) were referred to learning support. A full time Disability Officer post was created in October 2020 and 115 students are now registering with the service; in February 2021 there are 167 students registered – an increase of 45%. The main reason for this increase is (i) our student body is becoming more diverse, and (ii) this is the first time a dedicated disability service was provided by the Institute. During the pandemic, it is likely that many students have not registered with the service as they are living at and learning from home. Implementing a UDL framework for Teaching & Learning will reduce the need for, and time required to arrange, individual reasonable accommodations.

2. Details of Outputs and Impact

A UDL Working Group established 2019 included Head of T&L, graduates of the NFDB, Instructional Designer and Disability Officer. This group planned UDL roll-out and institute-wide implementation

- **UDL Workshops & Digital Badge:** Despite UDL actioned in the Institute Strategic Plan, little had been advanced in achieving staff understanding of UDL or implementation changes in modules/programmes. Initial workshops & organised expert and guest speakers have been attended by 143 staff. A staff member experienced in teaching and disability awareness acted as the UDL facilitator and lead delivery of the NFDB to Faculty staff; in 2018-2020, 79 staff attained a NFDB in UDL or demonstrated significant change in their module to align with UDL principles
- In 2019 a staff member was one of three educators nationally, shortlisted for the John Kelly Award for UDL. https://www.ahead.ie/journal/What-happens-when-you-support-staff-to-reflect-on-their-practice-AHEADs-Digital-Badge-in-UDL-and-the-John-Kelly-Award
- 31 lectures took part in the National Forum funded SALTE project in 2019-2021 (An Effective Institutional Approach to Teaching, Learning & Assessment through a UDL Lens).

Anonymous feedback from SALTE Project participants:

- *"The process was very helpful. I feel all lecturers should avail of this and change all their modules over to a UDL principle. It benefits not only the students but the lecturers too"*
- *"The process provided the opportunities for a reflexive discussion around teaching formats and highlighted current research within the institute which was most welcome."*
- *"I found the UDL audit very useful. It was very beneficial to get another person to view your module independently through the UDL lens and get such detailed and valuable feedback."*
- *"I found the process very effective and supportive. The feedback was very worthwhile, and the goal was always to enhance the experience for the students."*

Feedback from students to the 31 lecturers who redesigned their modules (to be UDL compliant) was extremely positive in enhancing their learning experience.

Main developments arising from the UDL Initiative

- It was apparent early on that to effectively implement UDL, staff need continued support and 1:1 facilitation to incorporate UDL principles into modules; this was provided through the SALTE funding.

- The UCD Toolkit and CAST audit were adapted and modified to develop an IT Sligo specific UDL toolkit. Trust in the system is important and the UDL facilitators gained this with staff agreeing to their curriculum modifications being audited against UDL compliance.

- As lecturers need the support of their line manager, 1:1 training was provided to all HoDs, which also demonstrated that management valued UDL principles.

- The UDL working group wanted to integrate inclusive supports to the Institute's syllabus management software Module Manager (MM) and held a focus group on this of academic staff across all three faculties (March 2020). Following feedback, the working group added features to improve the user experience to incorporate UDL into the design stage of programmes/modules. The areas concentrated on were (i) Learning Outcomes and Taxonomy, (ii) Teaching and Learning Strategies, and (iii) Assessment. A notable benefit of this system is that it is flexible as best practice changes so can the resources and guidance provided to staff on this platform.

- Blackboard Ally was integrated into Moodle in October 2020. Ally is a tool to make digital content in Moodle more accessible for lecturers and students. It assesses the accessibility of content and provides a report with guidance for lecturers to improve course accessibility. Ally is now used to convert course materials into alternative formats, allowing students to choose which format is most appropriate for them to access. To date students have downloaded 11,000 accessibility formats, mainly tagged pdfs and html versions of content. Lecturers on 42 programmes have launched Ally 900 times resulting in 169 fixes to increase accessibility.

- Digital inclusion is a method of addressing issues related to digital literacy and access to ICT and making the benefits of digital technologies available to staff and students. One of the institute's Instructional Designers collated all UDL resources developed since 2018, including the UDL Resources Moodle Page, UDL Roadmap and Infographic and located these supports centrally within the UDL Moodle page which are easily accessible by staff.

- Working with the AHEAD and UCD Access & Lifelong Learning teams who developed a 'Digital Badge for UDL' course, IT Sligo's 5 UDL Badge Facilitators collectively facilitated 147 participants within IT Sligo, LyIT (A CUA partner) and other institutes, including FE & ETBs from around the country i.e. IT Sligo facilitated 22% of the National Roll-out of this course. This digital badge provided participants with a strong introduction to the UDL Framework and provided the opportunity to implement UDL approaches within the teaching activities they are currently undertaking. It was successfully completed by 536 participants in FET and HE nationally.

- Delivery of a UDL webinar to the Post Primary Sector has led to external collaboration between the two sectors of education to close the gap in a continuum of best inclusive practice.

- The Faculty of Business and Social Sciences are currently preparing for a Programmatic Review (PR). To promote the incorporation of UDL into programmes, a specific "**PR & UDL tile**" was created on the UDL Moodle page. The resources include:

    - **The content component of the UDL Digital Badge** including a progress bar that identifies staff who engage and to the extent. This information is aligned with CORE HR to evidence completion of the first part (1/3rd) of the UDL Digital Badge.

    - **Principles of UDL in Module Manager** including tutorial to support use of the new features in MM.

    - **Link to CELT Moodle Page** with tutorials on Learning Outcomes and mapping MLOs to PLOs.

    - *Brief details of any research that has provided key insights or findings that has informed the development of the initiative and who undertook this research.*

Maureen Haran, Lecturer in the Department of Social Science at IT Sligo and PhD Candidate at Queens University Belfast has been progressing research in the area of inclusion and UDL as a viable teaching and learning platform in Ireland's third level education sector. This research is on-going but key insights that derived from a pilot that was conducted within the Department of Business in IT Sligo and much of the field research informed the UDL/inclusive module audits, which is a key deliverable in this funded case study.

3. Key Learnings

- A top down, bottom-up approach is most effective in applying UDL principles in curricula.
- Staff development should be flexible and inclusive in applying the contextual needs and drivers for UDL.
- Use case studies to evidence student success through the UDL principles.
- Research allows the development of new models of collaborative provision, enhanced engagement between academics, students, and professional educators.
- Working across all levels of education is important to close the gap in a continuum of best inclusive practice.
- Audits of changes made to modules highlights the benefits of fostering inclusive teaching and learning.
- Accessible platforms improve the design experience which consequently improves the students' experience.
- Blackboard Ally allows students to access materials and content in multiple platforms and informs lecturers on content accessibility.
- Sharing of learnings: IT Sligo will:
  - Publish a UDL Best Practice Toolkit for Implementing UDL in Higher Education.
  - Facilitate National bespoke workshops (face to face or online) in the following areas: Inclusive Audits, Digital Inclusion, and Inclusive Curriculum, reflecting the contextual needs and drivers within and across other institutes.
  - Continued involvement with Digital Badge National Roll-out

The Future

- Facilitation of focus groups will identify common themes capturing the student voice and will address the commitment to the student as the centre of learning and embrace a UDL cycle of reflective practice.
- Building on the success of our inaugural CUA-UDL Conference, IT Sligo is hosting the next National CUA-UDL Conference which is scheduled for May 2022. This conference will provide an opportunity for students to speak to how UDL is impacting their third level learning experience as well give academics the platform to showcase all UDL developments across the CUA and HEIs nationally and provide a platform to promote best practice in UDL.

References

Refer to: IT Sligo UDL Webpage: https://www.itsligo.ie/administration/registrar/udl/

The IT Sligo UDL Working group has participated in the following conferences:

- **Ahead UDL 2020** – (Croke Park) Paper title: "Creating a Culture of Inclusion in IT Sligo.": https://www.youtube.com/watch?v=_w2r9LtWlfI
- **Sligo Education Centre 2020** – Title: "Is Your Classroom Universally Designed for Learning?": https://ecsligocourses.com/index.php?option=com_eventbooking&view=event&id=1339
- **Ahead Conference 2021**: "An Effective Institutional Approach to Teaching, Learning & Assessment through a Universal Design for Learning Lens.": Presented at: Ahead 2021 https://app.box.com/s/91mh5lx16y6s3iy9zs86zcbcasixyvza
- **UDL-IRN International Conference 2021**
- **IT Sligo Staff UDL Symposium**: https://itsligo.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=88cfc529-dd25-4262-bc0e-acda009ba4d0
- **CUA-UDL IT Sligo Lead Conference**: https://bit.ly/3wORwPX

Submitted by: Maureen Haran and Dr Niamh Plunkett

Theme 3: Transforming Assessment

Alternative Assessment Practice in Higher Education

Author	Annette Cosgrove
Name of Dept./Institute	Department of Computer Science & Applied Physics/Teaching & Learning Office, GMIT
Keywords	*Alternative assessments, Office Lens, MCQ, e-portfolio, MSTeams*

Section A: Case Study Summary

1. What I did/how I did it + team involved

This article is a sharing of practice of alternative assessments that I used across three different modules that were delivered during the COVID-19 pandemic

2. Outputs and impact achieved

The purpose of this article is to share my assessment practice experience to allow reflection of practice and possibly prompt reconsideration of our traditional assessment methods going forward in a F2F/blended learning environment.

3. What did I learn?

As a lecturer in the Department of Computing at GMIT, I have used various assessment methods/practices over the years for blended modules and for the traditional face to face classroom model. Following the recent Covid 19 pandemic, and the sudden transition to online delivery, all higher education lecturers were required to rethink their teaching practice and alongside this, their assessment methods. Some assessments required no change, e.g., essay submissions, project work, however the greatest challenge for lecturers was (and currently still is) the traditional exam and the in-class assessment e.g., lab exam. As we all know – authentic online assessment is an essential part of an effective online learning experience. **How to assess learning outcomes effectively with integrity during the current pandemic and going forward in the digital teaching space is one of the most topical challenges currently facing all higher education lecturers.**

This article illustrates that alternative assessments can be suitable for both formative and summative assessment. This is further supported by the fact that many recent studies demonstrate the opportunity of Covid-19 as a catalyst for blended learning becoming the norm (Uigin & O'Cofaigh, 2021) and also towards supporting sustainable change (Farrell & Robert 2021). Alternative assessment options deployed successfully during the pandemic in various subjects have been documented, examples from geography (Usher & Dolan, 2021), Mathematics (Fitzmaurice & Ni Fhlionn, 2021) demonstrate the value of thinking more deeply about our own methods of assessing students. A very recent study reflecting on the online Learning Experiences of Irish University Students during the COVID-19 Pandemic. Yang (UCD, 2021) also includes students positive experiences of alternative assessment practice.

Section B: Full Case Study

1.   Context/Rationale

During the recent Covid-19 pandemic, the main objective of higher education practitioners was to enable their students to achieve the learning outcomes and continue their education during the global pandemic. The pandemic was an opportunity to pave the introduction of digital teaching/technology enhanced learning (TEL), and to introduce new assessment strategies and alternative assessment opportunities. The purpose of this article is to share assessment practice experiences, to allow reflection of practice and possibly prompt reconsideration of our traditional assessment methods going forward in a face-to-face/blended learning environment.

2. Details of alternative assessment practice methods

Examination redesign is a solution to several challenges associated with the shift to remote online assessment. It encompasses many different types of adaptations that can be combined to create appropriate examination models for the specific context of institutions, faculties, students or courses (OECD, 2020). The OECD Report highlights the most frequently encountered solutions in the literature and cites recommendations issued by higher education institutions to help faculty members cope with the implications of the COVID-19 crisis. There are numerous modes of assessment that can be considered by institutions and faculty members to replace final examinations. Common examples of asynchronous project assignments used in online courses include: Written assignments such as argumentative essays, synthesis papers, critical analysis, blog posts and student diaries. Online interactions between students through discussions on blogs, wikis or forums. Research projects for which students need to carry out fieldwork, collect data or conduct interviews (OECD, 2020).

This case study will share some examples of alternative assessment methods used successfully in an online teaching model at GMIT.

1. **Final end of term exam** – this method of assessment can still work very well if the questions are reconsidered for the new method of deployment – a handwritten answer – uploaded using **Microsoft office lens app** to scan exam paper and the lecturer corrects like a normal exam. Concerns for integrity of this method can be reduced by ensuring questions require applying a case example/unique problems (that can't be copied easily), a 3-hour window for exam (40 mins minimum should be allowed for upload to Moodle), and an option for the student to email the answers to the Lecturer in the event of a technical issue.

2. Replacement of the traditional exam (for example worth 50% – can be replaced with 2 Robust **MCQ** exams worth 25% each).

   A few tips:
   a. Create a bank of questions in Moodle, so questions in the MCQ can be randomized.
   b. Use Different Question types – Drag and Drop definitions/Images/Text based question – all offer an enhanced opportunity for more accurate assessment of the subject matter.
   c. Use a suitably timed MCQ (not too short and not too long) to ensure a successful outcome.
   d. Deferred Feedback option – often allows for flexibility and accuracy to ensure answers and scores are corrected accurately.
   e. Use Safe Exam Browser (Option in MOODLE Quiz setup), ensuring students can't switch between screens during session.
   f. Using different type questions (essay type) may require more effort in the correction process (manually correct some questions) however, this ensures integrity of the exam and allows good students to excel and demonstrate their knowledge

The above pointers are especially important in an online environment, where MCQ type assessment allows the student to demonstrate competence in the subject area:

3. Project Work and presentations – **Virtual live presentations via Microsoft Teams**, where students demonstrate their websites and project work to their Lecturer and there is also an opportunity for peer review. This worked very well in May 2020 for a final year project demonstration on a computing programme, where the student groups showcased their projects via Teams and received feedback from their class via Microsoft Forms feedback sheet.

4. **Screencasting** is a useful tool to allow students to create a recording of their project work and submit it as a submission via Moodle. This proved a very useful feature for the computing students who submitted a Screencast of Unity Game they had created and demonstrated gameplay. The Screencast was submitted, along with a project report via Moodle submission space.

5. Student presentations of the outcomes of asynchronous assignments. This can be done synchronously in front of the class or asynchronously through podcasts, video recordings, or any other type of multimedia product.

6. **Flip grid** is a useful video app for video submissions e.g., may be useful for the hospitality discipline, where students may upload videos of bakery outputs created at home.

7. **Podcasts**, is another opportunity for students to submit an assessment via Moodle. An example would be a language module where students would read an excerpt aloud and assessment can be based on pronunciation.

8. Traditional asynchronous assessment tools e.g., **Forums** continue to be very useful in an online teaching environment, often for a small percentage assessment, these can be suitable for summarising a case study and evaluating a piece of software.

9. **Microsoft Class Notebook** – a great alternative to in class worksheets where students may acquire 20% for weekly worksheet submission.

10. **E-Portfolio** submission – a popular tool in the compting design programmes is Weebly ePortfolio software, utlised with the first-year students as part of their assessment methodology. This is an excellent tool to give students an opportunity to gather evidence of learning in one space. PebblePad is another example being piloted in GMIT.

11. Use of **Digital Badges/MOOCs** – online delivery provides an opportunity to expand the course offering outside the virtual learning environment. Microsoft digital badges is a regular feature and learning experience on the digital media courses and a short 'Coursera' course is in another recommended.

In an online teaching environment, it is imperative that we, as educators embrace more creative practice for assessing students. The above, are but a few examples of varying methods of assessing students learning outcomes effectively in an online environment. This is an area that will continue to evolve rapidly in the upcoming few years where we will see pivotal changes in digital learning and assessment.

References

- Ní Uigín, D. & Ó Cofaigh, É. (2021). Blending learning – from niche to norm. Irish Educational Studies. 40. 1-7. 10.1080/03323315.2021.1933566.

- Usher, J. & Dolan, A. M. (2021) Covid-19: teaching primary geography in an authentic context related to the lived experiences of learners, Irish Educational Studies, 40:2, 177-185, DOI: 10.1080/03323315.2021.1916555

- OECD (2020), "Remote online exams in higher education during the COVID-19 crisis", OECD Education Policy Perspectives, No. 6, OECD Publishing, Paris, https://doi.org/10.1787/f53e2177-en.

- Ní Fhloinn, E. & Fitzmaurice, O. (2021) *Challenges and opportunities: experiences of mathematics lecturers engaged in emergency remote teaching during the COVID-19 pandemic.* Mathematics, 9 (18). ISSN 2227-7390

- Kilcoyne, A. (2021) Living and learning with Covid-19: re-imagining the digital strategy for schools in Ireland, Irish Educational Studies, 40:2, 247-253, DOI: 10.1080/03323315.2021.1915839

- Tony Hall, Delma Byrne, Audrey Bryan, Karl Kitching, Déirdre Ní Chróinín, Catriona O'Toole & Joan Addley (2021) COVID-19 and education: positioning the pandemic; facing the future, Irish Educational Studies, 40:2, 147-149, DOI: 10.1080/03323315.2021.1915636

- Yang, L.H., UCD (2021) Online Learning Experiences of Irish University Students during the COVID-19 Pandemic. Vol. 13 No. 1 (2021): The Impact of COVID-19 on Irish Higher Education: Special Issue Part 2.

Submitted by: Annette Cosgrove

Using Microsoft Lens as an Assessment Tool

Author	Dr. John Healy
Name of Dept. and School/ Faculty and Institute	Department of Computer Science & Applied Physics, School of Science & Computing, GMIT
Keywords	Assessment, Microsoft Lens, Remote Written Exams

Section A: Case Study Summary

1. What I did/how I did it + team involved

Used MS Lens in conjunction with MS OneDrive to enable a remote written examination.

2. Outputs and impact achieved

The process was used as a replacement for a terminal final-year written exam in Artificial Intelligence for 4th year software development students. It was utilised for two assessments involving 58 students, worked (almost) perfectly, and enabled similar types of questions used in a written examination to be applied in a remote context.

3. What I learned

The exploitation of an ubiquitous technology, like a mobile phone camera, together with an integrated (single sign-in) learning platform and data repository, can enable more traditional modes of assessment to be delivered over on-line learning platforms.

Section B: Full Case Study

1. Context/Rationale

The advent of the Covid-19 pandemic has had a major disruptive impact on the viability of traditional modes of assessment in higher-level education. In a 2020 analysis of the impact of Covid-19 on 424 higher education institutions (HEIs) in 109 countries, Marinoni *et al* (2020), reported that remote learning had replaced physical attendance at more than 66% of HEIs and that circa 50% of HEIs had either postponed or cancelled written examinations. They did note however, that the forced move to distance teaching offers important opportunities for more flexible models of learning. This view is corroborated by Dennis (2020), who argues that the forced change away from traditional modes of learning should prompt the leadership of HEIs to retire outdated business models, develop imaginative and innovative learning modes, and replace competition between HEIs with collaboration.

A detailed study by the OECD (2020) of remote online exams in HEIs during the Covid-19 crisis, identified potential student academic dishonesty, the assessment and certification of practical knowledge/skills, ensuring fairness and the risk of technical failure, as the key challenges to overcome when supplanting written examinations with alternatives. The report cites viable candidate strategies for online examinations as cancellation and postponement, online proctoring, redesigning examinations (oral examinations, flexible modes of examination, varying sets of exam questions), reduced time limits and open book written examinations.

Notwithstanding these alternative examination strategies, a traditional written examinations remain important for subjects requiring a complex technical or mathematical articulation of answers. This case study describes how the use of a ubiquitous mobile phone technology and a mature remote learning platform can circumvent the pandemic-induced preclusion of traditional written examinations with a comparable remote examination that both retains academic quality assurance and significantly reduces the risk of technical failure. The process involved the use of MS Lens, MS OneDrive, MS 365 Authentication and Moodle to deliver the equivalent of a 5 credit written examination in Artificial Intelligence, a discipline of computer science that does require the complex articulation of answers in both text and graphical form.

2. Details of Output and Impact

The traditional 2-hour written examination in Artificial Intelligence, that typically requires a student answer 4 out of 5 questions was replaced with two 1-hour online summative assessments comprising multi-part questions on heuristic search and adversarial search respectively. Other elements of the module, such as fuzzy logic and artificial neural networks, were assessed using a Moodle Quiz from a large bank of calculated and drag-and-drop questions. The overall process is depicted in Figure. 1.

Figure 1: MS Lens Assessment Process

The process commences with the creation of a bank of questions for a Moodle Quiz. The use of "Essay Format" allows analogs of written exam questions to be created and the enabling of an "optional text input" response option provides redundancy in the case of a technical failure with other elements of the process. Once the Moodle Quiz has been set up and scheduled, the "Request File" feature of MS OneDrive is used to communicate the details of the Moodle exam and the file upload instructions to the cohort of students. The "Send File Request" option on MS OneDrive enables a student file (or files) to be securely uploaded to a private central data store. Students can see and modify their own submission, but not that of others. The students take the Moodle quiz by reading the question generated from the question bank and then **writing out their answer using pen and paper**. The final step in the process happens after the examination time has elapsed. Students use the MS Lens app on their mobile device to capture their written answer as a PDF document and upload it to the specified "Request File" directory on MS OneDrive.

The MS Lens application is free to download/use and is available for both Android and IOS platforms. MS Lens and MS OneDrive are fully integrated, enabling the "Request File" directory to be directly accessible from the "Save As" option on MS Lens. It is noteworthy that all the different elements of this process are fully integrated from an authentication perspective, allowing the Office 365 single login to glue the different components together.

The two assessments were conducted on two different days with 58 students or 116 student responses. Throughout the examination, a MS Teams session was available to trouble-shoot any technical issues that may arise. Multiple pages of answers can be uploaded separately (all prefixed automatically with the student name by MS OneDrive) or zipped. Out of 116 students uploads, only one student experienced a problem and they were able to successfully submit their exam script by uploading the MS Lens PDF documents directly to Moodle.

3. Key Learnings

This section can focus on identifying key learnings from the project on how these have been disseminated and embedded. Moving to an online mode of learning means that traditional forms of assessment need to be re-imagined rather than scrapped. The MS Lens assessments demonstrated that a written examination that requires students demonstrate an advanced knowledge of a technically challenging area through the complex articulation of a textual or graphical answer is possible in an online learning environment. A key element to the success of such assessment strategies is the elimination of technical and/or administrative issues through fully integrated authentication and inter-communication between the different systems involved in the collaboration. The inclusion of a Moodle Quiz in the process presented the student cohort with an examination format that they were already very familiar with and, combined with the utilisation of a cross-platform freely available and fully integrated application for a ubiquitous mobile device, eliminated most potential technical issues.

References

- Marinoni, G., Van't Land, H. and Jensen, T., (2020). The impact of Covid-19 on higher education around the world. IAU Global Survey Report.

- Dennis, Marguerite J., (2020). The impact of COVID-19 on the world economy and higher education. Enrollment Management Report 24, no. 9 (2020): 3-3.

- Organisation for Economic Co-operation and Development, (2020). Remote Online Exams in Higher Education During the COVID-19 Crisis. Paris: OECD Publishing.

Submitted by: Dr John Healy

An exploration of the barriers and benefits of implementing ePortfolio based learning in third year BA (Hons.) Culinary and Gastronomic Science curriculum

Project Team/Authors	Dr Clare Gilsenan[1] Dr Marie English[2] Dr Carina Ginty[3]
Name of Dept. and School/Faculty and Institute	[1] Galway International Hotel School, Galway-Mayo Institute of Technology. [2] School of Business, Galway-Mayo Institute of Technology. [3] Head of Teaching and Learning, Galway-Mayo Institute of Technology.
Keywords	*eportfolio, reflective practice, culinary education*

Section A: Case Study Summary

Background to the case study

The BA (Hons.) Culinary and Gastronomic Science is a four-year degree program combining the scientific principles with the theoretical and practical aspects of food (GMIT, 2021). The first two years of this program centres on Culinary Arts, fundamentals of Food Science and Technology, Nutrition and Gastronomy. The focus of the latter two years is on the acquisition of more advanced Food Science, Sensory Science, Entrepreneurship and Food Product Development. Graduates of this program seek employment in a wide variety of diverse roles in the food sector. Finding employment in a very competitive job market is challenging, and one which requires learners to possess more than discipline specific knowledge. Holtzman, Kraft and Small (2021) recommend that higher education providers embed eportfolio based learning into their curricula, so that graduates can gain competitive advantage over other applicants in the jobs market. It was on that basis the lecturer redesigned the assessment strategy for Introduction to Sensory and Consumer Science to include eportfolio based learning. The purposeful incorporation of digital technology into this module ensured learners developed a level of specialist digital skills, that are so vital for learning and work in an increasingly digitised world. The eportfolio provided the learners with a digital tool which enabled them to collect, curate and communicate their knowledge and skills gleaned in GMIT. The learners also showcased personal achievements and reflections in their eportfolio.

It was necessary for the lecturer to devise a series of online introductory lectures, which were delivered at the beginning of the semester. This helped learners with the development of their eportfolio. The purpose of the eportfolio was communicated with the learners, in order to encourage buy in. A lecture on digital ethics was given, and following on from that, a practical eportfolio workshop was executed. The learners used the portfolio platform Pebblepad to create their eportfolio. Every effort was made by the lecturer to ensure that the eportfolio could be successfully adopted. Exemplars were created and shared, Donaldson's (2018) "Holy Grail of Rubrics" was adopted, and support was provided.

Following completion of the module, learners were invited to give feedback on their experience of developing the eportfolio. Several benefits and barriers for undertaking an e-portfolio were identified by the lecturer and learners.

1. What I did/how I did it + team involved

The lecturer redesigned the assessment strategy for Introduction to Sensory and Consumer Science to include eportfolio based learning. Initially, an evaluation of the online module design was performed using the OSCQR rubrics (OSCQR, n.d.). Following on from the evaluation, the ABC Learning Design Process (Young and Perović, 2014) was utilised to inform the process of redesigning the assessment strategy.

2. Outputs and impact achieved

A series of online introductory lectures were delivered at the beginning of the semester which helped students with the development of their eportfolio. A lecture on digital ethics was given, and a practical eportfolio development training workshop was conducted. The learners used the portfolio platform Pebblepad to create their eportfolio. Exemplars were created and shared, Donaldson's (2018) "Holy Grail of Rubrics" was adopted, and support was provided.

Following completion of the module, learners were invited to give feedback on their experience of developing the eportfolio. Several benefits and barriers for undertaking an eportfolio were identified by the lecturer and learners.

3. What did we learn?

On reflection, this research highlighted many benefits and barriers for incorporating eportfolio based learning into the third year BA (Hons.) Culinary and Gastronomic Science curriculum. Much time and effort goes into the development of an eportfolio by learners. Equally, there is a need to build in time for the lecturer to fully develop their learning strategy and resources, in order to reap the benefits.

This would indicate that it is imperative that the purpose of the eportfolio is clearly defined, requirements are communicated, training is delivered, rubrics are created, exemplars are shared, and support is provided, in order for it to be successfully adopted. Failure to adequately prepare for its implementation may lead to unexpected consequences such as abandonment.

Section B

1. Context/Rationale

An eportfolio has been defined as "an organised collection of complex, performance-based evidence that indicates one's growth, goals, current knowledge and the skills needed to competent in a role or area of expertise" (Campbell, Cignetti, Melenyzer, Nettles and Wyman, 2011, p151). In the current jobs market, with an influx of applicants for each available position, graduates are seeking to differentiate themselves from others. Holtzman, Kraft and Small (2021) recommend that higher education providers integrate eportfolios in their curricula, so that graduates can gain competitive advantage over other applicants in the jobs market. Research has shown that the construction of eportfolios allows students to learn about the value of technology as a pedagogical tool through engaging activities that support their own learning (De Jager, 2019; Picardo and Sabourin, 2018; Pitts and Lehner-Quam, 2019; Wakeling, Aldred and Hains-Wesson., 2018). Gallen (2021) and Snow-Andrade (2019) also suggests that eportfolio development affords learners an opportunity to engage in experiential learning, reflection, metacognition and develop higher order thinking skills.

Farrell (2018) reports eportfolio based learning is extensively used in higher education in America, New Zealand and the UK, yet, despite their popularity internationally, to date, there has been a slow adoption of eportfolios in Ireland. This has been attributed to the fact their potential is not yet fully realised by all stakeholders (Farrell, 2018). In an effort to promote eportfolio practice in Ireland, a professional learning network for eportfolio practitioners and researchers was established in 2017, known as MaharaIRL, and later rebranded as Eportfolio (Eportfolio Ireland, 2021). Farrell (2019) indicated there were twenty-five members from seven Irish higher education institutions involved in a community of practice for eportfolios in Ireland.

Although, eportfolio based learning is widely acknowledged in the literature, little work has evaluated its impact on a Culinary Arts curriculum. There is huge benefit to both learners and lecturers alike. Research has shown that eportfolio based learning is regarded as an authentic and innovative means of assessment (Baird *et al.*, 2016; De Jager, 2019). By customising the eportfolio to meet industry expectations, Culinary Arts students can showcase their work, so that their eportfolio stands out to prospective employers. This research is supported by the GMIT Strategic Plan 2019-2023, which highlights one of its key strategic objectives as investing in innovative research and applied learning. The strategic plan recommends incorporating emerging technologies into curriculum design to equip learners with digital competencies for the future, which in turn could enhance the teaching and learning experience of the learners (GMIT, 2019).

2. Details of Outputs and Impact

As part of the third year BA (Hons.) in Culinary and Gastronomic Science program, the learners participated in a module entitled Introduction to Sensory and Consumer Science. Covid 19 necessitated the module to transition to a blended learning delivery. The lecturer redesigned the assessment strategy for Introduction to Sensory and Consumer Science to include eportfolio based learning. Initially, an evaluation of the online module design, was performed using the OSCQR rubrics (OSCQR, n.d.). This enabled the lecturer to improve the quality, delivery and accessibility of her module. Following on from the evaluation, the ABC Learning Design Process (Young and Perović, 2014) was utilised to inform the process of redesigning the assessment strategy.

Prior to the learners commencing the module, training resources were devised. During online lectures, these training resources were delivered, in an effort to demonstrate to the learners how to design their eportfolio effectively, and how to use it in a digitally responsible manner. Pebblepad, a digital portfolio platform was utilised by the learners. In addition to that, learners were shown exemplars, provided with support and guidance, and Donaldson's (2018) "Holy Grail of Rubrics" was adopted for the assessment of the eportfolio.

Following completion of the module, learners were invited to give feedback on their experience of developing the eportfolio. An online questionnaire was designed using Microsoft Teams in order to capture that feedback.

The results showed that almost two thirds of learners (Figure 1) surveyed agreed or strongly agreed that incorporating an eportfolio into the syllabus was a good way of assessing learning. From an assessment context, eportfolio assessment is viewed as student centred, as it enables learners to integrate their learning in an authentic and meaningful way (Farrell, 2019; Eynon & Gambino, 2017; Morreale, Van Zile-Tamsen, Emerson and Herzog, 2017).

Figure 1: Benefits of developing an eportfolio

Benefits of developing an e-Portfolio

Strongly Disagree · Disagree · Neutral · Agree · Strongly Agree
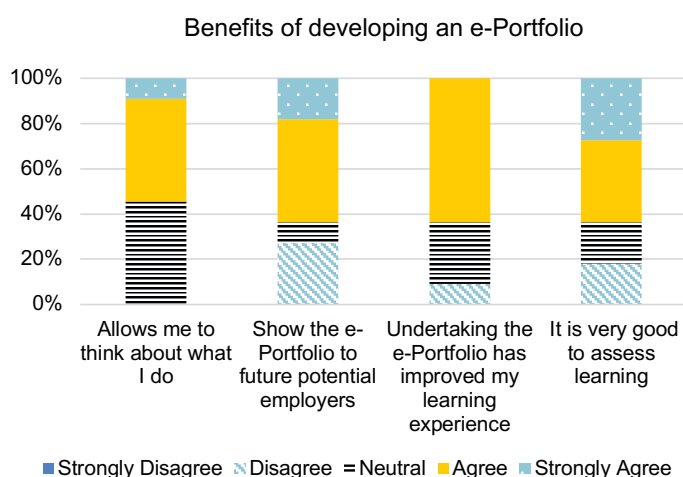
Almost half the participants surveyed believed the eportfolio provided them with a place to reflect on what they do (Figure 1). This result is also consistent with the findings of Gallen (2021) and Snow-Andrade (2019), who also showed that eportfolio based learning enables learners to reflect on their learning. By incorporating eportfolio based learning into the syllabus, the lecturer provided the learners with the opportunity to reflect on coursework and their learning. Hegarty (2011), states if learners are to become professional, knowledgeable and highly skilled culinary practitioners of the future, it is essential that reflective practice needs to be embedded into their programme design. Furthermore, eportfolios can be used effectively as a tool to support reflective practice (Gilsenan and English, 2021).

Another finding illustrated that almost two-thirds of participants claimed that undertaking an eportfolio during this module improved their learning experience (Figure 1). These results also corroborate with the findings of Picardo and Sabourin (2018).

Despite the many benefits eportfolios brought, challenges were also identified. The results of the questionnaire showed learners deemed the construction of the eportfolio as time consuming (Figure 2). Sixty-four percent of learners, indicated that they agreed with that statement. This was a common finding observed throughout the literature on eportfolio based learning. Barret (2005) suggests that the deeming eportfolio development as a high stakes assessment is detrimental. Learners need to consider the challenges they may face whilst undertaking an eportfolio but appreciate the potential benefits that they will be afforded with from the experience by developing an eportfolio.

Figure 2: Barriers to undertaking the eportfolio
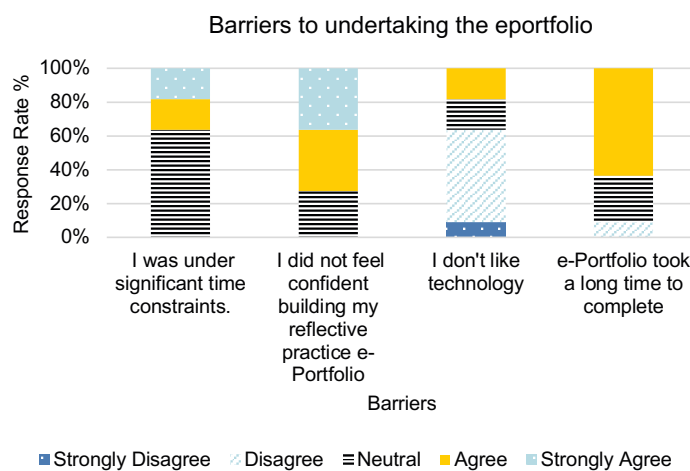
Just over a third of the learners claimed that they agreed or strongly agreed that they were under significant time constraints to meet deadlines, while undertaking the development of the eportfolio. This result is also consistent with the findings of Farrell (2019, p.20) who noted that student experience of undertaking the eportfolio development can be undermined by a lack of time commitment by the student. It is also clearly evident from figure 2 that disliking technology was not an issue for the learners. Only one fifth of learners who completed the questionnaire admitted to disliking technology.

On reflection on the process of incorporating an eportfolio assessment into the module Introduction to Sensory and Consumer Science, the lecturer believed she improved and innovated her teaching and learning practice. In addition, she demonstrated personal growth and enhanced her own problem-solving capabilities. The lecturer also took pleasure in witnessing the personal growth and development of her students throughout the module. Despite all the benefits achieved from incorporating an eportfolio into her assessment, it was not without its challenges. Firstly, the development of the eportfolio assessment and the creation of resources for the learners was time-consuming. One of the main barriers to the incorporation of eportfolios in higher education is the increased workload for lecturers implementing and supporting students with eportfolio construction (Farrell, 2019; Wakeling *et al.,* 2018). Secondly, not all learners found the task of building the eportfolio easy and enjoyable, due to a lack of technical skills. The lecturer spent a considerable amount of time supporting the learners. Thirdly, the lecturer lacked support from colleagues who had experience with eportfolio based learning and using Pebblepad. A final concern for the lecturer, centred around how the learners might approach the high stakes assessment.

3. Key Learnings

This was the first year an eportfolio based learning strategy was implemented in the module Introduction to Sensory and Consumer Science. Many benefits and barriers for undertaking an e-portfolio were identified by the lecturer and learners. Firstly, by integrating the eportfolio into the syllabus, the lecturer had the opportunity to improve and innovate her teaching practice. Secondly, by devising an eportfolio based assessment, the lecturer created opportunities for learners to develop greater digital competencies and enhanced learners' problem-solving capabilities. Thirdly, by embedding an eportfolio in the curriculum, it enabled learners to take ownership of their learning, and allowed them to develop reflective learning skills. In terms of barriers, the process of creating eportfolios proved to be time consuming for the learners. In addition, lack of technical skills required for developing the eportfolio was also documented.

In order for, an eportfolio to be successfully adopted by the learners, it is essential that the purpose of the eportfolio is clearly defined, requirements are communicated, training is delivered, rubrics are created, exemplars are shared, and support is provided. Failure to adequately prepare for its implementation may lead to unexpected consequences such as abandonment.

References

- Baird, K., Gamble, J., Sidebotham, M., (2016) Assessment of the Quality and Applicability of an Eportfolio Capstone Assessment Item with a Bachelor of Midwifery Program. *Nurse Education in Practice, 20,* 11-16.

- Campbell, D., Cigretti, P., Melenyzer, B., Nettles, D. and Wyman, R. Jr. (2010). How to develop a professional portfolio: A manual for teachers (5th Ed.). Boston: Pearson.

- De Jager, T. (2019). Impact of Eportfolios on science student teachers reflective metacognitive learning and the development of higher order thinking skills. *Journal of University Teaching and Learning Practice, 16*(3), 1-15.

- Donaldson, L. (2018). The Holy Grail of Rubrics. Retrieved from Holy Grail of rubrics Complete – Google Docs [Accessed 25 May 2020].

- Eynon, B., Gambino, L. (2017). *High Impact ePortfolio Practice.* Sterling: Stylus.

- Farrell, O. (2019). Developing critical thinking through eportfolio based learning: an exploration of the experiences of non-traditional online distance learners. (Doctoral dissertation, Trinity College Dublin, Ireland). Retrieved from: http://www.tara.tcd.ie/bitstream/handle/2262/85988/Orna%20Farrell%20Phd%20full%20final%20post-via%2024-1-2019.pdf?sequence=1&isAllowed=y [Accessed 25 May 2020].

- Farrell, O., (2018) Failure to launch: the unfulfilled promise of eportfolios in Irish higher education: an opinion piece. *DBS Business Review, 2.* doi: 10.22375/dbr.v2i0.30.

- Gallen, J. (2021). Eportfolios as reflective assessment of social justice. *Irish Journal of Technology Enhanced Learning, 6(1),* 22-28. Retrieved from https://journal.ilta.ie/index.php/telji/article/view/89/95

- Gilsenan, C. and English, M. (2021) An exploration of third year BA Culinary and Gastronomic Science student experiences of developing a reflective practice eportfolio at Galway-Mayo Institute of Technology, Ireland. Eportfolio Forum Australia.

- GMIT (2019). GMIT strategic plan 2019-2023. GMIT. Retrieved from https://www.gmit.ie/sites/default/files/public/communications/docs/gmit-strategic-plan-2019-2023-print-a4-v2-2.pdf [Accessed 27 January 2019].

- Hegarty, J. A. (2011). Achieving excellence by means of critical reflection and cultural imagination in culinary arts and gastronomy education, *Journal of Culinary Science & Technology, 9*(2), 55-65.

- Holtzman, D.M., Kraft, E.M. and Small, E. (2021). Use of eportfolios for making hirining decisions: a comparison of results from representatives of large and small businesses. *Journal of Work-Applied Management.* DOI 10.1108/JWAM-01-2021-0001.

- Morreale, C., Van Zile-Tamsen, C., Emerson, C.A. and Herzog, M. (2017) 'Thinking skills by design: a capstone eportfolio to promote reflection, critical thinking and curriculum integration', International Journal of Eportfolio, 7(1), pp. 13-28. Available at: https://eric.ed.gov/?id=EJ1142743

- OSCQR (n.d). About OSCQR. SUNY Online Course Quality Review. Retrieved from About OSCQR – OSCQR – SUNY Online Course Quality Review Rubric [Accessed 16 January 2020].

- Paulson F.L., Paulson P.R., Meyer C.A. 1991. What Makes a Portfolio a Portfolio? Retrieved From: http://web.stanford.edu/dept/SUSE/projects/ireport/articles/e-portfolio/what%20makes%20a%20portfolio%20a%20portfolio.pdf

- Picardo, K. and Sabourin K. (2018). Measuring student learning gains in independent research experiences in sciences through reflective practice portfolios. *Bioscene, 44*(2), 29-36.

- Snow-Andrade, M. (2019). Eportfolios and online learning: applying concepts of organisational behaviour. *International Journal of E-Learning and Distance Education,34*(1), 1-20.

- Wakeling, L., Aldred, P. and Hains-Wesson, R. (2018). Eportfolios and reflective practice for Food Science students. *Journal of Food Science Education, 17,* 52-59.

- Young, C. and Perović, N. (2016). Rapid and creative course design as easy as ABC. *Procedia-Social and Behavioural Sciences, 228,* 390-395.

Submitted by: Dr Clare Gilsenan

First-Year Engineering ePortfolio Assessment

Project Team/Name	Dr. Cormac Flynn
Name of Dept. and School/ Faculty and Institute	Mechanical and Industrial Engineering, School of Engineering, GMIT
Keywords	*ePortfolio; alternative assessment; first-year; physiology; engineering*

Section A: Case Study Summary

1. What I did/how I did it + team involved

The Covid-19 pandemic provided an opportunity to incorporate alternative assessments in place of more traditional ones such as closed-book written exams. I expanded an ePortfolio assessment in a first-year physiology class to enable students to demonstrate their knowledge in personally creative ways. Through eight scaffolded tasks, students researched and reflected on a diverse range of biomedical engineering topics. The tasks created links between the classroom environment and the world beyond.

OneNote Class Notebook was used as the e-portfolio platform. Templates were provided for each task along with details on how the task would be marked. Audio and written feedback was provided to each student after the task was completed.

Towards the end of the assessment, a survey was conducted to solicit students' opinions on the ePortfolio assessment.

2. Outputs and impact achieved

- Students engaged with the assessment throughout and created personal ePortfolios using a variety of tools and media. Pages included hand-drawn sketches, Prezis, audio, and the ever-present memes to demonstrate and reflect on knowledge.

- Topics researched included brain development, skin cancer, and soft tissue injuries and demonstrated learning that was connected to but went deeper than what was covered in the class. Some deep reflection was evident in student ePortfolios. Researching musical therapy for stroke recovery highlighted for one student the need for biomedical engineers to be multi-disciplinary in their approach for solutions.

- Student responses to the survey were positive about the ePortfolio assessment. Almost all responders agreed that the ePortfolio allowed them to further their learning and demonstrate it creatively. Few thought that the assessment workload was too much. The ability to research topics of their choosing came through strongly in the comments.

- Students did find some aspects of the ePortfolio assessment challenging. Reflections proved difficult for some students and did not go far beyond a summary of what was done in a task. Providing examples of reflections and additional prompts should encourage more students to reflect on how they learn and identify areas they want to develop. Students also found it challenging to determine the reliability of information found online. Time was spent in class highlighting tools to check the quality of sources.

- On the technical side, while most of the students had not used OneNote before, no one found it difficult to use. Almost all indicated their OneNote proficiency improved throughout the year. Students commented on the ease of accessing their e-portfolio on OneNote. The only drawback of using OneNote was the awkward process of allowing students to share pages for peer-reviewing.

3. What did I learn?

- EPortfolio assessments allow students to demonstrate their knowledge in creative and personal ways. Students like the opportunity to research topics of their choosing. The result is deeper learning beyond what is covered in the regular class content. They are an excellent alternative to closed-book exams.

- EPortfolio reflections are challenging. Some student reflections did contain explanations of their growth and included goals for continued learning. However, several reflections contained only a basic description of what was done and what they liked about the task. More focus on how to reflect is needed to help students get more benefit from the ePortfolio assessment.

- EPortfolios offer students good opportunities to develop their computer literacy skills. It is important to keep the technology as simple as possible. OneNote worked well for the e-portfolio. Students use it frequently for several modules in the programme so in a few weeks they are proficient using it. This resulted in me having to spend very little time on software support.

Section B: Full Case Study

1. Context/Rationale

The Covid-19 pandemic resulted in the cancelation of on-site examinations in most higher education institutes during the 2020-2021 academic year. In a first-year physiology module, an opportunity was presented to replace the closed-book written exam with an ePortfolio assessment.

EPortfolio assessments are digital representations of students' work in addition to their reflections on their learning (Reynolds & Patton, 2015). They can be introduced to decrease reliance on exams, which are known to have several issues.

The closed-book written exam format usually bears little connection with the real world (Race, 2015). Students typically have to write about a specific topic in a certain amount of time without any access to external resources. The result is that the exam tends to be a memory test and not a test of what the learner can do (Biggs, 1999; Dillon et al, 2018). During closed-book written exams, there is little opportunity for reflection (O'Keefe & Donnelly, 2013). In addition, feedback opportunities are limited due to restricted access to the exam scripts. If feedback is received, it is frequently after some time when students have less interest in knowing where they could improve (Race, 2015). Closed-book exams can also have accessibility issues. Their time-constrained nature disadvantages those who cannot focus due to anxiety or attention issues (Myyry & Joutsenvirta, 2015, Johanns et al, 2017). The written requirement excludes learners who cannot express themselves adequately through writing (Healey et al, 2006; Ryder & Norwich, 2019).

EPortfolio creation is an integrative learning process where learners make meaningful connections between content in the class and experiences outside it (Enyon & Gambino, 2017). Reflection is an important component of ePortfolios and allows learners to explain connections made, examine their learning process, and identify areas they would like to grow. These processes foster more deep learning, autonomy, communication, and leadership skills than could be achieved with exams alone (Gray, 2008; Haave, 2016; Yueh, 2013). EPortfolios are also accessible forms of assessment. Learners can use a wide variety of multi-media formats to create them with fewer time constraints than exams.

The e-portfolio assessment in this case study consisted of eight scaffolded tasks. They ranged from students stating their goals in the module to researching engineering solutions to various diseases. There were also some self and peer review tasks. Students were provided with a basic template for each task but were allowed to deviate from that template. A rubric detailed expectations for each task in several areas, including content, reflection, and creative portfolio design. Microsoft OneNote Class Notebook was used as the ePortfolio platform. After completion of a task, written feedback was left on the ePortfolio page along with audio feedback. Audio has been reported to enhance written feedback and be accessible (Deely, 2018; Carruthers et al, 2014).

Students were invited to complete an anonymous survey on their ePortfolio assessment experiences. GMIT Research Ethics Committee approved the survey and the collection of student ePortfolio samples.

2. Details of Outputs and Impact

Most of the class engaged with the ePortfolio assessment and completed the tasks. This was reflected in the survey responses with most indicating that the tasks were engaging and allowed them to demonstrate their learning (Figure 1). 78% of students always listened to the audio feedback and most agreed that the feedback received helped with subsequent tasks.

While the high engagement is not too surprising considering the assessment was worth 50% of the overall marks, the topics researched demonstrate deeper learning than contained in the class material. For a learning outcome related to the nervous system, students investigated topics as diverse as the aging brain, sleep patterns, epilepsy, and musical therapy for stroke recovery. A learning outcome related to soft tissues produced research on topics such as skin cancer and soft tissue injuries.

Figure 1: level of agreement to e-portfolio statements
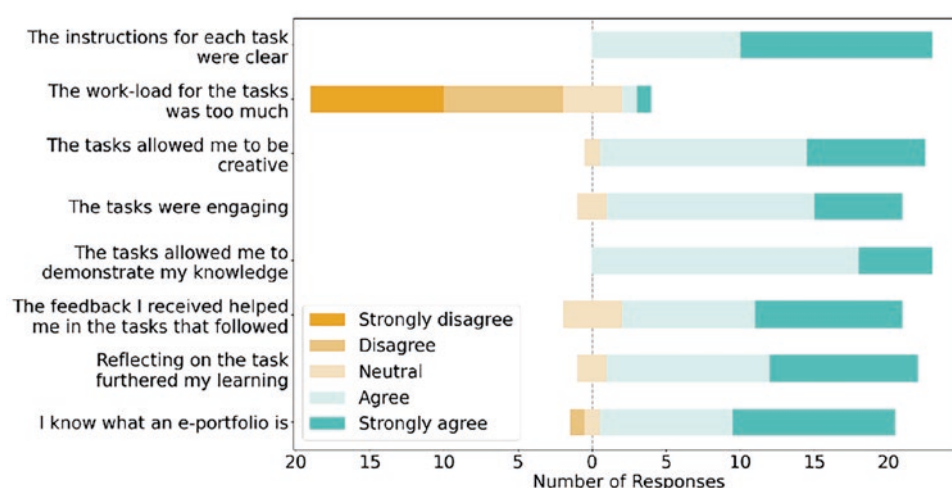
Reflections revealed personal connections to chosen research topics. Some students researched depression or brain injuries because they either suffered from these ailments themselves or knew someone who did. Reflections also identified pathways for development. One student reflected that biomedical engineers "have to have a lot of tools" because solving problems will require "multi-disciplinary approaches". While most survey responses agreed that the reflections furthered their learning (Figure 1), individual comments revealed that doing a reflection is challenging. For the ePortfolio tasks, there were some questions to prompt reflection. For example, students were asked to reflect on what they found challenging and how did they overcome it. One way to provide guidance is to implement scaffolded reflection tasks (Enyon & Gambino, 2017). Varying the reflection tasks and providing exemplars will support students and make the learning process visible to them.

Students used a wide variety of formats to create their ePortfolios in OneNote (Figure 2). Items in the ePortfolios included scanned hand-drawn artefacts to ones created using software such as Prezi, Word, or Publisher. Some students also embedded audio files to reflect on outputs. Memes also proved a popular means of reflection. Most student responses to the survey agreed that the ePortfolio task allowed them to be creative (Figure 1). This also came through in individual comments, e.g. "It really gave us a chance to show our own style of work and provide a sense of our personality."

Figure 2: samples from student ePortfolios demonstrating the different media used
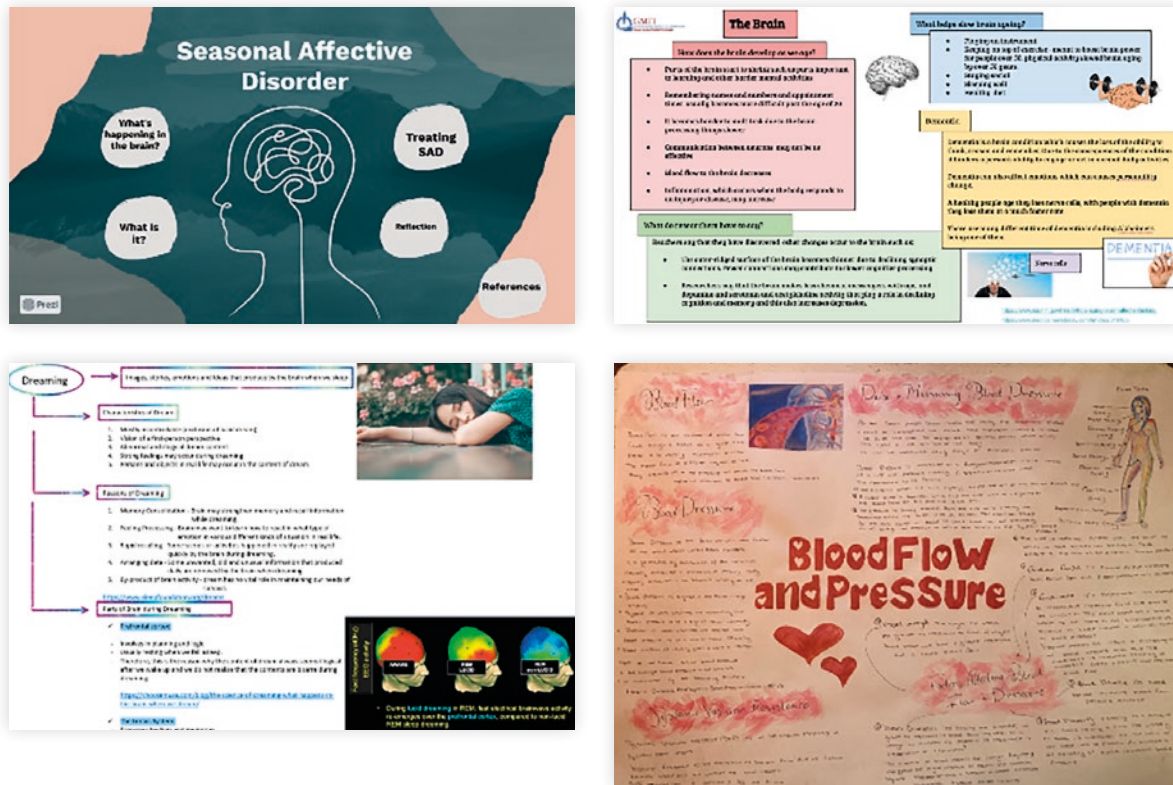
Individual comments also indicated that they found it challenging to be creative. A few ePortfolios followed a standard PowerPoint-type format with bullet points and images. Others contained text-heavy entries. Creativity is recognised as an important skill for solving problems in contemporary life so providing opportunities for students to be creative in their programme of study will prepare them better for their careers (Jackson, 2006). One of the obstacles to being creative possibly lies in learners assuming that creativity equates to being artistic and is an inherent skill that cannot be learned (Stretch & Roehrig, 2021). Fortunately, most higher education educators believe creativity can be developed given the right conditions (Jackson, 2014). Developing learners' creativity skills results in greater engagement in the programme (Álvarez-Huerta et al, 2021). In the context of this ePortfolio assessment, being creative means conveying the artefacts of the research in an interesting and aesthetically pleasing way. Rewarding creativity encourages learners to use their style and avoid simply copying and pasting content into their ePortfolios.

The challenges related to creativity were not due to using OneNote Class Notebook as the ePortfolio platform. Students reported no difficulties in using it and their proficiency with it improved during the module (Figure 3). Individual comments reported the ease of accessing and editing their ePortfolios. Students reported that syncing of the pages could be slow so a good internet connection is an advantage when using OneNote.

Figure 3: level of agreement to statements on using OneNote
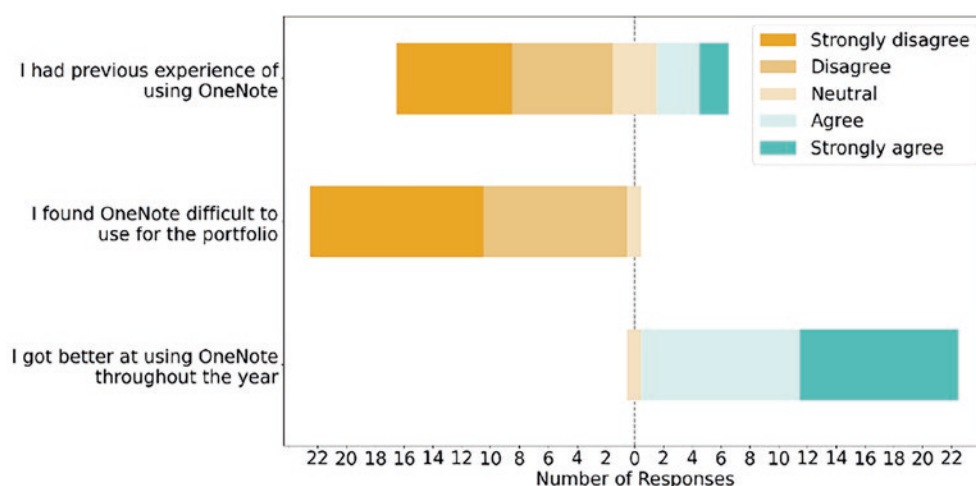
A significant drawback with using OneNote is that it inhibits the sharing of ePortfolios between students. Currently, students cannot share pages in their student section on the Class Notebook with other students. For peer-reviewing tasks, a workaround was devised where students copied pages into a section in the collaboration space on the Class Notebook. This workaround was the only time where several students required additional support using OneNote. I anticipate that using a dedicated ePortfolio platform such as Mahara would require significant training and would not be suitable for a class, which only meets one hour per week.

A challenge common to all research-type assignments is determining the quality of sources of information. To address this, an in-class discussion was held on what are the characteristics of a reliable source. In addition, some useful tools for establishing the quality of a source were shared. One such tool was the CRAAP test, where students answer questions on the Currency, Relevancy, Authority, Accuracy, and Purpose of a source (Blakeslee, 2004).

3. Key Learnings

Deeper learning was demonstrated in the ePortfolio assessment. Students reflected on topics that went beyond the content covered in the class and researched diseases and biomedical engineering technology. Students' personal connections to some topics motivated them to engage deeply with tasks.

Student reflections also demonstrated deeper learning and growth. Reflecting on the research they carried out highlighted for some the need for biomedical engineers to be multi-disciplinary in their approach to finding solutions. Many students find doing reflections challenging, so there is a clear need for instruction and guidance in this area.

The ePortfolio assessment enabled students to showcase their knowledge in a creative way using a range of media. Some students struggled with being creative and presented ePortfolios that resembled standard PowerPoint presentations or text-heavy Word documents. Showing exemplars of creative ePortfolios should encourage students to present content differently.

OneNote was a straightforward platform for the ePortfolio assessment. Students required very little support in using it. The only drawback was that the software inhibited peer review a bit. There is a workaround available using the collaboration space in the Class Notebook.

This ePortfolio assessment offered students opportunities for deeper learning, reflection, continuous feedback, and multiple means of expression. These are opportunities not typically afforded by other traditional assessments such as closed-book written exams.

References

- Álvarez-Huerta, P., Muela, A., & Larrea, I. (2021). Student engagement and creative confidence beliefs in higher education. *Thinking Skills and Creativity*, *40*, 100821.

- Biggs, J. (1999). Teaching for quality at university. *Society for Research into Higher Education, Buckingham, England*.

- Blakeslee, S. (2004). The CRAAP test. *Loex Quarterly*, *31*(3), 4.

- Carruthers, C., McCarron, B., Bolan, P., Devine, A., & McMahon-Beattie, U. (2014). Listening and learning: reflections on the use of audio feedback. An excellence in teaching and learning note. *Business and Management Education in HE*, *1*(1), 4-11.

- Deeley, S. J. (2018). Using technology to facilitate effective assessment for learning and feedback in higher education. *Assessment & Evaluation in Higher Education*, *43*(3), 439-448.

- Dillon, S., McDonnell, A., Murphy, D., & White, L. (2018). Alternative Methods to Traditional Written Exam-Based Assessment.

- Eynon, B., & Gambino, L. M. (2017). *High-impact ePortfolio practice: A catalyst for student, faculty, and institutional learning*. Stylus Publishing, LLC.

- Gray, L. (2008). Effective practice with e-portfolios. *Higher Education Funding Council for England, JISC, Bristol*.

- Haave, N. (2016). E-Portfolios Rescue Biology Students from a Poorer Final Exam Result: Promoting Student Metacognition. *Bioscene: Journal of College Biology Teaching*, *42*(1), 8-15.

- Healey, M., Bradley, A., Fuller, M., & Hall, T. (2006). Listening to students: the experiences of disabled students of learning at university. In *Towards inclusive learning in higher education* (pp. 50-61). Routledge.

- Jackson, N. (2006). Creativity in higher education: What's the problem? *Higher Education*, *7*, 1-11.

- Jackson, N. (2014). Developing students' creativity through a higher education. In A. Xie & N. L. Lei (Eds.), *Proceedings from the International Symposium on "The Cultivation of Creativity in University Students"* (pp.8-28). Macao: Macao Polytechnic Institute.

- Johanns, B., Dinkens, A., & Moore, J. (2017). A systematic review comparing open-book and closed-book examinations: Evaluating effects on development of critical thinking skills. *Nurse Education in Practice*, *27*, 89-94.

- O'Keeffe, M., & Donnelly, R. (2013). Exploration of ePortfolios for Adding Value and Deepening Student Learning in Contemporary Higher Education. *International Journal of ePortfolio*, *3*(1), 1-11.

- Myyry, L., & Joutsenvirta, T. (2015). Open-book, open-web online examinations: Developing examination practices to support university students' learning and self-efficacy. *Active Learning in Higher Education*, *16*(2), 119-132.

- Race, P. (2014). *Making learning happen: A guide for post-compulsory education*. Sage.

- Reynolds, C., & Patton, J. (2015). *Leveraging the ePortfolio for integrative learning: A faculty guide to classroom practices for transforming student learning*. Stylus Publishing, LLC.

- Ryder, D., & Norwich, B. (2019). UK higher education lecturers' perspectives of dyslexia, dyslexic students and related disability provision. *Journal of Research in Special Educational Needs*, *19*(3), 161-172.

- Stretch, E., & Roehrig, G. (2021). Framing failure: Leveraging uncertainty to launch creativity in STEM education. *International Journal of Learning and Teaching*, *7*(2), 123-133.

- Yueh, H. (2013). Engineering students' perceptions of and reflections on portfolio practice in leadership development. *International Journal of Engineering Education*, *29*(1), 99-106.

Submitted by: Dr Cormac Flynn

The Impact of Socrative Pro on Learning and Assessment

Project Team	Lucia Ramsey and Patrick Brennan – LYIT Socrative Pro Learning Enhancement Project
Name of Dept. and School/ Faculty and Institute	Maths Learning Centre, The Curve, Faculty of Business – Department of Tourism, Department of Business Studies & Department of Nursing and Health Care, LYIT.
Keywords	*Quiz maker, Reusable Digital Learning Objects, Continuous Assessment, Immediate Feedback, Survey, Learning*

Section A: Case Study Summary

Seven lecturers from different departments within the Letterkenny Institute of Technology used Socrative Pro to design quizzes for their students. The lecturers were supplied with Socrative Pro accounts and training.

This project intended to facilitate formative assessment in class and remotely. To reduce time spent marking exams. To add another medium to interactive learning. To motivate students and reinforce learning through logical questioning and immediate feedback.

Socrative Pro is an online resource that is very useful for assessment, it works on any device with internet. The lecturer creates quizzes which the students can answer during class or outside class using their mobile devices. The lecturer can determine how long the quiz will be available to the students for e.g., an hour, a week. The Socrative quizzes are reusable digital learning objects (RDLOs). They can be used over and over and will run on any online device such as pc, laptop, tablet and mobile phone. They are run independent of the institute's platform e.g., Moodle or Blackboard. The user interface is intuitive and easy to use. The lecturer can supply detailed feedback on each question with explanations, diagrams or photographs. Question styles are multiple choice, true or false and questions with open-ended essay style answers.

The weighted marking scheme allows lecturers to have different point values allocated to questions, including zero points for a question. Lecturers can also manually grade short answer questions after the quiz has been completed and give partial marks. The lecturer can override the marking scheme if a student has given an unexpected answer.

There is a free version called Socrative that is worth trying out, obviously it does not have as many features as Socrative Pro.

When the quiz was used in class the lecturer could view (and share) students' real time progression through a quiz. This immediately indicates questions that students are not doing well in that may require more tuition. The whole class can see the progress through a quiz, students can work in teams, it can be timed and carried out as a race to make it more interesting for students.

During Covid-19 the quizzes were used as remote assessment, for continuous and summative assessment and as a survey quiz.

1. What I did/how I did it + team involved

The team consisted of seven lecturers: three from the Maths Learning Centre, two from the Department of Nursing and Health Care, one from the Department of Tourism and Culinary Arts and one lecturer from the Department of Business Studies. Lecturers designed quizzes based on their individual teaching curriculum.

Some quizzes were designed to indicate the students' progression and students could do these quizzes in their own time and receive immediate feedback. Other quizzes were designed as examinations and students had to sit these quizzes at specific times. Quizzes were also used as surveys to get student feedback.

2. Outputs and impact achieved

Socrative made assessment easier especially during Covid-19 when students were largely off campus. Continuous assessment practice quizzes indicated how the students were managing throughout the course, this feedback became crucial to the lecturer as well as the student as it could highlight if a student was finding the course difficult or losing motivation. Time spent marking was greatly reduced.

Using Socrative enhanced the learning process as students could answer questions at their own pace. It reinforced learning and also highlighted areas of learning that required further attention.

Students found it easy to use and loved the immediate feedback of results and grades. Quizzes can be gamified and students could team up which encouraged peer learning.

3. What did we learn?

Lecturers became proficient and confident at designing and marking Socrative Pro quizzes. They worked collaboratively and shared quizzes. Socrative Pro is constantly upgrading and provides a team of experts that can be booked to give advice and training. They also notify lecturers of new features to Socrative Pro with information on how to use these features.

Lecturers could quickly identify topics that students were weak on and consequently provide more tuition and learning on those topics. The quizzes also enabled lecturers to discover if a student was falling behind and needed extra support.

Section B: Full Case Study

1. Context/Rationale

Socrative is an interactive web-based student-response system to questions posed by the lecturer. The rationale for Socrative was based on concerns expressed by project team members around the lack of feedback from students during lectures. This was a cry for help for a suitable formative assessment tool to increase student engagement and to provide feedback to lecturers to assist with assessment goals. According to Pryke (2020) Socrative Pro encouraged student participation, helped students retain information and improved achievement. He found that students liked Socrative Pro, not only was it fun but the students felt it was a valuable aid to learning. Cavanagh (2011) believes that if cooperative learning and active student engagement can be introduced as part of the lecture, then higher student motivation, enhanced information retention, better student attitudes and improved critical thinking skills will result.

Socrative Pro and the free version Socrative are very popular, according to Business Wire they were used by over 16 million people in over 65 countries by 2016. Some of our team had used the free version of Socrative and found it very useful and easy to use. We could grasp the main functions of Socrative and start producing quizzes within an hour. Socrative Pro provides an online support team that can train lecturers on Socrative Pro and any new additional functions introduced.

Unsure of how the ITs were merging to form the CUA we liked the fact that Socrative Pro is independent of Moodle or Blackboard.

The aim of this LEP was to show how Socrative can be used effectively by lecturers as a digital formative assessment tool to enhance teaching, learning and assessment. Specifically, the LEP aimed at:

- Widen access to and participation in learning in the classroom environment and online.
- Encourage all students to participate in learning within the class/lesson/lab by completing digital formative assessments.
- Support students to have the confidence to participate in learning by utilising the anonymity response option as many students, particularly males, are depowered by a fear of failure with direct questioning. The project team felt particularly strong on this issue as LYIT emerged with the highest deprivation index in a recent national HE survey.
- Support lecturers by providing real-time feedback on student learning and thus help to adjust teaching goals accordingly.
- Foster collaboration across departments in LYIT.

How does Socrative work? Lecturers prepare in advance rich quiz type questions choosing from multiple-choice, true/false, and one-sentence-response questions. Students access questions via a "Room Code" supplied by the lecturer and answers register immediately in real-time on the lecturer's computer as the students submit their responses on almost any device. The interactive feedback system supports students' learning performance because lecturers are going to use it in a bespoke way within their own disciplines to tailor learning to the needs of their students.

Students who are reluctant to raise their hands in class will value the opportunity to respond digitally and anonymously. With instant feedback, lecturers can see where students are missing a concept and adjust instruction accordingly. Socrative can thus be used at the start of a lecture/lab to recap on previous content or during lesson time to assess learning at one point in time or at the end to assess the agreed learning outcomes or even to spark conversation. This is possible as the software allows great flexibility in how lecturers structure questions, answers, and explanations or diagrams for immediate feedback.

All student answers can be graded with feedback for each student. At the end, teachers can see quiz data either on an individual or whole-class basis and download it through an Excel sheet or email it for further planning. This saves huge time on administration for lecturers who can have immediate access to full class results for formative assessments purposes.

The lecturer can accumulate a library of quizzes and share these quizzes with other lecturers. Using and reusing the quizzes and editing them if needed. The interface is intuitive and easy to use.

Socrative is simple and flexible, and crucially, it works on almost any web- or app-enabled device. It has been trialled successfully by two members of the team as an active learning methodology.

2. Details of Outputs and Impact

- Lecturers have found Socrative Pro fantastic for student engagement and the feedback from students is, they find it so easy to use and love the immediate feedback of results and grades.

- Lecturers have found by using Socrative Pro that it allows one to make questions worth a variety of points. This is useful when covering specific topics in class. Once a quiz is created. It allows the lecturers an option to manually grade and assign partial marks to student's short-answers, this is an excellent time saving tool.

- Lecturers have found with using the new weighted questions feature, you can assign different point values to your questions, allowing you to create more complex and in-depth assessments for our students. For example, let's say you want students to name four styles of learning. You can now make this a short answer question worth 4 points. Or, you could make it worth half points – half a point a learning style mentioned. The choice is ours as the lecturer. Questions can also be given a weight of 0 points, which is another way you can add flexibility to the types of questions you add to a quiz. Maybe you want to check in with your students' general understanding on the subject matter at the end of the quiz without having their responses affect their overall grade. Or perhaps you'd like to use the quizzing feature as an end-of-semester survey to get feedback from your students about how the module went. You can also have weighted questions, this allows our students to see what the question is worth in relation to other questions while taking the quiz.

- In relation to using manual grading and partial marks. Sometimes it's hard to predict every variation of an answer that students might submit to a short answer question. If a student's response doesn't match one of the possible correct answers you inputted, their response will automatically be marked as incorrect. Now, you can use the manual grading feature to override this and mark the student's response as correct, this for me is a huge positive point. In addition to overriding the mark given, you can leave short answer questions open-ended to manually grade later on. Maybe you want your student to pick a position on a topic and provide a brief argument to defend their position. Now, you can manually grade their response in the results table after the quiz has ended.

3. Key Learnings

- Students found Socrative Pro easy to use and loved the immediate feedback.
- During online learning imposed by Covid-19 it provided great feedback for lecturers.
- Facilitates formative assessment.
- Saves time in marking and administration.
- Initially the short answer questions were problematic however Socrative Pro upgraded its assessment program to allow lecturers to allocate a variety of points to questions, including zero. The lecturer can override the marking for short answer questions and give full or partial marks. This is particularly useful when you cannot predict every possible answer to a question or if an essay type answer is required.
- Can be used in class as a motivational and collaborative tool.
- Allocating zero marks allows flexibility when doing surveys and voting.

We thought Socrative Pro was so good we have renewed the licence for another year. This term we are continuing to carry out quizzes for assessment and learning and we are expanding the classes we intend to use Socrative Pro.

References

- Cavanagh, M. (2011). Students' experiences of active engagement through cooperative learning activities in lectures.
- Pryke, S. (2020) 'The use of Socrative in university social science teaching', Learning and Teaching 13(1):67-86
- Business Wire (2016), 'Socrative PRO: MasteryConnect Launches Premium Formative Assessment App', 27 July, http://www.businesswire.com/news/home/20160727005240/ en/Socrative-PRO-MasteryConnect-Launches-Premium-Formative-Assessment.

Submitted by: Patrick Brennan and Lucia Ramsey

Applied Visual Immersive Building Regulation Assessment

Project Lead	Irene Hayden
Name of Dept. and School/ Faculty and Institute	Department of Building and Civil Engineering, School of Engineering, GMIT
Keywords	*Virtual Reality, Visual Assessment, Building Regulation Pedagogy*

Section A: Case Study Summary

1. What I did/how I did it + team involved

Two Virtual Reality (VR) 360 panoramas created using 'AutoDesk Revit' were trialled with face-to-face first year architectural technology undergraduate participants and with mixed-discipline professional participants in an online continuing professional development course.

2. Outputs and impact achieved

VR was used to simulate an authentic assessment to adjudicate each persons' general knowledge and generalised applied understanding of aspects of the building regulations. It was delivered after teaching and learning was concluded. Individual participants were asked to note as many faults as they could in the two VR 360 panoramas and post their findings on Moodle. Quantitative and qualitative evaluative feedback was used to gauge its impact.

3. What did I learn?

I have learned that new assessment processes, particularly visual ones, have their place in undergraduate education and as part of professional development course design.

Section B: Full Case Study

1. Context/Rationale

One of the key shortcomings in the literature I found was the lack of reporting of students' experience when using visual assessment tools, as well as the reporting and evaluation of a visual assessment strategy in general for digital visual pedagogies. Closely connected to this was the shortcoming of a lack of competence assessment using digital visual pedagogies globally, including competence in the building regulations.

I believe that discipline-informed taxonomy should inform building regulation competence assessment, using phrases such as demonstration of compliance in some aspect of the building regulations, for example. Using 3D real-world scenarios engaging visual immersive applied authentic assessment practices to depict building regulation faults as a visual competence assessment tool situates this study to seek to contribute towards addressing these shortcomings.

Eaton (2016) suggested using 'real-world settings' when designing assessment processes. This was achieved in this study by incorporating authentic applied examples to encourage engagement. A similar finding was reported by Vasileska et al. (2013) in the use of visual simulation tools for teaching nanotechnology online. Dabbagh, Marra and Howland (2019, p6) suggested that 3D immersive learning experiences were suitable in an online learning environment for healthcare careers. They are equally so for teaching, learning, and assessing building regulations visually. Dabbagh, Marra and Howland (2019, p45) reported that a 3D simulation developed some additional pedagogical affordances such as:

i.   'Providing exploratory, experiential learning-by-doing

ii.   Providing a safe environment for trial-and-error learning

iii. Providing authentic context

iv.   Supporting formative feedback and a personalised learning experience'

A takeaway from this is that 3D Virtual Reality (VR) would be useful to depict real-world scenarios as a visual simulation tool when learning or being assessed on aspects of the building regulations.

Aldrich (2009, p4) strongly suggested that highly interactive virtual learning transformed the educational landscape in the research. Aldrich (2009, pp 5-6) argued that games were successful learning tools, that VR can give context to one's learning, that 'cognitive resiliency' can be achieved by experimenting in learning environments 'where failure is acceptable' and that participation is required to learn.

We must also be cautious when introducing new technology into higher education. To get learners onboard can be challenging. Digital fluency is not the same as digital literacy (Lalonde, 2019). The takeaway from this is to be mindful of the digital implications for learners of VR choices and applied visual interactive building regulation presentations. Mature learners' digital fluency will vary to younger learners, who are reported to be more comfortable with visual interactions.

2. Details of Outputs and Impact

Figure 1 and 2 below illustrate the VR assessments used in this study. Undergraduate and professional participants reported in the evaluation discussion forum that the assessment was good. A professional participant reported in the questionnaire that 'the 3D walkaround model was a very realistic/authentic and immersive test that was as close to a real-world exam as you are likely to get electronically/online'.

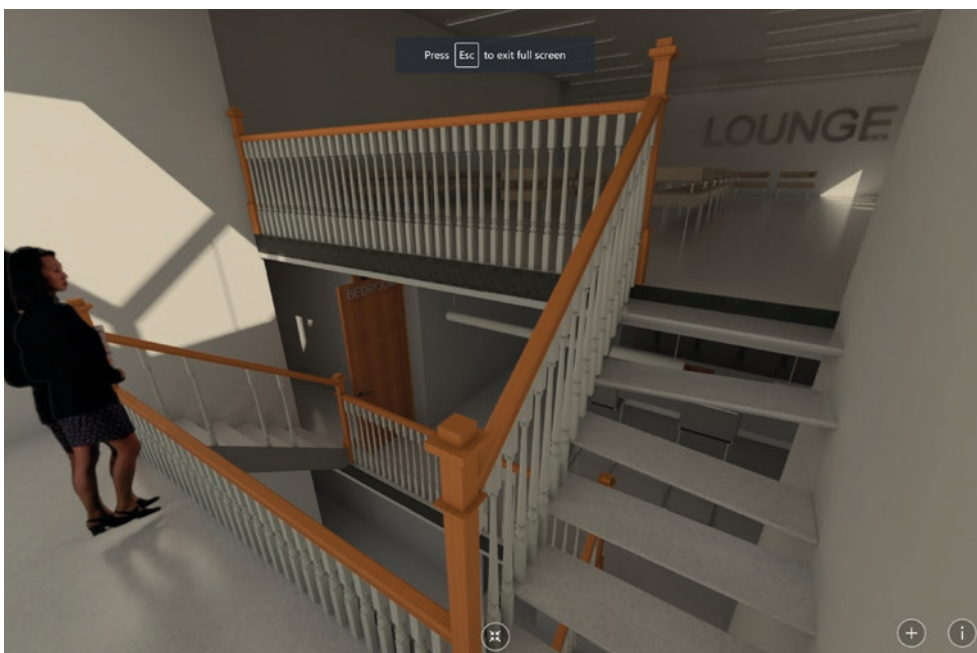**Figure 1: Revit visual assessment**

Figure 2: Visual assessments

Three research themes of **validation**, **improvement** and **complement** were noted in answer to the evaluation of the VR assessment. A professional participant, who is a building surveyor, commented that 'the assessment was good. The visual nature of the 3D images replicated, as much as is possible, a survey situation. The feedback was also helpful, and essential, to this process'. Table 1 outlines the quantitative feedback received in relation to the scope, breadth and depth of VR assessment achieved.

Table 1: Scope, breadth and depth of VR assessment

Question	Predominant opinion
The assessment of knowledge-based competencies was appropriate for a Continuing Professional Development course of this size and nature	Strongly agree
The assessments were appropriate in the context of the aspects of the building regulations covered	Strongly agree
The assessments adequately explored the new learning acquired	Strongly agree
The assessments adequately explored an understanding of the new learning acquired	Strongly agree

Table 2 outlines feedback received on the amalgamation of Technical Guidance Documents (TGDs), along with Health and Safety legislation information, and the accessibility of the VR assessment.

Table 2: Amalgamation of TGDs and accessibility

Question	Predominant opinion
The amalgamation of relevant TGDs in assessments was useful	Strongly agree
The visual building regulation pedagogy used in assessments made assessing building regulations more universally accessible	Strongly agree
The visual building regulation pedagogy used in assessments made assessing building regulations more universally accessible, for example, to those whose first language is not English	Somewhat agree

One professional participant reported in a questionnaire in relation to the 3D immersive final assessment

'I like how the system was combining more than one set of regulations to give it a more authentic experience and it may have contributed to a subliminal learning experience that would enhance the quality of teaching re: the overt regulation intended'.

Table 3 outlines the feedback received from professional participants in relation to the usefulness of gamification and immersive assessment strategies in an online CPD course.

Table 3: 3D immersive final assessment

Question	Predominant opinion
The integration of some gamified or motivational or immersive assessment strategies was useful	Somewhat agree

One professional participant inadvertently thought that one QR code was answerable and not two in the final assessment. A suggestion for improvement would be to have only one 3D image per assessment on Moodle.

3. Key Learnings

First year participants reported the novelty of this approach to be an enjoyable way to learn. They demonstrated good digital literacy skills and reflected capable gaming personality profiles, like that reported in the literature for this cohorts' age profile. This compared to professional participants, who were more hesitant with new technology and many of whom reported to have never experienced learning online previously. A takeaway from this is that on-boarding, and tutoring, using new technology as part of an assessment process needs to be formulated as part of the pedagogical approach. Best practice in student-centred assessment design would require a trial or test VR assessment, prior to the roll-out of formal assessments.

A significant difference was noted between first year participant's abilities to note extensive building regulation faults in comparison to the number reported by professional participants. First year undergraduate participants were able to comfortably identify a passing rate of 40% of the faults in the two 3D scenarios. As would be expected, professional participants demonstrated a capability to achieve an 80% pass rate, when combined with formative feedback. From an educational perspective, a takeaway from this is to specifically design VR assessments with the target audience in mind, and to moderate the number of faults, technical difficulty, and complexity to reflect the competence-skill and experience anticipated. Further takeaways include the acceptability of a competence assessment and a high percentage pass rate were also beneficial to professional participants.

Professional participants reported VR assessment to be beneficial when combined with formative feedback, and in fact, contributed to identifying more building regulation faults than were initially anticipated in the two simulations. A further take away is that the discussion piece around the building regulation faults should get as much emphasis as the assessment and adjudication process. This could be interpreted as an inductive practice, where further teaching and learning is created after the initial assessment, to reinforce new learning and really emphasise understanding. A suggestion for improvement would be to investigate VR assessment as a group exercise, instead of an individual assessment. This would encourage early-stages discussion within the assessment process and provide a richer learning experience as a result.

Submitted by: Irene Hayden

Theme 4:

Student Engagement and Technology Enhanced Learning (TEL)

Does the adoption of Padlet enhance peer to peer learning, cooperation, information sharing and knowledge exchange?

Author	Dr. Isobel Cunningham
Name of Dept. and School/ Faculty and Institute	Dept. Of Business Studies, Letterkenny Institute of Technology
Keywords	*Collaboration, peer to peer learning, knowledge exchange, collaborative tool, Padlet, postgraduate.*

Section A: Case Study Summary

The study sought to understand the added value of technology based collaborative learning on individual and collaborative learning (Blau et al, 2020). The study found that the use of Padlet was an effective tool to use to encourage peer to peer learning, cooperation, information sharing and knowledge exchange.

The study adopted Padlet as a collaborative tool and reviewed the effectiveness of the tool in terms of peer to peer learning and knowledge creation. The learners were postgraduate students who were undertaken an online work-based learning MSc programme. The study undertook desk research and also sought the opinions of the learners on the programme. Thus giving a better understanding of the effectiveness of Padlet as a tool to this particular student profile.

Based on Resta and Lafferriere (2007) and furthered (Beltran-Martin, 2019), the study investigated whether Padlet enabled each of the 4 areas to develop: collaboration skills and knowledge creation, engagement in knowledge creation, cognitive performance and flexibility of time and space. The study found that:

The use of Padlet enhanced online dialogue and was very effective in peer to peer learning.

Padlet was simplistic and encouraged knowledge creation. It was an effective tool when learners were working in small groups. The lecturer was able to see how conversations and thoughts were developing growing as they were populating Padlet as this developed. It also was effective when learners were engaging with the content and posting their thoughts and seeing the developing of others thoughts based on their perceptions and experiences.

As learners exchanged thoughts, ideas, best practice and information through Padlet, it was evident that the learners were better able to manipulate the concepts under discussion, it enhanced their problem solving and decision-making skills by developing knowledge around best practice.

Padlet facilitated student engagement with the ability to come and go and save work as time allowed. From a teaching perspective, it also allowed flexibility of time and space for collaborative learning and it could also be used to evaluate content and classes

In order to use technology based collaborative tools, the study gave initial thought to the instructional design and content of the module. This resulted in the module being redesigned to ensure content was engaging and enabled learners to engage with each other and enable knowledge creation and enhance cognitive performance.

1   What I did/how I did it + team involved

The study adopted Padlet as a collaborative tool and reviewed the effectiveness of the tool in terms of peer to peer learning and knowledge creation. The learners were postgraduate students who were undertaken an online work-based learning MSc programme. The study undertook desk research and also sought the opinions of the learners on the programme. Thus giving a better understanding of the effectiveness of Padlet as a tool to this particular student profile.

2.   Outputs and impact achieved

Based on Resta and Lafferriere (2007) and furthered (Beltran-Martin, 2019), the study investigated whether Padlet enabled each of the 4 areas to develop: collaboration skills and knowledge creation, engagement in knowledge creation, cognitive performance and flexibility of time and space. The study found that:

The use of Padlet enhanced online dialogue and was very effective in peer to peer learning.

Padlet was simplistic and encouraged knowledge creation. It was an effective tool when learners were working in small groups. The lecturer was able to see how conversations and thoughts were developing growing as they were populating Padlet as this developed. It also was effective when learners were engaging with the content and posting their thoughts and seeing the developing of others thoughts based on their perceptions and experiences.

As learners exchanged thoughts, ideas, best practice and information through Padlet, it was evident that the learners were better able to manipulate the concepts under discussion, it enhanced their problem solving and decision-making skills by developing knowledge around best practice

Padlet facilitated student engagement with the ability to come and go and save work as time allowed. From a teaching perspective, it also allowed flexibility of time and space for collaborative learning and it could also be used to evaluate content and classes.

In order to use technology based collaborative tools, the study gave initial thought to the instructional design and content of the module. This resulted in the module being redesigned to ensure content was engaging and enabled learners to engage with each other and enable knowledge creation and enhance cognitive performance.

3. What did I learn?

The key output from this study was in the learning both on the part of the student and the lecturer. The use of Padlet as a collaboration tool was effective when students were working individually and in a group. It facilitated student engagement and was effective tool when adopting the flipped classroom. As an educator, the key learning was around the instructional design of both the module and content in order to facilitate collaborative learning. Also learning about key pedagogies to adopt in order to achieve this.

Section B: Full Case Study

1. Context/Rationale

The use of digital technologies and technology based collaborative learning has gained importance in higher education due to the prevalence of constructivism teaching and learning approach and the emphasis on student engagement (Beltran-Martin, 2019). Online collaborative learning is seen as a learning process where students interact together to analyse a question and create shared meaning (Harasim et al., 1995). This primarily involves lecturer playing a facilitators role and students active and responsible for their own learning (Kirschner, 2001).

Although there are an increasing number of tools and online applications that support collaborative learning, the uptake of these tools is still relatively low (Beltran-Martin, 2019). However, the benefits are threefold. It is widely recognised that peer support and communication in a learning community that is consistent with the social-constructivist education paradigm is very beneficial to learners particularly when they are interacting with more advanced peers (Vvgotsky, 1978). The highest level of collaboration requires learners to engage in extensive exchanged of ideas and problems and demands more cognitive resources and inter-personal interactions (Blau and Shamir-Inbal, 2017a). The study recognised that without given due consideration to the teaching-learning processes, these tools and online applications would be of no benefit (Becker et al., 2017).

The primary objectives of this study was:

- to understand the added value of technology based collaborative learning on individual and collaborative learning (Blau et al, 2020).
- to investigate if online collaborative tools did enhance peer to peer learning, cooperation, information sharing and knowledge exchange.
- Participants were postgraduate learners who were undertaken a module on a MSc programme which foundations lay in work-based learning domain. All learners were mature students, had a middle to senior position in their organisation and due to this, had a high level of expertise and knowledge in a variety of areas.

The study utilised Padlet as a collaborative learning tool. Padlet is versatile and is capable of supporting a number of pedagogical strategies. Padlet does not require special training (Weller, 2013).

The study utilised the flipped classroom, knowledge and information sharing and collaboration. According to Resta and Laferriere, (2007) and furthered by Beltran-Martin., (2019), there are four instructional motives that justify the use of technology as means of collaborative learning (see figure 1). This study used this as a guide when designing the tasks, instructional design and thus the impact on collaboration and peer to peer learning,

*Based it on Resta and Lafferriere (2007) and furthered (*Beltran-Martin*, 2019).*

2. Details of Outputs and Impact

Figure 1: Instructional motives for the use of technology in collaborative learning.
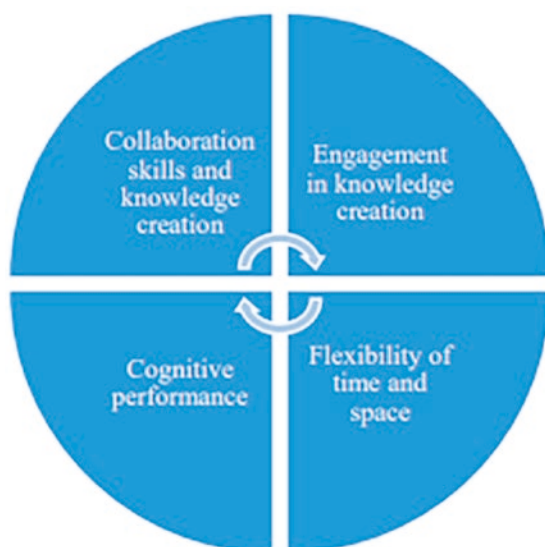
Source: own elaboration based on Resta and Laferrière (2007).

Instructional design

Output

In order to use technology based collaborative tools, the study gave initial thought to the instructional design and content of the module. It was a postgraduate module on a primarily work based programme. Due to the nature of the learner, they were mature learners, middle to senior roles within their organisation and had a wealth of experience and knowledge, the online content and structure had to support collaborative learning. It had to encourage application, analysis and synthesis of the course material. The virtual classroom had to ensure that it also supported this pedagogy. The lecturer undertook a course in Universal Design for Learning and read extensively around the area of instructional design and collaborative learning.

Impact

This resulted in the module being redesigned to ensure content was engaging and enabled learners to engage with each other and enable knowledge creation and enhance cognitive performance. This is time consuming but a task that is very beneficial in the long term.

Technology Collaborative Tools; Padlet

Output

As the module was of postgraduate level, the study gave much thought on what technology collaborative tool to use. After much research and based on the licenses that were held by the third level institution, Padlet was the tool of choice. Padlet is recognised as an effective tool to improve collaborative learning. It easy to use, requires limited training to use, multimedia, instant collaboration and mobile (Zhi and Su., 2015).

Did Padlet enhance peer to peer learning, cooperation, information sharing and knowledge exchange.

Output

Based on Resta and Lafferriere (2007) and furthered (Beltran-Martin, 2019), the study investigated whether Padlet enabled each of the 4 areas to develop: collaboration skills and knowledge creation, engagement in knowledge creation, cognitive performance and flexibility of time and space.

Figure 1: Instructional motives for the use of technology in collaborative learning.
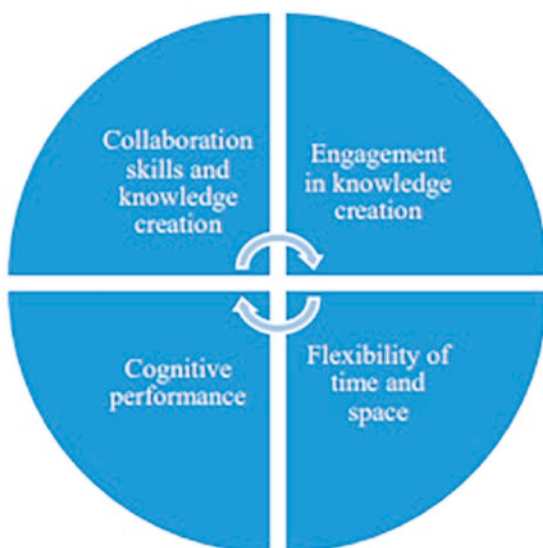
Source: own elaboration based on Resta and Laferrière (2007).

The study found the following:

Collaboration skills and knowledge creation; The learners were tasked with using Padlet both asynchronous and synchronous. The use of Padlet enhanced online dialogue and was very effective in peer to peer learning. This was crucial given the various expert knowledge that each of the learners possessed. As the weeks passed and the leaners became more familiar with the content and each other, this greatly enhanced further. When reflecting, the learners felt that is was a very effective tool for peer to peer learning.

Engagement in knowledge creation; Padlet was simplistic and encouraged knowledge creation. It was an effective tool when learners were working in small groups. The lecturer was able to see how conversations and thoughts were developing growing as they were populating Padlet as this developed. It also was effective when learners were engaging with the content and posting their thoughts and seeing the developing of others thoughts based on their perceptions and experiences.

Cognitive performance: As learners exchanged thoughts, ideas, best practice and information through Padlet, it was evident that the learners were better able to manipulate the concepts under discussion, it enhanced their problem solving and decision-making skills by developing knowledge around best practice. Many had encountered similar situations and were now better informed as how to overcome them. Arguments lead to reasoning and deeper understanding and justification of decisions that were made. They Lead to better problem solving and again peer to peer learning to help in decision making.

Flexibility of time and space: The ability to complete a Padlet at anytime was vital when choosing a tool. All learners were time poor due to their work commitments. Padlet facilitated student engagement with the ability to come and go and save work as time allowed. From a teaching perspective, it also allowed flexibility of time and space for collaborative learning and it could also be used to evaluate content and classes.

Impact

This led to a number of positive outcomes. Padlet as a means of peer to peer learning was very effective. This is most effective when the leaners are encouraged to share their thoughts and the group respects their opinions. It enhanced cognitive ability by developing a better understanding around why people perceive knowledge in such a way, best practice around problem solving.

It was a very effective tool when adopting the flipped classroom. This enabled the lecturer to ensure that the learner did possess a deep understanding of the concepts being discussed. It was an effective means of students demonstrating how various concepts worked in the real work scenario. This was very effective at bringing words to life. Due to the nature of the learner, it gave them a voice to share their experience and enabled the lecturer to enhance knowledge exchange by sharing the vast amount of experience and knowledge that the cohort possessed. Overall it promoted learners engagement and partnership in knowledge exchange and development.

Conclusion

The study sought to understand the added value of technology based collaborative learning on individual and collaborative learning (Blau et al, 2020). The study found that the use of Padlet was an effective tool to use to encourage peer to peer learning, cooperation, information sharing and knowledge exchange.

3. Key Learnings

The key learnings from this study are:

Initially, an educator must give consideration as to how you design your module both in terms of instructional design and also to ensure that the content is engaging. This is important before you consider how you are going to embed a technology enhanced collaborative tool in your teaching process.

The study found that Padlet was an effective collaborative tool to utilise when engaging with a mature cohort undertaking a level 9. The participants in this study were middle management in full time employment. They had a wealth of knowledge and skills to share. Padlet was an effective tool to enable the sharing of information, knowledge exchange and peer to peer learning.

References

- Becker, S.A, Cummins, M., Davis, A., Freeman, A, C and Ananthanarayanan, V., (2017) NMC horizon report; 2017 higher education edition, *The New Media*, Consortium, 1-60.

- Beltran-Martin, I (2019) Using Padlet for collaborative learning, *5th International Conference on Higher Education Advances*, University of Politecnica de Valencia.

- Blau, L., Shamir-Inbal, T. & Avidel, O., (2020) How does the pedagogical design of a technology-enhanced collaborative academic course promote digital literacies, self-regulation, and perceived learning of students?, The Internet and Higher Education.

- Blau, L & Shamir-Inbal, T. (2017a) Digital competencies and long-term ICT integration in school culture, The perspective of elementary school leaders, *Education and Information Technologies*, 22 (3), 769-787.

- Harasim, L.M., Hiltz, S.R., Teles, L. and Turoff, M. (1995). *Learning networks: A field guide to teaching and learning online.* Cambridge, MA: MIT Press.

- Kirschner, P.A. (2001). Using integrated electronic environments for collaborative teaching/learning. *Learning and Instruction*, 10, 1-9.

- Resta, P. and Laferrière, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, 19, 65-83.

- Vygotsky, L. (1978) Interaction between learning and development, *Readings on the development of children*, 23 (3), 34-41.

- Weller, A. (2013). Learning in science education. *Research in Teacher Education*, 3, 40-46.

- Zhi, Q., & Su, M. (2015, October). Enhance Collaborative Learning by Visualizing Process of Knowledge Building with Padlet. *In Educational Innovation through Technology* (EITT), 2015 International Conference of (pp. 221-225). IEEE.

Submitted by: Dr Isobel Cunningham

Fostering Transformational Learning in Higher Education: The Importance of Identifying Threshold Concepts and Troublesome Knowledge

Project Team/Author	Dr Trevor Clohessy and Dr Marie English
Name of Dept. and School/ Faculty and Institute	School of Business, Department of Enterprise and Technology, Galway-Mayo Institute of Technology
Keywords	*Learning, transformational learning, threshold concepts, troublesome knowledge, information systems*

Section A: Case Study Summary

Background to the Study

Students entering third-level higher education undergo a transformational learning journey. Learning in this context is defined as the need to understand key concepts (threshold) to engage with the academic content of the course. This learning journey is moulded by their experiences not only within the context of the third-level institution but is also moulded by their experiences in work placement. Threshold concepts and the inherent troublesome knowledge associated with them represent significant barriers to transformational learning.

This research uses a case study approach in the Galway-Mayo Institute of Technology to explore final year business information systems (BIS) undergraduate students' understanding of information systems. This research objective was developed following a comprehensive review of the literature which determined that there was a research gap in understanding how BIS students encountered and overcame threshold concepts and troublesome knowledge when learning about information systems. The research objective was investigated using several research questions which were explored using a mixed-method approach combining lecturer interviews, a student questionnaire, and a student focus group.

The study adopts a social constructivist research approach encompassing four theories of learning which act as theoretical lenses: threshold concepts, troublesome knowledge, socio-cultural development, and communities of practice. The findings reveal that the students find the theoretical, technical aspects, and the terminology used within the discipline relating to learning about information systems challenging. Specific threshold concepts and troublesome knowledge associated with these concepts are identified under these several headings. Additionally, it emerged that the students use specific coping mechanisms to assist them in their transformational journey to understand information systems which include peer learning, independent learning, practical application, lecturer support, and lecture experience, and work placement support and mentorship. Finally, the results suggest that information systems, as social systems, constitute a threshold concept whereby the students struggle with the following troublesome knowledge considerations when learning about social systems: communication, ethics, and social system versus technical system differentiation.

1. What I did/how I did it + team involved

This case study addresses an established educational framework that is emerging in the business information systems research field that asserts threshold concepts and the troublesome knowledge embedded within these concepts as mediators of learning outcomes. Compared to other disciplines, there has been relatively little published in the education literature on information systems threshold concepts and troublesome knowledge, despite calls from authors for more research into this area (see Cope and Staehr, 2008). To advance further exploration and debate in the threshold concepts field and provide potential results to inform teaching practice this study provided insights into business information students' grasp of the threshold concept of

information systems. Consequently, the primary objective of this case study was to identify and explore final year business information systems undergraduate students understanding of information systems using four main parameters: threshold concepts, troublesome knowledge, socio-cultural development, and communities of practice.

This study investigated the following several research questions(RQ):

RQ1: What threshold concepts and troublesome knowledge do business information systems undergraduate students encounter when learning about information systems?

RQ2: How do business information systems undergraduate students manage the liminal space when they encounter threshold concepts and troublesome knowledge?

RQ3: Do information systems, as social systems, constitute a threshold concept for business information systems undergraduate students?

The case study setting for this research was the Department of Enterprise and Technology contained within the Business Department of the Galway-Mayo Institute of Technology, Galway, Ireland and focused on the Bachelor of Science in Business Information Systems. The case study adopted a three phase approach: phase 1 consisted of interviews with lecturers, phase 2 consisted of a student questionnaire, and phase 3 consisted of a student focus group.

2. Outputs and impact achieved

The findings reveal that the students find the theoretical, technical aspects, and the terminology used within the discipline relating to learning about information systems challenging. Specific threshold concepts and troublesome knowledge associated with these concepts are identified under these several headings. Additionally, it emerged that the students use specific coping mechanisms to assist them in their transformational journey to understand information systems which include peer learning, independent learning, practical application, lecturer support, and lecture experience, and work placement support and mentorship.

3. What did I learn?

For students to traverse the liminal space successfully and repeatedly when encountering threshold concepts and troublesome knowledge throughout their professional and academic learning that a **structured approach is taken to curriculum development** that embodies:

- consistent use of discipline and professional language;
- practice and repetition of threshold concepts and troublesome knowledge;
- exposure to environments where the threshold concepts and troublesome knowledge can be teased out and questioned;
- exposure and refinement of skills within a community of practice.

Section B: Full Case Study

1. Context/Rationale

This case study addresses an established educational framework that is emerging in the business information systems research field that asserts threshold concepts and the troublesome knowledge embedded within these concepts as mediators of learning outcomes. In basic terms a threshold concept is information regarding a subject matter in higher education that once understood by the students transform the way they experience or understand the subject matter. They are concepts which define the discipline and help students define themselves within that discipline. For example, a student may not be able to get their head around algebra unless they first understand that the letters can stand for numbers. Without this fundamental understanding the student's learning maybe hindered. From an educator/lecturer perspective the process of becoming an expert in a discipline embodies a transformation on how we see the world and how we approach the teaching of subjects. Understanding the changes

that we have been through informs the manner with which we teach our students. Educator's ability to assist students with comprehending threshold concepts and troublesome knowledge forms a significant role when attempting to initiate them into our field of expertise and help them to connect with their learning. Ultimately threshold concepts are passports which enable students to access a realm of knowledge that they did not know they could access.

Compared to other disciplines, there has been relatively little published in the education literature on information systems threshold concepts and troublesome knowledge, despite calls from authors for more research into this area (see Cope and Staehr, 2008). To advance further exploration and debate in the threshold concepts field and provide potential results to inform teaching practice this study provided insights into business information students' grasp of the threshold concept of information systems. Consequently, the primary objective of this case study was to identify and explore final year business information systems undergraduate students understanding of information systems using four main parameters: threshold concepts, troublesome knowledge, socio-cultural development, and communities of practice.

This study investigated the following several research questions(RQ):

RQ1: What threshold concepts and troublesome knowledge do business information systems undergraduate students encounter when learning about information systems?

RQ2: How do business information systems undergraduate students manage the liminal space when they encounter threshold concepts and troublesome knowledge?

RQ3 Do information systems, as social systems, constitute a threshold concept for business information systems undergraduate students?

The case study setting for this research was the Department of Enterprise and Technology contained within the Business Department of the Galway-Mayo Institute of Technology, Galway, Ireland and focused on the Bachelor of Science in Business Information Systems. The case study adopted a three phase approach. Table 1 provides an overview of the number of participants who completed each of the research instruments, the timeline of when they completed them and the previous research on which they several research instruments are based.

Table 1: Case Study Research Strategy

	Phase 1	Phase 2	Phase 3
Research Instrument	Interview	Questionnaire	Focus Group
Cohort	Lecturers	Students	Students
Number of participants	8	20	8
Time Frame	November 2020	December 2020	January 2021

2. Details of Outputs and Impact

Framework used: Figure 1 highlights the main findings in relation to the several research questions posed for this case study. These findings are embedded with in a relational view of threshold concepts framework proposed by Land and Meyer, (2010). In this framework a student's journey towards the acquisition of a threshold concept begins with an encounter with a form of troublesome knowledge in the preliminal state. This troublesome knowledge serves as an instigative or provocative feature which provokes a state of liminality. Within the liminal state mode "an integration of new knowledge occurs which requires a reconfiguring of the student's prior conceptual schema and a letting go or discarding of any earlier conceptual stance"

(Land and Meyer, 2010, p.11). This integration/reconfiguration results in an ontological and epistemological shift which is categorised as a reconstitutive feature of the threshold concept. The instigative and reconstitutive features enable the student to cross a conceptual boundary into a postliminal mode and bring about the required new understanding. This postliminal phase manifests a process where the learning and student are both transformed. This change which is marked by a change of discourse is irreversible. These features of the postliminal phase are categorised as consequential features of a threshold concept. This case study focused on both the preliminal instigative mode and liminal reconstitutive mode features in the context of the teaching and learning of information systems. Ultimately, studying these two modes will identify how BIS students arrive at the postliminal consequential mode.

Figure 1: Case Study Research Findings (Adapted from Land and Meyer, 2010)
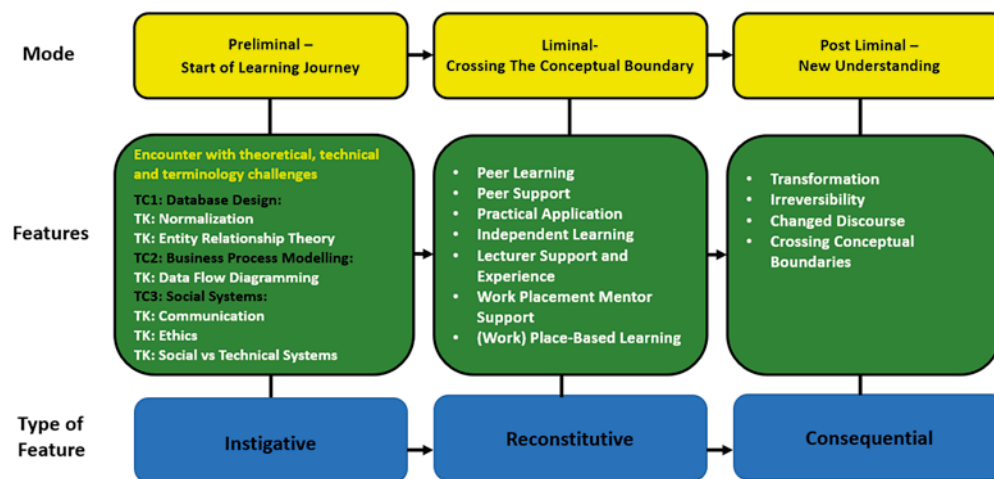
Findings

Preliminal Phase: In terms of the findings in relation to the preliminal mode, several threshold concepts were identified which included database design, business process modelling, and social systems. Within each of these threshold concepts, the study identified specific troublesome knowledge relating to each of these several threshold concepts. To recap, the preliminal mode represents a student's first encounter with a threshold concept and the troublesome knowledge associated with it (Land and Meyer, 2010). For example, this study has demonstrated that when Business Information Systems (BIS) students first encounter the threshold concept of database design, the troublesome knowledge of normalization and entity relationship theory embedded within the threshold concept "serves here as an instigative or provocative feature which unsettles prior understanding rendering it fluid and provoking a state of liminality" (Land and Meyer, 2010, pg.,9). This process of provoking a state of liminality also occurs for students when encountering the threshold concepts of business process modelling and social systems.

Liminal Phase: Next, the learner enters what is known as a liminal mode where the student uses a multitude of learning supports to integrate new knowledge with existing knowledge. In this process a learner's previous understanding of a concept(s) may be discarded. In the context of this study, the data analysis revealed how threshold concepts which the students encountered in the preliminal mode fell under the umbrella of **theoretical aspects, technical aspects, and the terminology** used within the discipline relating to learning about information systems. From a theoretical and technical aspects point of view, peer learning and support (e.g., teams-based continuous assessments), **practical application** (e.g., project that mirrors real life industry projects), **independent self-learning** (e.g., reading supplementary materials) and **lecturer support and experience** (e.g., real time feedback, more experienced other) play crucial roles in enabling students to overcome the troublesome knowledge associated with threshold concepts. These findings are significant as there is a dearth of extant research which has focused on how BIS students cope with threshold concepts and troublesome knowledge and students' approaches to learning plays a significant role in their ability to traverse the liminal space (Perkins, 2006). Additionally, some students "will resort to rote memory and routine

procedures as a way of coping. They will try to learn enough about ideas, explanations, and alternative perspectives to pass the test without developing and real insider feel (Perkins, 2006, pg. 37). This "real insider feel" refers to a student's ability to operate within their community of practice. This segways nicely into the zone of proximal development (ZPD) perspective (Vygotsky, 1978), in which students are guided through their learning with the assistance of a more **experienced other**, it is also important for educators to consider the two aspects of learner development associated with ZPD: the natural line (e.g., intelligence quotient) and the schooled line of development (e.g., what is learned in the community or from an expert other). For example, with regards to the former natural line, it would be important for a lecturer to teach the theoretical and technical aspects of information systems in a way that would enable the BIS students to traverse the liminal space. This would involve the students transforming from novice to expert with the assistance of the experienced lecturer. However, the teaching must be appropriate to the student's innate level of intelligence. In other words, a lecturer would not teach 4th year theoretical and technical concepts to 1st year students. Thus, there must be a scaffolded approach to the student's learning.

Impact

For students to traverse the liminal space successfully and repeatedly when encountering threshold concepts and troublesome knowledge throughout their professional and academic learning that a **structured approach is taken to curriculum development** that embodies:

- consistent use of discipline and professional language;
- practice and repetition of threshold concepts and troublesome knowledge;
- exposure to environments where the threshold concepts and troublesome knowledge can be teased out and questioned;
- exposure and refinement of skills within a community of practice.

3. Key Learnings

One of the main findings of the case study revealed that the **terminology** (e.g., language) used within the discipline is important. This points towards the development of a lexicon of terms which are troublesome for business information systems (BIS) students. This lexicon will also be beneficial for lecturers in that it will educate them and remind them that every subject within the BIS discipline has its own language and discourse. This resonates strongly with the work of Vygotsky (1994) who states that "thought development is determined by language (e.g., the linguistic tools of thought and the sociocultural experience of the [learner]." For instance, words and terms that are introduced by the lecturer in class (e.g., outer speech) are then used and practiced by the BIS students and becomes internalized (e.g., internal speech) which helps them to shape their understanding of a threshold concept and troublesome knowledge. **Language is key to this transformation** of outer speech to internal speech (Vygotsky, 1994). This process also holds true for BIS students are on work placements where their manager and work colleagues now become the vehicles for outer speech. Ultimately, the findings from this research will provide insights in how to inform better curriculum and assessment (re)design practices, from the micro (module) to meso (programme) to macro levels (the wider discipline in the workplace). The findings will also be presented both internally and external to educators to enhance knowledge transfer.

References

- Ashwin, P., Boud, D., Calkins, S., Coate, K., Hallett, F., Light, G., … & McCune, V. (2020). *Reflective teaching in higher education*. Bloomsbury Academic.

- Baillie, C., Bowden, J.A. and Meyer, J.H. (2013), Threshold capabilities: threshold concepts and knowledge capability linked through variation theory, Higher Education, 65(2), 227-246.

- Clohessy, T. (2021). Bridging the Knowledge Gaps in Information Systems: A Threshold Concepts and Troublesome Knowledge Perspective, A Teaching in Education Master's Thesis. Available Online: https://research.thea.ie/handle/20.500.12065/3608

- Cousin, G. (2006). An Introduction to Threshold Concepts, Planet, no. *17*(4), 4-5.

- Cope, C., & Staehr, L. (2008). Improving student learning about a threshold concept in the IS discipline. *Informing Science, 11*, 350-364.

- Land, R., Cousin, G., Meyer, J. H., & Davies, P. (2005). Threshold concepts and troublesome knowledge: implications for course design and evaluation. *Improving student learning diversity and inclusivity, 4*, 53-64.

- Land, R., & Meyer, J. H. (2010). Threshold concepts and troublesome knowledge (5): Dynamics of assessment. In *Threshold concepts and transformational learning* (61-79). Brill Sense.

- Meyer, J. H. F. & Land R. (2005). Threshold concepts and troublesome knowledge: Epistemological considerations and a conceptual framework for teaching and learning. Higher Education, 49(3), 373-388.

- Perkins, D. (2006). Constructivism and troublesome knowledge. In *Overcoming barriers to student understanding* (pp. 57-71). Routledge.

- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard university press.

- Vygotsky, L. S. (1994). Extracts from thought and language and mind in society. *Language, literacy and learning in educational practice. Clevedon: Multilingual Matters*, 45-58.

Submitted by: Dr Trevor Clohessy

Scaffolding Learners in an Online Environment

Author	Marie Finnegan
Name of Dept. and School/ Faculty and Institute	Department of Enterprise and Technology, School of Business, GMIT
Keywords	*Scaffolding, online learning, social interaction, active learning*

Section A: Case Study Summary

1. What I did/how I did it

I embedded scaffolding in a fully online module for first years – Microeconomics. This was taught fully face to face pre COVID19. In order to embed scaffolding into the module, I followed Jumaat et al (2014) who outlined four progressive levels of scaffolding in an online environment. These included procedural, conceptual, strategic and metacognitive scaffolding. Procedural scaffolding helps students to use appropriate tools and resources effectively. Conceptual scaffolding helps students to decide what to consider in learning and guide them to key concepts. Strategic scaffolding helps students to find alternative strategies and methods to solve complex problems. Metacognitive scaffolding prompts students to think about what they are learning throughout the process and assists students reflecting on what they have learned (self-assessment) (Jumaat et al, 2014).

2. Outputs and Impact

I matched an online activity to embed each level of scaffolding in the online environment and these can be seen in Table 1. These outputs – along with each of their impacts – are described in more detail in Section B.

Table 1: Scaffolding in an online environment

Type	Define	Online Activity
Conceptual scaffolding	Helps students decide what to consider in learning and guide them to key concepts	Weekly schedule published every Monday morning Rubrics for assessment Use conditionality: Combining activities into sequences, where results feed later activities
Procedural scaffolding	Helps students use appropriate tools and resuorces effectively	Clear signposting in Moodle page: Course structure four quadrants per topic
Strategic scaffolding	Helps students find alternative strategies and methods to solve complex problems	Break out rooms and problem solvingSuggested solutions posted to Padlet and discussed as collaborative work
Metacognitive scaffolding	Prompts students to think about what they are learning throughout the process and assists stuents reflecting on what they have learnt (self-assessment)	Embedded quizzes in PPTs and videos (MS forms and H5P) Facilitate guided active forums where students construct knowledge

Source: Adapted from Jumaat et al, 2014.

3. What did I learn?

I found that the online tools I used to embed procedural, conceptual, strategic and metacognitive scaffolding also had a number of positive spillovers in terms of social interaction and active learning.

Social interaction

Social interaction is central to learning (Dewey, 1938, Vygotsky, 1978). Social interaction was explicitly enhanced via the scaffolding tools employed in the delivery of this fully online module. For example, the guided forums allow students to post and comment on each other's posts. The breakout rooms and debriefing with the whole class where students shared their solutions from the breakout rooms by talking through their padlet posts helped to create a community of leaning.

Active learning

Active learning is central to supporting student learning (McLeod, 2015, Bruner, 1978). Some of the scaffolding tools had positive spillovers in terms of active learning. The active forums and breakout rooms ensured active learning. Videos/Screencasts (including interactive quizzes at key points in the video or ppt), H5P Quiz-Activity with quizzes embedded in YouTube videos, MCQ practice and graded quizzes and the use of quizzes created via MS forms in live sessions to check understanding also supported active learning. The live lectures also facilitated active learning.

Section B: Full Case study

1. Context/Rationale

Context

In March 2020, Ireland was suddenly and severely affected by the onset of COVID-19. Irish HEIs instructed to close from March 13th 2020 and advised to, where possible, teach online. The School of Business in GMIT went fully online academic year 2020-21. I had done some research on the student experience of delivery online after March 2020 and this showed that students that students were struggling with the online environment. One student commented, it is 'difficult to follow everything online. I was not able to follow lectures because there is no notification via email or application to inform me about adding new materials. FEELING LOST' (Finnegan, 2021). I decided to revamp the module teaching and assessment for all my online modules to scaffold students in their online learning to enhance their learning experience online.

Aim

Show how scaffolding is embedded in the digital teaching and learning strategy employed in the delivery of a fully online first year module – Microeconomics

Literature

Scaffolding is a concept this is also closely aligned with social interaction in the theory of social constructivism. The concept is most often associated with Bruner (1978) who stressed the 'inherently social nature' of learning and considered the role of scaffolding in the context of a mother teaching a child language.

> Scaffolding…reduces the degrees of freedom with which the child has to cope, concentrates his attention into a manageable domain, and provides models of the expected dialogue from which he can extract selectively what he needs for fulfilling his role in discourse" (Bruner, 1978, p.244).

In terms of pedagogy, scaffolding occurs when the lecturer provides student assistance to the extent that the scaffolded individual can do the task in hand by himself (Amerian et al, 2014).

The literature considers that scaffolding is key to delivering a module online. In online learning, Garrison (2011) shows that effective learning support is important for providing scaffolding in an online learning environment. Reingold, Rimor and Kala (2008) provide evidence to support the relationship between instructor's scaffolding (especially feedback and support) and students' reflective and metacognitive processes in an online environment.

I used the 4 level framework proposed by Jumaat et al (2014) to embed scaffolding into this module. Table 1 outlines the four progressive levels and matched online activities, and these will be discussed in the next section.

Table 1: Scaffolding in an online environment

Type	Define	Online Activity
Conceptual scaffolding	Helps students decide what to consider in learning and guide them to key concepts	Weekly schedule published every Monday morning Rubrics for assessment Use conditionality: Combining activities into sequences, where results feed later activities
Procedural scaffolding	Helps students use appropriate tools and resuorces effectively	Clear signposting in Moodle page: Course structure four quadrants per topic
Strategic scaffolding	Helps students find alternative strategies and methods to solve complex problems	Break out rooms and problem solvingSuggested solutions posted to Padlet and discussed as collaborative work
Metacognitive scaffolding	Prompts students to think about what they are learning throughout the process and assists stuents reflecting on what they have learnt (self-assessment)	Embedded quizzes in PPTs and videos (MS forms and H5P) Facilitate guided active forums where students construct knowledge

Source: Adapted from Jumaat et al, 2014.

2. Details of Outputs and Impact

Outputs and Impact

In order to embed scaffolding into the module, I followed Jumaat et al (2014) who outlined four progressive levels of scaffolding in an online environment. I matched an online activity to embed each level of scaffolding in the online environment and these can be seen in Table 1. This section documents some of the key outputs and impact of the scaffolding approach employed. It considers procedural, conceptual, strategic and metacognitive scaffolding.

Procedural scaffolding

Procedural scaffolding helps students to use appropriate tools and resources effectively (Jumaat et al, 2014). This was embedded mainly through the Moodle page organisation which is shown in Figure 1.

Each topic was divided into four quadrants with picture icons. These were videos, readings, practice and graded work. Typically, the practice section would include a practice quiz, a tutorial sheet, a space for collaborative work and a live tutorial schedule. An end of term evaluation of the module was posted to the Moodle page at the end of the term. 46 out of 80 students responded to the end of term evaluation, a 58 percent response rate. Figure 2 shows that 85% of students who responded to the end of term evaluation found this Moodle page organisation useful or very useful.

Figure 1
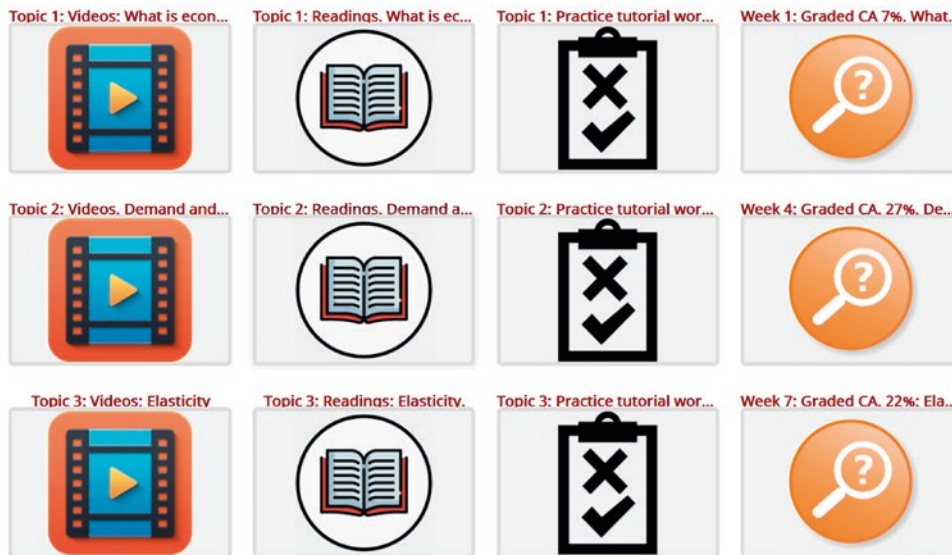
Figure 2: Feedback: 46 respondents out of 80 students. 85% very useful or useful

1. How did you find the organising of the Moodle page in 4 quadrants for each topic: Videos/Readings/Practice/Graded CA

More Details

● Very useful	28
● Useful	11
● Somewhat useful	2
● Not useful	0
● Other	1

Conceptual scaffolding

Conceptual scaffolding helps students to decide what to consider in learning and guide them to key concepts (Jummat et al, 2014). This was embedded in a number of ways. There was a weekly schedule published each Monday morning outlining the tasks and resources for that week's live class. An example of this can be seen in Appendix 1. Figure 3 shows that 91% of respondents found this very or somewhat useful.

Figure 3

2. How did you find the structure of delivery? e.g: Lectures released topic by topic and work outlined for live tutorials described on Monday

More Details

🔵 Very useful		42
🟠 Somewhat useful		4
🟢 Neutral		0
🔴 Not useful		0
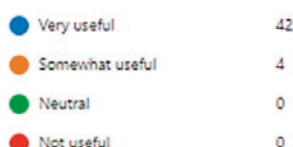
Rubrics were used for assessments so that students knew the key concepts they were being examined on. They were also provided with a video on how to approach the assessment. An example of a rubric can be seen in Figure 4.

Figure 4: An example of a rubric

Individual mark: Labelling	X and Y axis incorrectly labelled 0 points	X and Y axis correctly labelled 1 points	
Individual mark: Demand and Supply curves	Demand curve and supply curve not correctly drawn 0 points	Demand curve correctly drawn 1 points	Demand curve and supply curve correctly drawn 2 points
Individual mark: Shift or movement	Incorrect curve shifts 0 points	Correct curve shifts 2 points	
Individual mark: New equilibrium	New equilibrium incorrectly shown 0 points	New equilibrium correctly shown 2 points	
Individual mark: Description of change	Unclear description of change 0 points	Clear description of change 1 points	Clear description of the change and new equilibrium 3 points
Group mark: Overall consistency of document in terms of diagrams and describtions	No consistency 0 points	Some consistency 2 points	Good consistency 3 points

Finally, conditionality was used in Moodle where activities were combined into sequences, where results fed later activities.

Strategic scaffolding

Strategic scaffolding helps students to find alternative strategies and methods to solve complex problems. I sought to embed this using breakout rooms. Breakout rooms were used in MS teams for students to solve problems together, students post solutions taking a picture with MS lens of graph or mathematical solution and upload it to Padlet, students are brought back to the main room to discuss together and the padlet creation is saved as a pdf and posted to Moodle. Figure 5 shows an example of a padlet that students produced during their breakout sessions. Figure 6 shows some feedback on the breakout rooms.

Figure 5: Padlet example from breakout rooms

Figure 6: Feedback on breakout rooms:

Btw when it comes to the way you structure your module I have never been a student with a lecturer who gives such clear, direct instructions with easy-to-understand concepts of the module, I would say that the way you structure moodle is by far the most useful and informative designs and the break out rooms are a fantastic contribution to helping us to get to know each other.

Sincerely
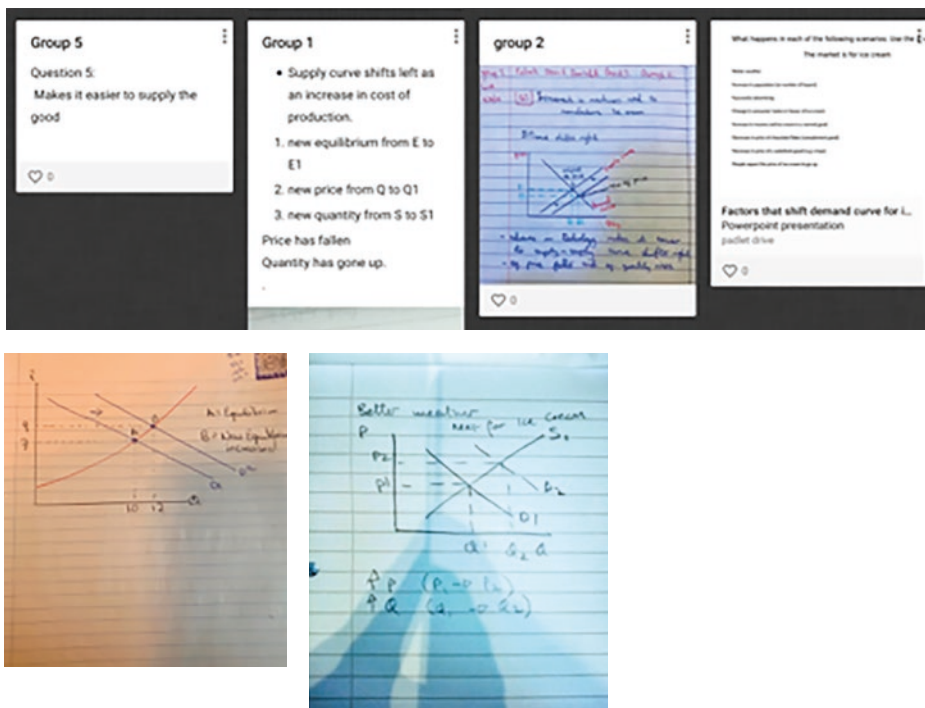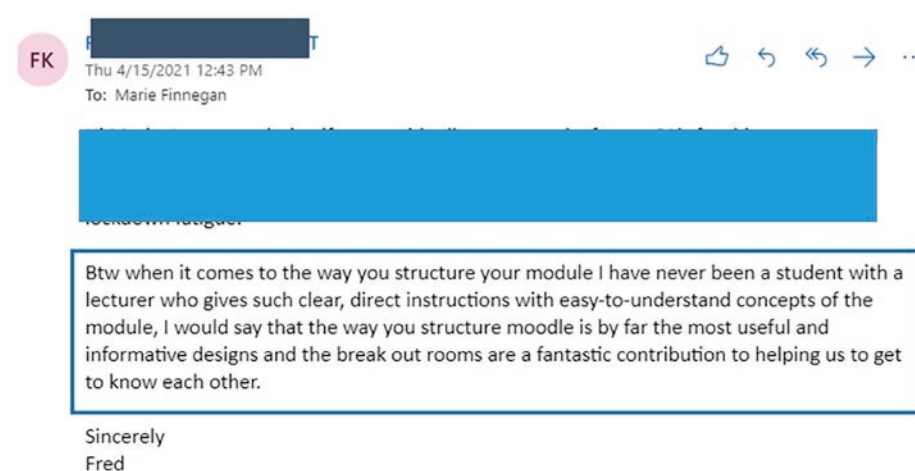Fred

Metacognitive scaffolding

Metacognitive scaffolding prompts students to think about what they are learning throughout the process and assists students reflecting on what they have learnt (self-assessment) (Jumaat et al, 2014). This was embedded using two tools: Quizzes and Forums. In terms of quizzes, there were embedded quizzes in ppts and videos (MS forms and H5P) at key points in the lecture to check understanding. Figure 8 shows that 87% of respondents found the embedded quizzes in videos and ppts to be extremely or somewhat useful. In addition, there were MCQ practice and graded quizzes, and quizzes constructed from MS forms in live sessions to check understanding. Facilitate guided active forums were used where students construct knowledge with one another by where students posting on academic content and commenting on other students' posts. Figure 7 shows an example of the guided forum. Figure 8 shows feedback on the active forums.

Figure 7: Example of a guided forum

Elasticity. Find it. Post it. Discuss it. 2% By Friday 20th November.

Task:

Post a resource that explains the concept of elasticity or an article on a real world application of elasticity helping to inform price decisions. Comment on why you found this useful and comment on another student's example (e.g. what did you learn).

Add a new discussion topic   Grade users

Figure 8: Feedback on forums. 78% of respondents found the forums to be extremely or somewhat useful

3. How did you find using the forums as a resource for this module?
More Details

Extremely useful	16
Somewhat useful	20
Neutral	6
Not useful	3

In addition, 87% found the embedded quizzes in videos and ppts to be extremely or somewhat useful.

4. How did you find the embedded quizzes in the videos/youtube video and PPT slides?
More Details

Extremely useful	28
Somewhat useful	12
Neutral	4
Not useful	2

3. Key Learnings

I found that the online tools I used to embed procedural, conceptual, strategic and metacognitive scaffolding also had a number of positive spillovers in terms of social interaction and active learning.

Social interaction

Social interaction is central to learning (Dewey, 1938, Vygotsky, 1978). Hernández-Sellés et al. (2019) suggests that online social interaction does not happen spontaneously and that when social interaction is taken for granted, it is most likely that groups socialise at a very low level.

Social interaction was explicitly enhanced via the scaffolding tools employed in the delivery of this fully online module. For example, the guided forums allow students to post and comment on each other's posts. The breakout rooms and debriefing with the whole class where students shared their solutions from the breakout rooms helped to create a community of leaning. Social interaction was also facilitated providing feedback through the rubric on their assignment.

Active learning

Active learning is central to supporting student learning. According to Piaget, learning requires an active learner, not a passive one, because problem-solving skills cannot be taught, they must be discovered (McLeod, 2015, Section 6). Bruner (1978, p.243) rejected the notion that students are passive rote learners of knowledge and display success by "by repeating what has been learned" but that learners should be active constructive learners.

Some of the scaffolding tools had positive spillovers in terms of active learning. The active forums and breakout rooms ensured active learning. Videos (including interactive quizzes at key points in the video or ppt), MCQ practice and graded quizzes engaged learners in active learning. In addition, the use of quizzes created via MS forms in live sessions to check understanding supported active learning.

References: Embed link to https://sway.office.com/WowweqKJwbyRzzhc?play

Appendix: Embed link to https://sway.office.com/veX0G4stvNGDArLz?play

Submitted by: Marie Finnegan

Engaging and Assessing Students Online using the ABC Learning Design Framework

Author	Lucia Cloonan
Name of Dept. and School/ Faculty and Institute	School of Business, GMIT
Keywords	*Assessment, ABC learning design, e-tivities, engagement, learning activities*

Section A: Case Study Summary

1. What I did/how I did it + team involved

This initiative was part of a re-design process for the learning and assessment methods of the module "Brand Management" in the School of Business at GMIT. It is a 5-credit module, NFQ level 8 on the BBS in Marketing and Sales, and it moved from face-to-face delivery to online delivery in September 2020 as a response to Covid-19 lockdown. The re-design process was based on the ABC learning design method (Laurillard, 2012, Young and Perović, 2015). The underlying pedagogy of the ABC learning design framework is learning types. The six learning types are acquisition, investigation, practice, discussion, collaboration and production.

2. Outputs and impact achieved

Learning through acquisition was achieved through the use of short guides, watching videos, reading documents, articles, websites, books, demonstrations and apps for engagement. Learning through investigation was achieved through analysis of information from articles, books, videos, case studies, web search and brand audit. Formative assessment included e-tivities on a weekly basis. Learning through discussion was achieved in synchronous and asynchronous formats through shared research findings, shared project output and project peer review. Learning through practice was achieved through use of H5p activities, brand audit and presentations. Learning through collaboration was achieved through discussion, project output and peer review. Learning through production was achieved through interviews with consumers, short report submissions and video creation.

3. What I learned

Students are more likely to engage when concepts are presented in multiple formats.

It is important to allocate sufficient time at the beginning of the semester to show students their online learning environment, how it operates, and how it links to learning outcomes and assessment.

Regular synchronous sessions are helpful in encouraging contributions, discussion and feedback. In the synchronous sessions, students preferred engagement tools which were pictorial (e.g. Menti word cloud) and those that could be accessed quickly without having to leave the teams environment (e.g. quick polls via forms). Students also mentioned that they were more likely to engage when the use of tools allowed anonymity.

Having weekly e-tivities involving research, discussion, short report uploads and H5p helped students stay focused and reflect. They liked being assessed on a weekly basis for small percentages rather than once, later in the semester for a higher percentage.

The teacher's role is crucial in setting up appropriate e-tivities which meet the learning outcomes of the module and providing enough scaffolding for the students to navigate their way through them. The majority of students (82%) highlighted the importance of the weekly expectations sheet which was issued each Monday as they felt it provided a roadmap for the week ahead.

Students are more likely to engage when they see others engaging. Asking students in advance if they would like to share their work with the class in the synchronous session gave them confidence in presenting their views and encouraged others to participate.

Digital badges motivate students. There was a high level of motivation to achieve the two digital badges on the module even though there were no assessment marks associated with them. Students also found them beneficial for their LinkedIn profiles.

Overall, the learning types identified in the ABC model have been helpful in the re-design of the Brand Management module, particularly for moving learning activities and assessment online.

Section B: Full Case Study

1. Context/Rationale

This initiative was part of a re-design process for the learning and assessment methods of the module "Brand Management" in the School of Business at GMIT. It is a 5-credit module, NFQ level 8 on the BBS in Marketing and Sales, and it moved from face-to-face delivery to online delivery in September 2020 as a response to Covid-19 lockdown. The re-design process was based on the ABC learning design method. This method is a student-centred approach based on the established theory "conversational Framework" (Laurillard 2012) and was developed by Clive Young and Nataša Perović in 2015. The underlying pedagogy of the ABC learning design framework is learning types. The six learning types are acquisition, investigation, practice, discussion, collaboration and production. Each type of learning activity represents a cycle between learner and teacher, or learner and peers, at the concept and/or practice level. Figure 1 highlights the learning activities and assessment methods used in the Brand Management module re-design.

Figure 1: Sample learning activities and assessment methods used for this study weeks 1-10

ABC Curriculum Story Board

Module Name: Brand Management
NFQ Level: 8
Credits: 5

Timing & Topics	Learning Activity Type	Learning Activities	Assessment Methods *F *S
Week 1 Introduction to the new teaching and learning environment Gather student profile	A: watching videos, reading documents C: using online discussion D: discussion forum in teams Pract: practice-based activities	A: short guides, Q&A forum, YouTube videos C: online discussion post D: first webinars Pract: practice-based activities using mentimetre, socrative, team meetings and team notes. Using forms in MS Teams	Microsoft Badge for Teams *F *S *F – Use of teams throughout semester & for meeting & presentation *S – badge earned based on test score

Timing & Topics	Learning Activity Type	Learning Activities	Assessment Methods *F *S
Weeks 2-3 Introduction to brands & brand management, customer-based brand equity	A: watching videos, reading articles C: using online discussion D: discussion forum in teams I: analyse information collected Prod: short reports Pract: practice-based activities	A: guided short readings, Q&A forum, video lectures with H5P incorporated, YouTube videos C: online discussion post and replying to peers' posts D: reflection on assigned tasks, webinars I: web search, action research Prod: interview with consumers, case studies Pract: H5P activities with feedback, case studies	Online classroom discussion via Teams *F H5P activities within videos *F E-tivities including reflection *F
Weeks 4-5 Developing a brand strategy	A: watching videos, reading articles C: using online discussion D: discussion forum in teams I: analyse information collected Prod: short reports Pract: practice-based activities	A: guided short readings, Q&A forum, video lectures with H5P incorporated, YouTube videos C: online discussion post and replying to peers' posts D: reflection on assigned tasks, webinars I: web search, action research Prod: interview with consumers, case studies Pract: H5P activities with feedback, case studies	Online classroom discussion via Teams *F H5P activities within videos *F E-tivities including reflection *F

Timing & Topics	Learning Activity Type	Learning Activities	Assessment Methods *F *S
Weeks 6-10 Designing and implementing brand marketing programmes **GROUP PROJECT**	A: watching videos, reading articles C: using online discussion D: discussion forum in teams I: analyse information collected Prod: short reports Pract: practice-based activities	A: guided short readings, Q&A forum, video lectures with H5P incorporated, YouTube videos C: asynchonous online discussion post and replying to peers' posts, shared project output, project peer review, synchronous discussion u sing breakout rooms in teams D: reflection on assigned tasks, webinars, roleplay I: web search, action research, lead a group project Prod: interview with consumers, case studies, recordings of group meetings, make and give a group presentation, brand audit, video production Pract: H5P activities with feedback, case studies, peer assessment of brand audit	Online classroom discussion via Teams ***F** H5P activities within videos ***F** E-tivities including reflection ***F** Group project: Brand audit, peer badge

A = acquisition, C = collaboration, D = discussion, I = investigation, Prod = production, Pract = practice.

Conole (2013) suggests that learning design as a methodology can enable teachers/designers to make more informed decisions on designing learning resources which is pedagogically informed and makes effective use of technologies. Active learning and cooperation among students are also important elements of course design (Chickering and Gamson, 1987). Palloff & Pratt (2009) present various principles for effective online assessment including assessments that include reflection and collaborative assessments. Active learning, collaboration and effective use of technologies were incorporated in the re-design of the Brand Management module through e-tivities, groupwork and peer assessment. Different types of assessment activity were introduced, including both formative (weekly activities) and summative assessment (end of semester group project).

Research studies have shown that video can be a highly effective educational tool and short videos can improve student learning in online education (Kay, 2012, Hsin & Cigas 2013). The Microsoft video app "Flipgrid" was used as part of the assessment strategy for the Brand Management module to encourage students to reflect on their learning.

The ability of students to access course materials and engage in the course activities is critical for the success of any online course (Khan A et al, 2017). Several online tools were used in the Brand Management module to engage students both synchronously and asynchronously.

Student-instructor communication can be improved using social media (Guo et al. 2018). For the Brand Management module, Twitter was incorporated as an external resource to encourage students to research articles, reflect on them and communicate with their peers and a wider external network in relation to their findings.

Educational research has demonstrated that social presence is connected to perceived learning satisfaction and persistence in an online course (Garrison et al. 2010). Establishing this social presence helps motivate the students and engages them with the module. Creating a learning community in the Brand Management module included online chat areas, weekly e-tivities for discussion/collaboration and video production.

2. Details of Outputs and Impact

2.1 Acquisition

Learning through acquisition enables the learner to develop concepts. The challenge is to make the learning an active rather than a passive process. The Brand Management module enabled learning through acquisition through the use of short guides, watching videos, reading documents, articles, websites & book chapters, demonstrations, Q & A forums in Microsoft teams, Padlet, Menti and Socrative. Using multiple means of representation can assist students in their learning. All lectures were pre-recorded as videos and were available on the virtual learning environment (VLE) Moodle. They were also available in PDF format for download. There was one synchronous session each week which covered expectations, concept summary and discussion. On the VLE, each topic was introduced through video and reviewed in document format. This sequence was to encourage students to preview what they expected to learn from each topic and reflect back on what they had completed. Interestingly, when surveyed, a high percentage of students also chose the option of using video for both the introduction and review of each topic. This is illustrated in figure 2 below.

Figure 2: Preferred media format to introduce and review each topic

In the synchronous lecture, teacher-student dialogue was encouraged through the use of Padlet, Menti, polls and Socrative. The first week of the semester focused on introducing students to their new teaching and learning environment and how it would operate. A resources area was created on the VLE to show students how to navigate content and participate in the module. A diagram was provided to illustrate how the technologies linked together to help achieve the learning outcomes of the module. This is illustrated in figure 3 below.

Figure 3: How the technologies used work together to achieve learning outcomes

How the Technologies we are using work together
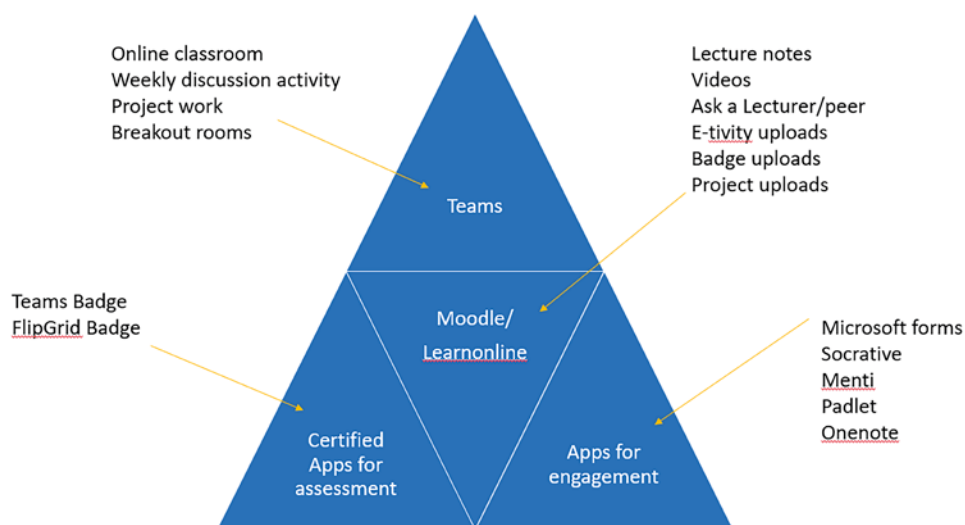
2.2 Investigation

Investigation enables the conceptual process to keep developing. It is intended as a way for the student to work independently of the teacher and follow their own pathway to understanding by finding out things themselves. The Brand Management module enabled learning through investigation by students analysing information from articles, books, videos, case studies, web search and brand audit. Formative assessment included e-tivities each week. The format of the investigation e-tivity was "View it, Do it, Submit it". Students were asked to complete a task and upload it to Moodle. A sample e-tivity is illustrated in figure 4 below.

Figure 4: Sample "View it, Do it, Submit it" e-tivity

The students also learned through research and investigation activities as part of a brand audit project. This active approach to the module content enabled them to develop a deeper understanding of theory and apply it to a brand of their choice.
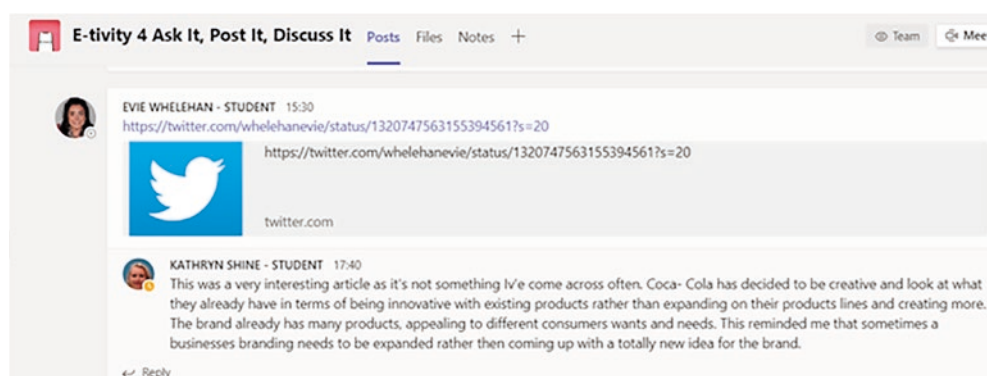
2.3 Discussion

Learning through discussion is an important method of learning as students can apply their learning and reflect on their own perspective in relation to their peers. The Brand Management module enabled learning through discussion, in both synchronous and asynchronous formats. Asynchronous weekly e-tivities were designed to encourage students to engage between the synchronous lectures. The format of the discussion e-tivity was "Ask it, Do it, Post it". Students were asked to complete a task, post it to the discussion area in Microsoft Teams and reply to another post. This enabled them to ask questions of other students and exchange ideas and viewpoints. A sample e-tivity is illustrated in figure 5 below.

Task

Figure 5: Sample "Ask it, Do it, Post it" e-tivity

Source a good article/post in relation to branding and use the following hashtag, #brandmanagment2020 to get your message out there. This enables you to communicate with a wider external network. You should comment on the article/post (no more than 160 characters) as well as posting the link.

Add a copy of your work to the discussion channel on teams and comment on another post (e.g. what did you learn about branding?). You can copy the tweet link and paste it into the chat on teams. There is a video under the resources section on Moodle to help you with this task.

The use of asynchronous discussion enabled the students to take their time, read other articles and reflect on what was discussed. Each week, two students were invited to share their e-tivity in the synchronous class. This helped create discussion and added variety to the class. Student feedback comments included "it builds confidence", "it's a natural way to have the class engage", "it encourages others to share their views".

Active involvement in discussion was also facilitated through shared project output and project peer review. OneNote and teams were used to facilitate project group meetings and discussion.

Synchronous online discussion was facilitated using breakout rooms in Microsoft Teams, Menti word cloud, Padlet boards, polls within teams, Socrative and the chat window in teams. The use of short guides and "how to" videos provided in Acquisition learning were crucial in the success of the synchronous online discussion as student knew in advance how to use each tool and how the process would operate. Students found the quick polls using Microsoft forms the most engaging app to use in class, as outlined in figure 6 below.

Figure 6: App preference for engagement in class

22. Which app do you find most engaging to use in class?

More Details

● Microsoft forms	25	
● Menti	21	
● Padlet	5	
● Socrative	3	
● Other	1	
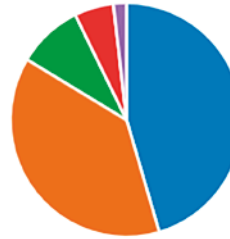
2.4 Practice

Learning through practice takes place when the teacher has prepared a task for the student to apply their understanding of the concepts to achieving a task goal. The Brand Management module enabled learning through practice using H5p activities within lecture content, role play as brand managers and group presentations via teams. An example of the use of H5p for learning through practice involved a 10-minute video with 2-3 questions embedded at certain points so that the student could reflect on the content. They were allowed unlimited attempts at each question but could not proceed through the video unless each question was answered correctly. They were also awarded marks for these e-tivities which linked to the gradebook of the VLE. Feedback from students indicated that using H5p in videos helped them to engage with the content, 78% of students rated High (4-5) on a five-point Likert scale for this question.

Learning through practice was also enabled through the brand audit group project where students assumed the role of Brand Manager and linked theory to a chosen brand. They also assembled, practiced and presented their shared brand audit output via teams.

2.5 Collaboration

Learning through collaboration involves students learning together and producing a shared output. The Brand Management module enabled learning through collaboration using online discussion posts, sharing views in synchronous classes, shared project output and peer review of the brand audit.

In the synchronous classes, breakout rooms in teams were used to engage students in discussion in smaller groups so that they could learn from each other. Closed project groups were also created in teams where students met on a weekly basis and recorded their minutes of meetings. This was monitored by the lecturer and feedback was given relating to progress. In the project peer review, 60 students in the class voted for their favourite brand audit presentation. There was also a lecturer award to the group of students with the best performance in the End of Semester Project. Recipients of the awards were issued with digital badges which they could use as part of their e-portfolios. Sample digital badges are illustrated in figure 7 below.

Figure 7: Sample Digital badges Issued

2.6 Production

Learning through production is the way the teacher motivates the learner to consolidate what they have learned by articulating their current conceptual understanding and how they used it in practice. The Brand Management module enabled learning through production using interviews with consumers, short reports, video creation, slideshows and presentations. An example of the interviews and short report submission is illustrated in figure 8 below.

Figure 8: Sample task incorporating interviews and short report

Students also engaged in a video task to reflect on their learning. Firstly, they were asked to complete short course on the video app Flipgrid. After they had achieved their badge of completion, they had to create a video, reflect on their learning experience of online learning and post to the shared grid.

3. Key Learnings

Students are more likely to engage when concepts are presented in multiple formats.

It is important to allocate sufficient time at the beginning of the semester to show students their online learning environment, how it operates, and how it links to learning outcomes and assessment.

Regular synchronous sessions are helpful in encouraging contributions, discussion and feedback. In the synchronous sessions, students preferred engagement tools which were pictorial (e.g. Menti word cloud) and those that could be accessed quickly without having to leave the teams environment (e.g. quick polls via forms). Students also mentioned that they were more likely to engage when the use of tools allowed anonymity.

Having weekly e-tivities involving research, discussion, short report uploads and H5p helped students stay focused and reflect. They liked being assessed on a weekly basis for small percentages rather than once, later in the semester for a higher percentage.

The teacher's role is crucial in setting up appropriate e-tivities which meet the learning outcomes of the module and providing enough scaffolding for the students to navigate their way through them. The majority of students (82%) highlighted the importance of the weekly expectations sheet which was issued each Monday as they felt it provided a roadmap for the week ahead.

Students are more likely to engage when they see others engaging. Asking students in advance if they would like to share their work with the class in the synchronous session gives them confidence in presenting their views and encourages others to participate.

Digital badges motivate students. There was a high level of motivation to achieve the two digital badges on the module even though there were no assessment marks associated with them. Students also found them beneficial for their LinkedIn profiles.

Overall, the learning types identified in the ABC model have been helpful in the re-design of the module, particularly for moving learning activities and assessment online.

References

- Conole, G. (2013) Designing for Learning in an Open World, New York: Springer.

- Chickering, A. & Gamson, Z. F. (1987) Seven principles for good practice in undergraduate education, Available online at https://www.lonestar.edu/multimedia/SevenPrinciples.pdf [accessed November 10, 2020].

- Garrison, D.R. Cleveland-Innes, M. & Fung, T. (2010) Exploring causal relationships among cognitive, social and teaching presence: Student perceptions of the community of inquiry framework, in The Internet and Higher Education 13(1-2): pp.31-36.

- Guo, R, Shen, Y & Li, L. (2018) Using Social Media to Improve Student-Instructor Communication in an Online Learning Environment. International journal of information and communication technology education 14(1):33-43.

- Hsin WJ and Cigas J (2013). Short videos improve student learning in online education. Journal of Computing Sciences in Colleges 28, 253-259.

- Kay RH (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. Computers in Human Behavior 28, 820-831.

- Khan A et al, (2017) Active Learning: Engaging Students To Maximize Learning In An Online Course Electronic. The Journal of e-Learning 15 (2) 107-115 available online at www.ejel.org

- Laurillard, D. (2012). Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology. London: Routledge.

- Palloff, R. & Pratt, K. (2009) 'Assessing the Online Learner: Resources and Strategies for Faculty', Wiley & Sons.

- Young, C., Perović, N., UCL (2015). ABC Learning Design workshop. Resources available from https://abc-ld.org

Submitted by: Lucia Cloonan

Video Imaging of Basic Microbial Aseptic Techniques

Project Team	Cathy Hannigan and Dr Anne Nelson
Name of Dept. and School/ Faculty and Institute	Department of Life and Physical Sciences, LYIT.
Keywords	*Digital Library; Food Safety Experiments; Food Microbiology*

Section A: Case Study Summary

A suite of novel videos of basic microbial aseptic techniques were created as a Reusable Learning Object (RLO) for Food Science students studying Food Microbiology. Basic microbial aseptic techniques are paramount to successful microbial food testing and safety. These fundamental techniques are often stumbling blocks for students as the dexterity of the physical movements involved in aseptic technique whilst maintaining sterility is often difficult and takes repetitive practice to master. Reflective practice on personal teaching and learning strategies informed this research. Student apprehension and stress prior to engaging in the practical laboratory element of taught modules was observed and resulted in the creation of this RLO.

This series of short videos was shared with other academic teaching staff across numerous science degree programmes within the Department of Life and Physical Sciences. Its use as a preparatory tool for laboratory practicals changed the manner in which this element was delivered by the project team resulting in a more blended learning approach that targeted both visual and kinaesthetic learners. Using a Go Pro Hero 8 device I recorded and voiced over a series of short videos that showcased best practice of five basic microbial aseptic techniques. Equipment from, and the physical environment of teaching laboratories at Letterkenny Institute of Technology was used for these recordings. These videos were peer reviewed, edited and uploaded on the Virtual Learning Environment of Blackboard or Youtube. Members of the project team used these videos to support student learning and engagement prior to laboratory practical classes.

Upon surveying, students reported that the use of these videos increased their confidence in carrying out these techniques but also reduced their stress levels prior to participation in the laboratory element of their programme. Academic teaching staff that used these videos were surveyed and all reported that their use was a positive addition to their delivery. They also stated that they would reuse them again for supporting students.

It was found that this RLO supported students learning and engagement in basic microbial aseptic techniques better than classical demonstrations of such.

1. What I did/how I did it + team involved

As an aid to preparatory laboratory practical sessions for Food Science students studying Food Microbiology I created a novel video library of basic microbial aseptic techniques. These fundamental techniques are paramount to successful microbial food testing and safety, but often stumbling blocks for students. Using a Go Pro Hero 8 device I recorded and voiced over a series of short videos that showcased best practice of five basic microbial aseptic techniques. I used equipment from and the physical environment of teaching laboratories at Letterkenny Institute of Technology for these recordings. These videos were peer reviewed, edited and uploaded on the Virtual Learning Environment of Blackboard or Youtube. Members of the project team used these videos to support student learning and engagement prior to laboratory practical classes.

2. Outputs and impact achieved

This series of short videos became a flexible Reusable Learning Object (RLO) and was shared with other academic teaching staff across numerous science degree programmes within the Department of Life and Physical Sciences. Its use as a preparatory tool for laboratory practicals changed the manner in which this element was delivered by the project team resulting in a more blended

learning approach that targeted both visual and kinaesthetic learners. Upon surveying, students reported that the use of these videos increased their confidence in carrying out these techniques but also reduced their stress levels prior to participation in the laboratory element of their programme. Academic teaching staff that used these videos were surveyed and all reported that their use was a positive addition to their delivery. They also stated that they would reuse them again for supporting students.

A surprising impact was the request for training from other academics in the process of creating videos so that they could record further practical skills and upload them to supplement their own student cohorts learning experiences.

The findings of this work were disseminated in LYIT at the Teaching and Learning Forum.

3.   What did we learn?

The students responded positively to this teaching tool and used it for purposes other than its original intention such as self-reflection and study aids. Other teaching academics took this RLO and used it in different settings and for different purposes. This RLO supported students learning and engagement in basic microbial aseptic techniques better than classical demonstrations of such. I upskilled my teaching methodologies by learning to create, edit and upload short videos onto various platforms. To assess the impact of this undertaking, I engaged with new data collection systems.

Section B: Full Case Study

1. Context/Rationale

The aim of this project was to create a novel video library of basic microbial aseptic techniques accessible to Food Science students studying Food Microbiology. Basic microbial aseptic techniques are paramount to successful microbial food testing and safety. These fundamental techniques are often stumbling blocks for students as the dexterity of the physical movements involved in aseptic technique whilst maintaining sterility is often difficult and takes repetitive practice to master. These techniques are formally taught in a laboratory setting. Funding for this undertaking was sourced from a competitive Learning Enhancement Project, LEP call.

Reflective practice on personal teaching and learning strategies informed this research. Student apprehension and stress prior to engaging in the practical laboratory element of taught modules was observed. A strategy to reduce this was formulated and resulted in the creation of a visual reusable learning object. A suite of videos showcasing best practice of basic microbial aseptic techniques was developed.

By using these videos as preparatory practical instruction it was hoped to reduce student stress and instil confidence prior to partaking in practical laboratory experiments. The fact that the student could view the videos, at their own pace and in their own safe environment, should enhance learning. The use of the demonstration video would allow all students to see the demonstration clearly, whereas in the actual lab, some students are not physically positioned correctly to permit clear visibility of the fine manipulations carried out by the lecturer. This tool was intentionally created to also permit better time management within the practical element as repetitive demonstration on behalf of the lecturer is made redundant. Saved time would allow the lecturer to engage more fully with students and to assess their needs and support their learning in real time.

The use of the created videos has exceeded the expectation of the project team, developing into a Reusable Learning Object (RLO). This has been used in combination with pre-lab quizzes, as a tool for self-assessment, as a reflective piece to compare their own skill against best practice, and as a starting point for the student to create their own support videos in the context of bring your own device (BYOD). BYOD was a supplementary research piece undertaken by Dr.Eilis Flanaghan, Cathy Hannigan, Dr.Anne Nelson, Dr. Christina Forbes and Tina Parnell in conjunction with PDP for Lyit. PDP-LYIT was an 18 month project funded by the National Forum for the Enhancement of Teaching and Learning seeking to develop a sustainable approach to continuous professional development aligned to the National Professional Development Framework for All Staff who Teaching in Higher Education. BYOD encouraged students to record themselves carrying out a laboratory technique and enabled reflective practice on their own skillset and technique.

The preparatory videos created here allowed the student to take ownership of their learning. The student was able to visualize, conceptualise and synthesize new technical information that would support them prior to engaging in a new technique themselves. The student could control their learning environment independently and use it at their own unique pace.

This research and resource was created for a 10 credit Year 3, Food Microbiology Module, which forms part of the BSc in Food Science and Nutrition, Level 8 degree at Letterkenny Institute of Technology by Cathy Hannigan and was supported by her colleague Dr Anne Nelson.

2. Details of Outputs and Impact

For the members of the project team, one of the biggest impacts that was found was the flexibility of the library of videos recorded. While they were initially intended to be used in the delivery of the Food Microbiology Module in year three of the BSc in Food Science and Nutrition, the team was able to extend their use across several other modules in different degree programmes. The videos were shown as support for lecture material covered with first year BSc Agricultural Science and BSc Veterinary Nursing students and as preparatory material for third year Bsc Bioscience students. Other lecturing staff, that were not part of the project team, also used them for both lecture and preparatory practical support for second year students undertaking a Microbiology module on the BSc Bioscience, BSc Food Science and Nutrition and BSc Pharmaceutical and Medicinal degree programmes.

This created resource has reinforced a new way of preparing for laboratory practicals. It has changed delivery of such to include a more blended learning approach.

In relation to teaching and assessment approaches, it reinforces a new way of preparation for lab practicals. It allowed the strategy of a blended learning format that targeted both visual and kinaesthetic learners and allowed flexibility in delivering preparatory practical classes. It gave autonomy to the student and developed a flipped classroom event where the student could come with relevant questions prior to the actual practical event.

To assess the impact of this teaching tool, a 'Peer Review' survey was carried out in relation to the use of these videos. Of those surveyed, 100% agreed that the use of the videos for pre practical preparation was a positive addition to their teaching and learning strategies. All participants said they would use this resource again. A surprising output and impact from this undertaking was other lecturers use of the equipment to record preparatory videos for their own subject areas. Having used this resource, they decided to create their own. Peers recorded supporting videos for other practical modules such as Applied Immunology and Cell Culture.

Upon surveying, it was found that students reported an increase in their confidence after use of this resource. They stated that their confidence level pre-practical rated 'fair to good' prior to use, but after watching the videos they all reported an increase and stated 'good – excellent'. Of students surveyed, 77% reported it reduced their stress level before laboratory practicals.

Comments from the survey showed that students found the videos – easily accessible, easy to follow, gave them assurance, made them more aware of best practice and some used them to critique their own technique.

The fact the student could look over the videos in their own time, at their own pace, in their own environment, contributed to the confidence of the student before undertaking the laboratory practical session. By reducing stress and increasing the students' confidence, it enhanced the students learning experience in the laboratory. Sometimes in the laboratory, the student is unable to view the correct angle when the lecturer is demonstrating a technique which can lead to errors, but the angle of the videos negated this and supported and enhanced the students learning experience.

Creating this resource has certainly impacted and changed the delivery of preparatory laboratory instruction for team members but the use of these videos and new ones created upon dissemination of such, will be widely used not just across Food Science but across the Science Department as a whole.

Covid 19 and its impact on delivery within third level education has accelerated the use of pre-recorded videos to highlight laboratory skills and techniques. As stated previously, this resource has been used in several other Science modules and will no doubt be extended across other core Science modules in the future.

3. Key Learnings

Video creation, editing and uploading were key learning points for the project team. In order to produce the suite of videos encompassing the Basic Microbiology Techniques, several activities had to be carried out. Initially, a Go Pro Hero 8 device had to be sourced. There was a learning process involved in trying to use this device correctly to facilitate best quality recordings. Covid restrictions added pressure on the videoing of the procedures. Normal laboratory access and working conditions were impeded and as such, prior planning to incorporate new health and safety restrictions was necessary. As these videos captured working with live bacteria and specialised media, the preparation and timing of each video was critical. Once the videos were recorded, each was reviewed and edited. The videos were also peer reviewed prior to publication. The project team undertook self-training in editing software. While some of the videos could be placed on the colleges Virtual Learning Environment (VLE) platform called Blackboard, some were too big for submission. The project team had to learn how to develop a 'You tube' channel – not only for the cool teenager! This itself was a learning experience with some of the videos proving to be very popular with the public domain.

The method of data collection changed from the traditional pen and paper to a web-based survey system. Google was used to survey the students to get an understating and collect data on their confidence and stress levels of lab practical work pre and post the watching of the videos. Peers who used this resource as a teaching tool were also surveyed using Google. Data was collected on their usage by students and to ascertain if it enhanced student learning, its importance as a preparatory tool and their use as a RLO. Developing surveys on Google both for the students and for Peers added to the learning activities for the project team.

What has been developed in this project is a Reusable Learning Object. It is like a piece of Lego in the Teaching and Learning Environment that can be used by the lecturer in relation to preparatory laboratory sessions, quizzes, reflection, critiquing, assessment and feedback to name a few.

It has changed the way we approach pre-lab work creating a student-centred approach to this endeavour.

This research was disseminated internally in Letterkenny Institute of Technology by invitation, through a talk and presentation by Cathy Hannigan for LEP funded projects.

Submitted by: Cathy Hannigan and Dr. Anne Nelson

Challenges with VLE Standardisation

Author	Michael Carey
Name of Dept. and School/ Faculty and Institute	Business Studies, LYIT
Keywords	*Template, student experience, paced-learning, OSCQR, Digital Education*

Section A: Case Study Summary

1. What I did/how I did it + team involved

Many years ago, LYIT embarked on the delivery, of a unique technology based programme in the Faculty of Business. This programme was driven by the needs of local industry at the time. Due to the demand, programme delivery transitioned from being local classroom delivery, a remote 'location' delivery (Limerick and Dublin) but then, due to the Dublin Bus strike of September 2016, we 'accidentally' went 100% digital with our delivery. Our world changed forever and, … (strangely enough) … 'for the better!'.

Sixteen years on – and the success of this programme is down to the support of the key stakeholders! Champions such as the, Head of Department, industry partners, technology sponsors (IBM), government initiatives (Springboard, Skillnets), and a 'foot-soldier'. The risks were high, in that there were numerous 'points of failure', but the college responded quickly to deliver to the needs of industry and it worked!

LYIT's virtual learning environment (VLE), coupled with the necessary culture and supports, promoted throughout our college, have allowed the current programme delivery to remain 100% online for the past four years. Being 100% online – has breathed 'new-life' and ensured the future sustainability of this programme.

Over the past 4 years, the modules have completely evolved, and this change is constant! Initially, this change was a 'mix' of accidental, experimental, but more recently due to the arrival of a new Flexible & Online Learning department, coupled with key Teaching and Learning training, the VLE has 'taken-off'! But not without its challenges.

2. Outputs and impact achieved

1. SUSTAINABILITY: Because the programme is 100% Online, the sixteen-year-old programme 'continues to survive'.
2. VIRTUAL STUDENT: 100% of the student base is now remote.
3. INDUSTRY DEPENDENT: Strategic company decisions are dependent on the continuance of this online programme, to support their mainframes.
4. APPRENTICESHIP: In some companies the recruitment of mainframe roles now align with this online programme. The VLE is available at the times that suit the 'working' student. Outside of working-hours have proven very popular for the mainframe student.
5. ONLINE STUDENT: Anytime and Anyplace. With digital T & L and 100% online, the value of recordings cannot be underestimated. VLE technology facilitates the individual learning needs of students, allowing them to progress at their own pace.
6. RETENTION: Because the student is 'doing it for themselves' (self-learning), resulting in less demands for additional lecturing supports. One must always be cognisant of the fact that we are dealing with a group of people with diverse learning needs. The paced-learning feature allows the lecturer, time to concentrate on supporting and facilitating two very important sets of student-type 'outlier' groups. Both groups requiring additional 'on-demand' supports. The results are that – everyone is challenged and stays the course.
7. LECTURER: I am now teaching 'better' on-line than I did when face-to-face!

3. What did I learn?

1. RISK: "Jump-in and … Risk it!" … "What are the alternatives"! Returning to the Dublin Bus Strike, this provided me with the need to reach-out to my customers (students and industry). I connected digitally to all my students and they liked it.

2. TIME: is the enemy, it takes so much time to learn-try-and-test. Time is the key-driver for determining when your module is ready and when to 'walk-away'.

3. ENTERTAINER: I as a lecturer had to change my own teaching delivery style, approach, and personality. Yes, online is a performance and the entertainment factor is part of the act! But without honest empathy directed at the student 'you will fail'!

4. TECHNOLOGY: I have learned to depend on technology as my new 'single point of failure'. When it comes to synchronous class delivery (true Online), Technology is now the new 'risk'. Computing hardware and the communications support need to be always – functional.

5. SKILLS T & L EDUCATION WITH DIGITALED: I had to educate and retrain myself in the use-of modern-day online training Apps, approaches and methodologies and in their effective application, integration and implementation.

6. BEST PRACTICES: By applying both the T&L-OSCQR methodology and the college recommended template to my VLE design, I greatly improved the intuitiveness and functionality of my delivery.

Section B: Full Case Study

1. Context/Rationale

1. Four years ago, the decision to go online was unplanned, but opportunistic. I was due to teach in Dublin and awakening to the news of a sudden Dublin Bus strike, and the fact that I would not have any students attending my class, I had two choices. I gladly chose the 'going online' option.

2. During the subsequent weeks and months, I had to self-educate myself in all aspects of the Virtual Learning Environment. Due to the low uptake of the VLE, and the lack of in-house technical supports, I would invest a lot of my own personal time self-learning/discovering the functionality of this VLE system.

3. For the next two years, my VLE programme became static but functional. It delivered on the intended Learning Outcomes. It contained the basic Content (Course-materials, quizzes, and assignments). A somewhat 'mirror' of how I delivered the programme from within the classroom.

4. In the academic year (20/21), two 'key' events occurred:

    a. A Flexible & Online Learning function was established at LYIT. Providing much needed guidance, advice, best-practice, templates, education, and instructional-design expertise to all lecturers.

    b. I completed the GMIT (L9) – Digital Teaching & Learning module certificate. This immediately connected me to an important group of 'like-minded' peers, united in expanding our knowledge of the Online Learning environment. This group consisted of lecturers from the three IOTs (GMIT, IT Sligo and Letterkenny IT). Lecturers were from a wide range of disciplines – practical based, to theoretical, facilitating an 'outside the box' critique of each other's work. The GMIT module also provided participants with a 'wealth' of current day apps, articles, models and key speakers, all of which, assisted each lecturer with the tools to complete the module assessments. One assessment, in particular, forced me to 'revisit' one of my static VLE modules – with a view to 'Improvement'!

5. The thought of returning to what I believed to be a perfectly functional online module, was my initial challenge. But, armed with a much improved and current knowledge base of what was achievable within the VLE Online environment, alongside the in-house VLE technical supports, the timing was right for bringing my online module to the next phase of its development!

6. From the outset, it was obvious that the existing module required an extensive overhaul. Determining where to begin, was greatly aided with the use and application of the highly recommended 'Module Design Review Rubric (OSCQR Scorecard) OSCQR (GMIT-DT&L module tool). This scorecard lists all of the recommended VLE features, and when applied to my existing module, it became obvious what key areas of my module required either a presence, enhancement, or alternatively, were deemed to be non-applicable.

7. With a total re-engineering project looming, the extent and focus of the required changes were driven by the GMIT DT&L module assessment task. This in turn was driven by my own time availability, as this was in the middle of an academic year! (albeit a Covid year).

2. Details of Outputs and Impact

1. Adoption and implementation of LYIT's in-house (Flexible & Online Learning) recommended VLE module template. This provided me with a 'best practice' layout and model for my VLE module. It greatly improved the intuitiveness factor resulting in less questions from the students and a very friendly, less cluttered, and sequential representation of my course content. The appearance of the module also positively transformed by using appropriate graphical content to represent the subject matter. This resulted in extensive revision to existing content, along with new materials being added to my existing 'static' module such as specific sections intuitively sequenced into:

   a. (New) Welcome and Get Started
      i. Welcome videos explain the module deliverables and content
      ii. Pre-requisites before commencement of class
      iii. Announcements
      iv. Lecturer information
      v. Syllabus
      vi. Online Class Schedule
      vii. Instructions on accessing the VLE from varying hardware and software technologies
      viii. And a very graphical and 'eye-catching' – Homepage

   b. (Revised) Student Collaboration & Community
      i. Discussion Board – vital for (lecturer) early-warning along with student/peer – learning and collaboration
      ii. VIRTUAL CLASS
         1. The nightly online class 'join' weblink
         2. Access to all Online recordings
         3. (Instructions to students) on – how to join the synchronous online class and how to access recordings

   c. (Revised) Module[name] – Content
      i. (the all-encompassing) – Course/module – content!
         1. (Revised) a clear and sequentially sequenced series of 'Lessons' which serves as a Calendar for the students.
         2. (Revised) each lesson comprising of – Introductory video, Introduction, Practical, Theory then finally – the Lesson-Quiz.

3. (Revised) – Paced-Learning 'driver' – each Lesson is designed with the 'adaptive release' VLE feature, which implies that the student must gain a pre-advised Quiz score before permitting the student to proceed to the next Lesson in the sequence. This allows each student to progress through the module – at their own pace. In addition to improving the student experience, the lecturer can also avail of the VLE reporting feature – therefore providing the lecturer with complete visibility of each student's progress, ahead of every class. Therefore, providing valued 'early-warning' triggers for the lecturer This is one of the strongest features of the VLE online teaching model.

d. **(New) Assignments and assessment**

i. My Assignments – From the commencement of the module – students can instantly access and review the expected assessments for this module (in detail), ahead of the commencement of the scheduled class. Each assessment shows the module 'weighting' and the 'Rubric' (marking scheme).

ii. My Marks – (at all times) – students can instantly check their current score for this module.

e. **(New) Student Resources**

i. Learner Support – contains a volume of college provided – student information regarding Netiquette, VLE usage, Student Handbook, Policies & Guidelines, Harvard Reference Guide, How to Deregister.

ii. Help – which consists of all VLE Help (in our case Blackboard).

2. A quality review of my module was carried out using the Open SUNY Course Quality Review (OSCQR) Scorecard template. Introduced during the GMIT Digital & Learning module certificate. Providing the lecturer with a rubric and a process for evaluating a module with a view to improving the completeness, quality and accessibility. This greatly improved the student experience.

3. I have introduced the Padlet application to the module. I currently employ it to gather the end-of-module student feedback. Results in valued student feedback. Students posted against three headings – (1) What Worked/(2) What didn't Work – and (3) Improvement Suggestions.

4. As a result of implementing the 'adaptive-release' tool. True paced-learning is now provided by the VLE module. The discovery of three separate categories of student learner. Those that are progressing as expected by the lecturer, those that are 'struggling', and finally, a group of very highly driven learners and achievers. Implementing this tool has resulted in the freeing-up of the lecturer's time, and facilitating much improved student-supports i.e. to detect, follow up, and support these two key student 'outlier' groups. As a lecturer, we are always challenged by the diverse needs of the class.

5. The extensive use of pre-recorded videos – welcome, lesson and complex videos provided a great support to all student-types within the class, by providing asynchronous student learning support.

6. Student learning experience and student retention has improved, along with student feedback stating that they enjoyed completing the module, and that they found the module very self-explanatory.

3. Key Learnings

1. Finding optimum VLE module design is an iterative process. It requires evaluation, design improvement, implementation and testing (student feedback). I currently carry out a single PASS of this iterative process once a year. In the future, I plan to use the OSCQR tool in assessing the future needs for this module. Increasing the frequency of this iterative process, is very much dependant on the lecturer workload.

2. For evaluation, using a suitable tool such as Padlet. I have introduced Padlet to effectively gather the end-of-module student feedback. A well-designed, end of module Padlet will uncover areas of weakness and improvement, and acts as your guide. In future, I will embed the Padlet tool feature throughout the module, possibly on a Lesson-by-Lesson basis. Conscious of the risk of – evaluation-overkill, student annoyance and confusion.

3. Pre-recorded videos provide very effective asynchronous learning support for the student. I have embedded videos in areas such as – Welcome, Lessons, and areas of complexity. In the future, there will be a challenge with app switching. Previously I have only used the Camtasia tool, which is very rich in features. The college has now recommended Panopto as the college standard. Now I have a mix of video type. I plan to use Panopto for all new videos.

4. OSCQR has been instrumental for me, by providing me with a very comprehensive and effective assessment tool and guide. In the future, I plan to re-visit this tool with a view to instructional-design improvement.

5. Within every VLE, there exists a very useful reporting function. I have failed to take advantage of the current reporting functionality of our Blackboard VLE system. In the future, I plan to avail of training in the use of these reporting features. For example, Course Reporting (User Activity, Course activity, Course Performance, Overall Summary of User Activity, User Participation, User Activity in Forums, User Activity in Groups) and how to actively analyse the Student Performance Dashboard and the Retention centre statistics.

To access the resources referred to in this case study, please visit DigitalEd.ie knowledge platform and use the search function to find further details on any of the resources outlined in this case.

Submitted by: Michael Carey

Theme 5:

Supporting Students in an Online Learning Environment

Supporting students for whom English is not a first language across the Connacht Ulster Alliance through the implementation of an Online English Language Support Programme

Project Team	Dr Niamh Plunkett, Head of Teaching & Learning (IT Sligo); Patricia Henry, CELT Support Officer (IT Sligo); John Joe Callaghan, Director, Native Speaker Language School
Name of Dept. and School/ Faculty and Institute	Centre for Enhancement of Learning & Teaching (CELT), IT Sligo
Keywords	*English language support; Student Support; Online Support; Connacht Ulster Alliance*

Section A: Case Study Summary

1. What I did/how I did it + team involved

The aim of this multi-campus project was to provide IT Sligo, LYIT and GMIT students (for whom English is not their first language) with high quality online English language support that included live online lectures, online video lessons and tests.

The programme was available to all undergraduate, postgraduate and Erasmus students across all three Institutes. The project critically evaluated the effectiveness of the programme on students' English language skill development and support, not only from an academic perspective but also from a personal language skills development in the 'real' world.

A tender process was required to avail of the most appropriate English Language provider to support the particular needs of students. Native Speaker, English Language School were successful as their Online programme offered a bespoke approach to ensuring students engagement no matter their language level, reasons for requiring support or geographical location.

Ensuring student engagement from the outset of programme registration was very important to us. Patricia Henry, CELT Support Officer actively engaged with students and programme Director on a continuous basis. Additional incentives were developed to encourage student engagement and maintain motivation and progression on the programme (Student Leader Board).

2. Outputs and impact achieved

The programme offered students the support needed with English language in relation to reading, writing, listening, and talking skills. This was viewed by students as something integral to their academic programme rather than something that was additional. The programme was tailored to meet students' specific needs, irrespective of current language level or reason for enrolling onto the programme. For many students, they wanted support to increase their confidence both academically but also socially – outside of the Institute, in the workplace and in public.

- We provided a programme that fits into the busy student schedule
- Offered the support needed regardless of the student's English language level
- Delivered content and assessment directly to the student in bite size chunks that fits into their daily routine
- And allowed students to improve their English 'on the go' – using their ipad, android, phone, or laptop to access content at any time

Initially, a pilot programme was conducted at IT Sligo between January and March 2020 with a total of 67 students to tease out what worked well, any improvements in both marketing & communication and in maintaining student engagement, prior to rollout across the CUA.

We focused on feedback from this cohort to ensure that we offered students across the CUA a really well thought through programme that specifically supported students and enabled them to gain confidence with English language skills.

In total, **228 students** from across the CUA registered for the main programme between **Sept 2020 and March 2021**.

The programme was very successful and positively evaluated by students. This initiative is important to enhance the academic offering of the CUA by providing a high quality online English language support programme for students that will assist them in their studies. This will also convey to international partner institutions that their students' academic progress is being supported.

3. What did we learn?

A thorough evaluation of the programme ensured that we kept track of all students who enrolled. Descriptive statistics included each student's sex, age, nationality, Institute, programme, programme level, year of study, mode of study and reason for registering onto the programme. We gained valuable insight from students throughout the programme to understand what their specific needs are. We created a WhatsApp group with students permission to create a safe community for students. This also proved very effective for students who wished to practice their speaking/presentation skills as they could upload a short WhatsApp video, send to the course tutor, and receive immediate feedback. Most importantly, we learned that offering students for whom English is not a first language places on academic programmes, we need to be mindful of their specific needs and the importance of supporting them to develop and hone English Language Skills.

Section B: Full Case Study

1. Context/Rationale

IT Sligo Strategic Plan commits to:

- *Providing strategies to foster a sense of inclusion and belonging for fulltime and online learners*
- *Identifying shortcomings in student supports*
- *Identify learners who require additional support earlier in their academic life and ensure adequate supports are provided*

Across the CUA each Institute's strategic plan aims to grow the number of International students for both on campus and online programmes. Therefore, we must support these students to not only succeed in their academic programme but to develop and enhance their English Language Skills to graduation and beyond into the work force, thereby maintaining retention and success.

While each Institute offers Academic Writing Support Centres, these do not fully serve the needs of International students (or any student for whom English is not a first language) who are struggling with or want to improve their English Language Skills.

From our conversations with students the main reasons they enrolled onto the programme were because of:

- A yearning for answers that they couldn't get from those around them, such as grammar and phrasing
- Time pressure with many saying "I don't have time to do all this English'
- Some students struggling with academic assignments, reports, and exams

But **all** students alluded to a lack of confidence in their language performance.

An extensive evaluation of the programme on addressing students' needs was conducted encompassing quantitative data on student demographics and the extent of student involvement on the programme. Qualitative data provided rich descriptions of student feedback on the programme, support, and effectiveness.

2. Details of Outputs and Impact

English Language Support Programme

Our proposal was supported through the 2019 National Forum SATLE funding. In recognition of the collaboration between CUA Teaching & Learning Working Groups it was agreed to run this programme across all three Institutes, led by IT Sligo. The programme offered a very flexible approach to learning. Students registered onto the programme in as little as three clicks, using any device and from anywhere in the world. The programme provided live tutor support through online webinars twice per week (Tuesdays and Thursdays) and also delivered written, video and audio content with assessments that assisted the students 24/7. Students could join the programme at any time throughout the academic year and it was this flexible 'dip in dip out' approach that resonated with students and enabled them to fit language support into their schedule whilst completing an academic programme.

Student Demographics

Student uptake was fairly evenly dispersed with 38% of the total number from IT Sligo, 32% from GMIT & 31% from LyIT.

56% of students were female and 44% male. The majority were aged between 31 and 36 years.60% were fulltime students and 40% part-time.

The majority of students, 63% were on undergraduate programmes and 37% on postgraduate.

Students enrolled were from 51 countries.

Interestingly, 42 students included Ireland as their Nationality either because they have got residency or citizenship OR identified as being Irish.

Percentage of Students across the CUA
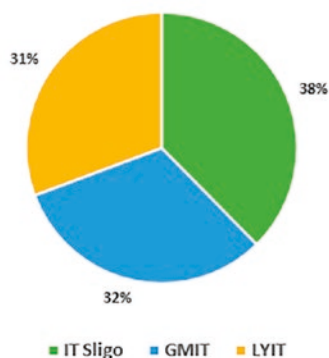
Nationality of Participating Students - **51** countries in total
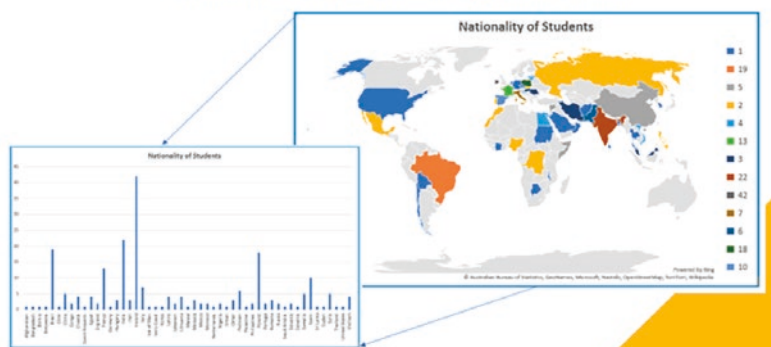
Students participating were at all levels from Level 6 to 10 with majority of students on Level 8 & 9 programmes with Level 6 & 7 to a lesser extent.

The majority – 58% are online students, 27% blended and 14% on campus

Programme Level of Study

Current Mode of Learning
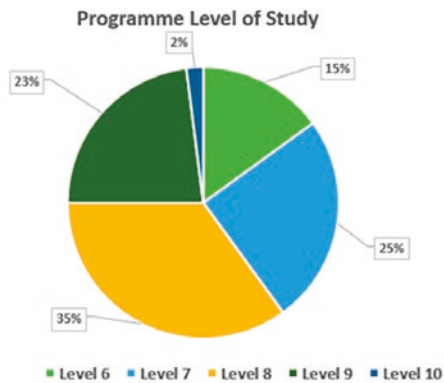
The greatest number of students were in Year 1 (36%) and Year 2 (21%) and Post graduate Year 1 (14%) with the remaining students dispersed across all other years.

Students were on a wide variety of programmes, but the majority of students were in the disciplines of Engineering, Computing, Science and to a lesser extent Business.

Year of Study

Programme Area of Study
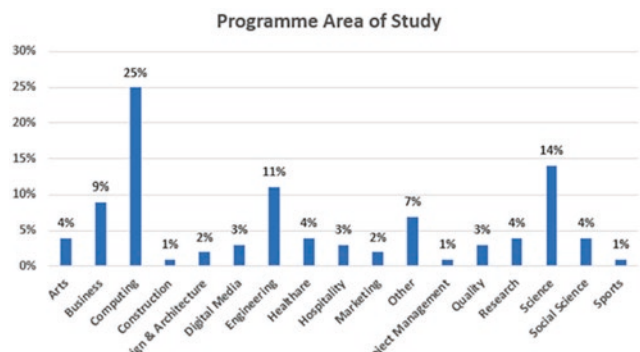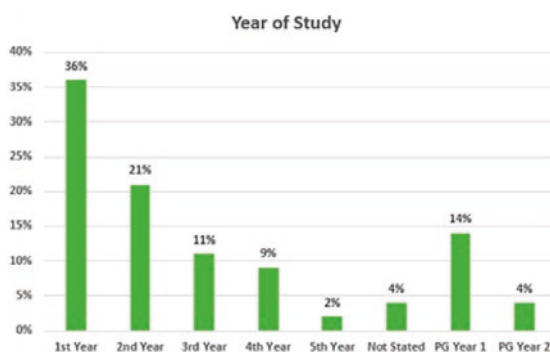
Overview of the programme

In the period September 2020 – March 2021, 228 students enrolled onto the programme.

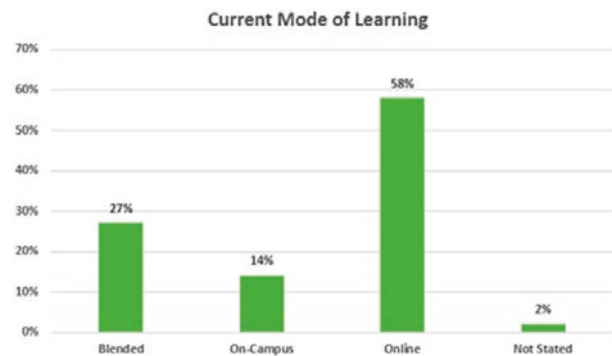**Live weekly webinars:** Students could attend online weekly live classes which could be accessed from any devise, anywhere in the world. This also provided an opportunity for students to interact with their instructor in addition to the instructor checking each student's comprehension. Feedback was provided through a range of reports to students.

Online Materials: All webinars were recorded and available. In addition, a synopsis video was available for each live session. Slides of lessons were stored in PDF format. Animated slides with voiceover; tests on each session; and full progress reports were also available.

A '**Leader board**' was established to develop a healthy competition among students and Institutes whereby awards were given to the top 3 students from each Institute who engaged the most with:

- Content
- Live webinars
- Online Platform
- Assessment and
- Overall engagement
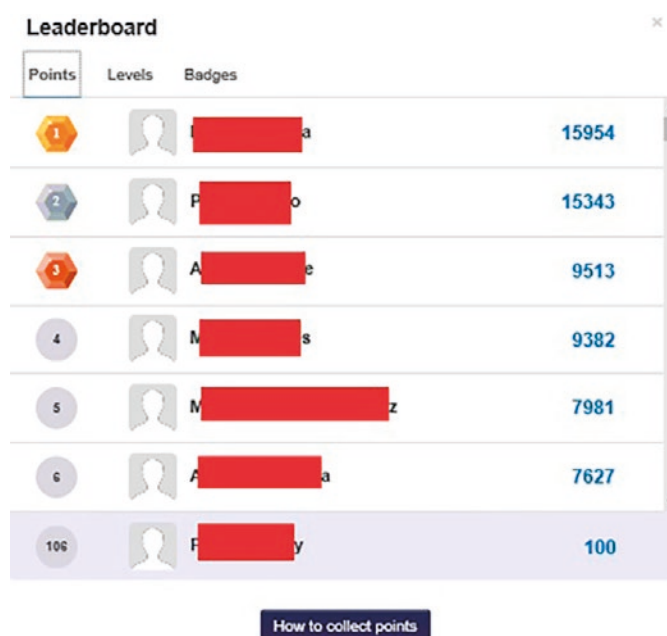
Engagement with the programme

Total Participants	Live Engagement	Platform Engagement	Dual Engagement	Independent Engagement	Yet to Engage
228	68	54	135	80	26

Live Engagement: This is where students engaged with the live webinars from 3:00pm-5:00pm on Tuesdays and Thursdays

Platform Engagement: Where students engaged with the content that is on the Platform because they may have been unable to attend live sessions

Dual Engagement: Where students engage with both the live webinars and the platform material. Feedback suggests that students appreciated the flexibility of being able to balance their personal life with academic engagement

Independent Engagement: Where students engage with the content on their own terms: They prefer to download the material and study at their own pace, print off slides and PDFs etc.

Yet to Engage: These students registered but did not engage with the content. This was due to various other commitments such as busy family life, course work, career commitments etc.

Evaluation of the Programme

Students were asked to provide feedback on the programme. Below are some testimonials from students from across the CUA:

"I am very happy with the course; I think its brilliant. It is great that it is delivered through Zoom, the tutor is excellent, and it is like meeting face to face, it is a very normal environment.

The reason I took part in the programme is because I am not Irish, I need help with my English, to spell correctly, hold a conversation and pronounce my words properly. Yes I would 100% recommend students to take part, it is brilliant."

Joilita Budriene, 1st Year, Computer software Development, GMIT

"I can confirm that it was well worth attending the English class.
The course covered a lot of English writing, speaking, grammar and vocabulary to improve the level of English.

It was delivered in concise chunks that were easy to absorb. The structure was clear, logical and effective. I've got the impression that a lot of thought and expertise was put into designing the course for international students who take courses at IT Sligo.

The main benefits came from doing assignments, listening to recorded lessons on the learning platform, as well as receiving individual feedback and interacting with the instructor and other participants.
This English course gave me the confidence to improve my writing skills in English".

Henry Koehler, Germany, Postgraduate Student, IT Sligo

"Overall, I think the programme is very good. It is a great help for me, and the teacher is excellent and very patient with me. Six months ago, I would not have been able to hold a conversation like this.

It is great that you can view the lectures and notes online so if you miss anything you can always catch up in your own time.

I would definitely recommend this programme to other students. I signed up in order to help me communicate better while living in Ireland and to allow me to study."

Hamed Zuhairy, 1st year student completing Social Studies Degree at LyIT

Feedback from students demonstrates the effectiveness of the programme. It gives them the confidence to go forward with their academic programme by virtue of improved use of English. They are supported through an innovative delivery system directly to them and have enhanced learning through state-of-the art software and course design which brings English language content to them. It is this learning 'on the go' which ensures they can 'fit in' English language support around their academic schedule and home life.

The National Forum Interim panel review took place on Monday 22nd March. The feedback provided by the review team included:

"Overall seems like a really strong initiative that should be implemented everywhere, especially in a country which has a lot of different ethnicities. The team are to be congratulated for their work and commitment to completing this initiative"

Full video presentation is available to view:

https://itsligo.hosted.panopto.com/Panopto/Pages/Sessions/List.aspx?folderID=a7e2004d-8adf-4d84-9ae6-aaa90108ccb6

3. Key Learnings

The evaluation of the Online English Language Support Programme led to some key recommendations:

1. The programme should be continually available to all students for whom English is not a first language across the CUA. Through the INOTE Project – funding has been approved to run this programme from September 2021 – May 2022. Live webinars will finish in May but participating students will maintain access to all online resources, materials and tests for the duration of 1 year.

2. The Leader board will operate on a monthly basis with the 'top' student in each Institute identified. This will be promoted on the individual IT newsletters and in the CUA newsletter.

3. Focus groups will take place with students across Institutes & Faculties to ascertain what works well and any improvements needed

4. Follow up correspondence with students who register but do not engage to ascertain reasons why they have been unable to partake.

5. Any remaining places on the programme is being piloted with Partner Institutes overseas

6. It is anticipated that English Language Support will continue to be promoted and available to all our students for whom English is not a first language.

Submitted by: Dr Niamh Plunkett

Academic Writing Digital Badge

Authors	Aoife Murray, Academic Writing Tutor Dr. Ellen McCabe, Instructional Designer
Name of Dept. and School/ Faculty and Institute	Academic Writing Centre, Centre for Enhancement of Learning & Teaching,(CELT), IT Sligo Centre for Online Learning, IT Sligo
Keywords	*Academic Writing; Digital Badge; Student Support; Online Support; Remote learning; Self-directed learning; UDL*

Section A: Case Study Summary

1. What I did/how I did it + team involved

The academic writing digital badge was developed by IT Sligo under Work Package 3 of the Innovative Opportunities Transforming Higher Education (iNOTE) project. This work package seeks to develop an online learning student support services model. The badge is an academic writing support for CUA students and has been designed as part of a framework of flexible resources that are easily embedded in curricula. This freely available, self-directed and interactive programme was designed to develop the academic writing skills of all students. The programme complements 1:1 appointments, in-class tutorials and the bank of online resources currently offered by the academic writing centre. Covering key topics in academic writing, this programme is particularly useful for those transitioning from 2nd to 3rd level, remote learners and lifelong learners returning to education.

2. Outputs and impact achieved

Student and staff engagement with the badge in the academic year 2020/2021 was extremely positive, with 3,356 individual unit badges awarded and the digital badge was embedded into 13 modules within 4 departments.

3. What did we learn?

An evaluation of student and staff experiences using the digital badge found that a large majority of both students and staff believe the academic writing badge to be a user-friendly, valuable and effective resource. The badge was shown to have had a considerably positive effect on students' engagement with their learning material and on their learning experience. The evaluation findings also indicated a significantly positive impact on the teaching experience and workflow of staff. Recommendations for development of the badge focus on opportunities for increasing engagement. The evaluation also recommended the badge be embedded, with credit, on all programmes. A flexible approach to this incorporation should be taken with decisions on timing of content delivery to be determined at programme level to ensure maximum relevance and engagement from students.

Section B: Full Case Study

1. Context/Rationale

The academic writing digital badge was developed by the Academic Writing Centre and Instructional Design team under the iNOTE project at IT Sligo. The rationale for the development of this programme included:

- Develop a self-directed, flexible and accessible resource to improve students' core academic writing skills.
- Develop a resource to support teaching of academic writing skills within academic programmes.
- Utilise digital badge technology to allow completion of academic writing content to be linked to Module continuous assessment.

Address the iNOTE Work Package 3 objectives of:

- Provision of appropriate supports and services for all flexible learning students including those with disabilities.
- Reviewing support systems, thereby determining appropriate methods by which learners within the CUA can access supports in a structured and equitable way.
- The production of a suite of support packages, online supports and resources.
- Mitigate the necessity for students to seek out services, facilitating an inclusive student experience, in line with the principles of UDL.

2. Details of Outputs and Impact

The Academic Writing Digital Badge

The project proposal was developed by IT Sligo's Academic Writing Centre and submitted for approval under the iNOTE project. Funding was granted for the Academic Writing Tutor and an Instructional Designer to collaborate on the development of content and technical delivery of the programme. Testing was conducted with academic and professional staff, resulting in some minor revisions to the programme. The programme was developed using the Articulate Rise and Storyline 360 e-learning platform and is hosted on Moodle.

Divided into 7 Units, each unit contains course content, practice activities, downloadable resources, and a final quiz to check understanding (Fig.1):

- Unit 1: Introduction to academic writing
- Unit 2: Effective reading and note-taking
- Unit 3: Avoiding plagiarism: citation, referencing and paraphrasing
- Unit 4: Writing an assignment: a step-by-step approach
- Unit 5: Critical analysis and critical writing
- Unit 6: Report writing
- Unit 7: Grammar, punctuation and spelling

Figure 1: Academic Writing Digital Badge on Moodle

The programme adopts a flexible approach, with options to complete individual units or the whole programme. Digital badges are awarded for each unit completed, with an academic writing digital badge awarded for completion of the entire programme. Participants can also choose to complete particular elements of each unit according to their needs. However, in order to receive a digital badge, both course content and the final quiz must be completed in each unit.

Figure 2: Academic Writing Digital Badge

Impact of the Academic Writing Digital Badge

In the period October 2020 – May 2021, 330 students completed the entire digital badge with 3,356 individual unit badges awarded. The three most popular units were Unit 1: Introduction to academic writing (n=712), closely followed by Unit 3: Avoiding plagiarism (n=630) and Unit 2: Effective reading and note taking (n=497).

The academic writing digital badge was also embedded into 13 modules across various programmes within 4 departments using a variety of approaches:

- Embedded into continuous assessment with marks awarded for completion.
- Embedded into the course/module Moodle page and used as a teaching resource by lecturers.
- Embedded into the course/module Moodle page as a student learning resource with completion recommended.

The digital badge's unit structure and ability to track student completion rates within each unit, allowed either the entire badge or specific units to be embedded within modules. This flexibility was essential, as it allowed individual modules and programmes make decisions on what was appropriate for their student cohort. For example, a Level 9 Masters programme required students to complete the entire digital badge, whereas a Level 8 degree programme required students to complete the first three units.

Evaluation of the Digital Badge

A research project evaluated the impact of the digital badge on the learning experience of students and the teaching experience of lecturing staff during the academic year 2020/2021. The most significant finding was that the majority of both students and staff believe the academic writing badge to be a user-friendly, valuable and effective resource which they would recommend to colleagues and fellow students.

> I used it right at the start when I really needed it and it has helped in building my own confidence to be able to continue with my subsequent assignments. If I get stuck on something I often check for help or clarification on things there, really useful. (Student respondent #31)

Results point to the badge having had a positive effect on students' engagement with their learning material and on their learning experience. Particularly in relation to understanding the requirements and importance of academic writing; avoiding plagiarism by using citation, referencing and paraphrasing; confidence in approaching an academic assignment and avoiding the pitfalls.

> It has taken me personally from an underconfident person in approaching assignments and has provided clarity, understanding but also has boosted the confidence when it comes to academic writing. (Student respondent #22)

In addition, the evaluation indicated that the badge had a significantly positive impact on the teaching experience and workflow of staff. Staff cited a better overall quality of written assignments with a reduction in incidences of plagiarism and common errors, as improving their corrections experience.

> The quality of assignments has improved in terms of the structure, layout & professionalism of reports. (Staff respondent #11)

They also cited the information and resources provided within the badge as extremely useful as a classroom resource and as a useful referral tool to answer commonly asked questions or for students for whom academic writing is a challenge.

> I had very few issues with plagiarism since students completed the badge and although there were still academic writing issues, I have a resource I can ask students to go back and review. (Staff 8)

There was a strong belief amongst staff, based on feedback from employers in their sectors, that high quality writing is a highly valued skill in the workplace. However, lecturing staff did not believe their students were fully aware of this. The findings support that belief, with only half of the student survey respondents seeing the benefit of displaying the academic writing badge on their CV for potential employers.

> In work, they will have to write […] The ability to communicate clearly will have an impact on career, no matter how technically proficient they are […] (Staff respondent #14)

Suggestions for developing the badge did not focus on any fundamental changes to the content or structure, rather on opportunities for increasing engagement by making completion of the badge credited, mandatory and phased for all or particular groups of students, allowing access to the badge before courses commence and enhancing the assessment element by making adjustments to the quiz structure.

Evaluation of the badge underlined the importance of facilitating the integration of supports into curricula. The flexible design of the badge allowed lecturers to position the badge in the context of their learning material. This rendered the badge more meaningful to students and simplified access. This has provided a framework for flexible support design and dissemination. A number of digital badges based on this structure are currently in development at IT Sligo.

3. Key Learnings

The evaluation of the academic writing digital badge led to some key recommendations:

1. The academic writing badge to be embedded into all programmes with consideration given at programme level as to how it can most effectively be embedded to ensure learning is achieved.

2. Explore the development of a *staff guide to the academic writing badge* to highlight the benefits of embedding the badge within a module and to support staff in the effective use of the badge.

3. Add additional information on the benefits of a digital badge and instructions for how to download, save and display badges.

4. Enhance student understanding of the transferability of academic writing to the workplace, emphasising connections between academic writing and professional writing.

5. Extend the suite of flexible, affiliated supports available for integration into academic modules.

Academic writing can be daunting for students, especially for those who are new to education or coming back to education, this resource provides some key information to students to make that task less daunting and provides good resources that they can view time and time again. (Staff respondent #16)

Submitted by: Aoife Murray, Dr. Ellen McCabe

Theme 6:

Supporting Academics in an Online Teaching Environment

Ask Me Anything! (AMA) – Answering the call of Academic Staff transitioning to the world of Online Teaching and Beyond

Project Team	Orla Skehill, Dr. Sean Daffy, Dr. Kevin Cunningham
Name of Dept. and School/ Faculty and Institute	Teaching and Learning Office, Galway-Mayo Institute of Technology
Keywords	*Teaching and Learning; Online support; Technical support; Learning Technology; Technology enhanced learning; MS Bookings*

Section A: Case Study Summary

1. What I did/how I did it + team involved

The pandemic brought with it the impetus to introduce a new service from the Teaching and Learning office in GMIT called 'Ask Me Anything' (AMA) – trialled initially with a select cohort in June 2020 before being rolled out to all staff in September 2020 for the start of the new academic year.

AMA clinics are simple 15-minute online one-to-one pre-booked sessions with a Learning Technologist from the Teaching and Learning Office, where academic staff can ask about anything they like: teaching and learning approaches, the Virtual Learning Environment (VLE), computer equipment, video conferencing, digital tools or a combination of these. The rationale behind this is not only to support staff with technology issues but also to show how learning technology can complement and enhance their teaching practices.

The AMA clinics provide an informal opportunity for learning technologists and academic staff to collaborate and explore the potential of technologies for group work, peer-peer learning, active learning and more student-centred learning approaches (Brandes and Ginnis 1986, Lea et al. 2003, O'Neill and McMahon 2005, Bayram-Jacobs and Hayırsever 2016); as well as helping staff incorporate Universal Design for Learning principles into their teaching practice (McGuire & Scott, 2006; Padden, 2017). While staff may take up formal training and qualifications in teaching and learning, the theory, skills, and competencies learned from this are not always straightforward to implement in their teaching practices. The aim of all AMA clinics is to assist staff on their journey of inquiry by providing just the right amount of knowledge and direction. This will continue to include helping staff to adapt or improve their teaching practices in order to enhance student engagement on the modules they deliver. Technology plays a key role in creating an engaging but also effective environment for students to engage with, provided they are designed effectively.

To deliver this service we selected Microsoft Bookings as the platform to manage the pre-booking of sessions. This enabled us to present a self-service booking interface to automate the process of clients scheduling their appointments. The tool allowed us to easily offer multiple timeslots over the course of the week whilst taking into consideration the personal calendars and availability of the Learning Technology team members. Overall, this mechanism enabled a very user-friendly, efficient, and convenient method to meet with staff to discuss their query.

2. Outputs and impact achieved

The implementation of this support service has to date delivered over 400 clinics to academic and professional service staff across all programmes and functions in the institute. For those who have used the service, there has been positive feedback, both formally and informally about how it has benefited them with their query. As learning technologists, working as part of the teaching and learning office, it has provided us with a better connection to staff across disciplines to gain insights to discipline specific issues as well as more general issues both of which have been able to inform our training and resources which are provided in addition to these AMA clinics.

3. What did we learn?

Over the last 18 months, there has been a vast amount of experience and knowledge developed on our understanding of the challenges and issues which academics face. On the personal side we gained insight to the isolation, pandemic anxiety and the effects remote working had on many of our colleagues. We discovered that aside from technological or pedagogical support many staff found value in just a simple online face to face chat with us during the lockdown period.

On the technological front we already knew staff faced substantial challenges due to the growing need to adopt technology in their teaching practices in general. Prior to the pandemic there was a greater informal office support network available to help them work through these problems in a just in time fashion. During the pandemic, this network was completely lost with the consequential shift to a fully virtual work environment. Every member of staff had to rely on using various forms of unfamiliar technology and applications some of which necessitated rapid upskilling in relation to their use. The speed of this upskilling varied widely depending on two factors – the base IT literacy level of the member of staff and their general motivation to engage with this technological shift. This became more apparent with each AMA clinic as we re-encountered the different profiles of AMA client. Consequently, the AMA's have helped inform us of what supports to create, when to deliver them as well as what kind of level to pitch these supports at to maximise value for the consumer.

Section B: Full Case Study

1. Context/Rationale

The potential of learning technologies to improve and transform educational practice is widely recognised, however research shows that attempts to harness this potential often fall short of expectations (E. Dahlstrom, D.C. Brooks and J. Bichsel, 2014; Porter & Graham, 2016). A key factor in the introduction and implementation of learning technologies in higher education is the adoption and use of learning technologies by academic staff. Studies have shown that academic staff respond in vastly different and sometimes unpredictable ways to the introduction of new technologies (Heilesen & Josephsen, 2008; Sahin & Thompson, 2006) and do not necessarily adopt learning technologies in ways that transform teaching (Kirkup & Kirkwood, 2005).

Barajas and Gannaway (2007) found that academics struggled to make sense of centralised technical training provided by IT staff that have purely technical roles, while tailoring support for academics was not considered important by IT staff. Conversely, multiple studies have shown that more informal supports and communication networks were key to successful innovation and adoption (Keppell, O'Dwyer, Lyon, & Childs, 2010). It is recommended that sessions should leave room for collaboration with academics so that they provide hands-on, authentic problem-based learning experience, which facilitates adoption (Johnson, Wisniewski, Kuhlemeyer, Isaacs, & Krzykowski, 2012; Tynan et al., 2010).

In a review of relevant research published to date, Liu, Geertshuis, and Grainger (2020) listed a range of recommended strategies for successful learning technology adoption in higher education. These included:

- Recognise diversity and allow for levels and rates of adoption
- Design training and support that caters for diversity
- Develop systems for listening and responding to grassroot concerns
- Provide a rich support regime so staff can efficiently learn what they want to learn when they want to learn it and with minimum risk

The AMA clinics follow these strategies: providing support and advice for the real-world problems and specific needs of individual staff members in an informal, friendly environment. The sessions also provided opportunities for us to listen and understand the issues academic staff were facing that informed the design and how to tailor further training sessions and resources to meet these needs.

2. Details of Outputs and Impact

Since March 2020, the AMA clinic service has proven immensely popular with over 400 clinics booked to date. Feedback from staff indicated a strong demand to continue this service even when students return physically to campus. It has proven popular for many reasons; One to one advice and guidance, technical support to implement teaching and learning strategies and perhaps the most important aspect is the ability to discuss an idea or issue they are having with a support staff member to help with it.

It is commonly known that academic staff do not require any pedagogical training to become a lecturer instead they hold a qualification in a particular area of expertise. The role of training and diplomas in this area continues to be implemented in colleges across the country which is an important initiative. When an academic staff member starts in their role, they may have little to no experience with managing a Virtual Learning Environment. The combination of this being an IT, but also a teaching and learning challenge presents an obvious rationale for staff needing ongoing support for the use of Moodle, MS Teams, and a variety of online tools to design and deliver effective instruction and assessments. This does not even account for the challenge which the COVID-19 virus presented to the delivery of education as colleges attempted to avoid any course being postponed during this time period. The restrictions implemented by the Irish government in response to the pandemic required education be delivered virtually by staff who were to work remotely. This sudden shift presented significant IT challenges for academic staff. As colleges quickly adapted to this and pursued delivery online, the IT applications used needed to be brought up to speed quickly to match this demand. In May 2020, the idea of an Ask Me Anything style support was brought to fruition by Orla Skehill (Learning Technologist, GMIT Teaching and Learning Office) who at the time was the only Learning Technologist in the Teaching and Learning Office. In September 2020, Sean Daffy was added as an additional Learning Technologist and in January 2021, Kevin Cunningham joined, again as a Learning Technologist to expand the team to its current structure of 3 Learning Technologists. By the end of 2020, over 150 AMA clinics were undertaken by academic staff. By May 2021, this had increased to over 330 and to date (October 2021), this figure stands at approximately 400 and growing.

Figure 1: The evolution of the AMA Service

This AMA support service provides a sounding board to staff to talk through ideas and provides inspiration and/or encouragement to implement these ideas. Furthermore, the AMA service offered a friendly face and support to staff feeling the isolation of remote working and the frustration of having to get to grips with their new way of working. The adaption to solely having to rely on all virtual forms of delivery i.e. Moodle, MS Teams and a variety of applications in addition to this, for some provided a stark contrast to how they delivered previously as they may have never delved too deep into the world of digital education during there years teaching. Figure 2, shows a word cloud of the most common type of query associations which were received for AMA clinics.

Figure 2: Word-cloud capturing key clinic topics

An advantage of adding this type of support in addition to scheduled training and workshops was to create an environment for staff to ask questions. Before AMA's staff may have been unsure who or how to ask or even, in some cases, been embarrassed or shy to ask prior to COVID-19. The pandemic gave impetus and cover to staff, who could now say *'I've never had to do this before'* or *'I have had no experience with this.'*

Furthermore, some feedback from staff who participated in a remote working survey in GMIT (n=101, Response Rate ~20%) outlined that *"Ask me Anything clinics were a brilliant support which assisted greatly with really difficult problems, please continue these going forward".*

The request to continue the AMA clinics going forward was repeated several times in response to questions in the survey which were open ended and asked staff what they struggled with, what challenges they faced and what helped/what they think would help overcome these going forward.

The AMA clinics created a space to simply ask anything. Apart from just providing a singular immediate benefit for the AMA participant, these AMA interactions helped to shape and guide our institute wide training as we, the Learning Technologists, heard first-hand the issues, frustrations, and needs of staff. Armed with this insight the delivery of timely and appropriate training materials became simpler and more effective. The more insights that we as the teaching and learning team can gain before providing training sessions and resources significantly helps us to deliver the best support possible. This appears to have been successful and we are aiming to continue to grow, enhance and indeed sustain this type of support going forward as feedback from the staff survey outlined that *"The Teaching and Learning Office have done an excellent job, keep up the great work".* With this feedback, we take encouragement that there are positives to take from what we have done as a Team, and we look forward to enhancing our support services across the college going forward armed with the knowledge and experience which we all have gained to date.

3. Key Learnings

Tailoring training, workshops and resources for an audience is much simpler and effective when you understand the challenges and issues faced by them. The AMA's have helped the Teaching and Learning Office identify gaps in knowledge and thus what supports to create and which ones to revise where key concepts were evidently not understood. With over 400 AMA clinics taken, we have been able to gain substantial insight from different perspectives; Departments within the institute, levels of IT ability and a variety of IT issues, all of which have been hugely beneficial in informing us how to tailor our supports. The clinics have helped to put further structure on the timing of deliveries as well as levels at which to pitch certain materials.

As the research from (Barajas and Gannaway, 2007) suggests, there is a gap in the pure technical training that is usually provided by IT staff. AMA clinics have helped to address several key points raised in the research; An informal open environment to communicate issues which academic staff face and the AMA's have helped to overcome this gap. In addition, AMA clinics can also be collaborative so together with the support and/or discussion with a learning technologist, academic staff can put their ideas into practice effectively with the support of appropriate technologies (Johnson, Wisniewski, Kuhlemeyer, Isaacs, & Krzykowski, 2012; Tynan et al., 2010). Without the connection to academic staff which these AMA clinics has provided us with, we would have been much more reactive in response to issues which arose. AMA clinics have allowed us to be proactive in providing supports and resources which address key issues for academic staff.

References

- Barajas, M., & Gannaway, G. J. (2007). Implementing e-learning in the traditional higher education institutions. *Higher Education in Europe*, 32(2-3), 111-119.

- Bayram-Jacobs, D. & Hayırsever, F., (2016). 'Student-centred learning: How does it work in practice? Journal of Education, Society and Behavioural Science, pp. 1-15.

- Brandes, D. & Ginnis, P., (1986). A guide to student-centred learning. Oxford: Blackwell.

- Dahlstrom, E., Brooks, D. C., & Bichsel, J. (2014). The current ecosystem of learning management systems in higher education: Student. faculty, and IT perspectives.

- Heilesen, S. B., & Josephsen, J. (2008). E-learning: Between augmentation and disruption? *Computers & Education*, 50(2), 525-534.

- Johnson, T., Wisniewski, M. A., Kuhlemeyer, G., Isaacs, G., & Krzykowski, J. (2012). Technology adoption in higher education: Overcoming anxiety through faculty bootcamp. *Journal of Asynchronous Learning Networks*, 16(2), 63-72.

- Keppell, M., O'Dwyer, C., Lyon, B., & Childs, M. (2010). Transforming distance education curricula through distributive leadership. *Research in Learning Technology*, 18 (3), 165-178.

- Kirkup, G., & Kirkwood, A. (2005). Information and communications technologies (ICT) in higher education teaching – a tale of gradualism rather than revolution. *Learning, Media and Technology*, 30(2), 185-199.

- Lea, S.J., Stephenson, D. & Troy, J., (2003). 'Higher education students' attitudes to student-centred learning: Beyond 'educational bulimia'?'. Studies in Higher Education, 28 (3), pp. 321-334.

- O'Neill, G. & McMahon, T., (2005). 'Student-centred learning: What does it mean for students and lecturers'.

- McGuire, J. M., & Scott, S. S. (2006). Universal design for instruction: Extending the universal design paradigm to college instruction. Journal of Postsecondary Education and Disability, 19(2), 124-134.

- Padden, L., O'Connor, J., & Barrett, T. (2017). Universal Design for Curriculum Design: Case Studies from University College Dublin. Dublin: Access and Lifelong Learning University College Dublin.

- Porter, W. W., & Graham, C. R. (2016). Institutional drivers and barriers to faculty adoption of blended learning in higher education. *British Journal of Educational Technology*, 47(4), 748-762.

- Sahin, I., & Thompson, A. (2006). Using Rogers' theory to interpret instructional computer use by COE faculty. *Journal of Research on Technology in Education*, 39(1), 81-104.

- Tynan, B., Adlington, R., Stewart, C., Vale, D., Sims, R., & Shanahan, P. (2010). Managing projects for change: Contextualised project management. *The Journal of Distance Education*, 24(1), 187-206.

- Liu, Q., Geertshuis, S., Grainger, R., (2020). Understanding academics' adoption of learning technologies: A systematic review, *Computers & Education*, Volume 151.

Submitted by: Orla Skehill

Theme 7:
Embedding Employability

Embedding Employability in GMIT – An Innovative Careers Education Programme, The Next Step – Transition to Work

Project Team/Name	Bridie Killoran and Orla Skehill
Name of Dept. and School/ Faculty and Institute	Careers Office, GMIT Teaching and Learning Office, GMIT
Keywords	*Employability, Innovative, Online, Agile, Embedded*

Section A: Case Study Summary

Embedding Employability in GMIT

GMIT has one overarching goal: employability of our graduates as reflective lifelong learners through equipping them with requisite knowledge, skills, personal attributes and confidence to reach their career aspirations, whilst ensuring we meet the needs of our industry partners and employers from across the public and private sector.

In 2020 the Careers centre in collaboration and support from the GMIT teaching and learning department developed an accredited Online Careers Module, **The Next Step – Transition to Work**. This is an innovative education programme intended for all students across different disciplines and academic schools within the institute. The 5 credit module was designed as a practical on-line career preparation journey with a catalogue of bespoke career materials across different disciplines and career sectors. New technologies were employed, and the user experience was enhanced by strong elements of instructional design using iconography, built-in activities using HP5 on a Moodle platform.

In addition, the module was used as an alternative to work placement, and this was particularly relevant during the Covid pandemic as many GMIT students had their placements cancelled. This 5-credit module adopted new technologies such as the Sonru Video interviews, online CV tool Career Set (powered by artificial intelligence) online CAPPFINITY strengths profiling. Students also benefitted from virtual careers fairs, on-line employer workshops and meet-ups, graduate talks and one-to-one appointments.

The success of this project was brought about by the fact it involved a unique collaboration of departments and stakeholders. Involving GMIT academic departments, Teaching & Learning, Instructional designers, Lecturers, Students, industry, professional bodies and GMIT alumni was key to its success.

The development of the career's employability module was a positive first step in embedding careers education and employability into the curriculum within GMIT. The module is aligned to the institute's Employability Statement and Framework which highlights the Institute's commitment to working with employers, ensuring that our graduates are prepared for a constantly changing world of work.

The model that underpins both the Employability Statement and Employability Module in GMIT is the CareerEDGE model, developed by Darce, Pool and Sewell (2007). The five critical elements of the framework are shown in the diagram below.

This accredited online career module is aimed at developing the learner professionally and personally and equipping students with the necessary skills and knowledge to enable them to plan for and achieve their career goals. The module is primarily online and delivered in a blended model with a suite of career workshops delivered on TEAMS.

Figure 1: GMIT Employability Statement

The learner is brought through **three key stages** of Employability:

STAGE 1: Student Self Awareness	

- Personality & Strengths Profiling
- Skills & Competencies
- Industry Sector Analysis
- Emotional Intelligence
- SWOT Analysis
- Career Development Plan

STAGE 2: Recruitment & Selection Process	

- Understanding the Selection & Recruitment Process
- CV & Branding
- LinkedIn Profile & Online Presence
- Elevator Pitch
- Job Description Analysis
- Assessment Centres
- Interview Process & Techniques, etc.

STAGE 3: Students first 100 days in the workplace	

- First 100 Days in the workplace
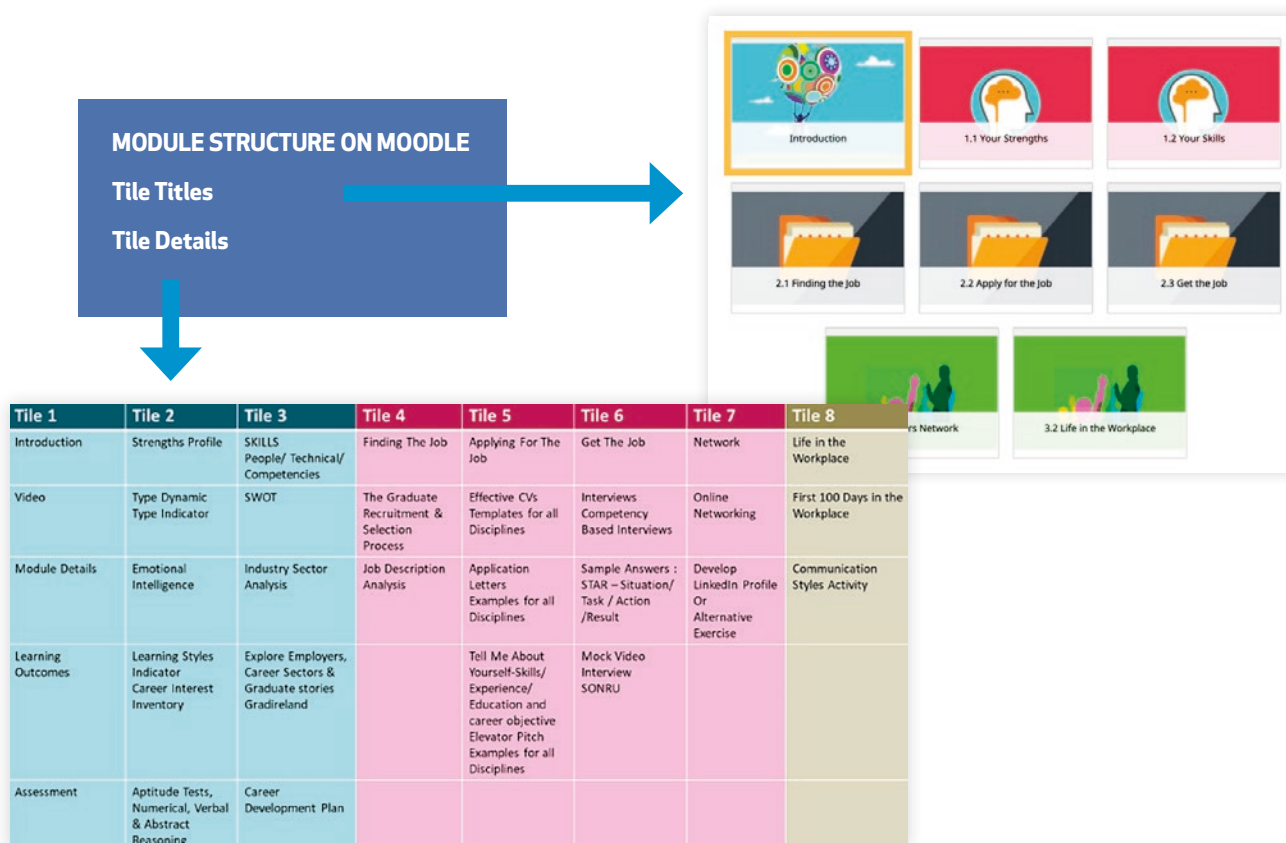
1. What I did/how I did it + team involved

I developed an accredited bespoke *Careers Education Programme* that was offered totally online to 678 students across 5 campuses and different disciplines. The 5 credit module was designed as a practical on-line career preparation journey supported by a catalogue of bespoke career materials for each discipline and career sector. New technologies were adopted such as the Sonru Video Interviewing tool with personalised feedback, online CV tool Career Set (powered by artificial intelligence), virtual assessment centres, online strengths profiling and psychometric testing. Students also benefitted from virtual careers fairs, on-line employer workshops and meet-ups, graduate talks and one-to-one appointments. The main deliverable was a career development plan which included personal strengths profile, personal SWOT analysis, skills audit, sector profile, CV and covering letter to match a real job description.

The design and structure of the content was carefully considered, and a theoretical approach underpinned the content and in the construction of learning outcomes. A credible and visible pedagogic rationale was established so that material was practical and relevant to the learner and they could adapt the material and templates to their own situation.

The user experience was enhanced by strong elements of instructional design using iconography, built-in activities using HP5 on a Moodle platform.

A huge transformation was achieved in such a short period of time through dedication, collaboration and innovation among staff from the Careers Centre, Teaching and Learning Office, and four academic schools – Business, Engineering, Science & Computing and the Hotel School. In total, 678 students completed the module – 378 students have completed the module for credit purposes and a further 300 plus students completed in a non-accredited environment.

This was a unique collaboration involving GMIT academic departments, Teaching & Learning, Instructional designers Lecturers, Students, industry and GMIT alumni was key to its success.

MODULE STRUCTURE ON MOODLE

Tile Titles

Tile Details

Tile 1	Tile 2	Tile 3	Tile 4	Tile 5	Tile 6	Tile 7	Tile 8
Introduction	Strengths Profile	SKILLS People/ Technical/ Competencies	Finding The Job	Applying For The Job	Get The Job	Network	Life in the Workplace
Video	Type Dynamic Type Indicator	SWOT	The Graduate Recruitment & Selection Process	Effective CVs Templates for all Disciplines	Interviews Competency Based Interviews	Online Networking	First 100 Days in the Workplace
Module Details	Emotional Intelligence	Industry Sector Analysis	Job Description Analysis	Application Letters Examples for all Disciplines	Sample Answers : STAR – Situation/ Task / Action /Result	Develop LinkedIn Profile Or Alternative Exercise	Communication Styles Activity
Learning Outcomes	Learning Styles Indicator Career Interest Inventory	Explore Employers, Career Sectors & Graduate stories Gradireland		Tell Me About Yourself-Skills/ Experience/ Education and career objective Elevator Pitch Examples for all Disciplines	Mock Video Interview SONRU		
Assessment	Aptitude Tests, Numerical, Verbal & Abstract Reasoning	Career Development Plan					

2. Outputs and impact achieved

- 678 students completed the module, across different academic schools and disciplines.
- The module was supported by the latest employment technology.
- Both employers & graduates contributed to the module content and online workshops.
- GMIT Careers Service centre had increased engagement from all students across all campuses as they participated in online employability workshops, assessment centres and learned from graduates and industry about their sector and job opportunities.
- Increased Transversal Skills development amongst students including technical and personal skills and attributes that employers look for.
- Students got the opportunity to identify their key strengths and personality type by completing the online strengths profile and psychometric tests thus enhancing their self-confidence.
- Five Academic schools and staff got to participate in elements of the online module.
- Over 50 Employers engaged in the online career's evens and employer networking sessions

3. What did we learn?

1. The importance of collaboration across all departments in trying to embed employability in a higher educational institute.
2. Embedding a careers module increases the profile of the Careers Service amongst students, industry, academic staff and management.
3. Better outcomes were achieved for students through effective relationship building with GMIT employers and the GMIT Careers Service.
4. The impact of implementing UDL principles in the module enhanced the teaching experience of the career's module offering multiple means of engagement, representation and action.

Section B: Full Case Study

1. Context/Rationale

National Context: In recent years, both in Ireland and the UK, governments are addressing the importance of employability skills of graduates from Higher Education Institutions and this has influenced policy, with for example the HEA giving specific direction to HEI's in areas such as work based learning and employability statements. There are also other drivers to developing employability at institutional level. For example, in today's modern economy, employers are expecting Higher Education Institutions to embed generic or employability skills more fully into the curricula (IBEC 2010).

Government reports, all discuss importance of employability skills:

i. Ireland's Industry 4.0 Strategy 2020-2025.
ii. Future Jobs Ireland 2019: Preparing Now for Tomorrow's Economy, Government of Ireland, 2019.
iii. Project Ireland 2040 National Development Plan.
iv. Enterprise 2025 Renewed: Building resilience in the face of global challenges, Department of Business, Enterprise and Innovation, 2018.

This project was a positive step for GMIT to demonstrate its commitment to more meaningful career and employability development.

- the fact that graduate employability needs to be a central feature on all academic programmes in order to prepare graduates TO compete in the dynamic, knowledge led economy
- this initiative was an important step in trying to embed the elements of employability and using the language of employability into academic programmes to make employability more obvious and accessible to all stakeholders.
- Employability initiatives needs to reflect the changes to the GMIT student profile in order to be effective for the complete student body, embracing diversity, inclusion, access & disability.
- As a result of Covid-19 and the impact on the graduate's employment opportunities over the next few years. The recent survey of employers in Ireland[1] carried out by the Association of Higher Education Career Services (AHECS), the findings indicate that graduate recruitment will decrease by at least 40% in 2021. There is also a predicted decrease in the number of placements available for students. As a result, almost all third-level and further education colleges in Ireland will have to seek alternatives to work placement.

Findings that have informed the development of the initiative and who undertook this research

In 2019, Bridie Killoran, Careers Officer led out on the development of an Employability Statement and Employability Framework for GMIT, which outlines its overall approach to employability and the supports available to both students and graduates. This was completed in GMIT in 2019 with guidance from the steering committee nominated by the Institute registrar Dr. M. Hannon. This statement was approved by Academic Council and is available on www.gmit.ie website.

This process involved researching different definitions and models for employability and it was concluded that the CareerEDGE model of employability, developed by Darce, Pool and Sewell (2007) which was considered the best fit for GMIT. The five critical elements of the GMIT Employability Statement are shown in the diagram below.

Figure 2: Five elements of employability (Darce et al)

---
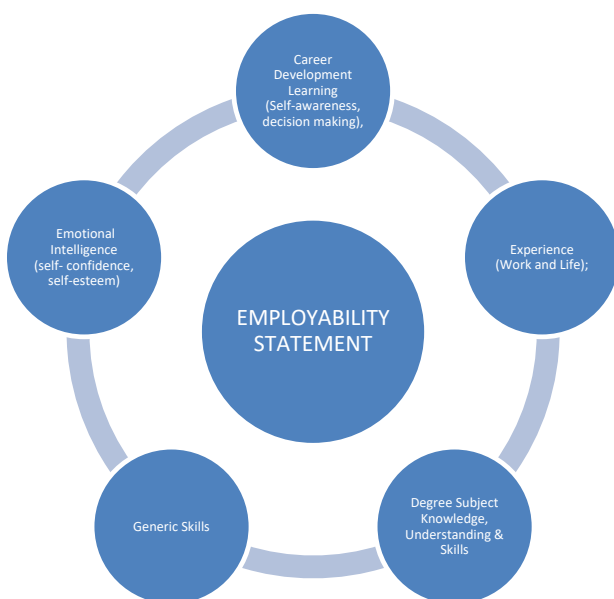
1   https://www.ahecs.ie/wp-content/uploads/2020/10/AHECS_GMS_2020-final-soft-copy.pdf

In 2021 employability became one of the key themes for academic programmatic review which ultimately will have an impact on all students across all courses and campuses.

2. Details of Outputs and Impact

The Online Employability Module, The Next Step – Transition to Work was launched in 2020, just before Covid and was in place when all teaching had to be transferred to an online environment. The module reflected the modern and accelerated changes that was happening in the workplace e.g. on-line recruitment.

Technology

The latest technology was employed and incorporated into the module allowing students to become familiar with the new employment recruitment technology:

- Career Set/Artificial Intelligence CV Software
- Sonru Online Interview Software.
- CAPP Strengths Profile psychometric and careers assessment
- Virtual Careers Fair Software: Career Fair Plus
- Team Focus Psychometrics Assessment
- P Virtual Chats
- E-Guidance Psychometric Testing Online
- Graduate Outcomes Survey
- CRM System, Careers Connect

Discipline Specific Career Materials

A catalogue of bespoke career materials was researched, prepared and incorporated into the module for all disciplines and career sectors.

Figure 3: Sample Bespoke interactive Career Resources
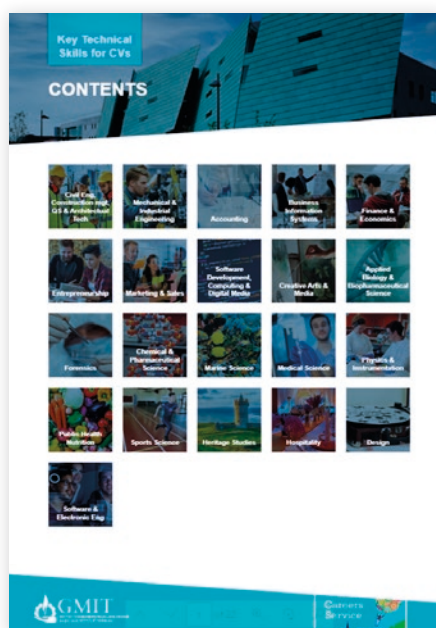
Module Design

The Design of the Module was creative and distinctive, and the user experience was enhanced by strong elements of instructional design using iconography, built-in activities using HP5 on a Moodle platform. Other aspects to the design included:

- Strong integration of theory and practice throughout module content
- Transparent pedagogic framework
- Introductory videos for each section with clear learning outcomes and methods, activities and timings
- Easy-to-use materials (e.g. websites, activity sheets)
- Assessment strategies linked to learning outcomes
- Suitable for curriculum and non-curriculum-based delivery
- Embedded into the curriculum, thus optimising student engagement and learning.
- The modules can also be delivered flexibly within the extra or co-curricular framework and can reside within an employability awards framework.
- A modular intervention allows employability departments to work in partnership with academic leads to provide tailored solutions to strategic priorities such as placement uptake and retention. Modules also enable departments to be flexible and responsive to changes within the graduate labour market.
- The modules were designed through co-creation with stakeholders including employers and students and were delivered using a range of creative and innovative teaching and learning practices.
- These included flipped classroom activities, individual research, paired discussion, mobile interaction, and self-directed learning and assessment

Student Reach

678 students completed the Online Careers Module – 378 for credit purposes and a further 300 + as a standalone module.

Placement Alternative

The module was offered to over 300 students as an alternative to work placement offering professional support to students preparing for work placement. Student who completed the module had a competitive advantage of being well prepared presenting to an employer and this enhancing the reputation of GMIT students with employers.

Student Engagement

- The cross disciplinary nature of student groups completing the module allowed for better student engagement from different courses and allowed for more cross disciplinary employability projects. The on-line nature of this accredited module allowed for a highly efficient use of time and resources for a large number of students.
- There was approx. 50% increase in the numbers of students getting access to CV reviews and approx. 70% to mock interviews. The online delivery made it easier to timetable cross-disciplinary and employer workshops. Quality was enhanced with excellent on-line packages and individual coaching was still possible.
- The most used online element was the section focused on "Your Skills", which included traditional self-discovery techniques such as: "SWOT diagram" (17,273 views) and a presentation on "Skills every college student has" (17,238 views) along with the modern "SKILLZ" resource (17,157 views).
- The second most widely consulted online element was the section focused on "Finding the Job" which appealed to students with features such as "Review the job description" (17,027 views).
- "Apply for the job" section contained the ever-relevant topic "About yourself" (17,130 views).

Stakeholder Involvement

Both graduates and employers contributed to the course content and shared their experiences of navigating the employment market.

- Recent graduates were highly impressive in presenting their careers to date and the break-out sessions with students from the various disciplines were highly engaging. This blended learning experience, consolidated the learning, supported learning preferences and was assisted with bespoke online resources
- *Academic staff* got to participate in some elements of the learning outcomes, and the online module acted as an additional accredited module to go towards the students work placement credits.
- *Employers* got to inform students about their companies, the sector, graduate programmes and opportunities, their recruitment process, and skills they look for in students.

Student key takeaways

- Personal career plan which included strengths profile, psychometric assessments, personal SWOT analysis, skills audit, sector profile, CV and covering letter to match a real job description.
- Participated in online employability workshops, assessment centres and learn from graduates and industry about their sector and job opportunities.
- Developed a professional online professional presence using digital technologies.
- Honed advanced skills for work aimed to develop their own employability journey
- key component of the CV application process was a 30-minute one-to-one consultation.
- Provided with bespoke email communication which highlighted relevant placement opportunities and support available from the Employability and Careers Hub

Student Feedback

- 80% of the student's survey rated the module excellent, very good or good
- 82% of the students reporting enhanced self confidence
- 80% reported finding the online virtual mock interview excellent, very good or good
- 74% of students reported they found the mock interview feedback excellent, very good or good

3. Key Learnings

- The key to the success for embedding an employability programme, such as **The GMIT Careers Module – Transition to Work**, into the curriculum is the support from senior management and collaboration from the teaching and learning department and the academic departments. There is still not universal agreement from the academic community in relation to the placing of employability initiatives within the curriculum. However, we have seen an increase in support from the academic community looking to engage students with the concept of employability early on in their courses. If a system is in place to allow students to articulate and record their career goals, which can lead to action planning and reflection, this will inevitably have an impact on student's self-confidence with underpins the CareerEdge model of sustainable employability.
- The curriculum enabled students to recognise and develop their transversal skills sought by employers.
- Embedding the careers module increased the profile of the Careers Service amongst students, industry, academic staff and management.
- Better outcomes were achieved for students through effective relationship building with GMIT employers and the GMIT Careers Service.
- The impact of implementing UDL principles in the module enhanced the teaching experience of the career's module offering multiple means of engagement, representation and action.

References

- ACHECS, (2020), Association of Higher Education Career Services in Ireland research during Covid-19 with Graduate Employers. Available at https://ahecs.ie/our_resources/graduate-market-survey-2020/

- Darce Pool, L., & Sewell, P. (2007). The key to employability: developing a practical model of graduate employability. Education and Training, 49(4), 227-289.

- Dept. Business Enterprise and Innovation (2021). Future Jobs Ireland 2019. Available at https://www.enterprise.gov.ie/en/Publications/Publication-files/Future-Jobs-Ireland-2019.pdf

- ESRI, (2020). Covid-19 having a significant but disparate impact on the Irish economy https://www.esri.ie/news/covid-19-having-a-significant-but-disparate-impact-on-the-irish-economy

- Government of Ireland (2021), Ireland's Industry 4.0 Strategy 2020-2025. Available at https://www.gov.ie/en/campaigns/09022006-project-ireland-2040/

- Government of Ireland, (2021). Enterprise 2025 Renewed: Building resilience in the face of global challenges, Department of Business, Enterprise and Innovation. Available at https://enterprise.gov.ie/en/Publications/Enterprise-2025-Renewed.html

- Kolb, D., (1984). Experiential learning: experience as the source of learning and development, Englewood Cliffs, NJ: Prentice Hall. Chapter 3: Structural foundations in the learning process.

- McCash, P. (2011). Designing a generic career studies module: a practical example, Reading: Centre for Career Management Skills.

- Praslova, L. (2010). Adaptation of Kirkpatrick's four level model of training criteria to assessment of learning outcomes and program evaluation in higher education, Educational assessment, evaluation and accountability, 22 (3): 215-225.

Submitted by: Bridie Killoran

Theme 8:
Students as Partners and Co-creators

Covid, a Trigger to Re-evaluate the Approach to Reflective Practice in Culinary Education at GMIT

Project Team/Author	Ulrich Hoeche and Anne O'Leary
Name of Dept. and School/ Faculty and Institute	Culinary Arts, GMIT
Keywords	*Reflective Practice, Experiential Learning, Peer Assisted Learning, Blended Learning, Community of Practice*

Section A: Case Study Summary

Background to study

The sudden Covid crisis forced a very swift move to online teaching posing many challenges to lecturers and students alike. However, GMIT's digital strategy developed prior to the pandemic, clearly outlines the goal of transitioning to a blended or fully online based approach for some module delivery, while taking the nature of subject areas into consideration.

One aspect though highlighted by the pandemic is the existence of technology that allows the integration of interactive teaching and learning techniques with the more conventional on-campus style of delivery.

The format used traditionally in the Galway International Hotel School at GMIT for culinary module delivery incorporates practical lab classes supplemented with face-to-face related theory in a traditional classroom setting. Students are required to prepare a class report for each practical lab, a section of which requires students to reflect on their learning during class. Class reports are submitted after class via Moodle.

The ABC Toolkit for learning design was instrumental to reviewing traditional approaches to culinary education and to identify innovative approaches and tools to assessment in a blended learning environment. One of the digital tools chosen to support this new format of blended delivery was Padlet, a highly customisable online noticeboard. Padlet replaced the individual reflection component that traditionally was completed by student in their class reports. The tool promoted both collaborative and independent learning.

Class reports pre covid were only shared between individual students and the lecturer. Padlet created an innovative way of sharing reflections between students, creating a community of practice. This tool was applied to the Modern Classics and Global Cuisine module as each menu ran for a two-week period, with students completing different tasks each week. Students were tasked with posting their reflections and uploading a photograph of their dish each week. Padlet enabled students to learn from the reflections of their peers. To provide guidance and a clear structure to students an assessment rubric was developed prior to introducing Padlet. In addition, students were given access to samples that represented different standards of reflective practice. Culinary arts students are very much visual learners. Padlet provided students with a tool that allowed them to showcase their dishes and to see how their peers interpreted dishes. It stimulated the students to compare, contrast, and reflect on each other's dishes, allowing them to comment on visual aspects such as shapes, colours, and flow. A survey was conducted to evaluate the impact of digital tools while online teaching during the pandemic. Student feedback showed that they valued Padlet as a digital tool for reflection, to share ideas and learn from each other. Students also commented favourably on the social aspect of using Padlet in breakout rooms during group work.

Padlet as a tool for reflective practice has demonstrated considerable potential and the benefits will be communicated and disseminated throughout the Galway International Hotel School, and it is envisaged to embed the formal process of reflective practice into teaching across the culinary department. However additional research is required, and much can be learned from the nursing profession, where reflective practice and critical reflection are an essential part of education. Learning about and engaging in the process of reflective practice will provide culinary students with an important life skill, that will enable them to achieve, maintain and continuously improve professional competencies throughout their working life.

1. What I did/how I did it + team involved

The Covid pandemic forced culinary arts lecturers to consider how best to deliver their modules using a blended approach. GMIT's digital strategy designed pre Covid informed the adoption of Padlet as an interactive tool to encourage students to develop their reflective practice. The module Modern Classics and Global Cuisine delivered by Anne O Leary and Ulrich Hoeche was selected as the module of choice for this case study. Pre Covid students completed class reports which included a section for their reflections after class. This written work was only seen by the lecturer and the student. The formal application of a reflective cycle or the process of reflective practice was not evident. The use of Padlet provided students with a collaborative space, offering them an invaluable life skill to improve the quality of learning, enabling students to identify their own strengths and weaknesses once they were willing to question their own way of doing things.

2. Outputs and impact achieved

Padlet provided the opportunity to re-evaluate how students engaged with reflection and reflective practice. Students were able to share and learn from each other's reflection enabling peer assisted learning and, in the process, developing a community of practice. The barriers to reflective practice such as individuals feeling vulnerable, time constraints, organisational culture, and a lack of appropriate skills as suggested by Fook (2015) and Thompson and Thompson (2018) where overcome by providing students with a supportive structure, specific brief and assessment rubric. To gain better understanding and insights on the blended mode of delivery a survey was conducted. Students commented positively on the use of Padlet as a tool, that was easy to use and encouraged learning from each other. Students also commented favourably on the social aspect of using Padlet in breakout rooms, allowing them to focus on a group task around culinary topics, to share ideas on this digital canvas while being able to talk to their peers, something that had been quite difficult during the pandemic.

3. What did we learn?

The use of Padlet as a digital learning tool has demonstrated potential for its use as a blended learning medium that supports reflection, reflective practice, peer learning and collaboration. It supports visual learners and enhances engagement with reflection, developing a sense of team spirit and pride in the creation of this digital canvas which has the potential to be a long-term learning tool that can be used as an inspirational resource for menu creation in the workplace.

While the assessment rubric and the brief on reflective practice and tuition by the lecturers was very beneficial to the students as a supportive structure, additional work is needed to build upon this study to formalise reflective practice and develop critical reflection as an important life skill that will enable students to achieve, maintain and continuously improve professional competencies throughout their working life.

Further research is required, and much can be learned from the nursing profession to make critical reflection work within the culinary educational context.

Section B: Full Case Study

1. Context/Rationale

Traditional formats of on campus teaching had to move very quickly online when the pandemic of Covid 19 struck Ireland in March 2020. While the transition to a blended or fully online based approach of teaching dependent on the nature of programmes, had been and is part of GMIT's digital strategy, the sudden move online posed many challenges to both students and lecturers.

What became apparent is that the technology exists that allows the fusion of digital teaching and learning strategies with the more traditional on campus mode of delivery. Furthermore, the covid crisis seemed to serve as a catalyst for a transition phase that seems to be unavoidable in the face of a rapidly progressing digitization, forcing higher education to review and assess the efficacy of existing teaching formats and routines in the face of digital alternatives (Skulmowski & Rey 2020).

The pandemic presented a challenge but also an opportunity to evaluate the fully on campus practical culinary modules and redesign parts of them for a blended delivery, leveraging current technology and pedagogic tools to provide an enhanced student experience, that resulted in part of the modules being delivered online. The ABC Toolkit for learning design (ABC Learning Design 2018) was used to create a structure for new learning activities that would support this blended mode of delivery. The Modern Classics and Global Cuisines module was selected to incorporate a variety of tools to better facilitate the different learning styles of students and enhance online engagement. It became very clear during the initial stages of development, that moving to the online environment required a restructuring of learning, teaching and educational concepts. As the use of technology in online delivery creates new and innovative learning opportunities it challenges the traditional formats of teaching and learning by making education available in a variety of new formats (Collins & Halverson 2018).

One of the digital tools chosen to support this new format of blended delivery was Padlet, a highly customisable online noticeboard. The tool promotes both collaborative and independent learning (Dianati, S., Nguyen, M., Dao, P., Iwashita, N., & Vasquez, C. 2020). Here Padlet was to transform the process of reflection. Culinary education and its traditional pedagogies have in the last number of years come under scrutiny because of its simplistic emphasis of acquiring skills through demonstration followed by replication (Woodhouse 2016). According to Davies (2012) and Ghaye (2010) reflective practice offers an invaluable life skill to improve the quality of learning, as it enables students to identify their own strengths and weaknesses once they are willing to question their own way of doing things. Reflective practice will enable those students to achieve, maintain and continuously improve professional competencies throughout their professional working life, way beyond college.

In the traditional delivery of culinary arts in GMIT students are asked to reflect on their practical work, the formal application of a reflective cycle or the process of reflective practice is not evident. With this in mind Gibbs's Reflective cycle was researched and modified for application in the culinary module providing a framework and structure for the students experiential learning. Considerable learning can be gained from the nursing profession, where reflective practice and critical reflection is embedded into education and daily practice (Bulman, C., Lathlean, J., & Gobbi, M. 2012; Smith, E. 2011; Vanlaere, L., & Gastmans, C. 2007).

Padlet was the tool used to introduce the students to the process of reflective practice by Anne O'Leary and Ulrich Hoeche in their blended delivery of the culinary module Modern Classics and Global Cuisines in the Galway International Hotel School at GMIT during the academic year 2020/21.

2. Details of Outputs and Impact

Culinary modules at GMIT had been delivered over the last number of years as fully on campus practical modules with some containing theory elements delivered in a traditional classroom setting. Most of the teaching, learning, communication, assessment, discussion, and reflection was conducted in the practical kitchen or the classroom, with the Virtual Learning Environment (VLE) Moodle mainly providing supportive material such as theory notes and recipes. Covid was the catalyst to re-evaluate the process of reflection and reflective practice in culinary education.

In the past students reflected on their practical experience in class reports submitted to the lecturers. Here the lecturer provided feedback to the students individually.

During the pandemic the digital tool Padlet was introduced on an initial trial basis as a tool for reflection to second year culinary students on the module Modern Classics and Global Cuisines. The digital tool provided the opportunity to re-evaluate how students engaged with reflection and reflective practice, and in addition for the first time the students were able to share and learn from each other's reflection. However, in some cases reflection may make individuals feel vulnerable, therefore identifying the benefits of the reflection process is essential (Fook, 2015). Additionally, it is important to recognise other barriers to reflective practice such as, time constraints, organisational culture, and a lack of appropriate skills, although all these obstacles can be overcome through critical thinking, self-awareness, supportive structures, being professional and making practice work (Thompson and Thompson 2018).

With the above in mind the benefits of using Padlet for reflection was clearly communicated to the students. A specific brief and assessment rubric was developed to inform and provide guidance to the students along the way. Additionally, samples of reflections were made available to the students demonstrating the strengths and weaknesses of each.

The benefits of using Padlet compared to the original way of reflection as part of the class reports became apparent very early on during the trial. The reflective process was previously only shared with the lecturer where now it was accessible via Padlet to the other students. Padlet provided many benefits as each culinary menu produced during practical classes was repeated for a second week, with students rotating within the menu on specific dishes. Each reflection submitted during the first week of the menu informed another student producing the same dish in week two creating a strong community of practice among the group. Students were able to learn from each other's experience which enhanced collaboration, enabled peer assisted learning, in the process fostering a learning community (Zhi & Su, 2015).

Culinary practice is a very sensorial skill, students develop their own sense of taste, smell, and an appreciation of the impact of textures and the aesthetics of plate presentation when presenting and creating dishes. As such culinary arts students are very much visual learners. Padlet provided students with a tool that allowed them to showcase their dishes and to see how their peers interpreted dishes. It stimulated the students to, compare, contrast, and reflect on each other's dishes, allowing them to comment on visual aspects such as shapes, colours, flow, contrast, and focal point.

To gain better understanding and insights on the blended mode of delivery for this culinary module during the pandemic, a survey was conducted. Students commented positively on the use of online engagement tools and highlighted the benefits of Padlet as a tool that was easy to use and that encouraged learning from each other. Students also commented favourably on the social aspect of using Padlet in breakout rooms, which allowed them to focus on a group task around culinary topics, to share ideas on this digital canvas while being able to talk to their peers away form the lecturer, something that had been quite difficult during the pandemic.

3. Key Learnings

The use of Padlet as a digital learning tool has demonstrated potential for its use as a blended learning medium that supports reflection, reflective practice, peer learning and collaboration, which warrants further exploration. It supports visual learners and enhances engagement with reflection, developing a sense of team spirit and pride in the creation of this digital canvas which has the potential to be a long-term learning tool that can be used as an inspirational resource for menu creation in the workplace.

The success of the trial and the benefits of using Padlet for reflection and reflective practice in culinary education will be communicated to all lecturers in the Galway International Hotel School and a future full rollout of the tool is envisaged to promote and integrate the process of reflective practice more formally across all departments.

While the assessment rubric and the brief on reflective practice and tuition by the lecturers was very beneficial to the students as a supportive structure, additional work is needed to build upon this study to formalise reflective practice and develop critical reflection as an important life skill that will enable them to achieve, maintain and continuously improve professional competencies throughout their working life.

Further research is required, and much can be learned from the nursing profession to make critical reflection work within the culinary educational context.

References

- Bulman, C., Lathlean, J., & Gobbi, M. (2012). The concept of reflection in nursing: Qualitative findings on student and teacher perspectives. *Nurse education today, 32*(5), e8-e13.

- Collins, A., & Halverson, R. (2009). *Rethinking education in the age of technology: the digital revolution and the schools.*

- Davies, S. (2012). Embracing reflective practice. *Education for Primary Care*, 23, p 9-12.

- Dianati, S., Nguyen, M., Dao, P., Iwashita, N., & Vasquez, C. (2020). Student Perceptions of Technological Tools for Flipped Instruction: The Case of Padlet, Kahoot! and Cirrus. *Journal of University Teaching and Learning Practice*, 17(5), 4.

- Fook, J. (2015). *Reflective practice and critical reflection.* In: Lishman, J. (ed.) Handbook for practice learning in social work and social care. Jessica Kingsley Publishers.

- Ghaye, T. (2010). *Teaching and learning through reflective practice: A practical guide for positive action*, Routledge.

- Skulmowski, A., & Rey, G. D. (2020). COVID   19 as an accelerator for digitalization at a German university: Establishing hybrid campuses in times of crisis. *Human Behaviour and Emerging Technologies*, 2(3), 212-216.

- Smith, E. (2011). Teaching critical reflection. *Teaching in higher education, 16*(2), 211-223.

- Thompson, S. & Thompson, N. (2018). *The critically reflective practitioner*, Macmillan International Higher Education.

- Vanlaere, L., & Gastmans, C. (2007). Ethics in nursing education: learning to reflect on care practices. *Nursing Ethics*, 14(6), 758-766.

- Woodhouse, A. (2016). *Critical self-reflection: A means to instigate a culinary education revolution.*

- Zhi, Q., & Su, M. (2015, 16-18 October). *Enhance Collaborative Learning by Visualizing Process of Knowledge Building with Padlet.* Paper presented at the 2015 International Conference of Educational Innovation through Technology (EITT), Wuhan, China.

Submitted by: Anne O'Leary and Ulrich Hoeche

Power App for Interactivity in Maths

Author + Project Team	Dr. Etain Kiely and Year 1 Computing Students GMIT (Galway-Mayo Institute of Technology)
Department and Institute	School of Science & Computing, GMIT
Keywords	*Maths, digital technologies, assessment, student engagement, students as partners, students as co-creators*

Section A: Case Study Summary

1. What we did/how we did it

This project explored the potential of Microsoft Power Apps to connect, engage and support learners in maths. The app offers an interactive interface which enables first year students to access the suite of Maths learning spaces and tools from their phone or computer in the first six weeks of college life. A major benefit is how the app embeds within the students Maths Team space for easy access.

2. Outputs and impact Achieved

The app was co-developed with students and focuses on a suite of key maths learning spaces and technologies to help transition to students to college life. The app introduces the learner to the Maths lecturing team and shares students' video and word cloud of past learning experiences. Tools such as track my progress allows students to track and predict their progress in the module. The app links the learner to learning spaces including Live Lectures and tutorial sessions (Teams), Interactive Notes (OneNote Classroom), Assessments (Moodle Quizzes and Assignments) and additional Help (Maths Learning Centre) as well the opportunity to Book a Group or 1 to 1 slot with the maths Lecturing Team.

The app focuses on interactivity and ease of access for the following learning spaces.

1. **Interactive assessment tracker app** (progress checker). Students can make sense of assessments scores and how this contribute to overall success in the maths module.

2. **Interactive Notes:** links to OneNote classroom which provides interactive self-paced learning using embedded GeoGebra, Replit IDE, Microbit and Forms and for interactive questions and solutions. The real untapped potential however is the automatic generation of practice questions based on a single question. This outputs an instant Quiz which embeds in OneNote. GMIT students enrolled in the OneNote Classroom can access this on their phones with no additional sign-in.

3. **Interactive Learning Spaces:** Calendar with live lecture and tutorial sessions join buttons. In class interactivity is promoted linking to Slido app which is embedded within Teams. An additional Power Meeting App template is available for lecturers to extract lecture Teams meeting details to OneNote capturing attendance and follow up tasks to Microsoft planner).

3. What did we learn?

This project sought to explore the potential of Power Apps to harness interactivity and engagement with first year maths students. The following learnings were captured.

- There is an extensive collection of interactive tools and technologies for maths learners. Many of these are free and useful to engage learners however the different locations within Teams, Moodle, OneNote, replt.it, geogebra, Slido, booking, forms can lead to technology overload and confusion in the early weeks of college life. Using a Power App all the technologies are brought to a single access point which can be downloaded on the student's phone, computer or embedded within their module Team site.

- Interactive self-paced feedback is critical in learning maths offering students the space to make mistakes and retrieve and practice questions which leads to mastery of a concept. Many of the technologies can be integrated and embedded within Microsoft environment, however the limiting factor is the knowledge of the connectors and how to harness the full potential of tools. For example, geogebra and replt.it embeds within OneNote enable learners to interact with maths visually and test their understanding with question and solution check questions.

- To utilise the full potential and give students a personalised welcome, and timetable would require an upgrade on the student Microsoft licence. For example, to avail of dashboard of personalised results the Microsoft licence would need to be upgraded to include row level permissions within Power BI.

Section B: Full Case Study

1. Context/Rationale

Practise and retrieval at different and increasing spaced intervals of time is a simple yet effective learning strategy which creates strong neuropathways, encourages mastery and long-term memory. Retrieval practice can help with both fact-based learning and learning transfer (Smith et al., 2016). During retrieval practice with feedback the brain develops neural pathways over time via myelination. Enabling learners to make choices and offering opportunities to make mistakes increases electrical brain signal through conscious attention and awareness that an error has been made. Timed practice and feedback can thicken the myelin required for strong neural pathways. Some of the concerns with traditional approaches are that passive lectures or repetitive reading produces little evidence of meaningful learning (Callender & McDaniel, 2009) and can in fact lead to higher failure rates than active lectures in science subjects (Freeman et al.,2014). This proposal seeks to develop a power app which encourages active in lecture learning and out of class interactive note reading which reduces cognitive overloading through retrieval practise and feedback opportunities.

Approximately 500 first year learners undertake maths in GMIT Science and Computing programmes. Many are in large group lectures. Currently tools such as Kahoot and Turning Technology are used to engage learners in lectures, provide feedback and interactive practice opportunities. The project built on research conducted in the School of Science and Computing from 2015   2019 which illustrated that learners enjoy active learning environments. The limitations of the current practices are that these external tools used by lecturers are not accessible to learners after class or embedded within their learning space.

This proposal explored the potential of developing a power app which maximizes practice and retrieval opportunities for learners both in and out of class. The app harnesses the potential of Microsoft tools which the college has already licences for such as Power App, MS OneNote classroom. Currently OneNote will automatically replay in-class notes as they were written during the lecture, translate to multiple languages and guide the lecturer on the best format for accessibility for diverse learner sets.

This proposal explored the potential of this technology through the development of a power app which

- Transition learners to college technologies having a one stop shop app that connects the suits of learning tools such as Teams, Moodle, OneNote.

- Introduce the learners to the maths team and hear past students experiences of learning the module.

- Clearly map and outline the assessment types, deadlines and weighting. Students can use the track my grade app to explore the value of assessment activities and they contribute to their final mark.

- Harness the interactive power of OneNote classroom and enable learners to make choices, mistakes, and offer feedback to encourage further effort
- In class interactivity can be aligned with lecture questions embedded within the interactive lecture notes with immediate feedback to develop mastery.
- Engage learners in large groups with immediate feedback on questions using mobile technology and seamless sign in.
- Capture and dashboard class understanding of concepts to allow for conceptual change and difficult concepts to be reinforced in lectures

2. Details of Outputs and Impact

This power app interfaces and integrate tools already in use in GMIT. The ease of learner and lecturer access and use gives the project scalable institute wide potential. Below are some screens shots of outputs. The homepage welcomes the students with encouragement and outlines how to use the app as presented in figure 1.

Figure 1: Home page linking the key components of the site
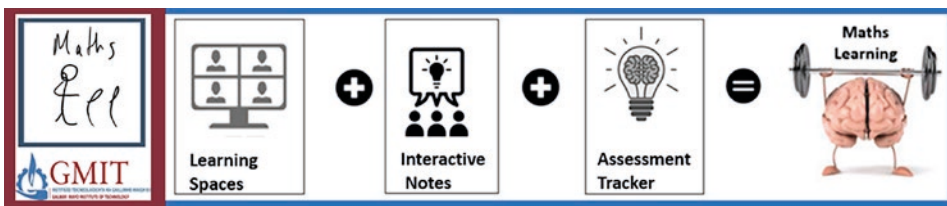
To introduce students to the Maths team in a friendly way each of the lecturers has made a welcome video introducing themselves, their interests, their philosophy on learning. This is presented in Figure 2.

Figure 2: Meet the Maths Team and Past Students
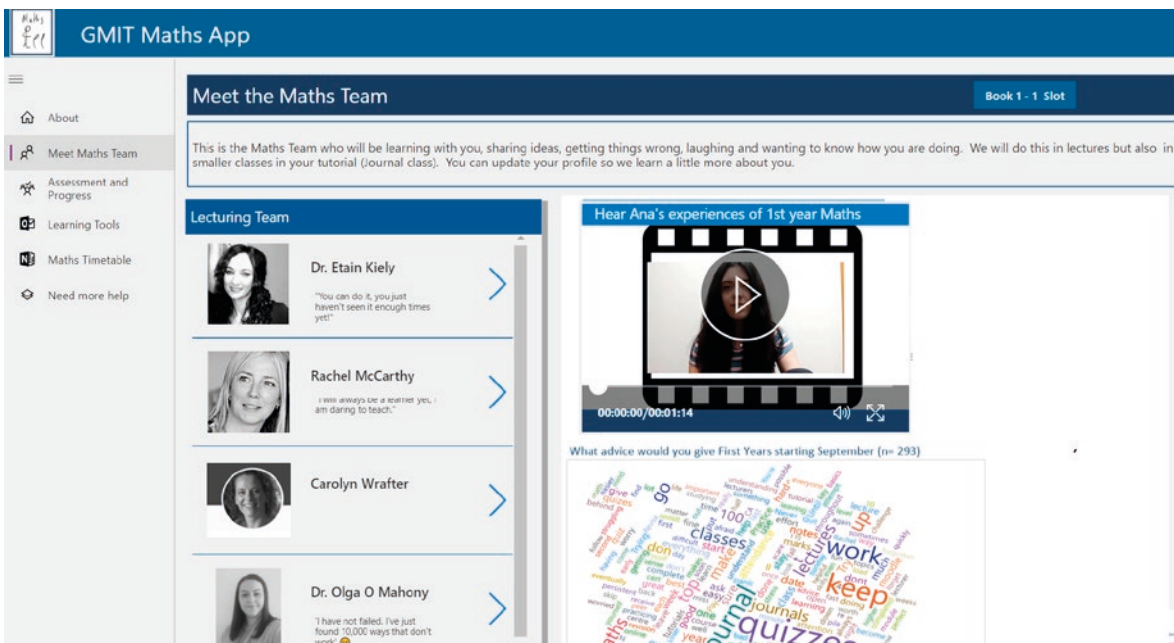
Students also share their experiences of learning maths, four students from diverse cultural and maturity backgrounds explain how they succeeded in maths. A word cloud of "advice students would give first years starting in September" is shared. This has been collected over 5 years.

The essence of the tool is to connect students to the myriad of maths learning spaces shown in Figure 3. The app explains each of the learning spaces and connects students directly to the spaces such as the live lecture, recorded live lectures, question and answer sessions, pre-recorded "how to videos". It directly links the students to the quiz and assessments within Moodle pages.

Figure 3: Learning Spaces and Tools
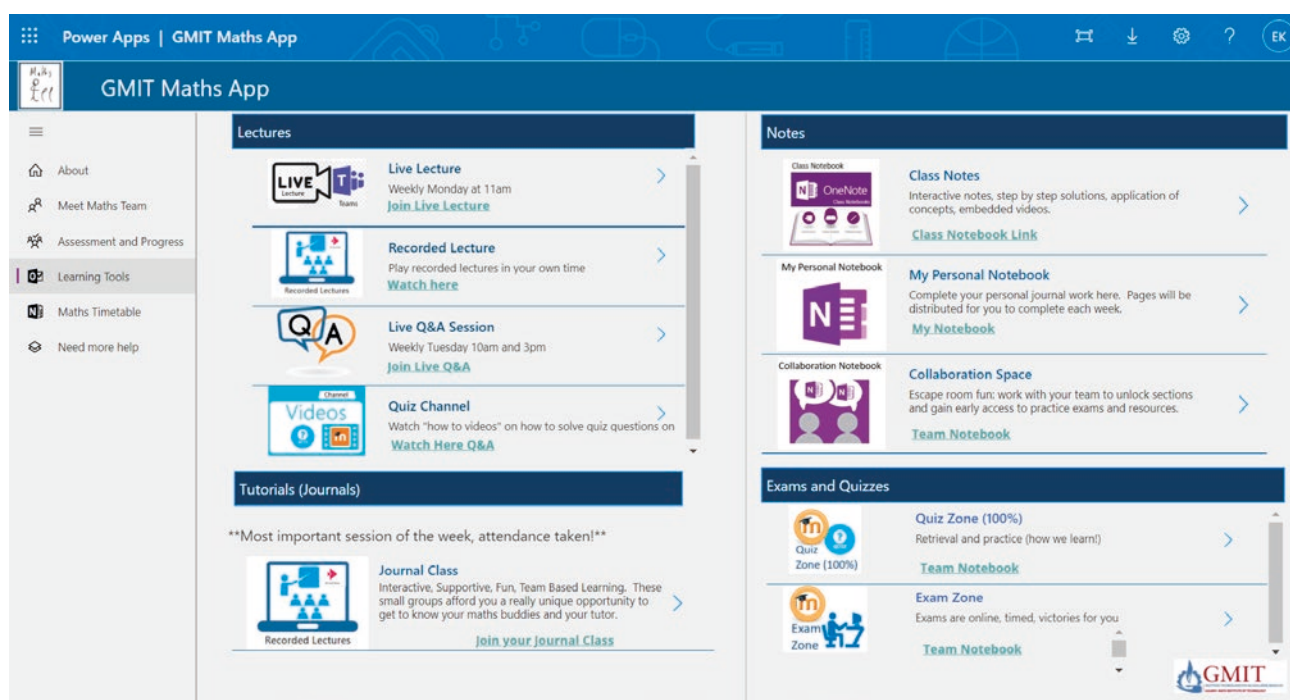
A demonstration of the interactive dimensions of OneNote are showcased as the primary self-paced maths online learning space. Figure 4 illustrates how GeoGebra embeds in OneNote with hundreds of free visuals. For example, a student can manipulate the coordinates and find the modulus and argument on an argand plane. For more examples of free Geogebra resources click here.
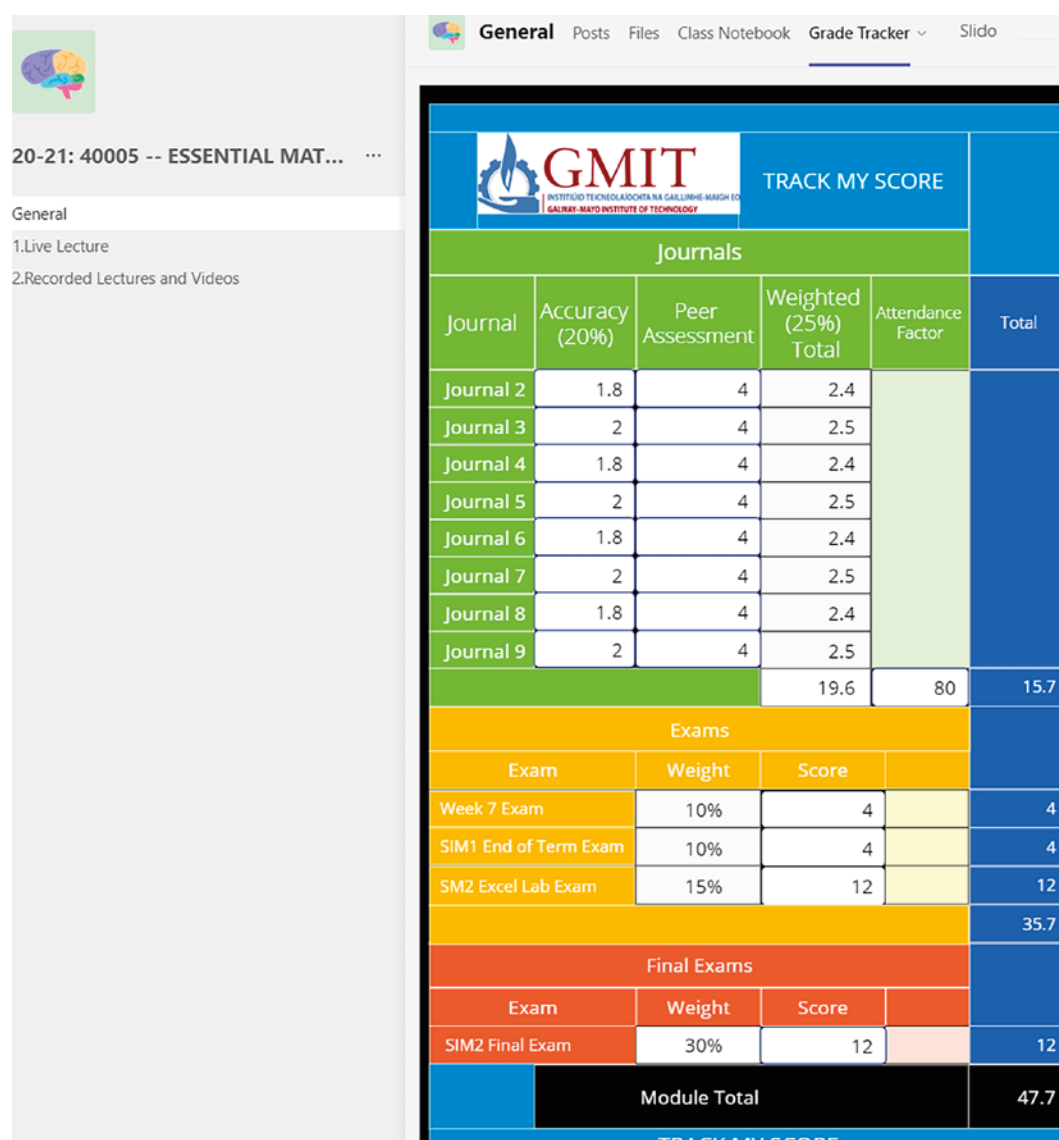
Figure 4: Embedded GeoGebra interactive visual within OneNote classroom notes
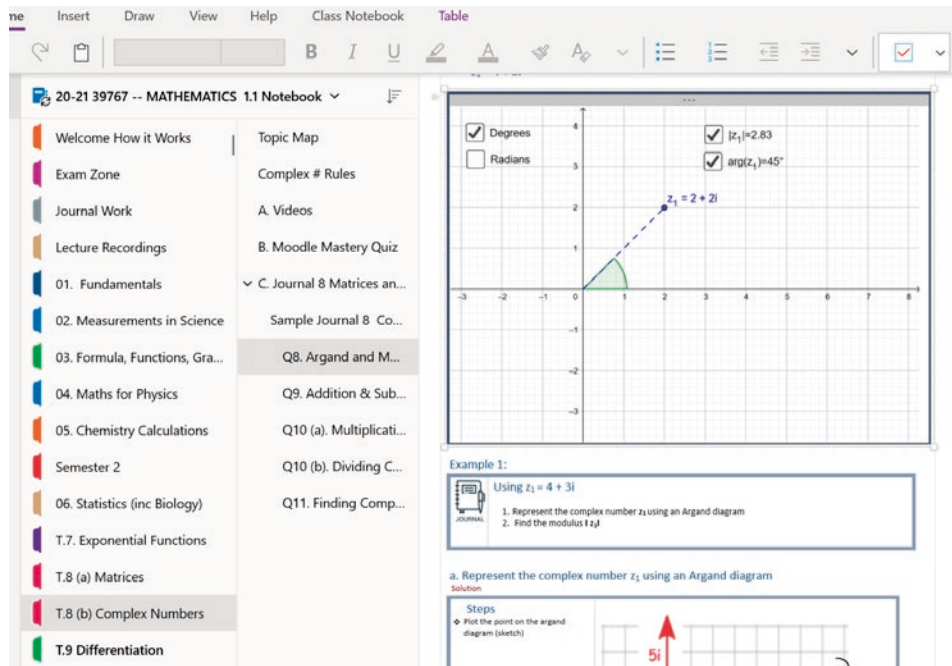
The computing students really benefit from the Repl.it IDE which embeds directly into OneNote. In the example illustrated in Figure 5 the students were able to write code to simulate Boolean logic for a Clean Room Scenario. Each of the students can then run and test the code within the OneNote notebook. Examples of a student's contributions are presented here.

**Figure 5: Interactive notes with embedded Repl.it IDE to run student's code
        Created by Orla Walsh Digital Media Student**
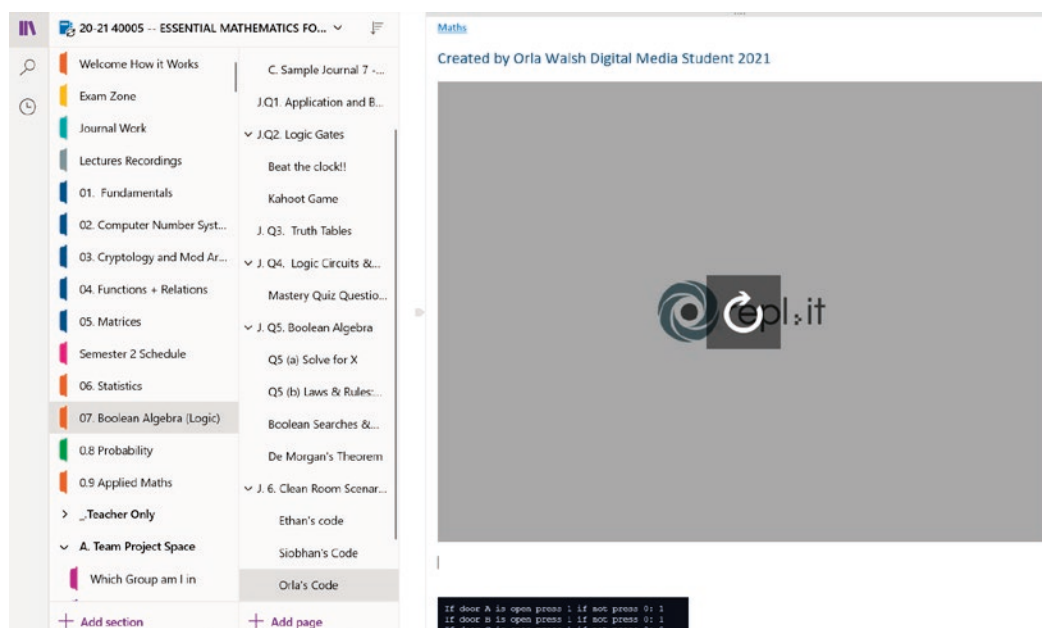
Students often struggle to gauge how well they are performing in a module, especially when they are given many low stake assessments which give frequent feedback. The students co-developed an assessment tracker which is embedded in the maths app. This can also be presented as a standalone power app within Teams. Computing students made their own versions and the students reviewed and evaluated the design interface and usefulness of the app. This can be used to track grades and also predict how a student may perform. Figure 6 illustrates how the app can be embedded separately as a power app in Teams.

**Figure 6: Power App Track my Score embedded within Teams**

Students made videos explaining how they made the assessment tracker power app. See Figure 7 demonstrating how the power app was made the maths behind the functions within the app.

Figure 7: Student videos of how to make Track my grade Power App
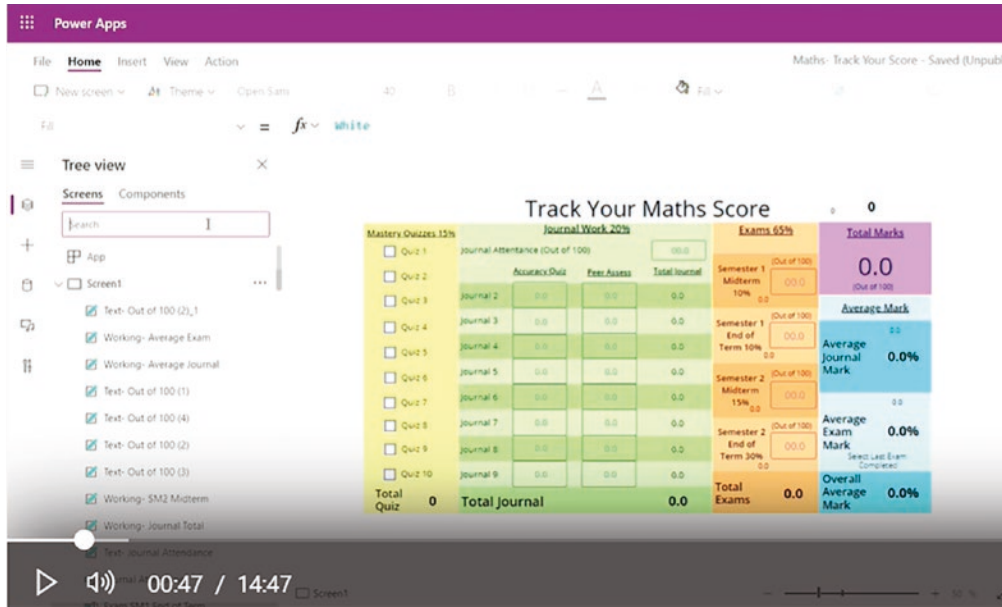

This year students were required to access all lectures and tutorial online using Teams. The app includes a calendar shown in Figure 8 with active links for lecture and tutorial times and join links. This can be useful in the early weeks and enables students to join other tutorial classes or the maths drop-in classes with the Maths Learning Centre. Assessment deadlines are also built into the calendar.

Figure 8: Maths calendar of live classes, assessment deadlines and maths drop-in times
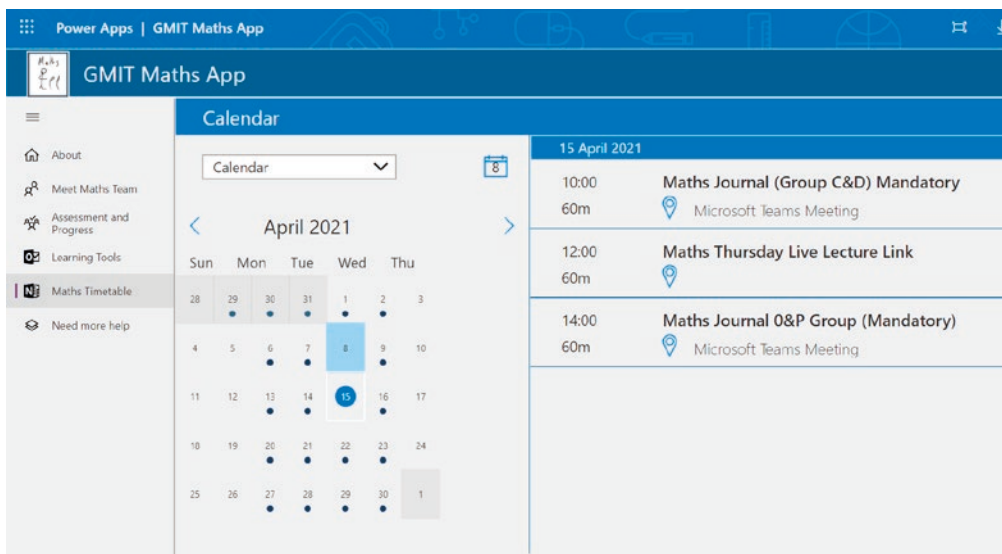
The final section offers students additional supports in maths. There are 2 options currently active, a live link to booking page for the maths learning centre, the ability to book a 1-1 session with a member of the maths learning centre (Figure 9).

Figure 9: Additional Maths Support Page
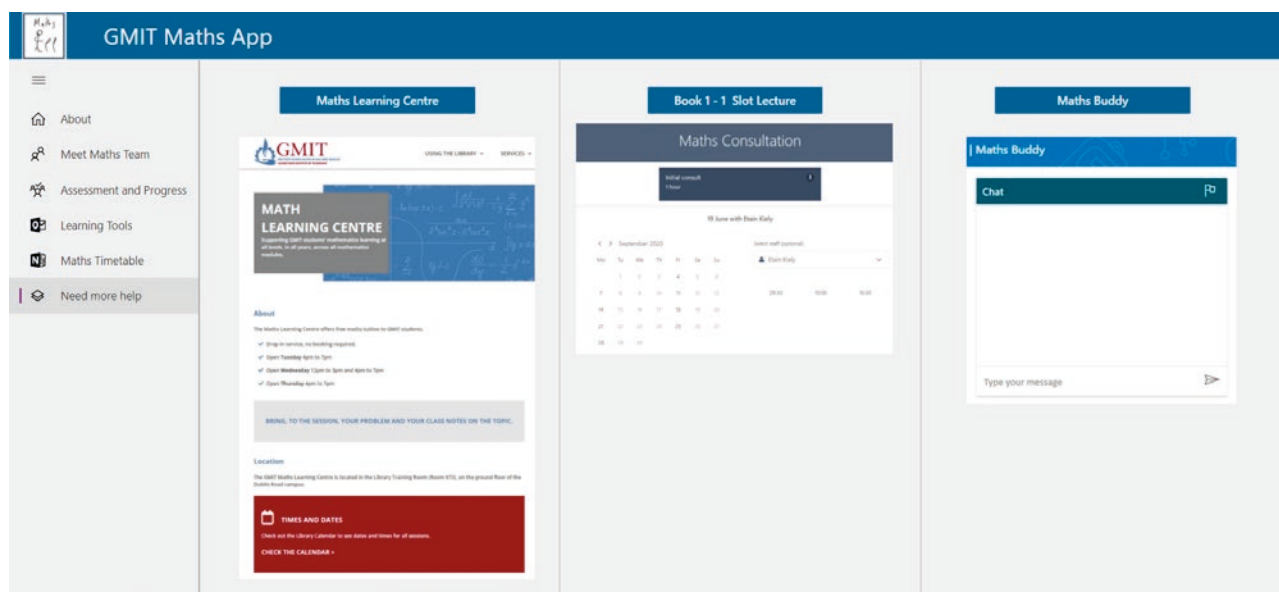
An option that could be developed in future work would include embedded a chat bot "Maths Buddy". This is an easily implemented intelligent tool, built on the Microsoft Power platform and Bot Framework. The Power Virtual Agent development process uses a guided, no-code, graphical interface approach to empower the lecturer to easily create and maintain an intelligent virtual agent. This can also be integrated into the Teams page. To develop this fully resources would be required in terms of time and services.

3. Key Learnings

Key Learnings

The project sought to explore the potential of power app to transition and engage first year maths learners. A key learning has been that while there is a myriad of tools to engage and support learners this can lead to technology overload and confusion for learners in the early weeks of college life. This app brings many learning components together for students to a single access point. The app has been co-developed with first year 2021 computing students. A focus group evaluation of the maths app's interface and functionality will be conducted in May 2021. A full evaluation will be conducted in September 2021 with a first-year intake. Dissemination will follow with national conferences and international publications.

While a proof of concept has been developed here, due to licence types not all permissions are enabled to allow for full development. For example, to enable students personalised maths score would require row level permission which would require a pro licence for the student. A full video demonstration can be provided on how to use the app, contact etain.kiely@gmit.ie

References

- Callender, A. & McDaniel. M., (2009) The Limited Benefits of Rereading Educational Texts. Contemporary Educational Psychology, 34(1) 30-41.

- Freeman., S, Eddy SL, McDonough., M, Smith., MK, Okoroafor., N, Jordt., H, Wenderoth., MP. (2014), Active learning increases student performance in science, engineering, and mathematics. Proc Natl Acad Sci USA. 2014;111(23):8410-8415.

- Smith, M.A., & Karpicke, J.D. (2014). Retrieval practice with short-answer, multiple-choice, and hybrid tests. *Memory, 22*(7), 784-802.

Submitted by: Dr Etain Kiely

Join the DigitalEd Community

Join the Digital Education Forum

Follow DigitalEd.ie News: Comment on stories or post a story to the community

Discover Your Digital Capabilities & Improve Your Digital Skills by engaging with the Digital Discovery Tool

Explore the Digital Tools Directory: Find out what tools are being used by CUA Digital Champions

Find out what an Online Lecture looks like or search for other Teaching & Learning Resources

Check out a range of Digital Stories shared by CUA partners

DigitalEd.ie

Book a Digital Teaching & Learning Workshop

ONLINE BOOKING
Teaching & Learning Workshop

Review Digital Teaching & Learning Research Papers

A

Meet a Digital Champion & learn more about Digital Teaching & Learning

Enrol in a Digital Education Learning Pathway & gain a Digital Badge

Sign up for a Level 9, Technology Enhanced Learning or Digital Teaching and Learning module to network & learn with colleagues. Contact TLO@gmit.ie to learn more.

Contact Us
Jessica Duffy,
TLO Project Coordinator
Learn more at www.digitaled.ie
or email TLO@gmit.ie