The 3rd Annual STEM Teaching Conference 2022

Welcome to the 3rd annual STEM Teaching Conference 2022

"Seasons change, but our commitment to student engagement remains constant"

Conference Booklet

2nd March 2022
Via MS Teams

Conference Webpage: https://stem.open.ac.uk/stem-teaching-2022

ACKNOWLEDGEMENTS

CONTENTS

Jo Smedley, Tricia Terndrup	**Feeding forward on feedback: encouraging student engagement**	**34-35**
PARALLEL SESSION 3: SHORT ORAL PRESENTATIONS		**36 - 39**
Helen Lockett	**Enhancing student engagement through practical learning in the OpenSTEM Labs**	**36**
Sarah Davies, N.R Edwards, Mark Hall, Philip Holden, Katya Pigott	**Clouds, containers, and downloads: improving student access to research-grade climate modelling software**	**36-37**
Alastair McCabe	**Home experiments and online engineering laboratories; a comparison of OU student experiences, feelings, and motivations**	**37-38**
Jeff Johnson, James Bowen, Zahra Golrokhi, Vikram Goolaup, Sotiria Psoma; Gwyneth Morgan, Alison Nash	**NanoLab: A novel e-learning platform for distance-teaching microscopy, metrology, and spectroscopy**	**38**
Mark Hirst, Christopher Heath, Katja Rietdorf, David Male, Francesco Crea, Sushila Rigas, Hilary MacQueen, LDS: Amanda Rose, Mustafa Bektick, Greg Black	**Improving user accessibility to interactive screen experiments in the Open Science laboratory**	**39**
PANEL DISCUSSION & PLENARY		**39**

We are delighted to welcome our panel to our annual STEM Teaching conference.

Our discussion will focus on the multiple ways in which the OU seeks to drive direct engagement with our students. So many people contribute to the team effort which supports students from the moment they enquire to the moment they graduate and beyond. For all of us in a distance learning context, engaging with our students in a meaningful and productive way can be challenging. Our panel will present their perspectives on student engagement at various points in the student journey and how we could foster better engagement to ensure the highest quality teaching and learning experience for all our students.

We will be joined by:
- **Chair: Diane Butler,** Associate Dean Academic Excellence
- **Vic Nicholas,** Associate Dean Student Experience
- **Melissa Elborn,** Senior Manager, Communications Manager, Marcomms, Strategy & Insight
- **Stephanie Stubbins,** Student Leadership Team, Students Association
- **Stephanie Lay** Senior Manager, Student Research, CIO portfolio
- **Colin Beesley**, Senior Manager, Policy & Controls, Academic Services
- **Steve Wilson,** Senior Manager, Operations, Academic Services, Student Support

CLOSING REMARKS & PLENARY	Professor Nick Braithwaite, STEM Executive Dean	**39**

PROGRAMME

9.15 – 9.30	**Registration**
9.30 - 9.40	**Welcome and introductions** (Plenary Meeting Room) (**Diane Butler,** Associate Dean Academic Excellence and **Vic Nicholas** Associate Dean, Student Experience, STEM)
9.40 – 10.10	**Keynote** (Plenary Meeting Room) **Tom Lowe,** Head of Student Engagement & Employability The University of Winchester **Abstract:** ***Engaging open and distance students in their success in 2022*** The need to research, pay attention and support 'Student Engagement' in Higher Education continues to grow, with increasing measures placed upon our institutions relating to retention, satisfaction, and student success. Creating a learning environment where our students truly thrive and can be inspired are motivations most educators can get behind, but beyond our feelings towards education, our universities are increasingly faced with government interest and measures relating to the 'outcomes' of University study. The time of "doing things the way we have always done them" in all Universities is changing, and it is more important than ever, especially during the chaos of COVID-19, that we come together to reflect on how Higher Education should adapt to the students of today. This talk will ask participants to look beyond the metrics and begin thinking about what online students' may deem their engagement to be in 2022. How can we create new environments and practices that support the post-pandemic world we are moving into? How might students, who still enrol into the Open University for its flexibility, become part of a community where engagement can occur whenever and however, they wish? This talk will argue that engagement and belonging begins with mattering, with each and every interaction being student centred. This talk will reflect on the above and outline the need to keep belonging, student support and student engagement a priority in Higher Education, to ensure our students matter, and enabling us to work together to be partners in our students' success.
10 .10 – 11.10	**Parallel Session 1 - Short oral presentations -** Short oral presentations are part of a chaired session which includes a number of short presentations (15 - 20 minutes). *Questions that are not answered in the session can be followed up afterwards.*

	Targeting particular student groups on a module (Meeting Room 1)	Academic Communities (Meeting Room 2)	Engagement via a specific area of the discipline (Meeting Room 3)
10.10 – 10.30	**Proactive help for ill-prepared Level 3 students** (Louise MacBrayne, Janet Haresnape, Fiona Moorman, Nicholas Power)	**Exploring scholarly teaching in key introductory level 1 modules in the Open University in Scotland** (Sally Crighton, Felicity Bryers, Ford Buchanan)	**Investigating how to enhance the idea generation process for academic project by students** (Martin Braun)
10.30 – 10.50	**Qualification focused student support within a single module: what problems are we trying to solve?** (Rachel Hilliam, Carol Calvert, Emma Steele)	**Getting off to a good start - Pre-module start events for science students: a model of collaborative, proactive support** (Fiona Moorman, Lorna Sibbett, Becca Whitehead, James Jepson, Fiona Aiken, Gemma Warriner, Amanda Porter)	**Improving student engagement with the study of Python in Level 1 Physics** (Gemma Warriner, Andy Diament)
10.50 -11.10	**Proactive contact project for Q78 Top-up BEng students new to the OU** (Donald Edwards)	**Student Engagement in online environments** (Rafaela Vasiliadou, Louise MacBrayne, Katrina Bray, Helen Fraser, Joanna Smythe, Maria Velasco)	**Engagement via specific skills - archive of problems** *Note: This session will not be recorded* (Michel Wermelinger)

11.10 – 11.20	Break		
11.20-12.20	**Parallel Session 2 – Short oral presentations**		
	Technology 1 **(Meeting Room 1)**	**Engagement with module design, forums and TMA feedback style** **(Meeting Room 2)**	**Underrepresented groups, interaction and retention** **(Meeting Room 3)**
11.20 – 11.40	**The value to students, and tutor experience, of drop-in tutorials to support assessment on U116 (Level 1 Environment module)** (Maria Townsend, Emma Champion, Wendy Berndt)	**Experiences Enhancing Students Retention and Satisfaction for a Level 2 Computing and IT Module (TT284: Web Technologies)** (Soraya Kouadri Mostefaoui)	**Developing Disability Champions** (Lisa Bowers, Elouise Huxor, Theodora Philcox)
11.40 – 12.00	**Supporting Student Engagement with the Virtual Microscope** (Thea Herodotou, Kate Fox)	**Improving engagement of Post Graduate M815 students on module forums** (Jill Shaw)	**90% student retention** (Jeff Johnson)
12.00 – 12.20	**Game-based learning in a Level 2 computing module** (David Bowers)	**Effective support for reflective writing: learning from improvers** (Charlotte Webb, Cathy Smith)	**Forums, (Virtual) Face-to-Face & (eTMA) Correspondence Education: what role Padlet and Mentimeter in the panoply of technologies to enhance student engagement in computing and IT projects?** (Robert Manderson)
12.20 -1.00	**LUNCH and POSTER sessions available** https://stem.open.ac.uk/stem-teaching-2022 • **Investigating remote access to live exercise physiology testing experiments through interactive webcasts** (David Conway, Ben Langdown, Karen New) • **Black student experience on S112: improving a level 1 STEM module** (Louise MacBrayne, Jennie Bellamy) • **Linking Labcasts to Assessment – Encouraging Student Engagement with Live Events** (Louise MacBrayne, Rob Janes, Mike Batham, Kate Bradshaw) • **A collaborative home experiment to form bioplastics and study their degradation by monitoring the release of a dye with a smart phone** (Simon Collinson) • **Translating scholarship findings into practical actions** (Clare Morris) • **Modulating reflections on student support integration and partnership working - a multi-team systems perspective** (Karen Potter, Sinead O'Connor-Gotra)		
1.00 – 1.45	**WORKSHOP SESSIONS** *This is a 45-minute workshop*		
	(Meeting Room 1)	**(Meeting Room 2)**	**(Meeting Room 3)**
1.00 – 1.45	**Creating Ideas to enhance social dimensions Online** (Gareth Neighbour, Kambiz Saber-Sheikh)	**Exploring the use of different styles of tutorial to enhance student engagement** (Janet Haresnape, Janette Wallace, Fiona Moorman)	**Feeding forward on feedback: encouraging student engagement** (Jo Smedley, Tricia Terndrup)

1.45 – 2.45pm	Parallel Session 3 - Short oral presentations – Technology and practical support	
	Technology 2 (Meeting Room 1)	**Technology 3** (Meeting Room 2)
1.45 – 2.05pm	**Enhancing student engagement through practical learning in the OpenSTEM Labs** (Helen Lockett)	
2.05 – 2.25pm	**Clouds, containers, and downloads: improving student access to research-grade climate modelling software** (Sarah Davies, N.R Edwards, Mark Hall, Philip Holden, Katya Pigott)	**Home experiments and online engineering laboratories; a comparison of OU student experiences, feelings, and motivations** (Alastair McCabe)
2.25 – 2.45pm	**NanoLab: A novel e-learning platform for distance-teaching microscopy, metrology, and spectroscopy** (Jeff Johnson, James Bowen, Zahra Golrokhi, Vikram Goolaup, Sotiria Psoma; Gwyneth Morgan, Alison Nash)	**Improving user accessibility to interactive screen experiments in the Open Science laboratory** (Mark Hirst, Christopher Heath, Katja Rietdorf, David Male, Francesco Crea, Sushila Rigas, Hilary MacQueen, LDS: Amanda Rose, Mustafa Bektick, Greg Black)
2.45 – 3.00pm	**Break**	
3.00 – 3.50pm	**Panel Discussion and Plenary** (Plenary Meeting Room) We are delighted to welcome our panel to our annual STEM Teaching conference. Our discussion will focus on the multiple ways in which the OU seeks to drive direct engagement with our students. So many people contribute to the team effort which supports students from the moment they enquire to the moment they graduate and beyond. For all of us in a distance learning context, engaging with our students in a meaningful and productive way can be challenging. Our panel will present their perspectives on student engagement at various points in the student journey and how we could foster better engagement to ensure the highest quality teaching and learning experience for all our students. We will be joined by: • **Chair: Diane Butler,** Associate Dean Academic Excellence • **Vic Nicholas,** Associate Dean Student Experience • **Melissa Elborn,** Senior Manager, Communications Manager, Marcomms, Strategy & Insight • **Stephanie Stubbins,** Student Leadership Team, Students Association • **Stephanie Lay** Senior Manager, Student Research, CIO portfolio • **Colin Beesley,** Senior Manager, Policy & Controls, Academic Services • **Steve Wilson,** Senior Manager, Operations, Academic Services, Student Support	
3.50 – 4.00pm	**Closing remarks** (Plenary Meeting Room) by Professor Nick Braithwaite, Executive Dean, STEM	

WELCOME AND INTRODUCTION

Welcome to the 3rd Annual STEM Teaching Conference. After a very successful conference last year we are delighted to repeat this event. Ongoing circumstances mean that we are meeting online (the new normal!) but we are pleased that this mode of delivery enables wider participation from our geographically distributed colleagues and our students. Thanks to all our presenters for their willingness to engage online.

The aim of the Teaching Conference is to highlight the innovative and ground-breaking teaching that we deliver across our faculty and to share best practice around STEM teaching, learning and student support. Topics covered in the conference range from new assessment practices, using new collaborative tools for teaching and innovative approaches related to teaching specific disciplines.

The conference programme is an exciting mix of keynote, panel discussion, short oral presentations, Workshop sessions and Poster presentations showcasing work from colleagues in the STEM Faculty.

We are delighted to welcome Tom Lowe (University of Winchester) as our keynote and **Melissa Elborn**, Senior Manager, Communications Manager, Marcomms, Strategy & Insight, **Stephanie Stubbins**, Student Leadership Team, Students Association, **Stephanie Lay** Senior Manager, Student Research, CIO portfolio, **Colin Beesley,** Senior Manager, Policy & Controls, Academic Services and **Steve Wilson**, Senior Manager, Operations, Academic Services, Student Support to participate in our panel discussion.

At the end of the conference the STEM faculty's Executive Dean, Professor Nick Braithwaite will close with conference with a plenary session.

We welcome you to our 3rd STEM Teaching Conference and hope you have an informative, stimulating, and enjoyable day.

Diane Butler (AD Academic Excellence) and Vic Nicholas (AD Student Experience)

OPENING KEYNOTE SPEAKER BIOGRAPHY

Tom Lowe, Head of Student Engagement & Employability,
The University of Winchester

Tom is the Head of Student Engagement and Employability where he leads the University's careers, student development and extra-curricular opportunities, staffing and strategies relating to fostering student success at Winchester. Tom is also the Vice Chair (Acting) for the international network RAISE (Researching, Advancing and Inspiring Student Engagement) and the programme leader for the MA in Student Engagement in Higher Education, working at the cutting edge of Student Engagement in international Higher Education. Tom has recently published a co-edited book "A Handbook for Student Engagement in Higher Education: Theory into Practice" which offers an array of case studies of best practice, sector commentaries and critical reflections on engaging students in educational developments. Tom is an expert in the practicalities surrounding Student Engagement in quality assurance, learning and teaching, University governance and Students' Unions, as well as student involvement in extra-curricular activities and overcoming barriers to student success through inclusive practice. He has experience working with over 30 HEIs from across the UK and is a frequent contributor and author in journals and conferences.

Keynote: *Engaging open and distance students in their success in 2022*

The need to research, pay attention and support 'Student Engagement' in Higher Education continues to grow, with increasing measures placed upon our institutions relating to retention, satisfaction, and student success. Creating a learning environment where our students truly thrive and can be inspired are motivations most educators can get behind, but beyond our feelings towards education, our universities are increasingly faced with government interest and measures relating to the 'outcomes' of University study. The time of "doing things the way we have always done them" in all Universities is changing, and it is more important than ever, especially during the chaos of COVID-19, that we come together to reflect on how Higher Education should adapt to the students of today.

This talk will ask participants to look beyond the metrics and begin thinking about what online students' may deem their engagement to be in 2022. How can we create new environments and practices that support the post-pandemic world we are moving into? How might students, who still enrol into the Open University for its flexibility, become part of a community where engagement can occur whenever and however, they wish? This talk will argue that engagement and belonging begins with mattering, with each interaction being student centred. This talk will reflect on the above and outline the need to keep

belonging, student support and student engagement a priority in Higher Education, to ensure our students matter, and enabling us to work together to be partners in our students' success.

PANEL DISCUSSION – PANEL MEMBERS' BIOGRAPHY

We are delighted to welcome our panel to our annual STEM Teaching conference.

Our discussion will focus on the multiple ways in which the OU seeks to drive direct engagement with our students. So many people contribute to the team effort which supports students from the moment they enquire to the moment they graduate and beyond. For all of us in a distance learning context, engaging with our students in a meaningful and productive way can be challenging.

Our panel will present their perspectives on student engagement at various points in the student journey and how we could foster better engagement to ensure the highest quality teaching and learning experience for all our students.

We will be joined by:

Chair: Diane Butler, Associate Dean Academic Excellence

Diane Butler is Associate Dean (Academic Excellence) in the OU STEM Faculty. Her portfolio includes scholarship and innovative practice strategy; academic staff development strategy; and widening access and success, equality & diversity. She is a Life Scientist from the School of Life, Health and Chemical Sciences.

Over a period of over 26 years with the OU, Diane's teaching has largely focussed on interdisciplinary science at levels 1 and 2. She chaired the University's flagship level 1 interdisciplinary science module, amongst others, and was Deputy Programme Director in the Science Faculty. As Director of eSTEeM (the STEM faculty's Scholarship and Innovation Centre) for 4 years, she supported the further development of the scholarship of teaching and learning in the faculty. Her current interests include supporting scholarship communities in Higher Education.

Dr Vic Nicholas, Associate Dean Student Experience

Vic Nicholas is the Associate Dean Student Experience in the STEM Faculty at the Open University. In this role she provides strategic leadership to the faculty on tuition, assessment, module design and student support. She is responsible for Faculty strategy to ensure the delivery of a quality student experience. Vic works closely with the Faculty SST Leads, Lead Staff Tutors, Heads of Schools, Associate Deans, and other Faculty staff to achieve our retention and progression targets.

Melissa Elborn, MA, MCIPR, Senior Communications Manager, Marcomms, Strategy & Insight

Melissa Elborn works in the Strategy and Insights team in the OU's Marketing and Communications Unit. She is responsible for developing marketing and communications strategies for supporting student success. Melissa has worked at the OU since 2012 and has twenty years' experience in marketing and communications disciplines. She is an accredited practitioner with the Chartered Institute of Public Relations and is a mentor on the OU's Elevate Career Mentoring programme. Melissa is currently studying her fourth module with the OU.

Stephanie Stubbins, Student Leadership Team, Students Association

My name is Steph, and I am the new STEM Faculty Association Representative (FAR) and part of the OU Students Association Central Executive Committee (CEC).
I have been studying with the OU since 2015 and previously achieved an OU qualification in Business and Management. I recently started U116 and am studying towards the M05 Integrated Master's in Environmental Science.

I have previous experience as a CEC member (VP Community 2016-2018, Deputy President 2018-2020), Central Committee Representative (various committees from 2016-2020), Senate Reference Group Member (2015-2021) and have had various other volunteer roles. I put myself forward for this role because I want to represent STEM students, listen to their views, ideas, and concerns, and take back their student voice to the relevant areas within the University to positively impact decision-making.
I wanted to take this opportunity to let you know that I am approachable, and you can contact me through my CEC email: - stephanie.stubbins@open.ac.uk

Stephanie Lay, Senior Manager, Student Research, CIO Portfolio
Academic Services

I'm a senior manager with 20 years of experience of working in analysis and insight for higher education, and I'm a qualified cognitive psychologist with a PhD in the perception of near-human faces. I've been with the Open University since 2002 in a range of data-related roles. In my current role of senior manager for student research in the Data and Student Analytics team, I lead survey operations and reporting for the large institutional surveys (NSS, Graduate Outcomes, PTES, PRES, SEaM) and oversee the work of the Student Research Project Panel who are responsible for all bespoke educational research with students. I am currently leading a project to replace SEaM with a new internal student

survey and have a keen interest in how we can improve the way we analyse and report survey results to give better insights for the university and ultimately improve the quality of the student experience.

Colin Beesley, Senior Manager, Policy & Controls, Academic Services

Colin is the Senior Manager, Policy & Controls in Academic Services. He and his team have operational responsibility for most of the university's discretionary funding schemes. This includes the oversight and delivery of the Disabled Veterans Scholarship Fund and Carer's Scholarship together with a growing suite of other scholarships, bursaries, and hardship funding schemes. He started his OU career in the Disabled Students Allowances Office and supporting students with disabilities and additional requirements remains very close to his heart.

Steve Wilson, Senior Manager, Operations, Academic Services, Student Support

I am a Senior Manager and have worked at the OU for 16 years with roles ranging from front line student support to the role that I am in now as Senior Manager, Student Support Operations where I lead the 'Advice' service tier of the Information, Advice & Guidance for the STEM and Access student support team in England. My team directly support STEM & Access students through both reactive means where students approach us for assistance as well as proactive means where alongside colleagues within the faculty, we look for opportunities to pre-empt issues that may affect a student's ability to engage with their studies. I am particularly excited by opportunities to improve student experience, engagement, and attainment.

CONFERENCE INFORMATION

Registration
Conference registration will take place between Tuesday, 2ⁿᵈ February and Monday 28ᵗʰ February via Eventbrite

To join the conference on the day, visit the STEM Teaching Conference webpage using the links available via the Conference Programme https://stem.open.ac.uk/stem-teaching-2022

Please familiarise yourself with the Programme, paying particular attention to the short oral sessions that will be running in parallel. Using the different meeting links, you may dip in and out of meeting rooms to the presentations you wish to view. Facilitators in each of the meeting rooms will be responsible for ensuring the sessions are run on time.

There will be an opportunity for Q&A throughout the Parallel sessions and Panel discussion at the end. Please feel free to submit your question/s via the MS Teams chat box during the session and if there isn't time to answer you during the session, it will be done afterwards.

Online Helpdesk
An online helpdesk will be available throughout the conference to help you with any queries that you may have. You can reach us by emailing michelle.leonard@open.ac.uk or Jayne.Jones@open.ac.uk with any queries. Alternatively, you could use Skype Instant Messenger.

Conference sessions and recordings
Please note that all sessions will be recorded. The recordings will be made available after the conference is finished and a link will be shared when this is ready.

Audience members are participants in this process. If you have any concerns, please speak to a member of the STEM Teaching conference team.

Session etiquette and electronic equipment
We respectfully ask that all delegates use any personal electronic equipment in their homes with respect for session presenters and fellow delegates. We suggest using mobile phones and electronic equipment in silent mode. Obviously, your household and its inhabitants - partners, children, parents, grandparents, flatmates/housemates, pets etc - can't be set to silent mode, so please do your best to keep your microphones muted during all presentations.

Functionality in MS Teams
To ensure you have the best possible experience during the conference, please have the latest version of MS Teams by clicking on your picture ID on the top right corner of the function bar, and then choosing 'Check for updates'.

Poster Presentations
There will be Poster presentations available on the STEM Teaching Conference webpage. You are welcome to browse the presentations over lunch. If you have any questions around any of the Poster Presentations, please contact the authors directly.

CONFERENCE INFORMATION continued…

Session changes
We will try to keep session changes to a minimum but inevitably there may be some last-minute changes or cancellations. It is acknowledged that 2nd March 2022 is a strike day and our programme may be affected. We will let you know on the day by email or via the online meeting room any information about changed or cancelled sessions.

Conference refreshments
There will be regular refreshment breaks throughout the Conference, please do make yourself a coffee or have light refreshments available nearby to keep you going in the morning and afternoon.

Feedback
We welcome your feedback. If you have any issues or concerns, please contact
Michelle.Leonard@open.ac.uk or Jayne.Jones@open.ac.uk

BOOK OF ABSTRACTS

Keynote: Tom Lowe, Head of Student Engagement & Employability, The University of Winchester

Engaging open and distance students in their success in 2022

The need to research, pay attention and support 'Student Engagement' in Higher Education continues to grow, with increasing measures placed upon our institutions relating to retention, satisfaction, and student success. Creating a learning environment where our students truly thrive and can be inspired are motivations most educators can get behind, but beyond our feelings towards education, our universities are increasingly faced with government interest and measures relating to the 'outcomes' of University study. The time of "doing things the way we have always done them" in all Universities is changing, and it is more important than ever, especially during the chaos of COVID-19, that we come together to reflect on how Higher Education should adapt to the students of today.

This talk will ask participants to look beyond the metrics and begin thinking about what online students' may deem their engagement to be in 2022. How can we create new environments and practices that support the post-pandemic world we are moving into? How might students, who still enrol into the Open University for its flexibility, become part of a community where engagement can occur whenever and however, they wish? This talk will argue that engagement and belonging begins with mattering, with each and every interaction being student centred.

This talk will reflect on the above and outline the need to keep belonging, student support and student engagement a priority in Higher Education, to ensure our students matter, and enabling us to work together to be partners in our students' success.

Parallel Session 1: Short Oral Presentations

Proactive help for ill-prepared Level 3 students
Louise MacBrayne, Janet Haresnape, Fiona Moorman, Nick Power
School of Life, Health and Chemical Sciences
STEM Faculty

Within the School of Life, Health and Chemical Sciences, the level 3 modules in biology (S317) and chemistry (S315) typically have a substantial proportion of registered students who either do not have the recommended pre-requisite study (S294 and S215 respectively) or have obtained a low pass in these modules. Students new to Open University study, who have been awarded credit transfer for the Open Degree are of particular concern as many lack a comprehensive science background.

A new proactive support scheme was piloted for S317 and S315 20J, in which students deemed to be ill-prepared and hence at risk of not completing, or failing the module, were identified, and targeted for proactive support. Two groups were drawn up based on student profile. Group one students (mostly new and continuing students on Open Degree with insufficient or unknown science background) were deemed to be at highest risk due to the pass rate gaps illustrated in Table 1. These students were offered a one-to-one session with their own module tutor to ascertain how they were coping with level 3 study and to identify any particular academic concerns common to the group. Group two students (those who had the required level 2 prerequisite study, but a grade 4 pass), together with group one students were specifically invited to additional supportive sessions. delivered by a module tutor, or member of the module team to address common areas of difficulty and to respond to ad hoc queries about basic aspects of the topics.

Pass rates
Group 1 Pass rates 19J (module cohort pass rates)   S315 31% (70%)   S317 52% (74%)
Group 1 Pass rates 20J (module cohort pass rates)   S315 42% (70%)   S317 70% (77%)

Table 1 Pass Rates for Group 1 Students vs Module Cohort

This presentation will provide a detailed update of our findings from 19J onwards and will reflect on the potential usefulness of such a proactive approach for level 3 modules in future presentations to increase overall student retention and success.

Exploring scholarly teaching in key introductory level 1 modules in the Open University in Scotland
Sally Crighton, Felicity Bryers, Ford Buchanan
School of Mathematics & Statistics
STEM Faculty

In the Open University E&I, module U101, there has been a steady increase of around >4% (2019) in the proportion of students presenting with complex ability needs, or combinations of physical and mental issues. For tutors to facilitate a universal student engagement, that could enable a full engagement 'for all', involves tutors supporting a broad range of students with and without

varied or complex needs. In addition, tutors need to be able to support full student engagement with their able-bodied students to an equal level to that of their ability-need students.

Investigating how to enhance the idea generation process for academic project by students

Martin Braun
School of Engineering & Innovation
STEM Faculty

An online toolkit for the T452 project module was developed to improve the efficiency of student engagement at the early stages of the idea generation process.

The problem: Project modules, such as 'T452 – the engineering project', are different from other undergraduate modules. In 'normal' modules, students work on well-defined problems that have been posed by somebody else (such as TMA questions or the module website activities) for which there exists a more or less well-defined answer. What the student must do is to apply the methods taught in the module to find this answer. In contrast to this, a project module asks the student to come up with a specific research question, an individual method of answering this question and a unique answer - and all this with limited guidance.

Proposed solution: Based on a literature review the following hypothesis was developed:
Students need guidance to engage with the idea space to create project ideas. An ideation toolkit can provide such guidance and thus increase the number and quality of such ideas if this toolkit:

• provides necessary/sufficient guidance,
• provides appropriate stimuli, and
• is fun.

A Google form (including short videos) was used to develop such an on-line toolkit to serve five different strands of the T452 module including 'hard' engineering subjects, e.g., 'Structural integrity: designing against failure', and subjects on the 'softer' end of engineering such as 'Innovation: designing for change'. This toolkit has two parts. One part introduces idea generation tools to increase students' confidence in independently attempting to generate a topic idea. The other part captures initial ideas in a structured way so that the subsequent tutor-student engagement is more meaningful.

Envisaged benefits: This toolkit has been designed to both foster autonomy and creativity of students and, at the same time, lay the groundwork for a more meaningful tutor-student engagement when discussing project ideas.

Qualification focused student support within a single module: what problems are we trying to solve?

Rachel Hilliam, Carol Calvert, Emma Steele
The School of Mathematics & Statistics
STEM Faculty

Students taking qualifications in data science and economics are now the largest cohort of students on the second-year undergraduate statistics, M248. The module has been steadily growing, with a current cohort of 738 students compared to 561 in 20J and 457 in 19J. The module was re-written in 2017 when it was a specialist module for statisticians and the material is very much focussed on these students, however over a quarter of the current cohort are Data Scientists and nearly a fifth Economics students. To support the differing study intentions of these

students the way in which students on M248 are supported has been gradually changing since 2019.

Students studying Economics have a limited exposure to some of the mathematical techniques that are used in M248. A large amount of revise and refresh material exists for these students on the Mathematics and Statistics Study Site. By working with the School of Economics we have been able to provide these students with dedicated support during the summer months prior to the module start; through targeted material, a forum, and tutorials.

A more radical change has been the way in which students are allocated to tutors. Since 2019 this has been based on the qualification the student is studying. For 21J it was clear there was going to be an increase in the number of students and therefore an obvious extension was to recruit tutors with knowledge and expertise in the qualification areas that students were studying. This was no minor task as M248 recruited 17 new ALs of whom 7 were new to the OU. The staff tutors and module chair have run a series of online AL sessions during 21J to build a team approach to tutoring on M248 sharing ideas around retention, tutorial support and assessment.

In 20J the tutorial resource consisted of existing 'core' tutorials which covered the content of the module, supplemented by a limited set of qualification focussed tutorials. Evaluation in 20J showed that students tended to view the recordings of the 'core' tutorials, but attendance was greater for qualification focussed tutorials. One explanation is the value that students place on the social aspect of these tutorials and the fact that they are amongst qualification peers. Based on feedback the number of qualification tutorials have been increased in 21J.

Whilst pass rates have been more heavily influenced by the change in assessment due to covid19, evaluation has shown that student appreciate the qualification focus of the support received. In 20J students who declared disabilities had a 2.4% gap in good module pass rates compared to the faculty gap of 6.8%. Though these numbers are based on a small number of students it does support the idea that students feel more comfortable in tutorials with students on similar qualifications. Perhaps because they feel more able to express their misunderstandings. In 22J we plan to explore this idea in more depth by using standard statistics anxiety questionnaires.

Getting off to a good start - Pre-module start events for science students: a model of collaborative, proactive support

Fiona Moorman LHCS SST Lead
Fiona Aiken EEEs SST Lead
Gemma Warriner SPS SST Lead
Becca Whitehead SRSC Link AL
Lorna Sibbett SRSC Link AL (Access Staff Tutor)
Amanda Porter SRSC Link AL
James Jepson Science Operations Manager

Subject Study sites contain a wealth of useful information with study skills and resources accessible to registered students before their module website(s) are open. Furthermore, evidence from a recent eSTEeM project (Hilliam, 2020) highlights benefits of student engagement on study sites. However, it seems that relatively few students access their Study website despite receiving MILLS interventions signposting them to these sites.

In response to these issues, a 'Getting ready for your next Science Module' pilot session was run in early September 2020 for students registered on Science modules; students were alerted by CAMEL to the event which was delivered by Science Faculty SST Leads in collaboration with a STEMA Educational Advisor. During the session, a tour of science study sites was provided to direct students to key preparatory and skill development resources. OpenLearn courses offering students opportunities to develop their online confidence and maths skills and were highlighted and there was a focus on each of the different qualifications within science. The SST adviser provided guidance and responded to queries to help students make the most of SST support. This pilot event proved very popular (attended by over 500 students, recording receiving in excess of 400 views). Student engagement also seemed high with active discussions in the chat pod and many queries raised. Building on this initial success, we delivered similar 'Getting ready for your next Science module' events for students registered on 21J science modules; this time four sessions were offered, with a focus on each level of study. As before, students were signposted to helpful resources on their subject sites, introduced to key qualification-specific aspects and provided with helpful guidance from the SST adviser. The remit was also expanded, with link SRSC Science ALs joining faculty SST leads and SST advisors to offer a holistic session to support students in making the most of support from their tutor.

Attendance and engagement at the pre-21J events were high, with between 80 and 200 students attending each session. Informal feedback was gathered from students by way of free-text polls at the end of the sessions when students were asked about their aims, their concerns about study and actions they planned to take following the session.

This presentation will update on the findings arising from these large-scale, collaborative student support events and will reflect on the potential usefulness of such an approach to enhance student experience and to support student engagement and retention.

Improving student engagement with the study of Python in Level 1 Physics

Gemma Warriner, Andy Diament
School of Physical Sciences
STEM Faculty

SM123: Physics and Space is a Level 1 module aimed at preparing students to study physics, astronomy or planetary science at OU level 2. One issue students face is getting to grips with programming In Python. Our own experience as ALs on SM123 suggested that this was an area that students could find very difficult to engage with, a view supported by other colleagues. Feedback from previous cohorts and on forums suggested that studying Python was causing some students a great deal of anxiety, and leading students to give up this part of the module. In some cases, it affected their performance on the module.

We investigated this with an eSTEeM project and our results guided in us in providing greater support for students on SM123. Firstly, we ensured that all students in the following presentation, were clear about the Python content in advance of starting the module, as it seemed that the study of Python was a surprise to some students. It was clear from our surveys that students were spending a great deal of time looking at a multitude of other resources on the internet, increasing the time spent on study and increasing their frustration with the topic. Many were simply enjoying this part less than the science content. We identified specific areas where

students had problems engaging. We therefore looked to develop and in-house set of resources that they could use in preparation and during the module itself, tailored to the SM123 content.

This was achieved by updating an existing resource, the Python for Physical Sciences website. This site was developed for students on SXPS288: Remote experiments in physics and space but we identified that it could provide a resource useful across modules. The updated content was written by two ALs addressing the issues that students found particularly difficult in the surveys. The site now has a new section aimed at SM123 students, with embedded pdfs of guidance and additional activities. The expanded website has been retitled Programming for Physical Sciences. News about the updates were disseminated to colleagues and links were put on the SM123 website within the Python week information on the Study planner. An email was sent to all prospective 21J students highlighting the Python content and directing them to the new website and the 'Are You Ready for SM123?' resource, giving them the opportunity for enhanced preparation.

This presentation will detail some of our findings, how they were used in the website update and some further actions that we hope will be put into place in the future, to enhance student experience and to support student engagement and retention.

Proactive contact project for Q78 Top-up BEng students new to the OU

Donald Edwards
School of Engineering & Innovation
STEM Faculty

Q78 is a Top-up BEng programme, allowing students with a prior vocational qualification to obtain an honours degree by completing their Stage 3 studies with the OU. Feedback from these students suggests that many feel at a disadvantage to those more familiar with the OU approach to learning and tuition, particularly in the early stages of their first modules. Even though these students have study at an equivalent level, they do not have experience with the peculiarities of study with the OU typically gained during Stage 1 & 2 study, such as our systems, methods, and terminology.

To address these issues a proactive contact project was undertaken for 'new to the OU' students enrolled on Q78 in September 2020 and again in September 2021. Associate Lecturers from the four most common initial modules undertaken by Q78 students (T312, T313, T317 and T357) gave additional induction sessions, both individually by email and/or phone and group sessions using Adobe Connect.

These sessions provided an opportunity for students to engage with Associate Lecturers covering the knowledge typically gained by OU Stage 1 & 2 students. This included topics such as the OU approach to teaching and learning, the sources of support available to students, the role of the tutor and the structure of modules and qualifications.

The response from both tutors and students has been extremely positive. Tutors reported that many students did say that they had felt overwhelmed and 'welcomed a real person getting in touch' with survey data showing improved student confidence in target groups. The value of this early, targeted student engagement with tutors is perhaps summed up by one student taking two

modules who commented that they felt 'more prepared for the unit I've had contact with' and that their other module 'feels daunting and unprepared for.'

In this talk we will describe our approach to the project and our evaluation data. We will illustrate how this model of early engagement with students with non-standard previous study has broad applicability across many programmes, both for students taking top up qualifications and for credit transfer students.

Student Engagement in online environments

Rafaela Vasiliadou (1st Presenter), Lecturer in Biological Chemistry, LHCS-STEM
Katrina Bray (2nd Presenter), Communications & Engagement Manager, STEM
Louise MacBrayne (3rd Presenter), Staff Tutor, LHCS-STEM STEM Faculty
Helen Fraser (Physical Sciences), Joanna Smythe (STEM Deanery), Maria Velasco (LHCS) Corinne Kay (Staff Tutor)

An online event entitled Women in Chemistry was held at the Open University, as a part of the chemistry week (2020). A group of female OU academics met in a friendly interview to discuss their career pathways and share real life–experiences, in an attempt to educate future chemists in academia and industry. The aim was to bring together academics and students, giving them space to engage and interact with each other. The team developed an online community, in which chemistry students from diverse backgrounds, expectations and different stages in life felt welcomed and comfortable to participate. Taking place in the evening, live engagement from the audience of 100+ was encouraged by online moderators interacting in the lively conversation. Students of all ages, genders and at different levels of study, had the chance to ask questions. Questions ranged from study queries to research and career progression questions. The event was livestreamed and recorded on YouTube to enable a wider community participation. The recording can be found on The Open University's Faculty STEM's YouTube channel (currently 345 views). Students also had the chance to register through the Eventbrite (~100 tickets). Those numbers imply the success of the women in chemistry, as well as the significant role of developing online communities, to enhance student engagement in distant learning environments. Students engaged in a friendly and supportive environment, building trust relationships with the academics. We recommend the conduction of similar online events across the STEM faculty since it's a unique opportunity to communicate effectively with students and educate them on career aspects.

Engagement via specific skills - archive of problems

Michel Wermelinger
School of Computing & Communication
STEM Faculty

Note: This session will not be recorded

Students tend to like having opportunities to grow their skillset and to gain further experience, outside the module materials. This fosters their autonomy and creativity (Bryson 2014, principle 6) and thus employability. One such opportunity is to solve problems used in technical interviews

and competitions, like the International Olympiads in STEM subjects. There are large archives of such problems that could be used in our STEM modules. M269 exercises include algorithmic problems adapted from such archives. This talk reflects on our experience, presenting the pros and cons of various types of archives, the support and changes needed to reuse these problems, how students engage with them, and future plans.

One way to foster student creativity and enrich their experience is to ask them to solve the kind of problem presented in technical interviews and International Olympiads in STEM. There are large archives of such problems. We report on using them in M269, how to adapt them and the student engagement.

Parallel Session 2: Short Oral Presentations

The value to students, and tutor experience, of drop-in tutorials to support assessment on U116 (Level 1 Environment module)

Maria Townsend, Emma Champion, Wendy Berndt
School of Engineering & Innovation
STEM Faculty

Do students want more presentation-based online tutorials, or is there room for different approaches as well?
Our project considered one alternative, which aimed to put students in the driver's seat – drop-in tutorials. Student experience and behaviour at the tutorials was investigated, as well as the tutor experience of facilitating the drop-ins.

For a variety of reasons, many online tutorials have a structured didactic style and can be a top-down approach to learning. The online environment can also hinder student active participation. However, students do consider online tutorials to be valuable, although some choose to consume them in different ways, such as reviewing recordings.

The project assessed the place for less formal drop-in tutorials on U116 (the E&I Level 1 core environment module), specifically to support assessment. The approach is more bottom-up, with the aim of students leading the direction of the tutorial with their questions. The drop-in tutorials complemented, rather than replaced, the existing more traditional style of online tutorials delivered on U116.

Forty-eight drop-in tutorials, which were not recorded, were delivered during the 20J presentation of U116, and at the end of each event an anonymous poll of student confidence was taken. In addition, students were surveyed twice to gain an understanding of how they value the drop-in tutorials and their experience of attending them. To complement the survey results, a student-led focus group also took place. The important aspect of the tutor perspective on delivering the drop-in tutorials was also gathered, which included the tutors' top-tips for running drop-in tutorials.

This short presentation will report on the findings of the project with regards to student and tutor experience, including a summary of the guidance document for tutors for running drop-in

tutorials, which was produced from the tutors' top-tips. It will also reflect on what might be next for the project.

Experiences Enhancing Students Retention and Satisfaction for a Level 2 Computing and IT Module (TT284: Web Technologies)

Soraya Kouadri Mostefaoui
School of Computing & Communications
STEM Faculty

TT284 'Web Technologies' is a Level 2 Computing and IT module, focussing on the foundations of web applications, including web standards and protocols as well as web content handling. It builds on these by investigating application architectures and alternative application designs before considering how applications and content can be made more responsive and suitable for mobile devices. The module is made up of four study blocks and is assessed by three Tutor Marked Assessments (TMAs) and a final End of Module Assessment (EMA) split in two parts (EMA-Part1 the workplan, EMA-Part2 the practical project work). The module had 11 presentations since February 2012, and a major rewrite in 2018. It attracts high numbers of students across the different qualifications and pathways including the Open Degree.

TT284 considers a wide range of tools and programming languages and their roles in web applications development, including HTML, CSS, JavaScript, and PHP. One of the major issues students faces is understanding the different languages and more importantly how the different components interact with each other. This usually causes high levels of anxiety and stress for students and impacts negatively on the engagement and motivation, the overall students' satisfaction and the progression and retention rates.

Following five principles from Bryson' (2014) students engagement framework, the module worked with experienced module tutors over the last five presentations to implement a variety of interventions aiming to enhance the students' engagement, satisfaction and retention. These include:

- Inclusion of more guidance and detailed instructions on how to tackle the programming activities and assessment tasks
- Recruitment of two experienced tutors as module authors
- Revision of the module workload and the provision of better-balanced study blocks
- Inclusion of dedicated forum discussion activities
- Provision of module wide specialised programming tutorials and Q&A questions
- Provision of ByteSize video tutorials for the key programming concepts and the assessments
- Provision of a container-based version of the module materials

This presentation will report on our findings assessing the impact of each of the interventions on the study experiences, satisfaction and retention rates and explores new ways of enhancing these further.

Bryson, C. (2014) Understanding and Developing Student Engagement. London: Routledge. doi:10.4324/9781315813691.

Developing Disability Champions

Staff tutor project leads and presenters: Dr Lisa Bowers, Mrs Elouise Huxor, Ms Theo Philcox
AL Disability Champions, not presenting: Mrs Dawn Corriea, Laura Fletcher, Irene Tsiampakou
STEM Faculty

Due to the importance of student engagement, it is vital that students can gain access to a full and rich engagement for their current and future success. It is important to further understand how tutors can support all-inclusive student cohort.

This study draws on a range of ability needs case studies from the U101 'Design Thinking' student cohort. The study reviews patterns between D-flag students and their attrition from U101. It also examines how the eSTEeM project team (Disability Champions) can support level one design tutors to better facilitate a fuller student engagement with all their students with or without ability needs without breaking the support for their able-bodied students. The aim of this project is intended to evaluate whether Disability Champion tutors can aid their U101 peers to offer timely, effective, and dynamic support for D-Flag and mainstream students in a more cohesive approach.

Supporting Student Engagement with the Virtual Microscope

Thea Herodotou, Kate Fox
STEM Faculty

Existing studies about the use of the virtual microscope (VM) by university students suggested that students need ongoing support and guidance when using the tool that can confirm or correct their interpretations of slides and clarify any misconceptions. In this study, we examined different forms of student support to identify how best to scaffold student's learning and engagement with the VM. We evaluated the new version of the VM, and student support took three forms: a) a tutor providing help to students while they were using the VM (synchronously) (n=7), b) a detailed written activity guide designed to support the use of the new version of the VM (n=4), and c) basic activity instructions (n=7). An overall sample of 18 self-selected students, randomly allocated across the three groups and identified via the Curriculum Development Student Panel took part in the study. Data were collected from a follow-up questionnaire assessing student experience of using the VM and the marking of answers to a set of activities. In all three groups, students noted difficulties with completing the activity related to missing VM features or features they could not identify on the VM interface. They all stressed the importance of immediate or instant help that would help them resolve any difficulties they faced. Students in the live support group acknowledged the importance of having a tutor while completing the activity as this boosted their confidence by having any issues been resolved immediately. Implications for how best to support students' engagement while using the VM will be discussed.

Improving engagement of Post Graduate M815 students on module forums

Jill Shaw
School of Computing & Communications
STEM Faculty

Engagement of Post Graduate students, particularly on M815 Project Management in the module discussion forums has been identified by tutors as an area which could be improved. The discussion forums are module-wide, and many students do not engage or contribute, which has prompted tutors and the Module Team to look for ways to improve that engagement and better support students as they progress in the module. This oral presentation will examine some of the reasons behind the limited online engagement by Post Graduate students and discuss options for improvement ranging from assignment requirements to use of social media, sharing experiences from Post Graduate modules in STEM.

90% student retention

Jeff Johnson
School of Engineering & Innovation
STEM Faculty

The 40-60 assessment model was designed for maximum student retention in 2014 for the module T218: Design for Engineers. The idea is that TMAs and EMAs have a 40-60% split of the marks: Part I has ten 4-mark questions and Part II has three 20-mark questions. It is relatively easy to answer the Part I questions which refer to explicit parts of the module. The Part II questions require students to think more deeply and apply what they have learned. The underlying principle is that students who are struggling to get the assessment done can start with the easier 4-mark questions and rapidly get to the stage that know they will score about 30 marks out of 40. Then they just need 10 marks from 60 to pass the TMA/EMA and are motivated to finish and even strive for a good mark. It works! T218 has consistently had retention around 85% over the past seven years. This approach was applied to the design of the assessment for T212 Electronics: sensing, logic, and actuation which since 2017 has achieved around 90% retention in four presentations. It is used for T312 Electronics: signal processing, control, and communications which since 2019 has also achieved about 90% retention. It is used for T366: Nanoscale Engineering which in its first 2021J presentation has 90% submission of TMA01. It will be argued that this assessment model is a way to improve retention across STEM increasing typical 'good' retention of 75% across the board by potentially 10% for each module, giving a much better service to students, higher pass rates, and increased financial contributions

Game-based learning in a Level 2 computing module

David Bowers
School of Computing & Communications
STEM Faculty

I reported at the 2021 Teaching Conference on the evaluation of a game-based learning activity in the level 2 computing module, TM254: Managing IT: the why, the what and the how.

The game was offered to students in two formats: an email-mediated activity for groups of five students, which ran over two-three weeks, and a VLE-hosted online simulation. In the email

activity, one member of each group was asked for a response each day, which would influence the evolution of an underlying scenario for the group; whereas the online simulation used a weighted random number selector to choose a series of responses automatically.

That evaluation identified a number of issues with both the email-based activity (such as delayed, "junked" or lost emails; and receiving too few emails that required responses) and the simulation (which ran "too quickly" to see what was happening). This led the module team to develop an upgrade to the simulation, to provide an interactive alternative to the email-based activity, allowing students to steer the outcome of the game by choosing each response in turn.

This session presents student feedback comparing the two formats, including their perceptions of how each supported their learning. Although there was broad support for the simulation as being more useful than the email activity, which would suggest replacing the email-based activity with the simulation, there remains a significant minority of students who found (different) value in both formats.

Although the simple interpretation of the feedback would support replacing the email-based activity with the online simulation – which would both avoid the issues with email activity reported previously and also allow for the development of alternative game scenarios without requiring significant LDS programming effort.
However, some students have noted that, for example, the email-based activity does emphasise the consequences of missed or ineffective communications – there is no way to recover! – whereas the simulator can just be run again.

The Module Team must now decide whether the improved flexibility for future development offered by the enhanced simulator is sufficient to offset the loss of aspects of the learning experience such as realising that there is often "no way to recover" in the real world and the (minimal) experience of working in a functional team.

The session will conclude by outlining how additional scenarios might be developed for other subject areas to harness the data-driven, state-based code developed for the enhanced simulation.

A non-VLE, unbranded version of the simulator is available to run at
http://mcs.open.ac.uk/dsb69/TM254_simulator/

Effective support for reflective writing: learning from improvers

Charlotte Webb, Cathy Smith,
School of Mathematics & Statistics
STEM Faculty

Mathematics Education modules involve reflective writing, a form that applies academic analysis to personal practice and is common in professional disciplines. Students entering our level 3 modules, many with mathematical rather than social science backgrounds, need to develop these ways of thinking and writing to succeed.

The aim of this project is to identify, using semi-structured interviews, the resources and approaches used by Mathematics Education 'improvers': students who have made consistent or significant progress over the series of reflective assignments. This project investigates whether and how improvers have used recently added module activities focused on reflective writing; whether and how improvers use the feedback from assignments to inform future assignments; and what improvers identify as barriers and support for reflective writing. By capturing and documenting themes and practices identified as assisting students' progress, we will use these insights in planning support for modules in production and to inform the mathematics education community about ways to support distance-learning students with reflective writing, and to diversify the range of resources offered in module and teaching materials. This is a timely moment to affect the details of tutorial content and assessment design in new modules where the team has already sought to diversify the ways in which students can demonstrate the learning outcomes.

To gather student insight, 12 mathematics education 'improvers' were interviewed, with 7 of the students belonging to groups with a performance gap in recent presentations, (Black students (2% of 20/21 cohort), Asian students (12%), students with less than 2 A-levels (18%), and students with low SES (11%)). Our assumption was not of deficit in these groups, but of learning from students who have themselves been successful learners.

Preliminary thematic analysis reveals the varied positionality of students who join our mathematics education modules and the strength of emotion that some students bring, which may lead them to ignore the structure of assignments in favour of freer writing. Students from mathematical backgrounds identified challenges with 'writing about doing maths rather than doing maths' and those with essay or report writing experience reported difficulties with the move to writing about their personal reflections.

Student improvers described tutor advice as being helpful in developing themselves as reflective writers, frequently identifying 'using feedback from tutors to improve' as most important for success. Written guidance, attending tutorials and students' own actions, such as taking time to think more deeply and recognising other points of view, were also identified as supportive.

Reported difficulties included understanding assignment requirements and constructing a text, structurally and within the wordcount. Study skills and organisation were mentioned both in terms of support and as barriers to success, but these varied amongst improvers. We claim that is it the combination of unfamiliar requirements that students experience as a new barrier in these modules, as students are required to combine learning new mathematics with writing analytically and reflectively. We will present the implications of these findings on module production.

Forums, (Virtual) Face-to-Face & (eTMA) Correspondence Education: what role Padlet and Mentimeter in the panoply of technologies to enhance student engagement in computing and IT projects?

Robert Manderson
School of Computing & Communications
STEM Faculty

A comprehensive variety of communication technologies are used to support student-supervisor interactions as part of the computing and IT project, centred around the facilities of the module website. Despite this, there appears to be space for further (external) communication technologies that could be used to support and thus enrich the student's learning experience, especially during the early virtual face-to-face sessions when student and supervisor brainstorm and negotiate the project topic (and its type, e.g., development). This interactive poster sets out

Padlet and Mentimeter as tools for enhancing student-supervisor communication (individual and group), but not simply as 'yet-another-technology'. Rather, the tools will be placed in relation to the existing communication technologies using the computer-Supported Cooperative (CSCW) space-time matrix to assess their utility. The matrix will sit alongside Bryson's Social (Locations, Structures, Spaces, Technologies, Staff, Students, Peers) aspect of the Conceptual Map of Engagement: the dynamic cycle. This is with a view to interactively exploring the support for Bryson's Principles of 'Engaging Students' (especially principles 1, 2, 5, 6 & 9).

Poster Presentations: available on the webpage

https://stem.open.ac.uk/stem-teaching-2022

Investigating remote access to live exercise physiology testing experiments through interactive webcasts

David Conway, Careers and Employability Services, Academic Services
Ben Langdown, Education, Childhood, Youth and Sport, WELS
Karen New, Life, Health and Chemical Sciences, STEM

Webcasts using onscreen 'widgets' to facilitate audience interaction are widely used across STEM as a method of exposing learners to environments which are not typically accessible. Research has shown webcasts increase student motivation towards study (Velasco, Thomson, and Bradshaw 2019) and widen participation (Robson et al, 2017; Conway, Gardner and Hughes, 2021). This presentation showcases ongoing collaborative work between Education, Childhood, Youth and Sport, Life, Health and Chemical Sciences and Careers and Employability Services, investigating the impact of exposing learners to immersive exercise physiology webcasts, where students can participate online, in experimental design, data collection and analysis of live data.

Black student experience on S112: improving a level 1 STEM module

Louise MacBrayne, School of Life, Health & Chemical Sciences
Jennie Bellamy, School of Earth, Environment & Ecological Sciences
STEM Faculty

It is now well known that there is an awarding gap between Black and White students' outcomes at the Open University, and indeed HE sector-wide. The gap exists at qualification and module level, and for outcomes (for example the degree class awarded) and rates of completion and progression.

The Open University's Access, Participation and Success Strategy details the University's strategic approach to supporting students from underrepresented and disadvantaged backgrounds to access HE and achieve equitable outcomes. Data for the module S112, Science Concepts and Practice seems to indicate that pass rates for Black students are much lower in comparison to white students and students from other ethnicities, despite completion rates closer to the rest of the cohort.

At this preliminary stage there were two overarching research questions:

- What are the needs of Black students in S112 and barriers in S112 to their study?
- What reasons could be influencing the exam performance of Black students in S112?

This poster will report preliminary findings from an eSTEeM funded project with four main aims:
- To develop understanding of issues faced by Black students throughout S112 module presentation, including a focus on the revision period leading up to and including the exam.
- To raise awareness of these issues amongst STEM staff including tutors, tutor and student support staff, and module teams.
- To consider how S112 tutors could adapt their tuition practice to respond to Black students' needs throughout the module presentation as well as to support exam preparation and practice.
- To consider module wide interventions (including module material modification and changes to assessment strategy and tuition) to support and improve Black student experience and success on S112.

These findings aim to include key outputs from an online focus group run in December 2021 in which former S112 Black students were invited to informally share their own experiences of studying S112 and whether they experienced any specific difficulties or barriers (including in relation to assessment and the exam). The poster will also present initial findings from an intersectionality study performed to consider any relationships between ethnicity and other HEA descriptors such as employment status, caring responsibility, PEQ and socio-economic status with respect to module pass rate.

It is anticipated than longer-term outcomes from dissemination of these outputs will include developed understanding of the needs of Black students amongst tutors and others who support students, and more inclusive tuition practice. This should help develop tutors' confidence and ability in supporting this student group which should have a positive impact on students' experiences and performance including fostering a greater sense of belonging for the Black student demographic. Findings may also help identify training needs for tutors and others who support students.

Linking Labcasts to Assessment – Encouraging Student Engagement with Live Events

Louise MacBrayne, Rob Janes, Michael Batham, Kate Bradshaw
School of Life, Health & Chemical Sciences
STEM Faculty

The module S285 Investigative Approaches in Biology and Chemistry (currently in its first presentation in 21J) has a strong focus on investigative, practical and laboratory skills. Consequently, the tuition strategy was designed to incorporate live lab casts to support learning in each topic.

Previous lab casts delivered as part of modules within the School of Life, Health and Chemical Sciences have been designed to support topic content, either by introducing practical work or by enriching topic content, demonstrating applications of the topic material to a laboratory. Historically, attendance at lab casts can be low (less than 10% of the whole student cohort at level one, 25 – 33% at level 2 and 22 – 50% at level 3).

For the first presentation of S285 in 21J it was decided to increase student engagement with the first labcast in the module (either by attending live or viewing the recording) by linking the content to assessment within TMA01. This poster presentation will give an overview of the approach adopted for this first S285 labcast, held in November 2021, assessed in TMA01. 106% of registered students engaged with the live event and/or recording of this lab cast in comparison to a subsequent lab cast in which only 44% of the student cohort attended live or watched the recording.

The labcast focused on the process of calibration – a concept that students encounter several times in the module and known to be a tricky topic. After viewing live data collection and analysis, students were supplied with calibration data needed to answer one TMA question. Student involvement in the data collection was promoted via widgets and the chat box, all of which were directly relevant to assessment. This presentation will highlight how a lab cast can be used to promote student engagement with assessment at a suitable time period prior to the TMA cut-off date.

A collaborative home experiment to form bioplastics and study their degradation by monitoring the release of a dye with a smart phone

Simon Collinson, *Joanne Handford, Michael Batham, Matthew Kershaw & Nicholas Chatterton.*
School of Life, Health & Chemical Sciences
STEM Faculty

Introduction: There is growing interest in novel sustainable plastics due to the growing issues with the waste management of plastics and pollution especially following Blue Planet II. This home experiment introduces students to the synthesis of novel bioplastics using everyday renewable chemicals and then studies their degradation in alkaline solution by release of an added dye. The students then discuss their findings within their tutor group forum as well as considering aspects of the wider context of developing bioplastics and sustainability.
This home experiment builds on published procedures but needed to be adapted for the UK and for use as a home experiment by OU students in our new module S248 Chemistry in Life. Consequently, this home experiment was run first as a pilot with three Nuffield A-level students (working at home), then with two apprentices at the Open University and a SXM390 Frontiers in Chemistry project student (working at home). This research involved:
• synthesising polymers containing a food dye
• measuring a dye in solution using a Smart phone App
• analysing the degradation of the polymers in alkaline solution using a Smart phone App
• modifying the procedures and instructions to facilitate the experiments for OU students
Results: We successfully synthesised polymers from pairs of household chemicals namely starch & glycerol, citric acid & glycerol, starch & citric acid, and mannitol & citric acid. The pilot data was also used to produce materials for an Alternative Learning Experience.
Conclusions: We have succeeded in using the home experiment with both Nuffield project and apprentice students who have used their results in their project reports. S248 is in its first presentation so work is ongoing to streamline the experiments and avoid issues noted by students and tutors on the module forum. Importantly, the students seem to have engaged well with the activity and forum discussions.

Translating scholarship findings into practical actions

Clare Morris, STEM Faculty

A scholarship project completed last year (and discussed in a workshop session at last year's conference) investigated students' reactions to and use of the feedback they receive on marked TMAs. This poster will summarise the ways in which the findings from that work are being taken forward (under the auspices of an eSTEeM project) and translated into practical action which will impact on students' learning. The poster links with a presentation by Jo Smedley and Tricia Terndrup titled 'Feeding forward on feedback: encouraging student engagement', which examines one aspect of the current work in more detail.

Modulating reflections on student support integration and partnership working - a multi-team systems perspective

Karen Potter, Sinéad O'Connor-Gotra
School of Engineering & Innovation
STEM Faculty

Associate Lecturer, Student Support (SRSC) and Module Team expertise plays a key role in enhanced student engagement across their STEMA module and towards their qualification. But how do all integrate and work in partnership with the student? We carry this as a core question into this conference, yet aware this concern resides in hiatus in our E&I (Associate Dean-Student Experience sponsored) scholarship project that was recently incepted to explore the relational dynamics and deficits – purely- between Associate Lecturers and the Student Support Team (SST) in shaping the student experience.

This presentation will first report on the nature of communication and collaboration between the SST and Associate Lecturers. Given the lack of prior theorisation on the subject, we conceptualise these two groups as a 'multiteam system' (MTS). This is a task context whereby two or more teams' interface directly and interdependently towards the accomplishment of collective goals. Using a combination of semi-structured interviews and data from AL forum archives (netography), we find a failing trust in the system and motivation to work closely across teams. Rather than exemplifying Bryson's (2014) principles, working together in partnership with the student, resolving issues and accommodating challenges, managing workload, and supporting learning, there is often an unnecessary duplication of roles causing undue stress to students. We currently see the building of an unrealistic expectation that a large body of ALs can have individual relationships with a small number of Senior Advisors and Educational Advisors in the SST, with resultant frustrations. An effective MTS should not only include shared understandings of how teams are connected, but how they can respond to challenging situations. Both AL and SST teams are composed of committed and highly experienced individuals, but are forced through electronic forms of communication, and lack the mechanisms to work together on more complex cases.

The body of MTS research also offers guidance regarding critical factors for the effectiveness of our working partnership – also activating wider questions of which further teams work together in an integrative support system. This presentation therefore will rapidly shift the emphasis to discuss possible interventions to facilitate and improve our practice in student engagement. We

have to date focused on a stripped-down context to the AL and SSRC MTS, but appreciate not hearing the full complexity, where there are other key 'teams' (module teams?) and boundary spanners (staff tutors?) at play. The OU has been seeking to provide a continuity of student support around a programme of study. Whilst closer relationships have also been focused on between the SRSC and the Faculty, we would like to consider in particular; how do ALs fit into these closer working partnerships on the student's journey and quest for enhancing student engagement – does this require attending to new forms of exchange across Module Teams, ALs and SRSC?

Workshop Sessions:

Creating Ideas to enhance social dimensions Online

Gareth Neighbour, Kambiz Saber-Sheikh
School of Engineering & Innovation
STEM Faculty

The ability to socialise in an OU context, e.g., residential school, post F2F tutorial chat, OU meet-ups, etc., has been limited during the pandemic. There has been a trend to using apps like WhatsApp, etc. and the use of Module & Tutor Group Forums appear in decline. The post-pandemic experience is likely to retain elements of working practices developed in recent months as well as the increasing number of 'full-time students' (especially in the range 18 - 25). Nevertheless, it is important for well-being, inclusivity and developing the feeling of belonging and cohort identity that opportunities exist to share experiences and to socialise generally in a safe, welcoming, inclusive, and friendly online environment. The activities involved will include an introduction and an example from an existing module and allowing participants to empathise with the student experience and then use that experience to generate a list of ideas as an output utilising their own experience.

This workshop will be composed of three parts:
(i)   a brief introduction and summarising learning from key texts / literature presenting a proposed conceptual framework & principles;
(ii)   (ii) an example from T885, using Adobe Connect and YouTube, in which it will be shared with participants as if they were 'students';
(iii)   (iii) a plenary session or in small groups (depending on numbers) in which participants generate and document new ideas related to their own practice and modules and what they considered are the 'needs'.

This then will be brought together as a single output which can then be shared as a 'take-away' from the workshop. Participants will leave the workshop inspired to think about the added value that they create outside formal sessions, a conceptual framework linked to Bryson's 10 principles of student engagement, so that they can measure own performance against the framework and a list of ideas (as a take-away) that will help them. Equally, the output from this workshop may help inform module teams enhancing student engagement and fostering co-creation of the student experience.

Exploring the use of different styles of tutorial to enhance student engagement

Janet Haresnape, Janette Wallace, Fiona Moorman
School of Life, Health & Chemical Sciences
STEM Faculty

The core tuition strategy for LHCS modules includes cluster tutorials which are based on the module materials, and tutor group tutorials which are usually more skills based. These tutorials aim to provide information and help students develop skills which will enable them to succeed in their learning and do well in the module assessment and are often content heavy and formal in style.

Student success can be supported in other ways, such as through learning in informal environments, via an enriched tuition programme, and interaction with peers. This informal learning can encourage student engagement and confidence and help build communities, something especially missed by students and staff during the pandemic. Increasing student numbers in recent years have resulted in more tutor tuition time than required to deliver core tutorials, thus providing Module teams with an opportunity to pilot different tutorial styles on different modules to enhance the student experience and support student engagement.

The alternative tutorial styles we have piloted include:
• Informal module-related tutorials at level 1, 2 and 3 where module wide tutorials were loosely based on module topics to stimulate interest and discussion rather than cover any specific aspects of the module materials. These were introduced to encourage student engagement and build confidence and community. They also enabled tutors to share their own individual expertise and experience and provided an enhancement opportunity for students.
• Informal drop-in/Q & A tutorials at level 2 and 3 specifically relating to module content to support students with difficult concepts and/or to provide a space for discussions. These provided opportunities for students to ask questions and clarify areas that they might have struggled with.

In this workshop we will discuss different tutorial styles which can make learning more participatory, dialogic, collaborative, and active, and in some cases may even facilitate a more authentic and critical learning experience.

We will outline our perceptions of the advantages and disadvantages of each tutorial style we have used and summarise feedback we have received on each from students and tutors. The workshop will give participants the opportunity to think about the use of these alternative tutorial styles in their own modules, and to consider which might work well in their context.

Feeding forward on feedback: encouraging student engagement

Jo Smedley, Tricia Terndrup
STEM Faculty

Feedback from tutor marked assessments (TMA's) are a major component of the distance student learning experience. However, a significant proportion of students do not pick up their marked TMA's and hence miss out on these invaluable insights to inform their ongoing learning.

In 2019, this represented around 10% for all 19J modules across the University – so around 40,000 uncollected scripts which is an enormous amount of work from tutors.

An eSTEem funded research project (Calvert, 2020) and limited to statistics modules within STEM, focused on gaining insight into the reasons why students don't take advantage of this feedback and also their view on the feedback. Over 200 students provided responses which generally showed that students appreciate positive comments and boost student motivation.   Challenges identified included the PT3 form which was unpopular with students with some experiencing difficulties with access on mobile technologies. Common reasons for failure to pick up included forgetfulness, unawareness of availability, fear of reading negative comments and lack of student learning engagement. Continued research developments during 2020-2021 have widened engagement across STEM modules.

During the online session, the technological approaches to monitor assignment pick-up will be demonstrated. Additionally, participants will be encouraged to reflect on their module pick-up rates to contribute to a shared understanding across subjects. Subsequently, participants will be encouraged to research details of the pick-up rate on their modules and reflect on reasons to support these module-by-module outcomes.

The online session will:-

• Welcome participants and present an overview of the project and its overall findings.
• Gather and review data on participant module pick-up rates through online polling.
• Enable participants to share reflections on possible reasons for pro- and lack of student pick-up engagement and identify key aspects from in-group contributions.
• Work in small groups in break-out rooms, to:
    o Encourage AL sharing experiences of students using feedback (or not) in feed-forward.
    o Explore opportunities to improve pick-up engagement at Faculty/subject level.
    o Identify key words to summarise.
    o Nominate group leader to present outcomes to another group in next session.
• Work in small groups, to reflect on findings from another group and provide feedback/feedforward with group leaders crossing groups/other group member remaining together.
• Summarise session with next steps.

Reference:

Calvert, C. (2020). "Improving student use of feedback on marked TMAs". An OU eSTEem funded project Final Report, August 2020.

Parallel Session 3: Short oral presentations

Enhancing student engagement through practical learning in the OpenSTEM Labs

Helen Lockett
School of Engineering & Innovation
STEM Faculty

Practical learning is a key aspect of STEM study that develops students' practical and professional skills as well as improving their understanding of theory through practical experience. It can be an effective means to motivate and engage students in their learning.

The OpenSTEM Labs allow us to deliver practical learning at a distance by offering authentic practical experiences using real time instrumentation, data, and equipment for practical enquiries over the internet.

This talk will present examples of OpenSTEM Labs activities that enhance student engagement. The talk will include a range of different activities that use different learning styles, as well as some lessons learned on how best to enhance student engagement in the OpenSTEM Labs.

Clouds, containers, and downloads: improving student access to research-grade climate modelling software

Sarah Davies, Neil R Edwards, Phil Holden, School of Environment, Earth, and Ecosystem Sciences,
Mark Hall, School of Computing and Communications, STEM
Katya Pigott - LDS

Integrating current research into the teaching process often requires exposing students to research-grade software. As such software is frequently developed within and for a Linux computing environment, provisioning the software for student cohorts, that for the majority use Windows and Mac computers, can be problematic.

In this presentation we describe the provision of the Earth system model GENIE for level three undergraduate students. GENIE is used widely by research groups internationally, and its applications have included studies of long-term effects of anthropogenic emissions on the climate and carbon cycle for the last three reports of the Intergovernmental Panel on Climate Change (IPCC). Students use GENIE to learn about the fundamental principles of Earth system modelling, ranging from model set-up and initialisation, through uncertainty quantification to projection of future climate change. It is important that students use such a sophisticated model to gain the requisite skills and deep understanding of climate projections.

In the past we have used a number of methods to provision the software for students, including bespoke Windows compilation, a "container" solution in which the whole software package was bundled up into an application that can run in many computing environments, and a cloud-based

solution. These all suffer from different issues, including lack of flexibility, difficulties with supporting students remotely, and cost.

The current solution uses a cloud-based infrastructure that has been put in place as part of the Modern Container-based Learning Interface and Delivery Infrastructure (MCLIDI) eSTEeM project. This re-uses the container-based solution developed earlier, where each student gets their own instance of the software running in the cloud. The big difference is that the MCLIDI infrastructure is shared between modules, handles the authorisation of student access to the software, and automates the process of allocating hardware resources to students needing to run the software. The practical and transformative outcomes for students and module teams are ease of use, minimal support requirements, lowered costs, and common experiences across modules.

We will discuss the progression of solutions in terms of flexibility, technical demands on students, student support requirements, scale and cost and explore how students engage with the different implementations.

Home experiments and online engineering laboratories; a comparison of OU student experiences, feelings, and motivations
Alastair McCabe
School of Computing & Communications
STEM Faculty

Very little research has been conducted on OU students' attitudes and motives for using the Open Engineering Lab (OEL). The OU started using home experiment kits with some science and engineering modules in its early days. Some work then moved to residential summer schools, and other modules started using online science labs. The practical engineering activities at the OU are now offered in a myriad of ways, residential school, online engineering laboratories and recently (because of COVID restrictions), home experiment kits

This study aims to uncover the usefulness of interactive resources and the differing student experiences when carrying out practical hands-on activities at residential schools, using the home experiment kit, or using the OEL. An overarching aim of the study is to bridge the disconnect between module team perception of resources usefulness with students learning experiences. Module teams often provide resources that students use during their studies; however, they may not always know how useful the students find them to consolidate their learning experiences. The study aims to uncover how students feel they were motivated in their studies during the module. How useful did they find the resources used in the home experiment kits? How different were their experiences compared to working at a residential school or using the OEL?

A two-stage survey and interview approach were adopted to gain an insight into students' perception of practical engineering activities. The OU students selected were chosen because they had previously attended a residential school, used the OEL in a previous module course, and in 2021 used the home experiment kit. These students were in a unique position, having gone through three different study modes, working at a residential school, using the OEL and working with home experiment kits.

The first stage of the pilot is complete, and five students have agreed to be interviewed. Semi-structured interviews will take place during the spring of 2022. The data processing will be

finalised after the interview stage is completed. Initial findings suggest that the students surveyed had only studied the module because it was required as part of their module profile. Some students also indicated that they were lone learners, who may explain why some of the synchronous and asynchronous online forums. There had been few interactions with tutors during scheduled drop-in sessions held during the practical sessions. Since only 8% of the students responded to the survey, this small number is not able to support future predictions. However, the responses will guide my future research with students from modules that use the OEL as a resource. Further research with students using the OEL is planned for Autumn of 2022, and I would also welcome suggestions from the audience about how I might progress my research into the use of the OEL.

NanoLab: A novel e-learning platform for distance-teaching microscopy, metrology, and spectroscopy

Jeff Johnson James Bowen, Zahra Golrokhi, Vikram Goolaup, Sotiria Psoma; Gwyneth Morgan, Alison Nash
School of Engineering & Innovation
STEM Faculty

NanoLab is a suite of graphics-based online interactive computer programs used to teach how electron microscopy can be used for measurement and analysis in nanoscale engineering and science. It shows hands-on how Scanning Electron Microscope (SEM) images, Energy Dispersive X-ray (EDX or EDS) analysis, X-ray-Photoelectron Spectroscopy (XPS) analysis, and Atomic Force Microscopy (AFM) can be used. These are the state of the art, expensive and powerful magnification tools for obtaining high-resolution two- and three-dimensional images used to investigate samples at microscopic and nanoscales. They provide topographical, morphological, and compositional information of micro/nano structures which are crucial and invaluable for research in a variety of sciences and industrial applications. The NanoLab user interface is designed to be intuitive and very easy to use, enabling students to make measurements within minutes of beginning their first session. There is just one screen with sessions selected from a bar at the top, actions and options selected by clicking on icons on the left and right sides, and analytic information displayed at the bottom. Activities for a session are selected from a menu of thumbnail images in the main window at the centre of the screen. SEM and other images appear in this central window for interactive measurement and analysis. NanoLab has three parts. In Session 1 of NanoLab 1 students measure the width of a human hair, the diameter of tungsten nanorods, the size of blood cells and viruses, and the dimensions of microchip transistors. Session 2 shows how EDX analysis can be combined with SEM imaging to analyse micro and nanoscale materials. Session 3 shows how XPS analysis can be used to analyse the composition of deposition nanofilms. Session 4 shows how machine vision can be used to recognise and analyse shapes. NanoLab 2 applies the techniques learned to lithium-ion batteries, investigating the formation of 'mosses' that can cause them to overheat, catch fire, and even explode. It uses computer animation for students to simulate the formation of dendrites and mosses and combines this analysis with measurements made from images of sample battery layers. Session 1 of NanoLab 3 shows how microscopic measurements can be used to analyse sensors for health applications. Session 2 shows how nanoscale AFM measurements can be made of the surface of samples using a state-of-the-art device. NanoLab was developed for T366 Nanoscale Engineering and its first presentation has been well received by students. It has the potential to be developed for modules in many other STEM areas including engineering, environment, bioscience, health, physics, chemistry, geology, and electronics.

Improving user accessibility to interactive screen experiments in the Open Science laboratory

Mark Hirst Christopher Heath, Katja Rietdorf, David Male, Francesco Crea, Sushila Rigas, Hilary MacQueen, School of Life, Health & Chemical Sciences, STEM Faculty
LDS: Amanda Rose, Mustafa Bektik, Greg Black

Interactive screen experiments (ISEs) are routinely used in science modules to present students with onscreen experiences and tools that replicate important aspects of analytical instrumentation and common experimental techniques. They promote active learning of important scientific investigational skills including experimental design, data collection and analysis, allowing this asynchronously and a scale, whilst also serving as preparatory stages before use of remotely accessed instrumentation and hands-on laboratory skills that are also offered as part of the OpenSTEM laboratories. Despite the important role played by ISEs in our teaching, most have remained inaccessible to groups of students that rely on using screen reader software or keyboard navigation. The approach used during recent production of a second level health sciences module to widen access to ISEs will be described. New ISEs and data tools were created to meet W3C Web Content Accessibility Guidelines (WCAG) 2.1 for keyboard, screen reader, audio, and video accessibility as well as onscreen content considerations including contrast, text-resizing and spacing. ISE function and appearance were considered throughout the stages of design, production and testing by academic and LDS members of the module team to maximise user usability.

Panel Discussion & Plenary:

We are delighted to welcome our panel to our annual STEM Teaching conference. Our discussion will focus on the multiple ways in which the OU seeks to drive direct engagement with our students. So many people contribute to the team effort which supports students from the moment they enquire to the moment they graduate and beyond. For all of us in a distance learning context, engaging with our students in a meaningful and productive way can be challenging. Our panel will present their perspectives on student engagement at various points in the student journey and how we could foster better engagement to ensure the highest quality teaching and learning experience for all our students.

We will be joined by:
- Chair: Diane Butler, Associate Dean Academic Excellence
- Vic Nicholas, Associate Dean Student Experience
- Melissa Elborn, Senior Manager, Communications Manager, Marcomms, Strategy & Insight
- Stephanie Stubbins, Student Leadership Team, Students Association
- Stephanie Lay Senior Manager, Student Research, CIO portfolio
- Colin Beesley, Senior Manager, Policy & Controls, Academic Services
- Steve Wilson, Senior Manager, Operations, Academic Services, Student Support

Closing remarks & Plenary

At the end of the conference the STEM faculty's Executive Dean, Professor Nick Braithwaite will close the conference with a few remarks.

*****We hope you enjoyed the conference, thank you for participating*****