

The 13th eSTEeM Annual Conference 2024

Conference Booklet

10-11 April 2024

www.open.ac.uk/esteem

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Programme – Day 1

Wednesday 10th April 2024

Time	Session	Room
9.15–10.00	Registration and Coffee	Medlar and Juniper
10.00–10.05	Welcome and Introduction Sue Pawley and Daphne Chang, eSTeEM Directors	Hub Lecture Theatre
10.05–10.15	Welcome Address Victoria Nicholas, Associate Dean (Faculty and Strategy)	Hub Lecture Theatre
10.15–11.00	Keynote Presentation Dilly Fung, Emerita Professor in Practice, LSE <i>Strength-based scholarship and ‘good’ education: Developing ourselves and the university</i>	Hub Lecture Theatre
11.00–11.15	Break	Medlar and Juniper
11.30–12.30	Parallel Session A: Workshop/ Demonstration –	CMR 1

	Access, Participation and Success	
	Andrea Patel, Chris Corcoran, Stephen Jones, Ralph Burns and Sean Starbuck	Empowering the Student Learning Experience through Support Network Mapping: an active learning workshop
11.30–12.30	Parallel Session B: Workshop/Demonstration – Employability	CMR 11
	Heather Fraser, Janet Haresnape, Hanne Bown, David Ruiz, and Hannah Gandy	Online enrichment workshops: how these can help you engage and enrich your students' experiences
11.30–12.30	Parallel Session C: Workshop/Demonstration – Access, Participation and Success	CMR 15
	Zoe Tompkins, Kate Feliciello and Amaninder Singh	STEM Decolonisation in practice
11.30–12.30	Parallel Session D: Workshop/Demonstration – Assessment and Feedback	Library Seminar Rooms 1 – 2
	Charlotte Lighter and Cathy Smith	Learning from improvers: Lessons for assessment (an interactive workshop)

12.30–13.30	Lunch	Medlar and Juniper
13.45–14.45	Parallel Session E: Short Oral Presentations – Access, Participation and Success & Inclusivity	CMR 1
Chair: Andrew Potter	Louise MacBrayne and Zoë Chapman	Is the cost of home experiments a potential barrier to learning?
	Jo Smedley, Hedieh Jazaeri, Alice Moncaster, Silvia Varagnolo and Fiona Glead	Improving and evaluating inclusivity in group project work for distance-learning engineering students
	Magnus Ramage, Zoe Tompkins, and Clem Herman	Understanding and amplifying student perspectives on decolonising the computing curriculum
13.45–14.45	Parallel Session F: Short Oral Presentations – Employability	CMR 11
Chair: Janet Haresnape	Kay Bromley, Joan Jackson, Jill Shaw, and Mark Slaymaker	Evaluating and enhancing student recognition of employability skills development – examples from

		postgraduate project
	Vera Hale, Nicole Lotz, Georgy Holden, and Derek Jones	Designathon: creative online career and employability development
	Alan Cayless and Arabella Nock	Learning Logs: Employability skills for remote experiments
13.45-14.25	Parallel Session G: Short Oral Presentations – Student Support & Continuation and Completion	CMR 15
Chair: Cathy Smith	Anne-Katrin Klehe	Aiming for a sense of community in a level 2 Physics module and its correlation with retention
	Cath Brown and Sue Pawley	A timed, marked mock examination to enhance student success
13.45-14.45	Parallel Session H: Short Oral Presentations – Innovations in STEM Teaching and Learning	Library Seminar Rooms 1 – 2
Chair: Fiona Moorman	Ruth Neal, Kaustubh Adhahari and Kellee Patterson	Assessment and feedback on the introduction of group work on M140

	Trevor Collins, James Smith, Victoria Nicholas and Alexis Peters	A strategic approach to innovation in the curriculum
	Anthony Johnston, Karen Kear, Helen Donelan, Jon Rosewell, and Kieron Sheehy	Synchronous Online tutorials: analysis to identify groupings or types of students
14.45-15.00	Break	Medlar and Juniper
15.00-16.00	Teaching Innovation Talks	Hub Lecture Theatre
Chair: Sue Pawley	Fiona Gleed and Claudia Eckert B	Building networks for female engineering students
	Phil Hackett	Tutor recruitment and retention on M269
	Sarah Daniell, Lorraine Waters, Katja Rietdorf, Heather Fraser, Patrizia Paci and Seth Racey	Exploring the impact of VR tutorials on S296, Cell and molecular biology
	Silvia Bergamini and Calum MacCormick	Quantum computing as a teaching resource for level 3 quantum Physics
	Tom Argles and Philip Wheeler	Teaching Geographic Information Systems (GIS)

		supercharged by ArcGIS Online
	Jotham Gaudoin	Teaching innovations in Mathematics and Statistics
16.00-16.45	Networking	Medlar and Juniper
16.45	Close of Day One	

Programme – Day 2

Thursday 11th April 2024

Time	Session	Room
9.00–9.30	Registration and Coffee	Medlar and Juniper
9.30–9.40	Conference Publication Launch	Hub Lecture Theatre
9.40–11.15	Workshop: Opportunities and Challenges of Implementing What Works	Hub Lecture Theatre
11.15–12.00	Poster Presentations	Hub Lecture Theatre
12.00–12.45	Lunch	Medlar and Juniper
13.00–14.20	Parallel Session I: Short Oral Presentations – Access, Participation and Success & Student Support	CMR 11
Chair: Christopher Hutton	Louise MacBrayne, Jennie Bellamy, Angela Richards, and Elaine McPherson	Closing the awarding gap: listening to our Black students
	Janette Wallace and Zoë	Initial findings when

	Chapman	evaluating the role and impact of a student intern in supporting the development of the LHCS student community and sense of belonging
	Nicole Lotz, Vera Hale, Cindy Darbandi, and Ida Rodrigues	Virtual interns: co-designing and decolonising curriculum in distance design education
	Cath Brown and Victoria Brown	Enhanced student support on MST124 – Personal Tutor scheme
13.00–14.20	Parallel Session J: Short Oral Presentations – Sustainability in the STEM Curriculum & Student Support	CMR 15
Chair: Sue Pawley	Martin Braun, Anita Dawes, Sally Jordan, Carlton Wood, Olga Andrianova, Maria Nita, Georgina Gough, Kathleen Calder, Paul Astles, Rosie Meade, Teresa Cox and Anna Elliott	Developing reflective assessment tasks to engage physics students with the key sustainability competencies
	David McDade, Phil Hackett, and	To evaluate the effectiveness of focused staff training in

	Anthony Johnston	recruitment on specialised modules
	Sarah Davies, Fiona Aiken, Elaine McPherson, Volker Patent, Maria Townsend, Debra Croft, Harriet Marshall, Joanna Shelton, and Kate Lister	Ecoanxiety and environmental education: stories, conversations, actions
	Fi Moorman, Gemma Warriner and Becca Whitehead	Can we reduce anxiety of students sitting online exams? Sharing best practice between SPS and LHCS
14.20-14.35	Break	Medlar and Juniper
14.35-15.35	Parallel Session K: Short Oral Presentations – Assessment and Feedback	CMR 15
Chair: Karen New	Soraya Kouadri Mostefaoui and Oli Howson	How useful are the Are You Ready for Your Studies Quizzes?
	Jonathan Nylk and Andy Diament	Understanding student perceptions and engagement for formative assessment: A study of interactive online

		quizzes
	Janette Wallace and Allan Mooney	The findings and challenges of the cross-faculty scholarship monitoring project
14.35–15.35	Parallel Session L: Short Oral Presentations – Student Support	CMR 11
Chair: Daphne Chang	Cath Brown, Sue Pawley and Claudi Thomas	Rapid response TMA support forums
	Colin Blundell	An investigation into running taster tutorials within prisons for non-OU students and an evaluation of how we can better help Students in Secure Environments (SiSE) generally
	Fiona Aiken and Christopher Hutton	Evaluation and improvement of print pack use for Earth and Environmental Science Students
14.35–15.35	Parallel Session M: Short Oral Presentations – Employability	CMR 1
Chair:	Michel Wermelinger and Michael	Collaborative editing and

Magnus Ramage	Snowden	commenting of Jupyter notebooks to learn professional skills
	Jo Sessford	Which factors are correlated with undergraduate engineering distance learning students' expectations of ethical issues?
	Lorraine Waters, Rachel McMullan, and Heather Fraser	Online journal club in S285: does this help students develop employability skills?
15.45-16.00	eSTeEM Scholarship Projects of the Year and Best Poster Presentation Awards followed by Closing Remarks	Hub Lecture Theatre
16.00	Conference Close	

Welcome and Introduction

Sue Pawley and Daphne Chang, eSTEEeM Directors



Welcome to the 13th eSTEEeM Annual Conference titled *Sharing Scholarship and Best Practice – Implementing What Works*.

The conference will again be run in a hybrid mode that facilitates both in-person and remote participation. We hope that this format continues to provide a good balance that allows all who wish to participate to gain as much as possible

from the conference.

The theme of the conference is on increasing the impact of scholarship within the Open University, and we have two events focused on this theme. Our keynote speaker on Day 1 is Professor Dilly Fung, Emerita Professor at LSE, and a Higher Education Consultant. Professor Fung will discuss how scholarship and “scholars” can contribute to the strategic development of higher education institutions. On Day 2, we have planned a workshop to explore some of the approaches by which projects can influence practice and ways we can overcome the barriers to implementing what works.



This year's programme includes twenty-nine short oral presentations and four workshops, grouped in four parallel strands across two days. Organised thematically, the sessions will focus on: Access, Participation and Success;

Assessment and Feedback; Continuity and Completion; Employability; Inclusivity; Innovations in STEM Teaching and Learning; Sustainability and Student Support. Additionally, just before our networking session we have a series of short innovation talks, concentrating on what works and how they have improved the student experience. Important contributions to our conference are the posters. This year we have a collection of thirteen which will be available online as well as on display in the Hub Theatre. Please make sure you get a chance to review them and vote for your favourite poster. We will award a best poster prize based on your votes. The conference, as usual, will close with the awarding of Scholarship Project of the Year prizes.

Last but not least, we would like to take this opportunity to launch the call for our conference journal. The aim of the journal is to allow authors to publish short papers relating to eSTEeM scholarship in a friendly environment. We will offer authors support to write their paper and enable those new to scholarship to gain valuable experience. More about that on Day 2.

We hope that you will have ample opportunity to find out about recent and on-going projects, engage in conversations about scholarship of teaching and learning and be inspired to try new things that will contribute to impactful

scholarship over these two days. Most importantly, we hope you enjoy the conference.

Keynote Speaker Biography

Professor Dilly Fung, Emerita Professor in Practice, LSE



Professor Dilly Fung is an Emerita Professor in Practice at LSE and a higher education consultant. She recently retired from her role of Pro-Director (Vice President) for Education at LSE, where she was the strategic leader responsible for student education and students' experiences across the LSE. She was a member of the Teaching Excellence Framework 2023 Panel and is

currently undertaking two related projects for the OfS: 'Educational Gains' and 'Strategic Development in Higher Education'. She was previously Professor of Higher Education Development at UCL, where she published her open access book [*A Connected Curriculum for Higher Education*](#), which has been downloaded more than 67,000 times across 185 countries. She draws on philosophies of education to explore the unity of research and teaching in curriculum design, providing a spectrum of practical applications to programme design within and across established disciplines. Her wider work focuses on the circle of scholarship that connects research, learning, engagement and leadership.

Conference Information

Registration

For delegates attending the conference in person, please make your way towards the Hub Lecture Theatre for registration which will take place between 9.15–10.00 on Wednesday 10th April and between 9.00–9.30 on Thursday 11th April. Please visit the [campus map](#) for more details.

For delegates joining the conference remotely via Microsoft Teams, please visit the eSTEeM & Co website at the following link – <https://bit.ly/esteem-and-co> to find all the links you need to join the conference online. Please note that you will be required to sign-in using your OU credentials. It may be useful to bookmark this page as this is the link you will need throughout the conference. If you become disconnected from a MS Teams call at any time, make your way back to the [eSTEeM & Co website](#). Please click on the conference programme for the relevant day and select the link for the required session.

If you do not already have the Teams app installed on your computer, upon clicking the link you will be asked whether you wish to ‘Download the Windows app’ or ‘Join on the web instead’, we would recommend that you install and use the app version which will allow you access to all of the features within Teams.

It is advisable to sign-in to MS Teams using your OU credentials – OUCU@open.ac.uk followed by your network password, otherwise you will appear as a ‘Guest’ and may experience issues accessing some of the features or viewing the content.

Luggage storage

If required, we will have a secure room available for you to store light luggage until the end of the day on Wednesday 10th April and Thursday 11th April. Please ask at registration for more details.

Conference refreshments and sustainability

Conference registration for delegates attending in person includes tea and coffee on arrival, morning and afternoon breaks, light refreshments during the networking session at 16.00-16.45 on day one and a buffet lunch on both days.

To reduce waste, we would encourage you to bring along a travel mug and/or refillable water bottle, if possible. All catering outlets have chilled water dispensers. If you do not have a travel mug/refillable bottle, disposable coffee cups will be provided which then go to a compostable waste stream. Water jugs will be available, and a small number of individual water bottles may be provided. If you use one of the individual water bottles, please retain this and refill as required. Please note that 90% of bottles are fully recyclable with some being both recycled and recyclable.

Conference sessions and recordings

As the conference will be hybrid, all sessions will be available for online participation and will be recorded. Recordings will be made available as replays soon after the conference via the [eSTeEM conference website](#).

A photographer and members of the eSTeEM conference team will be capturing photos and screen shots of the sessions, which may be made available to the

public via the internet. Audience members are participants in this process. If you have any concerns, please speak to a member of the eSTEEeM conference team.

Session etiquette and networking

For delegates attending in person, we respectfully ask that you use any personal electronic equipment with respect for session presenters and fellow delegates.

We suggest using mobile phones and electronic equipment in silent mode.

For delegates participating online, please ensure that you mute your microphone and switch off your camera during the sessions if you are not presenting and when you are not speaking. You may also wish to set any mobile phones/devices to silent. Do not forget to set your status to 'Do Not Disturb' in Skype for Business, especially if you are presenting.

Wi-Fi and electrical equipment

Whilst on campus you can connect to the internet via eduroam using your OU credentials. Alternatively, you can use The Cloud for which you will need to create an account if you do not already have one.

Please remember that only Open University equipment can be plugged into electrical sockets.

Social Media

You can get involved with the discussions throughout the conference via Twitter

[@OU_eSTEEeM](#) using [#eSTEEeMConf24](#)

Poster Presentations

A poster presentation session will take place for delegates attending in person on day two, Thursday 11th April between 11.15–12.00 in the Hub Lecture Theatre. You are welcome to continue browsing posters over lunch between 12.00–12.45 and during day one as posters will be displayed throughout the conference.

Delegates attending remotely on day two will be invited to watch the pre-recorded poster presentations; links to which can be found on the [eSTEEem & Co website](#).

All delegates will be invited to vote for the best poster presentation; the votes from in person delegates and those from online participants will be collated to determine the winning poster. The winning presentation will be announced at the end of the conference on Thursday 11th April, 15.45–16.00.

eSTEEem Scholarship Projects of the Year Awards

We will be announcing the 7th eSTEEem Scholarship Project of the Year Awards which celebrate excellence in eSTEEem projects. The winners will be announced at the end of the conference between 15.45–16.00 on Thursday 11th April.

Session changes

We will try to keep session changes to a minimum but inevitably there may be some last-minute changes or cancellations. Any information about changed or cancelled sessions will be posted on the notice board by the helpdesk and in the programme on the [eSTEEem & Co website](#).

Helpdesk

A helpdesk will be monitored by eSTEEeM conference staff in the Hub Reception throughout the conference to help you with any queries that you may have.

For delegates attending online, eSTEEeM conference staff will be available in the Medlar and Juniper online room to help you with any queries you may have. You are also welcome to use this space to informally network with other conference delegates who are attending the conference online during the lunch and refreshment breaks.

Security

If you have any emergency security issues, please ring ext. 53666 for the security lodge, or contact a member of the eSTEEeM conference staff. Please do not leave personal items unattended. The University will not accept liability for loss or damage to personal items or equipment.

Parking and transport

If arriving by car, please ensure that you park in a designated parking space. Any vehicle clearly parked in an unauthorised location will be issued with a parking charge notice by campus security.

Accessibility

There is level access in most areas of the campus, please see a member of eSTEEeM conference staff if you require assistance. Please contact us immediately if you have any mobility requirements of which you have not made us aware.

No Smoking Policy

The Open University operates a non-smoking policy. We ask you to respect this policy whilst on campus. All premises are designated smoke-free. Smoking is not allowed in any part of, or entrances to, any building, including bars and eating areas. Smoking whilst on site is only allowed outdoors in designated [smoking points/green areas](#).

Other queries

eSTeEM conference staff will be glad to help you with any other queries you may have.

Feedback

We welcome your feedback. If you have any issues or concerns, please contact a member of the eSTeEM conference team or email esteem@open.ac.uk.

Book of Abstracts

Keynote Presentation

Strength-based scholarship and 'good' education: Developing ourselves and the university

Dilly Fung, LSE

What is scholarship, what is 'good' education, and what is the relationship between these two? And in what ways can education-focused scholarship – and scholars – contribute to the strategic development of higher education institutions? Drawing on her recent experiences as Pro-Director (Vice President) at LSE and her journal article ['Strength-based scholarship and good education: the scholarship circle'](#), Dilly Fung will address these questions. She will explore ways in which, as colleagues working in higher education, we can orientate our own investigations to benefit our students, maximise our own strengths and opportunities, *and* enhance the future of development of the university.

Parallel Session A

Empowering the Student Learning Experience through Support Network Mapping: an active learning workshop

Andrea Patel, Chris Corcoran, Stephen Jones, Ralph Burns and Sean Starbuck,
STEM Faculty

Our project aims to use Support Network Mapping as a student-centred approach to support transition to university for undergraduate Engineering and undergraduate Design and Innovation students who reside in areas of the UK associated with higher level of socioeconomic deprivation. Support Network Mapping has historically been used by Social Care practitioners to map patient support networks provided through informal networks such as family and friends who can provide emotional and practical assistance. A student's support network may include family, friends, community support and support gained via the university (e.g., peers, tutors, careers advisors, student services, disability, or financial support). Our project supports students to map their Social Support Networks; empowering students to visualise and strengthen their individual networks as they go through their learning journey at university.

Transition to university is a complex process of development, change and identity shift, with research showing that a smooth transition is associated with high levels of retention, progression, and achievement. Students from low socioeconomic status (SES) backgrounds may experience more pronounced transition challenges (e.g., environmental, social, academic, financial) because

they generally possess lower cultural and social capital and are often viewed negatively. The project reframes the complexities of transition for SES students by providing them with agency to increase their social and cultural capital by expanding their support networks (e.g., by identifying and accessing new social groups and networks, information, and resources), supporting their transition to university and improving their academic outcomes.

Students at the beginning of their studies were invited to participate in Support Network Mapping workshops that enabled them to identify and map their individual support networks. Suggestions for additional sources of support were derived from focus groups with level 2 and 3 students.

The conference workshop will enable attendees to map their own professional support network using the techniques we have employed in our student workshops. Reflection and discussion in small groups will support attendees to consider the potential benefits and applications of support network mapping past the initial boundaries of our eSTeEM project.

Session learning outcomes are:

- Identify the importance of social support for student success.
- Use Support Network Mapping to create a draft professional support network map.
- Discuss the potential benefits and applications of support networking past the immediate boundaries of the eSTeEM project.

Parallel Session B

Online enrichment workshops: how these can help you engage and enrich your students' experiences

Heather Fraser, Janet Haresnape, Hanne Bown, David Ruiz and Hannah Gandy,
STEM Faculty

Following a successful pilot programme of 11 online enrichment workshops for undergraduate biology and health science students in June/July 2022, we ran an expanded programme of 22 events in 2023. The aim was to keep students engaged over the summer months, help create a sense of community, and raise awareness of potential employability benefits of engaging with module practical activities.

Creating a sense of community is particularly challenging via distance learning, as is keeping students engaged over the summer. Moreover, an online summer programme enables students to continue their learning journey between modules and may help students get back into study mode faster compared with having a long break.

In 2022, attendance was somewhat disappointing, so in 2023 the programme was extended to run from May–September, advertised to more students and in batches rather than all at once, and promoted by module tutors. The workshops included general employability skills and chemistry topics as well as biology/health science and an increased range of topics and styles, including.

- Insights into jobs in chemistry/biology/health science.

- Topics demonstrating how life, health and chemical sciences are used in different contexts.
- Overviews of work of OU research groups*
- Coverage of transferable and technical employability skills, the careers service and library skills development*
- Panel discussion with PhD students*
- Online Journal Club*

* New for 2023

Although numbers attending each event were still relatively low, over 200 different students attended at least one live event (c.f. 64 in 2022) and 443 different students either attended or viewed the recording of at least one event (c.f. 149 in 2022). Interaction was excellent with active participation in polls, internet searches, discussions, and other online activities. We avoided using breakout rooms because many students left the 2022 workshops when breakout room activities started.

Feedback was collected after each event in both 2022 and 2023, and comments were all very positive; three main themes emerged:

- Bringing studies to life/providing enrichment.
- Creating sense of belonging/Feeling part of a community.
- Building employability-related knowledge and skills.

Online enrichment facilitators and a student participant will lead this workshop, giving both the facilitator and attendee viewpoints. We will demonstrate

examples of successful interactive online activities and share feedback received.

Attendees will be invited to discuss (in groups) and summarise whether:

- Similar programmes exist in your School.
- A summer programme of interactive online enrichment events might be popular at your School, and what the potential benefits and challenges might be.
- Any possible opportunities might exist for PhD students to participate in outreach/teaching missions in your School via a summer programme, e.g., giving research talks, sharing data-handling/ analysing/ interpreting skills, to practise online presentation/oral skills for future dissemination.
- Panel discussions might be effective in your context – (it can be less intimidating to submit questions to an online panel than face to face).
- Attendees have suggestions for improvements or additions to such a programme.

Finally, participants will report to the group and share ideas on improvements and the potential for introducing such online enrichment programmes in different Schools.

Parallel Session C

STEM Decolonisation in practice

Zoe Tompkins, Kate Feliciello and Amaninder Singh, STEM Faculty

The title of the proposed workshop is “STEM Decolonisation in Practice” and the overall aim is to engage the research community within eSTeEM to review decolonisation work within the broad STEM sector currently being carried out within UK Higher Education Institutions (HEI’s).

The UK QAA Computing Subject Benchmark recommends mapping of equitable practices and processes which acknowledge and address how divisions of labour and hierarchies of colonial value are replicated and reinforced within computing. In parallel the attainment gap focus by the UK’s Office for Students on degree outcomes achieved by students from ethnic backgrounds compared to students who are not from ethnic backgrounds, gives further leverage to decolonising the curriculum. These are the key drivers for change by helping to recognise, understand and challenge the ways in which our world is shaped by colonialism. As decolonising work is set to question and ultimately transform what we know to be true, then we need to start that transformation now; we need to be thinking differently about ‘facts.’

This project is investigating UK HEI’s which have begun to transform their curriculum by mapping the terrain of decolonial activity specifically within the discipline of Computing and IT. A collaborative team of staff tutors and student researchers have completed desk research to identify activities, decolonising

STEM, and specifically Computing and IT, within UK HEI's by looking at public facing websites for evidence and so to chart or map the terrain. A short survey with computing practitioners who attended the UK and Ireland Computing Education Research (UKICER) of the ACM Special Interest Group in Computing Science Education at Swansea University in September 2023 have added personal insights to the decolonising activities underway and the challenges faced in this transformative space at Leeds, Sheffield Hallam, Durham, Swansea, Chester and Kent University.

The overall structure of the workshop will have an introduction and overview of the current findings. Participants will engage in groups to review current decolonisation activities and discuss their applicability to the Open University within an e-learning context. The groups will be organised along current roles depending on the attendees, for example groups of associate Lecturers, staff tutors, academics, and professional services. The discussion groups will be asked to consider a number of questions within their groups:

- Which of the activities are applicable to my current role.
- How can I make a change: today, next month, next year, longer term?
- What do I need to make this successful?
- What are the challenges I might face?

The learning outcomes for participants will be:

- A clearer understanding of the current decolonisation activities taking place within UK HEIs.

- Critically review those activities in the context of the Open University e-learning model.
- Define activities to develop own decolonisation practice in the short, medium, and longer term.

Parallel Session D

Learning from improvers: Lessons for assessment (an interactive workshop)

Charlotte Lighter and Cathy Smith, STEM Faculty

This interactive workshop session draws on the interview-based esteem project: Effective support for reflective writing in mathematics: Learning from improvers. We will share the questions the study findings raised about our assessment strategy for Mathematics Education modules and explain how they have directly impacted on assessment design, including the development of more integrated assignments.

Providing examples from Mathematics Education and other STEM modules, we will invite you to consider models of student progression, and to critique and articulate your own assessment strategies. For us, the value of the Learning from Improvers project has been in using students' knowledge to inform and improve future teaching. We hope that this workshop will help you to think creatively about how developing assessments in your subject can further support your students.

Parallel Session E

Is the cost of home experiments a potential barrier to learning?

Louise MacBrayne and Zoë Chapman, STEM Faculty

Practical work in the form of home experiments has always formed an integral part of the science curriculum for teaching and assessment. The move, however, from printed materials to online delivery has been accompanied by a change in the way students are supported in home experiments, with students no longer receiving a practical kit in the post, which would have contained the necessary materials and equipment required to perform any home experiments within their modules.

The current level one curriculum (S111 and S112), compulsory in some science qualifications, now has the expectation that students will be able to purchase and have ready access to equipment needed to perform experiments at home, contributing to core module content and assessment. Some of this equipment is relatively costly and may not be easily accessible to some students.

Furthermore, there is an expectation that students will have ready access to certain items of household equipment such as fridges and freezers.

The presentation will report findings from an eSTEEEM funded project with four overarching research questions:

- Are financially impoverished students being disadvantaged by the expectation to purchase additional equipment needed for home experiments in core level one science modules?
- Are financially impoverished students being disadvantaged by the expectation to use facilities assumed to be in the home (e.g., fridges and freezers)?
- Is the expectation to use facilities assumed to be in the home (e.g., fridges and freezers) and the requirement to purchase equipment for home experiments a barrier to achieving the learning outcomes associated with practical work?
- Is cost the only barrier to achieving learning outcomes associated with home experiment practical work?

The presentation will summarise findings from an online survey and subsequent semi structured interviews to show how students are experiencing issues in addition to cost, associated with the requirement to perform home experiments, and that other factors such as availability of consumables and environmental impact are also impacting on students being able, or willing, to conduct home experiments as part of core module content. The importance of alternative resources as a viable alternative to home experiments will also be considered.

Improving and evaluating inclusivity in group project work for distance-learning engineering students

Jo Smedley, Hedieh Jazaeri, Alice Moncaster, Silvia Varagnolo and Fiona Gleed,
STEM Faculty

Projects and teamwork are the predominant contexts in which most engineers work. Providing supported learning experience of such contexts supports employability for our students. However, group projects are particularly problematic within the OU setting, both because the distance learning format makes group cohesion more difficult, and because we have a relatively high number of students who might be disadvantaged through such activity.

Meanwhile, inclusivity represents a critical issue for the engineering professions. While most of the UK engineering professionals are white, male, and able-bodied, recent publications have highlighted the relevance of understanding the needs and experiences of different groups in engineering design and the positive impact that diverse teams can have. The OU has a critical role to play in supporting a more diverse engineering profession. However, to do so we need to make sure that all our students are supported in their studies, and that they are aware of the importance of diversity and inclusivity.

Our scholarship project is about improving inclusivity for distance-learning group projects. The specific context is T229, a Stage 2 specialist engineering module which includes a distance group project. The scholarship project also aims to add to the wider knowledge base on inclusivity in similar STEM distance-learning group projects.

The initial stage reviewed the academic literature and the feedback from students and ALs on the T229 group project, to identify potential barriers to different student profiles. This helped us develop survey questions for OU Stage 1 and 2 engineering students (including T176, T276 and T229) who have experience participating in distance group projects, and ALs who delivered the

first tuition of T229. Some longer interviews with students and ALs were carried out to collect deeper insights.

The analysed data from the literature, surveys and interviews were triangulated to develop guidelines for the design and delivery of inclusive distance-learning group projects.

In this presentation, we will describe the main findings of our investigation considering the problems experienced in distance-learning group activities. We will also give some tips for an effective and inclusive design and delivery of groupwork.

Understanding and amplifying student perspectives on decolonising the computing curriculum

Magnus Ramage, Zoe Tompkins and Clem Herman, STEM Faculty

There has been a growing movement for some years with UK higher education, including at the OU, to seek to decolonise the curriculum, through an examination of the colonial legacy entanglements of teaching materials and knowledge production. Within the School of Computing and Communications, this work has been focused through an eSTeEM project entitled 'Decolonising Computing: A Resource for Educators' (led by Mustafa Ali), which led to a further eSTeEM project entitled 'A case study analysis of STEM decolonising activity within UK Higher Education Institutions' (led by Zoe Tompkins) that is currently in progress, as well as an externally-funded workshop on decolonising computing across UK universities.

The current presentation reports on one aspect of the earlier project. A survey was conducted in June 2022 of a large number of undergraduate Computing & IT students at the OU, with responses from just under 400 students, studying 17 different modules. The survey was both quantitative and qualitative. First, we asked a set of Likert-scale questions about whether the curriculum provokes critical thought and challenges dominant ideologies, about how people from diverse backgrounds are represented, and about whether students found their own lived experience to be reflected in our modules. Second, we asked a series of qualitative questions about students' understanding of decolonisation, what it might mean to decolonise the computing curriculum and how that might be done, and how best to engage students in that process.

As a project team, we analysed the quantitative questions statistically and considered the impact of different demographic characteristics (especially gender and ethnicity, and to a lesser extent religion) upon responses; and we analysed the qualitative questions through a process of thematic analysis. The presentation will discuss some of the findings from this analysis, concentrating on those found in the qualitative questions, where we observed a wide range of perspectives about decolonising the computing curriculum, from highly positive and supportive to extremely negative and hostile. We will also discuss how this relates to student engagement, and the challenges this might face, and will seek to amplify the voices of minoritised groups who responded to the survey. Lastly, we will explore structural and practical concerns which should inform the computing education community in taking forward a decolonising agenda.

Parallel Session F

Is the cost of home experiments a potential barrier to learning? Evaluating and enhancing student recognition of employability skills development – examples from postgraduate project management

Kay Bromley, Joan Jackson, Jill Shaw and Mark Slaymaker, STEM Faculty

This eSTEeM project is set in the context of M815, a 30-credit postgraduate module in project management. The module is studied by students across a range of STEM MScs and MA/MSc Open. The project drew on a range of professional competence frameworks and the OU employability framework. Defined qualitative characteristics for postgraduate skills were combined with findings from the literature relating to employability skills. Based on findings from analysing these sources a range of technical and behavioural competences was identified, and student perception of development of these competences assessed using an online questionnaire and thematic analysis of assessment.

Informal analysis of chat from introductory tutorials suggests that student experience ranges from little experience of projects to being an experienced project manager. Many students also study the module who do not aspire to be a project manager but need the 30-credits as part of their qualification. The link between employability and knowledge and skills acquired in the module is already embedded in the assessment and reflection encouraged. However,

student perception of the link between transferable skills competences developed in M815 and employability still appears weak.

The questionnaire asked students about 18 technical project management competences and 4 behavioural competences. Behavioural competences relate closely to transferable skills and study skills. Students recorded their perception of knowledge and application, before and after the module, for each competence as unaware, aware, practised, competent, proficient, expert. Most students report increased competence, from before to after the module, by one or more levels across these competences.

The thematic analysis of assessment looked for instances of developing knowledge and ability to apply these 22 competences. Keyword searches also identified instances of positive impacts on organisations and recognition of transferable skills. The main technical competences which students felt were developed were the ability to engage and influence stakeholders, the ability to undertake time-based planning and the ability to identify, monitor and respond to risk. Students also recorded development in terms of the behavioural competences: problem-solving ability; critical analysis; and reflective practice. There was strong evidence that students felt more confident to apply the skills acquired during the module in a project management context and in terms of behavioural competences in their future studies. However, it is not clear that students recognise the transferability of these skills to any context and the impact this has on overall employability. Reflection embedded in assessment appears to be key in improving student perception of employability skills development.

Drawing on material from this research project, reflection on development of both technical and behavioural competences will be reinforced in future module assessment and linked more closely to the impact on employability.

Examples of how to engage students with development of transferable employability skills will be presented in this session.

Designathon: creative online career and employability development

Vera Hale, Nicole Lotz, Georgy Holden and Derek Jones, STEM Faculty

The Designathon is a day-long online workshop, where the OU Design group (initially with support from OU Career and Employability Services) collaborated with an organisation to set a design challenge for self-selected students from different levels on the Q61 Design Qualification. The design workshop uses a structured approach to design problem framing to help the collaborative thinking process between the students. The main aim is a chance for our students to develop employability skills and experience working on real-world problems.

It proved to be an engaging approach for online students to grow their career and employability skills and gain benefits from working together, which is not always practical within the OU VLE setting. We found that the Designathon was a dynamic place where the students, scaffolded by the Designathon framework and the support of their tutors, could learn teamwork, communication, design thinking, collaboration, and presentation skills.

The presentation will share our learning from working with the students, academics, tutors, and the support organisation, and highlights how others could utilise the Designathon framework to encourage similar student engagement to improve employability and career skills in their qualifications.

Learning Logs: Employability skills for remote experiments

Alan Cayless¹ and Arabella Nock², STEM Faculty¹, Academic Services²

As SXPS288 is the main experimental module at level 2 on the physical sciences pathways. Students carry out projects in astronomy, physics, and planetary science, each based around groupwork and remotely operated real time experiments. The module encourages students to develop their experimental skills and also other vital employability skills, with particular emphasis on opportunities in the space sector.

SXPS288 features an innovative new approach to recording, developing, and assessing students' progress towards employability-related learning objectives. To enable students to document and reflect on their progress in developing these skills the module makes use of Learning logs, which are a student-led tool based around familiar forum technology. Each student has access to a personalised Learning Log, visible only to themselves and to their tutor. Importantly the Learning Log will remain available to the student across modules, allowing them to build a skills development portfolio as they progress throughout their chosen qualification pathway.

The Learning Logs are based on the online VLE forums, offering a minimal learning curve. All the features of VLE forums are available, including embedding

of images and hyperlinks in posts, attachments such as documents or computer programs, and LaTeX formatting of mathematical formulae. Posts can also be tagged with keywords for later searching or retrieval.

To encourage participation, some activities relating to the Learning Logs are built into the module Skills Weeks and some activities are linked to assessment.

The overall aim of the current study was to obtain a better understanding of student engagement with the Learning Logs in SXPS288 and to assess their effectiveness over the first three presentations of the module, using a combination of unstructured student feedback, a targeted questionnaire, and analytics of student engagement, with an emphasis on both the timing and frequency of engagement with the Learning Logs.

Following publication of the final report, this talk will provide an update on the project and how the findings will be used to improve the effectiveness of the Learning Logs in future presentations. Participants will learn how to embed skills development activities and recording into module materials and how to use analytics and targeted surveys to assess student engagement.

Parallel Session G

Aiming for a sense of community in a level 2 Physics module and its correlation with retention

Anne-Katrin Klehe, STEM Faculty

Low retention rates at level 2 Science modules are a problem. This project concentrated on a group of students in S217- a 60 credit Physics module. Students at the beginning of the module are excited about learning, but there appears to be a conflict between the students' expectations and the reality of the module, as the rate of withdrawal in the first third of the module is approximately double that of later times. In a recent NSS survey less than 50% of students stated that they felt "part of a community of staff and students". We know that a sense of belonging is one of the key factors for students to succeed in their studies.

My aim was to instil a sense of belonging among my students by offering them something they considered worth their time. To that purpose I offered nearly weekly informal discussion meetings to a group of initially 60 students, collated feedback from them and compared retention and exam results with the rest of the cohort. A total of 21 meetings was offered and attendance at the meeting ranged from 10-40%. Within an 85% confidence level retention in my test group is better (+10%) than in the rest of the cohort. The biggest difference between the groups is seen in the first third of the module, i.e., my group did not show the increased withdrawal rate in the first third of the module. Exam results in both groups are the same, indicative that my intervention has no effect an exam-

outcomes just that more students made it to the end of the module (they sat the June exam). Students reported that they enjoyed the informal atmosphere of the meetings where they could easily ask questions and learn from each other.

A timed, marked mock examination to enhance student success

Cath Brown and Sue Pawley, STEM Faculty

Currently, The Open University use open book remote examinations; this approach started during the pandemic. Students have limited experience with this mode of examination and so are not aware of how best to prepare. The study by Warriner et al (2022) showed that OU students do not fully appreciate the need to revise for remote examinations. Evidence from mathematics examination markers indicates that finishing the paper appears to be a significant problem for many students. Warriner et al's study also showed that student anxiety is reduced by the opportunity to practise.

To address these issues and help students understand how to prepare, we offered students on a second level mathematics module (MST224) the opportunity to sit a timed unseen mock examination which was fully marked, thus replicating at least partially the circumstances of the actual examination. Students also receive specimen answers, short videos going through the questions and discussing exam technique, and the opportunity to attend drop-in sessions to discuss any queries. This was first offered in 22J, and the intention

is to continue to offer this going forward, refining the provision to reflect more closely the actual examination.

In addition to improving student performance, the hope is that students' improved awareness of examination demands will promote more effective preparation in future modules, leading to improved degree outcomes.

In 22J, a variety of students opted to take the mock, and their results ranged from a low failing grade to a high distinction. This talk presents the data, including the relationship between taking the mock examination and student performance, and the feedback from the student questionnaire taken after the actual examination. We found that students who sat the mock performed significantly better compared to their previous attainment than those that did not. Student feedback overwhelmingly suggests that taking the mock had a beneficial impact on the way they prepared for the actual examination.

This project has been enabled by a broader review of tuition on MST224 which included running as one cluster despite large student numbers (approx. 800); which has resulted in considerable flexibility in how Associate Lecturers (AL) can support students.

Reference:

Warriner, G, Whitehead B and Moorman, F. (2022) Can we reduce anxiety of students sitting online exams? Sharing best practice between SPS and LHCS, Online Seminar, 03/10/22 and current eSTEEM project Can we reduce anxiety of students sitting remote exams? Sharing best practice between SPS and LHCS

Parallel Session H

Assessment and feedback on the introduction of group work on M140

Ruth Neal, Kaustubh Adhahari and Kellee Patterson, STEM Faculty

The reticence of STEM students to get involved in group work is well recognised. We wish to find a method of successfully introducing an element of group work on a level 1 statistics module and to take this forward to level 2 and 3 statistics modules. TMA04 of M140 already has a seed growing experiment, we propose to introduce a trial of volunteer M140 students to work in groups in an online environment. Students are to share their data from this experiment, discuss any issues and suggest further analysis that they could perform on the shared data. We aim to assess the student's attitude to group work before the group work starts and then survey the students again after the group work. We aim to find ways to improve the student experience based on this feedback.

In this presentation, we will discuss the results of our initial survey and give an account of the group work activity and any initial findings.

A strategic approach to innovation in the curriculum

Trevor Collins, James Smith, Victoria Nicholas and Alexis Peters, STEM Faculty

Innovation in higher education can be seen as expensive, time-consuming, and risky^[1]. However, the challenges of studying STEM disciplines at a distance have led to a series of innovative uses of technology and developments in pedagogy

[2]. Furthermore, innovation is at the core of the OU's strategy [3] to provide life-change learning that enriches society. For example, the principles of the learning and teaching plan [4] explicitly call on us to provide high-quality, supported distance learning experiences through innovative teaching and assessment, and ensure our teaching is designed and delivered through a rigorous, research-informed process.

The role of strategic planning is to reflect and support a shared sense of purpose and direction across the institution, linking our mission and objectives to our operational strengths and capacities. Arguably, the implications of scholarly teaching through digital media, necessitates the focus on innovative, research-informed teaching in our strategy and plans. In this presentation, we will draw on examples from The OpenSTEM Labs where innovative methods and technologies have been deployed successfully to identify ways of working that foster innovation in the curriculum.

We note that innovation at the OU is both enabled and constrained by the scale of our operations. Distance learning enables economies of scale, which supports innovation, but also makes it challenging to implement. For example, when working in multidisciplinary teams, divergent thinking helps generate ideas, though implementing them requires alignment and focus. We argue that innovative teaching requires sustained engagement with stakeholders, in both academic and professional services roles, to align our working practices and institutional strategy. At the OU this is underpinned through community structures that facilitate the critiquing and development of teaching, including

the scholarship centres, module teams, projects, working groups and boards of study.

We conclude that matching the maturity of a technology, the affordances it brings for distance learning, and rigorous scholarship evaluating its effectiveness are all essential to motivate and implement innovative teaching, which requires collaboration across the institution.

References:

[1] JISC (2022) What's stopping innovation in higher education? Available at: <https://www.jisc.ac.uk/blog/whats-stopping-innovation-in-higher-education> (Accessed: 26th January 2024).

[2] Minocha, S. and Collins, T. (2023) Impact of Scholarship of Teaching and Learning: A compendium of case studies. The Open University, Milton Keynes, UK. DOI: <https://doi.org/10.21954/ou.ro.000155c0> (Accessed: 26th January 2024).

[3] The Open University (2022a) Learn and Live: The Open University's Strategy for 2022-2027. Available at: <https://about.open.ac.uk/strategy> (Accessed: 26th January 2024).

[4] The Open University (2022b) Teaching and Learning Plan 2022-2027. Available at: <https://openuniv.sharepoint.com/sites/intranet-vice-chancellors-office/Pages/Teaching-and-Learning-Plan-22-27.aspx> (Accessed: 26th January 2024).

Synchronous Online tutorials: analysis to identify groupings or types of students

Anthony Johnston, Karen Kear, Helen Donelan, Jon Rosewell and Kieron Sheehy,
STEM Faculty

When A typical learning outcome for an online tutorial is that students gain understanding of the subject such that they can talk about the area more assuredly or approach an assignment or exam more confidently. However, different types of students may benefit from different approaches in a tutorial setting for such learning outcomes to be achieved.

There is clear evidence that students who participate actively in learning gain higher scores in examinations and are more likely to be retained (Freeman et al, 2014). Different students respond to different tutorial models, and it is not easy for tutors to determine how best to engage the participants in a tutorial.

It is possible that students who attend tutorials can be classified into different groupings, for example according to their different backgrounds, epistemological beliefs, or needs. To examine these and identify other influences on attendance and active participation, there are techniques such as factor analysis, cluster analysis and principal component analysis, which can be used with large data sets to help uncover patterns and relationships.

In an investigation of synchronous online learning, a large-scale survey was conducted, yielding replies from 620 students on eighteen Stage 2 modules covering all faculties in the University (Kear et al, 2023). Students responded to questions about their participation in tutorials and about whether or not they

were inclined to participate actively. Other information pertaining to students' backgrounds and individual characteristics was also captured.

This work will determine the most appropriate method (such as factor analysis, cluster analysis or principal component analysis) to examine the possibility that the students in the large survey can be categorised into a number of groupings. An understanding of this could help guide module teams and tutors in determining the needs for particular types of students, and how best to help students of that type be more active in tutorials or gain more from them.

References:

Freeman, S., Eddy, S., McDonough, M., Smith, M., Okoroafor, N., Jordt, H., Wenderoth, M. (2014) 'Active learning increases student performance in science, engineering, and mathematics', *Proceedings of the National Academy of Sciences*, 111(23), pp. 8410–8415. doi: [10.1073/pnas.1319030111](https://doi.org/10.1073/pnas.1319030111).

Kear, K., Donelan, H., Rosewell, J., Cuffe, P., Elder, T., Mooney, A., Amor, K., Edwards, C., Sheehy, K., Okada, A. (2023) 'Online tutorials: addressing the challenges of active student participation', available online at <https://www5.open.ac.uk/scholarship-and-innovation/esteem/sites/www.open.ac.uk.scholarship-and-innovation.esteem/files/files/2023-04-Day-2-Session-K-Jon-Rosewell-Helen-Donelan-Karen-Kear.pptx>. last accessed Jan 2024

Teaching Innovation Talks

Building networks for female engineering students

Fiona Glead and Claudia Eckert, STEM Faculty

In July 2023, the Women in Innovation, Design and Engineering (WIDE) conference returned to a face-to-face format for the first time since 2019. A team of staff and students from E&I organised a weekend of activities at Walton Hall with team building activities on Saturday, followed by talks and workshops on Sunday. Over 60 people attended including 30 students, along with OU staff and invited speakers.

Whilst planning had primarily focused on content, it was soon evident that the students particularly valued meeting each other, staff, and guests with opportunities to share insights from OU study and professional careers. Female students are less likely to already be working in engineering than their male counterparts, raising the priority of networking opportunities and informal mentoring. Whilst female participation in engineering has increased nationally, the proportion of women on Engineering modules can be below 10% and targeted events can therefore provide an important boost to intervisibility and interaction. Holding the event on campus also allowed students to visit laboratories and develop their understanding of the OU as a University that combines teaching and research.

In this talk, we review scholarship that led to the first OU Women in Engineering conference in 2016 and reflections from the most recent conference to explore how the need and the benefits have shifted. The resulting evidence base will

help us to refine our approach to supporting female engineering students with academic progression and professional development.

Tutor recruitment and retention on M269

Phil Hackett, STEM Faculty

M269 (Algorithms, Data Structures & Computability) is a C&C Software Development module that also sits within the M&S Data Science qualification (R38). M269 is also one of the modules within the IfATE (Institute for Apprenticeships and Technical Education) approved 'Diploma of Higher Education in Software Development.'

It is a module that is difficult to recruit tutors to, due to the complex subject matter and range of knowledge, skills and understanding required. Retaining tutors has also been a challenge on M269 in recent years.

Following an award of funding, a project proposal was developed to support the recruitment and retention of tutors on M269. The project involved existing M269 tutors developing short video (30-60 minute) summaries, related to each of the weekly topics. The videos provide tutor guidance on approaches to teaching important module concepts. Tutors also created iCMA style quiz questions to supplement the videos.

In total, 17 topic videos were created totalling over 11 hours of tutor CPD in relation to M269. There were also 17 iCMA topic quizzes created, with over 130 module specific questions available for new and potential tutors to develop a firm understanding of the module.

The funding also enabled us to offer sponsorship to new and potential tutors, in order to support recruitment and retention on M269. So far, 8 newly appointed M269 tutors have taken up the offer of sponsorship. There are plans to offer sponsorship to ALs more widely over the next few months.

A tutor survey in relation to the CPD materials will be carried out later in the year. There will also be an analysis of tutor recruitment and retention on M269 for 24J, which will help to understand the success of this project and whether a similar approach would work on other modules.

Exploring the impact of VR tutorials on S296, Cell and molecular biology

Sarah Daniell, Lorraine Waters, Katja Rietdorf, Heather Fraser, Patrizia Paci and Seth Racey, STEM Faculty

With the advent of the XR studios, virtual reality (VR) is being used to create complex environments to aid teaching throughout the OU, however, isn't currently being used as a platform for tutorials. An increasing number of our students opt not to attend live online tutorials and tutors often struggle to get students to fully participate. This can lead to students becoming less engaged with their modules, affecting successful completion and continuation. Studies have shown that students are more willing to engage with their tutor and fellow students in a VR environment and that they feel engaged and learn better. The anonymity of VR also appeals to many students who experience periods of mental ill-health, including anxiety. This study has piloted the introduction of a series of short tutorials using the Mozilla Hubs VR platform on S296. The Mozilla

Hubs platform provides VR environments that can be accessed by a web-link on any device and don't require software development before use.

S296 students from the 23J cohort have been invited to participate in a series of tutorials held in VR beginning with four informal orientation sessions in December 2023. Four further tutorials are ongoing throughout January and February 2024. Each session is repeated four times to accommodate as many students as possible. In addition, equivalent tutorials are being carried out in Adobe Connect to enable a comparison of the two platforms.

The tutorials that have taken place so far have been evaluated by observational recordings, and informal student feedback, but the intention is also to carry out a survey and interviews to explore the popularity and accessibility of the VR sessions.

Our findings so far give a clear indication that the VR environment is conducive to students talking and working together more freely than they currently do in Adobe Connect.

Quantum computing as a teaching resource for level 3

quantum Physics

Silvia Bergamini and Calum MacCormick, STEM Faculty

We have successfully embedded the use of a quantum computer in a level 3 UG module in quantum Physics. Despite being considered an advanced topic, typically taught at postgraduate level, the response and outcomes of the students have proved its great pedagogical value. Quantum physics presents

some counterintuitive concepts that students find generally quite hard to grasp, just by making use of mathematical language or visualisation tools. Studying our module, the students have individually used the IBM quantum computer (third party asset) for a real experiment on superposition and entanglement which has been assessed in a summative TMA. As a result, the students have gained a much deeper understanding of the complex concepts of the subject, using a practical environment where they could explore the quantum behaviour that we cannot experience in everyday life. They have enthusiastically engaged with this newly emerging field and were able to visualise the relevance of new quantum technologies in career opportunities and future societal impact.

Teaching Geographic Information Systems (GIS)

supercharged by ArcGIS Online

Tom Argles and Philip Wheeler, STEM Faculty

Geographic Information Systems (GIS) permeate modern life, so GIS skills are a useful asset in many careers. GIS is conventionally taught face-to-face, in computer labs with armies of demonstrators; until recently learning GIS at a distance was either challenging, or tedious – or both!

An early foray into GIS distance teaching at the OU was made in 2013 with S288 Practical Science. We attempted to pioneer teaching practical GIS skills in a hands-on way for distance learners, using open-source, Spanish software (Argles, 2017). It did not go well...

Fast forward a decade, and staff in EEES have rapidly created GIS topics for S831 Environmental science challenges and S319 Geology and sustainability. S226

Environmental science will have similar GIS teaching embedded for its launch in 25J. The step change is a web GIS system, ArcGIS Online (AGOL), perfectly suited to distance teaching and learning. Our student's access AGOL via a web browser; no software downloads required! We are also working with colleagues in LDS to embed fully featured interactive web maps and apps in the VLE through the ArcGIS API.

Authoring in AGOL has been a really satisfying, creative experience. The platform encourages active learning focused on practical, problem-solving exercises that tap into a cornucopia of accessible data. This kaleidoscopic content engages the students in topical issues at the same time as boosting their employability. Feedback from students is very positive, with queries so far dominated by issues with the Single Sign-On system (now resolved).

We've formed an ArcGIS Management Group to share knowledge and practice about GIS at the OU.

Reference:

Argles, T. (2017) Teaching practical science online using GIS: a cautionary tale of coping strategies. *Journal of Geography in Higher Education* 41 (3), 341-352.

Teaching innovations in Mathematics and Statistics

Jotham Gaudoin, STEM Faculty

This presentation will give a necessarily brief overview of some current projects within the School of Mathematics and Statistics. In particular, we will consider how we are using the OpenSTEM Labs in several of our modules and the effect

this has had on one module in particular – M348 (Applied Statistical Modelling). We will also report on an innovative tuition pilot using paired tutor tutorials on M208 (Pure Mathematics), as well as our plans to incorporate employability skills in this module in a way new within the Mathematics curriculum.

Parallel Session I

Closing the awarding gap: listening to our Black students

Louise MacBrayne, Jennie Bellamy, Angela Richards and Elaine McPherson, STEM Faculty

The awarding gap for Black students vs White students has been widely reported across UK Higher Education. The existence of awarding gaps within the Open University for Black vs White students for pass rate and good module pass rate means Black students are not reaching their potential and has implications for OfS funding due to unfulfilled Access and Participation Plan targets.

Data examined in 2019 for the interdisciplinary science module S112 Science Concepts and Practice appeared to indicate that pass rates for Black students were much lower in comparison to White students and students of other ethnicities, despite completion rates closer to the rest of the cohort. Awarding gaps were wider than both Faculty and Institutional values.

This presentation will report the findings, conclusions, and recommendations from a completed eSTeEM funded project, which adopted a mixed method approach to investigate Black student experience on S112. The findings from an online focus group followed by semi structured Black student interviews will be presented, together with a concurrent intersectionality study to investigate any possible double disadvantage for S112 Black students.

The completed project findings presented will illustrate how thematic analysis identified a lack of representation of Black scientists and University staff

together with a lack of sense of belonging amongst the Black student community as being the most impactful barriers to success. Other themes identified such as perceived hidden costs associated with study could be relevant to wider student communities.

Engagement from Black S112 students with the project was low, with students showing some reluctance and hesitation to participate and share their experiences, despite being approached by a culturally appropriate member of the project team. A key recommendation of this project will highlight the need for further research to investigate this apparent lack of trust in the University, to open two-way channels of communication with project teams.

The presentation will also summarise further recommendations to address the issues likely to be faced by the wider student community such as minimising additional costs associated with study and ensuring home experiments have readily available cost-free alternatives.

Aims of the session: -

- To raise awareness of the existence of the university's awarding gaps, in particular that on S112 for our Black students.
- To highlight the importance of listening to our Black students and other marginalised student communities.
- To enable participants to apply our project findings and recommendations to their work with Black students and/or their module development/production.

Initial findings when evaluating the role and impact of a student intern in supporting the development of the LHCS student community and sense of belonging

Janette Wallace and Zoë Chapman, STEM Faculty

A sense of belonging has been linked to improved student retention, attainment, and satisfaction in both face-to-face and online environments. The LHCS Access Participation and Success team have a number of initiatives to increase sense of belonging and student community including student co-creation of digital assets (such as inspiring scientist postcards, the building an informal online space (e.g., café forum on the science site) and creating more informal events (e.g., virtual quizzes). To provide student perspective and facilitate the co-creation of the digital assets a student intern was hired. During this 12-week employment the student intern and supervisors/project leads have been completing short diary entries to journal thoughts and feelings of the working as and with an intern. The qualitative written entries will be evaluated using NVIVO to find common themes. The outcome of the project hopes to inform other potential supervisors/project leads and potential interns about the experience, logistics, challenges, and successes of the internship dynamic as presented in this case-study format. In addition, we hope to inform of whether the involvement of a student intern impacts their personal own sense of belonging when it comes to association with the OU. Initial findings from the diary entries will be shared in this short presentation.

Virtual interns: co-designing and decolonising curriculum in distance design education

Nicole Lotz, Vera Hale, Cindy Darbandi and Ida Rodrigues, STEM Faculty

This presentation introduces a novel approach to co-designing curriculum with OU students and academics at a distance. OU virtual interns created a collaborative space in Miro, called the Empathy Board, to develop empathy and improve collaboration with academic staff when developing new curriculum. We present what impact this space had on our efforts to decolonise the design curriculum at the OU.

The virtual internship programme invites current students with protected characteristics at the OU to support central academics with the production of modules and other activities. The programme is in its second year which facilitated the hire of two interns per year. The interns work closely with a team of eleven academics, two of which supervise, mentor, and line manage the interns over a period of three to six months.

In our analysis of the Empathy Board, we used collaborative autoethnography giving equal voice to both student interns and academic authors alike. Two examples of decolonising curriculum highlight the key processes of gaining trust and empathy between the collaborators. We found that the Empathy Board promotes reflexivity and dialogue by bringing intersecting identities into the virtual collaboration process. Engaging as a whole person and with openness to vulnerabilities supports the decolonisation process of our curriculum with student interns and academics as equal partners.

The presentation will reflect on best practice we have developed working with students from diverse backgrounds and outlines how other module or qualification teams could employ or develop a similar approach.

Enhanced student support on MST124 – Personal Tutor scheme

Cath Brown and Victoria Brown, STEM Faculty

Student retention and continuation are key focus areas for the university, and this is particularly true at Level 1, as students are adjusting to both distance learning and in many cases, Higher Education.

Improving retention and progression for MST124 (Essential Mathematics 1) is a high priority. This large level 1 module carries out service teaching for students on a broad range of qualifications many of which sit outside Mathematics and Statistics; it therefore attracts students from a particularly diverse range of academic backgrounds. For many it is both their first Open University module, and the first time they have studied mathematics for a long while, and many students find it this adjustment challenging. Whilst the standard tutor group system offers good support for students, there are some who will benefit from enhanced support to give them the best chance of success.

This project provides an increased level of support to students who have concerns about their ability to successfully complete the module and who choose to opt into the scheme. This support is in the form of “personal tutors” who are ALs who teach the module, and so are fully familiar with it, but who the students will not encounter within their own cluster.

The personal tutors do not provide academic support specifically related to the module but focus more broadly on the student's study; this may include study skills, helping students navigate university systems and signposting. They do not replace the module tutor but may be seen by students as a source of non-judgemental support since they are not involved in assessing the student's work.

The scheme ran in the 23B presentation and is running in both 23J and 24B. The intention is to continue to run this on MST124.

This presentation will give an overview of the project, including some examples of how personal tutors have been used. We will discuss how the initiative has evolved since its first presentation. We will also describe the questionnaire feedback from the first cohort of students, and accounts from the ALs involved. We will present an initial evaluation of the initiative with regards to retention and progression.

Parallel Session J

Developing reflective assessment tasks to engage physics students with the key sustainability competencies

Martin Braun¹, Anita Dawes¹, Sally Jordan¹, Carlton Wood¹, Olga Andrianova², Maria Nita³, Georgina Gough⁴, Kathleen Calder⁵, Paul Astles⁵, Rosie Meade⁶, Teresa Cox⁶ and Anna Elliott⁷, STEM Faculty¹, Faculty of Business and Law², Faculty of Arts and Social Sciences³, UWE⁴, LDS⁵, PVC-Students⁶, Faculty of Wellbeing, Education and Language Studies⁷

OBJECTIVE: UNESCO's Global Education 2030 Agenda urges education to foster the right type of competencies for a sustainable future. However, it may not be obvious how to do this in non-sustainability related modules, and asking teaching staff to become suitably proficient in education for sustainability to achieve this may be impractical. Therefore, this project investigates the effectiveness of reflective assessment tasks in a physics curriculum to engage undergraduate students with the key sustainability competencies as suggested by UNESCO. Here we report on the steps leading up to the design of such assessment tasks to further the academic debate in this area.

METHOD: A literature review supported the idea of basing this reflective approach on constructivism as a suitable learning theory since this theory suggests that new insights are actively constructed by the learner rather than passively assimilated. Reflection can facilitate this process as it guides a learner to make sense of concrete experience, which is also similar to Kolb's learning

cycle. The affective domain of Bloom's taxonomy has also influenced the assessment task design as it supports the learner in critically evaluating one's own value system and modifying it to accommodate new insights.

RESULTS: We have developed three set of assessment task for our undergraduate physics curriculum to help students to learn about the key sustainability competences in level one. In the next level we require undergraduates to consider the value of some of these key competencies and in level three we ask students to document how they demonstrated behaviour related to these key competencies for sustainability.

CONCLUSIONS: We found the process was limited by the module learning outcomes and the fact that this is a physics and not a sustainability related module, which needs to primarily develop the competencies required for physical sciences. However, we noticed that at level one sustainability can be included naturally and at the higher levels most of the key competencies overlapped with already included employability competencies. Hence, referring to key sustainability was possible without sounding contrived.

FURTHER RESEARCH: Once these assessment tasks have been administered their effectiveness will be investigated through student services and stakeholder focus groups/interviews.

IMPACT: The research project investigates a pragmatic approach to explicitly highlight the development of key sustainability competencies to student in an efficient way without the need for teaching staff to become experts in education

for sustainability. Therefore, this presentation will be of particular interest to those teaching on a non-sustainability related module.

To evaluate the effectiveness of focused staff training in recruitment on specialised modules

David McDade, Phil Hackett and Anthony Johnston, STEM Faculty

Over recent years, much has been said about the skills gap that exists within the cyber security workforce in the UK. During 2022, a significant proportion of businesses in the UK reported that they continued to lack staff with a range of fundamental cyber security skills (DCMS, 2022) An updated government report published in June 2023 by the Dept. of Science, Innovation and Technology (DSIT), continues this trend, highlighting that around 50% of businesses still have a basic skills gap and 33% have specialist/advanced skills gaps.

The problem of recruiting and developing academic staff in the areas of cyber security exists globally as well as across Europe, within the UK and at the Open University. The demand for skills 'makes it difficult for academia to attract academics with knowledge [...] and academic aspirations (Blažič, 2021)

At the Open University, within the School of Computing and Communications, recent updates to the curriculum with cyber security have also highlighted issues around skills gaps within the school and the impact this is having on tutor recruitment. Examples of this are the introduction of new modules TM256: Cyber Security and TM359: Systems Penetration Testing, both of which have been introduced as part of the new R60 BSc (Hons) Cyber Security qualification.

The school has sought to address this by offering training in specialist areas in a bid to increase the expertise of the AL community. This training has taken place through offering specialist computing 'vendor' training courses:

- Cisco Cyber Security Essentials
- Certified Ethical Hacker (CEH v11)

This has allowed tutors to upskill into specialist areas of cyber security. It has allowed tutors to develop confidence in applying for cyber security related modules, whilst gaining an industry recognised professional certification. It has also allowed the school to meet (and extend) the quotas for high demand modules. A significant portion of tutors that have completed these training schemes have gone on to become cyber security tutors on the R60 qualification.

This short oral presentation will discuss the research work that has been carried out over the past year during this eSTeEM project. It will also reveal the findings and experiences from a survey of 40 tutors in June 2023 and the role the upskilling programme played in applying for and teaching on the R60 qualification.

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Ecoanxiety and environmental education: stories, conversations, actions

Sarah Davies¹, Fiona Aiken, Elaine McPherson¹, Volker Patent,² Maria Townsend¹, Debra Croft¹, Harriet Marshall¹, Joanna Shelton¹ and Kate Lister¹, STEM Faculty¹, Faculty of Arts and Social Sciences²

Ecoanxiety is the distress related to the climate and ecological crises. Whilst it is, perhaps, a rational reaction to climate change, biodiversity loss and other environmental issues, ecoanxiety is often connected to negative emotions of grief, guilt, and hopelessness. But it can also be linked, more positively, to adaptive or 'practical' responses. The impacts of ecoanxiety on wellbeing can be unequal, depending on individual circumstances and capacities.

Ecoanxiety is increasingly recognised in learners themselves, by educators, and in media reporting. We are therefore seeking to determine the extent of ecoanxiety in our environment students, to explore how this affects their learning and to understand how to provide support around these issues. This is especially important in a distance learning context where students are often more isolated and may not have the immediate support of peers or tutors.

In this project we have undertaken a literature review of ecoanxiety and environmental education, explored how environment modules are covering issues that might provoke ecoanxiety and highlighted examples of good

practice. We have explored student experiences through a student survey (260 responses, 10% response rate) and interviews (11 students) across a range of environment modules. We are also planning to explore tutor experiences of supporting students experiencing ecoanxiety. In this presentation we will report on our investigations with environment students.

Although we are intending to develop support resources for students and recommendations for module teams and tutors as a result of the findings of this project, we were very aware that students experiencing ecoanxiety might want additional information and support during the survey and interview process. We therefore created a webpage around ecoanxiety with initial resources for students. This ecoanxiety webpage is hosted on the Environment subject website, under the Connect tab [Website: Environment | OU online \(open.ac.uk\)](https://open.ac.uk/subject/environment).

One valuable way of addressing ecoanxiety is to create safe spaces for open conversations. In this project, we are using digital storytelling to demonstrate different people's experiences of environmental issues and ecoanxiety in order to support students, to help them make connections with others affected by these issues and to open up conversations. We will report on our experiences of developing these digital stories and outline our plans for creating a range of stories to represent diverse opinions and experiences.

A further important aspect of dealing with ecoanxiety is taking action; in this project the feedback from students and staff will feed into discussions on how support resources, curriculum and pedagogy can be used to support students and to empower their thoughts, decisions, and actions around environmental issues.

Can we reduce anxiety of students sitting online exams?

Sharing best practice between SPS and LHCS

Fi Moorman, Gemma Warriner and Becca Whitehead, STEM Faculty

Context:

Our project was a collaboration between the School of Physical Sciences (SPS) and the Life, Health, and Chemical Sciences (LHCS) in response to reports of students expressing anxiety and feeling un-prepared for their remote exams. The literature is divided concerning online exams and student anxiety, with some studies reporting that online tests tend to reduce anxiety for those suffering from high anxiety in a traditional exam hall setting (Stowell and Bennet, 2010), but others instead indicating that online examinations are associated with higher levels of student anxiety than face-to-face exams (Arora, Chaudhary and Singh, 2021; Lee et al, 2022).

Methodology and activities:

As part of this project, we offered enhanced support to SPS and LHCS students in the form of exam preparation sessions to de-mystify the remote exams processes. Our aim was to increase student's self-efficacy regarding their remote exam by facilitating students to take ownership and problem solve potential issues.

A series of two one-to-many exam preparation sessions were offered to all SPS and LHCS students. Shortly after the 21J exam period (June 2022), a survey was disseminated to 2500 students across both schools, 349 of whom completed

the survey. Students were asked about preparation for their exams, the usefulness of our exam preparation sessions and their overall perspectives about their exam experience.

Following analysis of survey findings, e-mail interviews and focus group analysis were also conducted at a later stage (Spring 2023) to gain greater understanding of some of the issues raised in the survey.

Findings:

There were 291 attendees and 995 recording views for all 4 exam preparation sessions. When asked about usefulness of the exam preparation sessions, the majority of students reporting that these sessions were beneficial for overall exam preparation and in removing uncertainty (62.9% and 56.2% respectively).

Post-exam survey findings also indicated that most students engaged in the advance planning strategies recommended during our exam preparation sessions. However, only approximately 50% consulted the remote exams handbook and relatively few made use of module forums and FAQs. Although just over 50% of students were satisfied with their overall exam, approximately the same proportion found it challenging to complete the exam in the time available. Technical issues such as computer failure and internet disruption were also cited as affecting exam experience. In the interviews and focus group discussion students cited both pros and cons of sitting their exam at home and the differing level of anxiety associated with that setting and use of their own equipment. They discussed how this setting, coupled with access to the internet affected time considerations.

Project findings will be presented in this session to frame a discussion of how, going forward, we can best prepare and support students to achieve their potential in remote exams.

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Parallel Session K

How useful are the Are You Ready for Your Studies Quizzes?

Soraya Kouadri Mostefaoui and Oli Howson, STEM Faculty

The Are You Ready for Your Studies Quizzes have been implemented within the school of Computing & Communications to help students decide whether they are ready to study a module. There are usually three parts to such quizzes, which have a varying number of questions. In Part 1 students are asked a few general questions about their previous experiences. In Part 2 students are asked more specific questions related to the module content. In Part 3 they are asked about how they found the test. After they are done, students are given a score and a general impression of whether they are ready for the module. The aim of this project is to evaluate the usefulness of such quizzes for the core level 2 modules. Are the quizzes really assessing the students' readiness to begin studying their level 2 modules? Do they give an accurate indication of future success? The study focuses particularly on programming heavy modules with low retention and/or students' satisfaction. Modules M250, TT284 and M269 were investigated, along with TM255 which was used as a comparator module as it is Level 2 with non-programming content.

The research data includes: two focus groups of module team members and tutors of the level two modules investigated (n=9); a survey of level two students (n=74); and a follow up in depth interview with five of the survey respondents. These three sets of data were considered separately before a triangulation of the results was performed.

From the educators' perspective, the issue of 'where to go next,' if a poor result was achieved, and the lack of a discussion forum where students can discuss the quizzes and their results, emerged as themes for suggested improvements. The availability of a second quiz midway through the module presentation to assess the students' progress, as well as allowing for increased module content coverage and the inclusion of softer skills such as report writing, and time management were also suggested as potential ways of better assessing the readiness of students.

From the students' perspective, it was found that the most valuable aspect of the quiz for all participants is that it gives an insight into their potential for success in the module. Most participants interviewed found that the quiz offered an opportunity to refresh information from previous modules, including identifying areas to be addressed. The same participants also found it provided an opportunity to develop their skills before the start of the module. Students have however, suggested that the quizzes should be tailored to represent the content of the module more accurately, including harder/longer questions that are more representative of module content.

A statistical analysis was carried out to measure linear correlation for each module between quiz results and final grades using Pearson's correlation coefficient. Findings from the analysis suggest it is reasonable to use the AYRF results as an indicative predictor towards final grades for three of the four modules included in this study (TT284, M269 and M250) as these all had a significant correlation at $p < 0.5$. However, it would not be reasonable to use the TM255 AYRF results as predictors toward the module's final results; the far lower

completion rate of the AYRF quiz for TM255 led to very little data being available for analysis.

Understanding student perceptions and engagement for formative assessment: A study of interactive online quizzes

Jonathan Nylk and Andy Diament, STEM Faculty

Formative activities are integral for student learning and students that engage with these are more likely to achieve success in summative assessments (Rust, O'Donovan, and Price, 2005; Jordan, 2011). However, formative activities are often seen as optional and uptake by a cohort can be low. Typically, some module credit is given as an incentive to engage with these activities, but care must be taken in implementing this or the focus can shift from learning to counting marks (Jordan and Butcher, 2010). How should such activities be incentivised?

To investigate this, we sought to determine student engagement habits and perceptions of the online quizzes on a S217 "Physics: from classical to quantum", a 60 credit Level 2 core physics module. This module features online quizzes as a key formative activity for providing instantaneous feedback. However, the online quizzes do not contribute directly to the module assessment strategy. Instead, engagement with the online quizzes is encouraged indirectly by an item in formative tutor marked assignments in which students are asked to reflect on their performance in the quizzes.

This is a mixed methods study, making use of learning analytics data and a student survey. Learning analytics is used for quantitative analysis of quiz use behaviours over 3 academic years (from 2019/20 – 2022/23). A survey of the 2022/23 student cohort is used for qualitative analysis of students' perceptions of the online quizzes and their motivations to engage with these activities.

We will present the findings of our study, showing how and why student's make use of formative online quizzes when indirectly incentivised by a reflective item in another assessment. These will be compared and contrasted with other incentivisation strategies (as reported in, e.g. (Gikandi, Morrow and Davis, 2011; Agnew, Kerr, and Watt, 2021)).

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The findings and challenges of the cross-faculty scholarship monitoring project

Janette Wallace¹ and Allan Mooney², STEM Faculty¹, Faculty of Business and Law²

As part of a scholarship research project Cross-faculty Scholarship of Monitoring.

Evaluating the changes to monitoring looking to investigate the impact of these changes on:

- the role of the monitor
- the monitee
- correspondence tuition and
- students

The presentation will share the challenges of the scholarship project and the results of phase 2 of the project. This phase explored the monitoring process, training, practice, and the outputs of monitoring.

The findings included the areas of, training, benefits of monitoring, the use of the categories, the impact of monitoring and disagreements.

Parallel Session L

Rapid response TMA support forums

Cath Brown, Sue Pawley and Claudi Thomas, STEM Faculty

Student experience with TMAs is at the heart of retention and success for Open University students; successful completion of TMAs boosts student confidence and so will have a positive impact on retention.

The help available to students in the weeks immediately prior to TMA submission deadlines can be important for their success, and more generally to their feeling of being supported in their studies. Some students will readily contact their tutor if they are struggling and receive guidance in a timely fashion. However, significant numbers will either feel unable to approach their own tutor since they are the individual assigned to mark the work or feel they need a response within a short timescale to reduce their anxiety and enable them to progress.

After a student consultation in March 2020, the rapid response TMA support forums were set up to assist students who had requested consistent and timely support in the run up to TMA cut-off dates. The forums are open for two weeks before each TMA deadline and are generally staffed by a small team of experienced ALs. Each student can only see their own question(s) and the response from the AL. Students are informed that responses will be within a day; in practice they are typically within a few hours. Students can ask questions about the TMA much more directly than on an open forum; the AL moderators

use their professional judgement in deciding the extent of the help they will give. If a student asks multiple questions on a single TMA, the level of support will be geared to help student become independent, with advice on study skills as well as the direct help required to proceed.

The forums are currently in place on three mathematics modules: - MST124 Essential Mathematics 1, MST224 Mathematical Methods and MST368 Graphs, Games and Designs. Students on these three modules have been surveyed twice for their views on student support and in this talk we will discuss their feedback and the impact and utility of this initiative, including the positive feedback from the TEF panel.

An investigation into running taster tutorials within prisons for non-OU students and an evaluation of how we can better help Students in Secure Environments (SiSE) generally

Colin Blundell, STEM Faculty

This project originally aimed to conduct Maths and Engineering specific taster tutorials within prisons in the North West of England for prisoners not currently studying with the OU. As an Associate Lecturer having taught face-to-face in prisons for a number of years (pre-COVID) and noticing that there was a lot of interest about what I was teaching my students from prisoners within education who were not enrolled with the OU. They seemed to be fascinated by the module content and felt able to do it but there were many aspects of study putting prisoners off applying. This project set out to evaluate what those barriers were and what could be done to improve this. The idea was to go into a

number of prisons accompanied by a member of the Students in Secure Environments (SiSE) support team and talk to a group of prisoners along with their education department about what was involved in studying with the OU. Rather than give out books and module information I would run through level 1 and access module topics to try to demystify them and make them less overwhelming. The support team would run through more general administrative queries. The research had shown the OU had a number of prisons where take up was low, in particular woman's prisons and young offender institutions so these were to be focussed on.

The direction of the project altered due to the pandemic so the second part of the research evaluated, by having several SiSE only tutor groups, some of the issues we have when supporting SiSE and more importantly suggest ways we can improve this. By having the SiSE only groups and having the research running concurrently I was able go beyond tutoring and delve deeper, working with the education departments on what was missing. I spent more time with the students discussing what they felt issues with OU study were. This part of the research highlighted a number of key problems that seemed to be common amongst modules and prisons. I discovered some silo working across the board and also found a number of areas where quick wins could be had as well as some longer-term strategies for improving the OU's work with SiSE.

Evaluation and improvement of print pack use for Earth and Environmental Science Students

Fiona Aiken and Christopher Hutton, STEM Faculty

There is a legal requirement to provide students who have declared disabilities with reasonable adjustments which address their learning needs. An Advance HE report on this (Falsinger & Bryford, 2010) includes 'resources available' as a reasonable adjustment to address. However, even when following accessible design principles, Virtual Learning Environments are not necessarily accessible to students with certain disabilities e.g., students with specific learning challenges such as dyslexia can struggle to study on screen. Also, reading on a screen can lead to difficulties focusing especially if the text is interspersed with images and links (Habib et al., 2012). This can result in studying taking longer, which itself can be a barrier due to the impact on workloads which can negatively affect quality of life and lead to stress and anxiety (Lambert & Dyer, 2018). Books and print resources can be preferential to on-screen text; having the 'whole text in front' helps with comprehension and identifying important sections (Habib et al., 2012).

One way that accessibility can be improved for students with barriers to studying on screen-only materials is through producing printed versions of the materials, so-called "print packs" in the Open University. The aim of this research is to evaluate the efficacy of print packs as a way of providing reasonable adjustments to some disabled students and those in secure environments on Earth and Environmental Science modules. Initially we investigated (in the academic year 21/22) how students used print packs and the problems and benefits associated with them, through a student survey (43 invitations, 13 responses, 30% response rate) and scrutiny of institutional data. The survey highlighted that most students use print packs for over half of their study time with comments revealing that students blended study of the printed

materials with shorter periods of access to interactive online content and synchronous (tutorials) and asynchronous (forums) tuition. Only 23% reported having received any advice on how to make best use of print packs. Focus groups were conducted with Associate lecturers and student support team staff, the results triangulated with the student survey.

Based on the analysis of our results, we designed an intervention for the academic year 22/23. This involved recruiting and training two Associate Lecturer champions, one on each of our large year 1 and year 2 modules S112 (Science: concepts and practice) and S(XF)206 (Environmental Science). They provided support and advice to fellow Associate Lecturers through an asynchronous tutor forum and carried out their own evaluation of the effectiveness of the print pack materials on the two modules. Following this intervention, we have re-surveyed the students using print packs and have expanded the Associate lecturer champions roles to cover most of the modules in Earth and Environmental Sciences for the academic year 23/24. In this session we will report on the findings from this research and our current progress in scaling it up to cover more modules and qualifications.

References:

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Parallel Session M

Collaborative editing and commenting of Jupyter notebooks to learn professional skills

Michel Wermelinger and Michael Snowden, STEM Faculty

Jupyter notebooks are used by millions of scientists and educators, as they are the natural medium to mix code and explanatory text. We present an approach that allows students to more easily write notebooks, without any software installation, and comment on each other's notebooks, to practise professional skills like; communicating clearly a problem and its solutions; giving and receiving feedback; writing clean code using appropriate tools.

We developed the approach with our algorithms and data structures module (M269) in mind, but it can be adapted to any module teaching Python or using Jupyter notebooks in R or Python.

The approach is based on a cloud platform, with free education accounts, which provides the infrastructure and interface to write notebooks and comment on other's notebooks as easily as in Google Docs.

We created on that platform a project that includes all the necessary software and some example/template notebooks. With a few clicks, a student can copy our project to their account and start working on their notebooks immediately, by using ours as starting points.

We also created a website with guidance on how to structure notebooks, how to ask for and give feedback, and how to use the platform to share notebooks for commenting, either publicly or just with a few selected people, e.g., their tutor.

Finally, we wrote a small code library, included in the project that students copy, that makes it easier to test code, to check that it conforms to good Python style, and to check it only uses the Python constructs taught in your module.

This project is still work in progress. As we write this, we just finished producing all the above resources. By the conference date we should have some student feedback on them.

Which factors are correlated with undergraduate engineering distance learning students' expectations of ethical issues?

Jo Sessford, STEM Faculty

Engineers face ethical decisions on a regular basis, it is therefore important that students can clearly identify ethical issues and recognise that they are accountable for their actions. An additional reason for including ethics in curricula is there is an increasing focus on ethics being an integral part of accredited engineering degrees (Engineering Council, 2020).

There are however challenges associated with delivering ethics material as research has shown that engineering ethics education is often ineffective (McGinn, 2003) and there is some question regarding if it is possible to teach ethics. Other obstacles include that students often do not appreciate the importance of ethics education (Newberry, 2004). There is limited research in

the areas of engineering ethics education and even less in distance learning. Distance learning brings added challenges when delivering material on ethics, because of the reduced contact a student has with both peers and academic staff.

This project investigated the factors which correlate with distance learning engineering students' expectations of ethical issues and the influences on the ethical values of distance learning engineering students. One module from each undergraduate level was selected to collect data from using an anonymous questionnaire. The participation rate was very low with 40 students responding out of the 1100 students asked to participate.

Initial findings show that students at level 2, believed to a greater extent than students at levels 1 or 3, that their engineering studies had addressed the ethical issues or conflicts that arise within engineering. It has been hypothesised that this was as a result of a module at the end of level 1, which had an ethical content, and which included ethics in the assessment.

There is an indication that students expect the types of ethical issues or conflicts that were addressed in course materials to be the most likely to occur. It is therefore suggested that there is more of an emphasis on the types of conflicts that students are likely to encounter on a regular basis in module material. Student responses suggest that students who do identify with an ethical issue or conflict in the workplace may not be equipped with the skills needed to challenge unethical behaviour.

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Newberry, B. (2004) 'The dilemma of ethics in engineering', Science and Engineering Ethics, vol. 10, no. 2, pp. 343 – 351. [Online]. Available at <https://doi.org/10.1007/s11948-004-0030-8> (Accessed 4th January 2024).

Online journal club in S285: does this help students develop employability skills?

Lorraine Waters, Rachel McMullan and Heather Fraser, STEM Faculty

Developing employability skills has been identified as an Open University priority; there is evidence that these transferable 'soft' skills are often limited in science graduates entering the workplace. S285 (Investigative approaches in biology and chemistry) was designed to closely follow the 'OU Employability Framework' enabling students to gain confidence and competence in these skill areas. As part of this, an online journal club (OJC) activity has been embedded into the module which particularly maps to the areas of 'Core skills and competencies' and 'Personal attributes and behaviours.' OJC has previously been offered as an enrichment activity or part of a tutorial programme. This is

the first time, in STEM, that OJC has been an embedded assessed activity within a module. The premise for including the OJC was to enhance students presentational/DIL skills in readiness for level 3 study, develop their sense of community within tutor groups and develop their employability skills. Whilst previous internal scholarship studies show that voluntary participation in OJC is closely linked to development of these skills, in S285 students were asked to engage in OJC activities as part of their assessed coursework, with less autonomy over their engagement.

The aim of this study was to evaluate the OJC in S285 focusing on development of transferable 'soft' skills relevant to the 'OU Employability Framework', as well as its role in developing a sense of community and increasing student confidence.

A small cohort of students from S285 22J were invited to complete diary entries during the online journal club activity and participate in a focus group (3 students) to gain a deeper understanding of students' perceptions. We also carried out a focus group with Associate Lecturers (8 ALs) who tutored on S285 22J to investigate their perceptions of the activity in relation to their students.

Students were able to recognise the benefits of completing the activity and identified that it helped their communication skills and digital literacy skills, however, the overall benefit was varied dependent on their individual circumstances. Students also referred to development of time management skills, particularly around managing deadlines, and resilience in completing the activity. However, some students only saw this activity as a requirement for completing an assignment and the option of gaining a digital badge at the end.

Tutors found that students often referred to skills such as time management and digital literacy far more than simply communication skills. Neither students nor tutors felt that the activity particularly developed a sense of community, although all recognised that students were extremely supportive of each other during the presentation stage and had a sense of achievement following its completion.

It seems students can largely appreciate the benefits of completing the OJC in terms of development of employability skills, but the overall benefit may be greater for students who have had limited experience of presentations up to this point.

Poster Presentations

Developing reflective assessment tasks to engage physics students with the key sustainability competencies

Martin Braun¹, Anita Dawes¹, Sally Jordan¹, Carlton Wood¹, Olga Andrianova², Maria Nita³, Georgina Gough⁴, Kathleen Calder⁵, Paul Astles⁵, Rosie Meade⁶, Teresa Cox⁶ and Anna Elliott⁷, STEM Faculty¹, Faculty of Business and Law², Faculty of Arts and Social Sciences³, UWE⁴, LDS⁵, PVC-Students⁶, Faculty of Wellbeing, Education and Language Studies⁷

UNESCO's Global Education 2030 Agenda urges education to foster the right type of competencies for a sustainable future. However, it may not be obvious how to do this in modules not obviously related to sustainability, and asking teaching staff to become proficient in education for sustainability to achieve this may be impractical. Therefore, this project investigates the effectiveness of reflective assessment tasks in a physics curriculum to engage undergraduate students with the key sustainability competencies as suggested by UNESCO. Here we report on the steps leading up to the design of such assessment tasks to further the academic debate in this area.

See page 115 for poster.

An investigation into the progression of OU STEM students from taught courses to postgraduate research

Alice Fraser-McDonald, Sally Jordan and David Sharp, STEM Faculty

In the conventional HE sectors, there is often an established pathway for the progression of undergraduate and taught postgraduate students to postgraduate research within the same institution. However, generally, within the OU STEM Faculty, the proportion of PhD students who have previously completed a taught qualification with the OU is low. This project will investigate the current progression of OU STEM students from taught courses to postgraduate research (including any variation across the Faculty and/or by mode of study) and the reasons for pursuing or not pursuing this pathway.

The first project phase will focus on assessing the current progression of students from OU undergraduate and taught postgraduate courses to PhD research, both full-time and part-time. The second project phase will then investigate reasons for students pursuing or not pursuing the pathway to postgraduate research and the effectiveness of the current pipeline. This will involve surveying and interviewing OU taught students who have recently graduated and interviewing OU PhD students who previously studied with the University. Chairs of final year undergraduate project modules and postgraduate qualification leads across STEM will be interviewed to assess how OU courses currently support students in developing skills to progress to postgraduate research and how students on taught courses are currently made aware of PhD research opportunities.

The project findings will be used to improve understanding of the current situation and determine whether follow-on actions/projects would be appropriate. Potential follow-on projects include recommending and testing changes to current practice in a bid to increase the uptake of postgraduate research by students who have completed OU taught qualifications, and a comparison of findings related to student progression at the OU with the wider HE sector.

See page 116 for poster.

Decolonising Computing within UK Higher Education

Zoe Tompkins, Kate Feliciello and Amaninder Singh, STEM Faculty

M815 Project Management is a 30-credit postgraduate module, accredited by The UK QAA Computing Subject Benchmark recommends mapping of equitable practices and processes which acknowledge and address how divisions of labour and hierarchies of colonial value are replicated and reinforced within computing. In parallel the attainment gap focus by the UK's Office for Students on degree outcomes achieved by students from ethnic minority backgrounds compared to students from non-ethnic minority backgrounds, gives further leverage to decolonising the curriculum. These are the key drivers for change by helping to recognise, understand and challenge the ways in which our world is shaped by colonialism. As decolonising work is set to question and ultimately transform what we know to be true, then we need to start that transformation now; we need to be thinking differently about 'facts'.

This project is investigating UK higher education institutions (HEI's) which have begun to transform their curriculum by mapping the terrain of decolonial activity specifically within the discipline of Computing and IT. A collaborative team of staff tutors and student researchers have completed desk research to identify decolonising STEM, and specifically Computing and IT activity, within UK HEI's by looking at public facing websites for evidence and so to chart or map the terrain. A short survey with computing practitioners who attended the UK and Ireland Computing Education Research (UKICER) of the ACM Special Interest Group in Computing Science Education at Swansea University in September 2023 have added personal insights to the decolonising activities underway and the challenges faced in this transformative space at Leeds, Sheffield Hallam, Durham, Swansea, Chester and Kent University.

See page 117 for poster.

Identifying threshold concepts in the final year undergraduate engineering project

James Warren and Andrea Patel, STEM Faculty

Threshold concepts (TC) are a key learning theory which can be applied to many subjects within STEM; this study considers TCs within the capstone engineering project. Threshold concepts are concepts which require drastic reworking of one's own conceptual framework before crossing a threshold of understanding. Project tutors identified where students were the weakest in their project, or where students most often become stuck. The troublesome concepts

were mapped against the module learning outcomes and the professional engineering institutional framework. Tutors also made suggestions on how to help students through barriers which were: devising a robust aim and set of objectives, completing a literature review and, writing up the final piece of work. Time management and 'doing the project' were also cited as issues. The concepts were then mapped against; previous attempts, assessment scores, predicted probability of success, extensions on work, study intensity during their project, final module outcomes and the internal examiners' critiques for viability.

Findings include predicted probability values are good markers for success and can be mapped against many variables to demonstrate TCs. Extensions on assignment one indicates poorer performance overall and a struggle with project conception. Internal examiner comments on each project confirm this to be the case (6% of students do not meet the project requirements). Assignment one represents the largest point of withdrawal on the project due to the high concentration of TCs during these study weeks. It is likely that the largest impact for interventions to pro-actively support students needs to be from 3 weeks before the module starts until after assignment is returned. It is also clear from the study that different students have different readiness to tackle TCs dependent on their previous study and experience with engineering analysis. Participants will gain an understanding of threshold concepts especially with respect to project modules.

See page 118 for poster.

Sharing tutorial slides before online events: an initial evaluation of practice on three EEES modules

Jennie Bellamy, Jenny Duckworth and Harriet Marshall, STEM Faculty

Access to slides in advance of online tutorials is thought to benefit many students, including those with English as a second language and disabilities, and is given as a reasonable adjustment in the disability profiles of some students. Universal design principles (e.g. Burgstahler & Cory, 2008) suggest that this practice would benefit all students, not least as some will have undeclared needs. However, not all Associate Lecturers are keen or willing to share tutorial slides in advance, for example because they perceive that it might lead to lower attendance at the live event.

This project explores module team guidance and AL slide sharing practice for the EEES modules S112, S(XF)206 and SDT306 and aims to identify the perceived benefits of and barriers to advance slide sharing for both students and ALs.

Our poster introduces the project and presents the results of an initial evaluation of AL practice focusing on the extent and timing of slide sharing via forums from the 22J presentations of the modules. We then outline the next phase of the project, which involve surveys of ALs and students on the three modules. This should enable us to determine practice in sharing (ALs) and accessing (student) slides, together with their perceptions of the benefits and barriers of sharing online tutorial slides in advance. The results will be used to make recommendations to module teams regarding slide sharing guidance.

Reference:

Burgstahler, S., and Cory R.C. (eds.), (2008) Universal design in higher education: from principles to practice, Cambridge MA, Harvard Education Press.

See page 119 for poster.

Investigate how integrating vendor certifications within Computing modules affect student motivation, engagement, and employability prospects

Amaninder Singh, Andrew Smith, Andy Reed and David McDade, STEM Faculty

Within many OU Computing modules and microcredentials, vendor certification content is partially integrated, or the modules are created solely based on the industry accredited content (e.g., Cisco, Amazon Web Services (AWS), Education & Development Group (OpenEDG), EC-Council, Microsoft etc).

This project aims to investigate the impact of this integration, evaluating if it motivates and encourages students to study these modules in the first instance and to what extent this affects their overall performance. The project will also evaluate student perceived value and industry recognition for completing these specific modules and explore the potential effect of vendor elements on longer term promotion and employability prospects. We will focus on selected Computing modules and conduct student surveys and interviews, with other vendor certification stakeholders. As part of the literature review, the project will attempt to critically compare the OU offer, with competing universities, who are utilising similar vendor resources within their own comparable programmes.

See page 120 for poster.

TMA checklists: Snog, Marry, Avoid?

Kate Fox and Heather Fraser, STEM Faculty

TMA checklists have been proposed as a possible way of targeting and reducing the Attainment Gap for Open University students. Within the School of Life, Health, and Chemical Sciences (LHCS) the use of TMA checklists is patchy, and there is no cohesive strategy relating to checklist content or location. Anecdotal evidence from ALs on one new Level 2 module, (S296, Cell and molecular biology) suggests students find checklists helpful and may be of particular benefit to neurodiverse and/or anxious students.

This study aims to generate both quantitative and qualitative data to demonstrate an impact on attainment and retention for students on modules within the LHCS School. Initially, we plan to survey students on two modules with TMA checklists embedded from their first presentation, (S296 and SK190), to inquire about student use of checklists, their perceived value, and any potential barriers to their use. We then plan to introduce TMA checklists into three modules that have been running for greater than three years, at the start of the 24J presentation. We aim to generate data on TMA submission rates and attainment scores pre- and post-checklist implementation. Students on these modules will also be surveyed at the end of each module.

See page 121 for poster.

Agile development and implementation of a TMA catch-up activity for Stage 1 students

Paul Piwek, Cecilia Domingo and Richard Walker, STEM Faculty

Inspired by the DD102 tutorial sessions for students who miss the TMA cut-off date, the TM112 module team explored an agile approach to development and implementation of a way to support students who have missed the TMA cut-off date. Students who haven't submitted their TMA approximately 10 days after the cut-off date are contacted by email with a message from a tutor encouraging them to engage with an interactive short activity. The TMA catch-up activity is delivered as a VLE quiz and includes a motivational video followed by 'Tips & tricks for salvaging a TMA: a survival kit.' The activity and videos were developed end-to-end by the abstract authors (Module Team Chair, Associate Lecturer and PhD Student engaged through the C&C Teaching Scheme for PhD students) and has so far been used in two presentations. Whereas there was some upfront effort to create the materials (about 7 person days), the activity requires no further work during presentations apart from ensuring that students who submit late are contacted via email at the appropriate time after the cut-off date. Feedback and results have been encouraging with most students who engaged with the activity submitting their TMA and some qualitative feedback suggesting the activity made the difference for at least some students between submitting and not submitting. Our poster provides a detailed description of the activity and how it was produced, as well as evaluation results in terms student engagement, TMA submission rates and qualitative feedback.

See page 122 for poster.

Understanding Passive Withdrawal Behaviour on S111

Maria Velasco, Vic Pearson and Linda Moore, STEM Faculty

“Passive withdrawals” (as defined within this project) are where students remain registered until the end of the module but have had limited or sometimes even no engagement with the module content and assessment. It is not a new or unique problem to any one module as it is a challenge on most/all modules, but it is a recognised issue on level 1 modules across faculties. They are particularly visible on modules that have a single component assessment strategy; while these students may officially become de-registered by the university following Module Results Panel, the students are included in the final statistics for the module, resulting in a higher proportion of ‘fails.’

Although passive withdrawals are recognised and reluctantly accepted, it is not necessarily understood what the reasons or triggers might be for these behaviours. This poster will explore the initial findings from our project as we try to gain a greater understanding of the study behaviours, circumstances and motivations that lead to passive withdrawals, using the introductory science module, S111 Questions in Science as our case study.

See page 123 for poster.

Developing algorithms with peer feedback

Ravi Rajani, Stephen Rice, Jason Clarke and Phil Hackett, STEM Faculty

Some benefits of peer learning that have been reported widely in the literature include the development of lifelong learning skills such as collaboration, critical

enquiry, and learning-to-learn. In the context of distance learning, peer learning can also enhance the student experience by fostering a sense of community and reducing isolation. For these reasons, peer activities have already been incorporated in some computer science modules at the OU.

We have designed a peer-learning algorithm activity for the level-2 computer science module M269 Algorithms, Data Structures and Computability. The aim of our project is to evaluate its effectiveness by trialling the activity with 20 student volunteers and recording their feedback through a questionnaire and optional email interviews. The project team will evaluate data from the questionnaire, the quality of students' work produced, access logs from the peer-learning online platform, and improvements in TMA scores following the activity. If deemed successful, a recommendation will be made to incorporate such a peer activity in M269.

In this presentation, we will describe some details of the algorithm task, share some preliminary data from the questionnaire, and summarise our initial perceptions of the activity.

See page 124 for poster.

Academic conduct referrals and students from underrepresented groups

Jill Shaw, Rehana Awan, Jim Gillen, Katharine Jewitt and Mark Slaymaker, STEM Faculty

ACOs in the School of Computing and Communications observed and data from the previous 4 academic years illustrated a variance in the level of Academic Conduct referrals for students in underrepresented groups.

The aim of the project is to investigate the patterns in the demographics and referral data of students who are referred for Academic Conduct, review the literature and conduct primary research with key stakeholders including Module Teams and students in underrepresented groups.

The analysis of the data of students referred to the ACOs in the School in terms of demographics and review of the literature on academic conduct and integrity and underrepresented groups has been undertaken.

The next stage is to interview Module Teams and students in underrepresented groups on their experiences of the academic conduct process and analyse and evaluate the collected qualitative interview data.

The intended outcomes are to make recommendations on support and guidance to students in underrepresented groups on Academic Conduct and develop Academic Conduct resources that are sensitive to student backgrounds.

See page 125 for poster.

Evaluating the Programming for Physical Sciences website and forums on SM123 Physics and Space

Andy Diament, Gemma Warriner and Stella Bradbury, STEM Faculty

Physics and students need to learn to program in Python to analyse data and model phenomena. They start their journey on SM123 Physics and Space, returning to it in later modules. Many find it difficult and frustrating to learn programming. An earlier eSTEE M Study (Warriner and Diament, 2021) surveyed students on the module and identified areas where students were making poor progress. This led to a further project to write additional support material for the VLE Website, Programming for Physical Sciences.

This poster outlines a follow-on project. We will be analysing use of the website by accessing logs of website use, to understand which resources are used and when they are used. We will be running a survey of students using the site to learn more about how they use those resources. We are using qualitative analysis to evaluate the Python support forum in the now completed 22J presentation. This will provide a baseline for comparison with the current 23J forum, now complemented with a private forum (where students can ask questions that are only answered by tutors). We will include some preliminary findings from our analysis so far.

Reference:

Warriner, G. and Diament, A. (2021) How successfully are students engaging with the Python Component of SM123? Available at:

<https://www5.open.ac.uk/scholarship-and-innovation/esteem/projects/themes/supporting-students/how-successfully-are-students-engaging-the-python-component> (accessed 25 September 2023). Available at <https://go-gale->

com.libezproxy.open.ac.uk/ps/i.do?p=AONE&u=tou&id=GALE|A148046210&v=2.1&it=r (accessed 26 January 2024).

See page 126 for poster.

Late Markers: current usage and potential changes?

Fiona Moorman and Karen New, STEM Faculty

Tutor marked assignments (TMAs) are marked by Associate Lecturers (ALs) and although TMA submission deadlines are allocated by the module teams, each AL has the chance to award an extension for any student who requires further time to complete the TMA. ALs can award an extension of up to 3 weeks, although a further extension is potentially available, after discussions with appropriate stakeholders, such as staff tutors and members of the student support team and disability teams. In such circumstances, students submit their work by the new deadline, with no penalty for using an extended period. However, sometimes students submit their assignment after the TMA submission deadline, without contacting the AL first to ask for an extension; sometimes students submit their TMA beyond an agreed extension. In such circumstances, ALs have the potential to award an L-marker. With an L-marker, the AL can mark and grade the script as normal, but when the L-marker box is checked, the student is awarded a zero grade. This may have significant impact on the student, particularly where the module follows a single component model of assessment.

In the first phase of our project, we reported preliminary findings to follow 'what happens next' when a student receives a zero score for an assignment marked

by the tutor as being late (an L-marker). Here we present the second phase of our scholarship, where we explore the AL voice, asking associate lecturers from across the University their thoughts on issues related to the application of L-markers. We were very surprised by the passion that our AL colleagues felt with regards to the use of L-markers, which we felt demonstrated the importance of clarity over this issue.

We issued an online survey to a pool of 1000 randomly selected ALs and used thematic analysis to explore the qualitative findings. In response to our original research question 'an evaluation of use and impact of zero grades in assessment; are we being consistent, fair and transparent' our findings would suggest a lack of consistent practice, and a perceived lack of transparency, for ALs and potentially also students. Our findings also suggest that alternative models of application of L-markers might result in a fairer process. Our findings are shared with colleagues in ACQ, and it is anticipated will lead to positive changes with regards to L-markers.

See page 127 for poster.

Poster 1

Developing reflective assessment tasks to engage physics students with the key sustainability competencies



Martin Braun, Anita Dawes, Sally Jordan, Carlton Wood, Olga Andrianova, Maria Nita, Georgina Gough, Kathleen Calder, Paul Astles, Rosie Meade, Teresa Cox and Anna Elliott

Introduction

Module members are subject specialists, but not (necessarily) familiar with education for sustainability (EfS). Hence, the idea is to test reflective assessment tasks to assist such academics with embedding sustainability as a first step.

Challenges

- ❖ Concept of sustainability is challenging to incorporate in some non-specialist disciplines (e.g. pure and hard) (Vogel *et al*, 2023)
- ❖ Frequently EfS uses the 17 SDGs, but they have 169 targets and 247 indicators, and are contested (Kotzé *et al*, 2022)
- ❖ 'Embedding' ranges from individual efforts to institution wide initiatives (Vogel *et al*, 2023)
- ❖ Key sustainability competencies (KSCs) not finally defined (Redman and Wiek, 2021)

Proposed approach

(Adapted from Bloom's affective domain)



Example: Level 1 – Physics SM123 - Physics and space

- ❖ **Introduce:** Relationship between sustainability, employability and KSCs
- ❖ **Reinforce:**
 - ♦ Topic Domestic energy: Comparing insulation of two houses (anticipatory KSCs)
 - ♦ Practical work (collaboration KSCs)
- ❖ **Assess:** Heat loss question, reflective question regarding collaboration

Input requested

- Really embedding sustainability?
- Other frameworks?
- Reflective assessment question model?

Contact details: martin.braun@open.ac.uk

Other possible frameworks



Miller prism Process model of Eco-anxiety Maslow's hierarchy of needs

References

Vogel, M *et al* (2023) *Education for Sustainable Development a review of the literature 2015-2022*. York: AdvanceHE
 Kotzé, L J (2022) Planetary Integrity. *The Political Impact of the Sustainable Development Goals: Transforming Governance Through Global Goals?*
 Redman, A and A Wiek (2021) Competencies for Advancing Transformations Towards Sustainability in *Frontiers in Education* 2021

Poster 2

An investigation into the progression of OU STEM students from taught courses to postgraduate research



Alice Fraser-McDonald, Sally Jordan & David Sharp

Aim: Investigate the progression of OU students from undergraduate (UG) and taught postgraduate (PG) courses to postgraduate research and the reasons for pursuing or not pursuing this pathway.

Background and rationale

- Low proportion of OU PhD students completed OU taught qualifications
- Improve understanding of current situation
- Widening access to postgraduate research.

Expected outcomes

- Understanding current pipeline for OU students, including reasons for students' decisions
- Feedback to colleagues e.g. module teams, qualification leads, and PG Research Tutors.

Research activities

Assess current progression from taught courses to PG research



Review STEM modules and qualifications



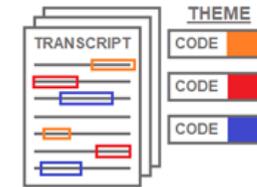
Conduct student surveys and interviews



Interview colleagues



Thematic analysis of responses



Potential **follow-on projects** recommending and trialling changes and comparing findings with wider HE sector.

Poster 3



Decolonising Computing within UK Higher Education Zoe Tompkins, Kate Feliciello & Amaninder Singh

What is decolonisation in computing?



Figure 1. UNICode 7.0 versions of (a) Man with turban, (b) Man with guro mask, (c) Western man.

Resources



Events



Curriculum



Project Background



Where - UK HEI Institutions

- Russell Group, e.g. Kings College, London
- Athena Swan (Silver) e.g. University of Warwick



How

- Desk based - external public facing web pages
- Standardised template completion



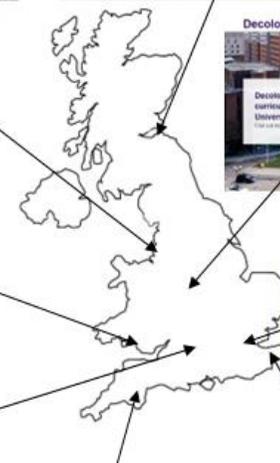
Who

- Project Team
- Student Researchers

Collaboration



Students Having a Say in the Library's Collection



Research

Towards decolonising higher education: a case study from a UK university

Open Access | Published: 29 December 2023
(2023) | Article

Strategy

Access and Participation Plan (2024-28)

9 Risks to Equality of Opportunity:



3 target groups

- Socio-economically disadvantaged
- Minority ethnic groups
- Declared disability

Hub/Physical space



Awards

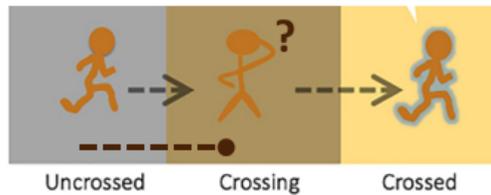


Poster 4

Identifying threshold concepts in the final year project James Warren, Andrea Patel



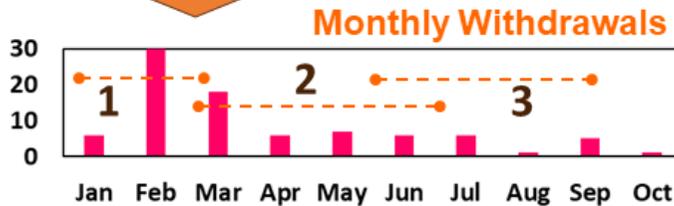
Threshold concepts have boundaries; students get stuck and completion drops. Can we raise retention?



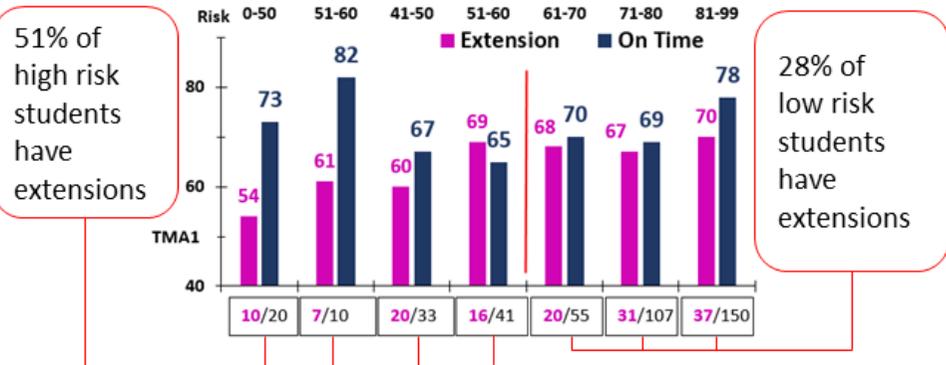
Irreversible
Non-troublesome
Transformed
Integrative

Tutors identified Threshold Concepts (T452 B)

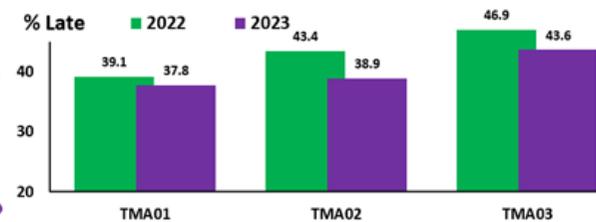
- 1 Scoping & choosing a 'do-able' project
DEVELOPMENT – highest withdrawals
- 2 Completing a successful literature review
IMPLEMENTATION – still troublesome
- 3 Writing a great final report
DISSEMINATION – 36% with good (1-2) result



Do late students have poorer scores and higher predicted risks? (TMA1)



Extensions and late submissions persist for all 3 thresholds



What are our next steps?

We would like to identify: the key factors that predict high risk students, ways to support students through thresholds, other project modules with similar trends.

Poster 5

Sharing tutorial slides before online events: an initial evaluation of practice on three EEES modules

Jennie Bellamy, Jenny Duckworth and Harriet Marshall

Background

- Access to slides in advance of online tutorials is thought to benefit many students.
- It is not known how making slides available in advance impacts tutorial attendance.
- Whilst the OU encourages advance slide sharing, guidance varies between modules.

Phase 1 Methodology

- Focused on sharing via Tutor Group Forums (TGF).
- TGFs sampled randomly.
- Recorded whether slides shared on TGF before or after tutorial, or not at all.

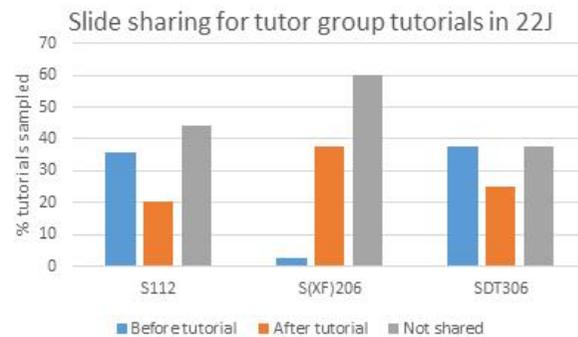
Module	No. Tutorials sampled
S112	84
S(XF)206	40
SDT306	48



Project aims

- Establish existing online tutorial slide sharing practice (Phase 1).
- Identify the benefits and barriers perceived by ALs, SST and students (Phase 2).
- Guidance for module teams and ALs

Results



Initial findings

- Slides often shared in advance on S112 and SDT306, which encourage advance slide sharing.
- Slides rarely shared in advance on S(XF)206.
- We only investigated TGF – some ALs share via other modes e.g. email.

Phase 2 Next Steps

- Surveys of ALs and students to gather quantitative and qualitative data on slide sharing, accessing and use.
- Focus group with student support staff to gain their perspective from their interactions with students.
- Analysis of data gathered.



Poster 6

Investigate how integrating vendor certifications within Computing modules affect student motivation, engagement and employability prospects

Amaninder Singh,
Andrew Smith,
Andy Reed,
David McDade.



Intention!

Evaluate how vendor certifications within Computing modules affect student motivation, engagement and employability prospects.

e.g., Cisco, AWS, EC-Council, CompTIA, OpenEDG



How!

Research and critically compare with competing universities who are utilising vendor resources within their own comparable programmes.

OU Module Focus

TM129, TMXY130, TM257, TM357, TM359, T828, T829 and Microcredentials

Expected Outcomes!

- Does the use of vendor certifications in Computing modules improve student motivation?
- What is the effect of vendor content on student participation and achievement?
- What is the effect of vendor certifications on student employability and promotion prospects?
- Evaluate, how other UK HEIs utilise vendor resources in their qualifications?

Poster 7

TMA Checklists: Snog, marry, avoid?

Kate Fox and Heather Fraser



Rationale

TMA checklists have been proposed as a possible way of reducing student anxiety around assessment, as well as improving TMA submission rates and scores. Within the School of Life, Health and Chemical Sciences (LHCS) the use of TMA checklists is patchy, and there is no cohesive strategy relating to checklist content or location. Anecdotal evidence from ALs on one new Level 2 module, S296 Cell Biology, suggests students find checklists helpful and may be of particular benefit to neurodiverse and/or anxious students thus potentially helping reduce the attainment gap.

Aims

This study aims to generate data to help inform a cohesive practice around TMA checklists; should we have a fleeting encounter (snog) with TMA checklists, commit ourselves to implementing them across the Faculty (marry) or run fast in the opposite direction (avoid)?

We will generate both quantitative and qualitative data to evaluate impact.

We plan to survey students on two modules with TMA checklists embedded from their first presentation, (S296 23J and SK190 23J), to enquire about student use of checklists, their perceived value, and any potential barriers to their use. Initial interest in checklists for TMA01 and TMA02 on S296 has been positive (Figure 1).

We also plan to introduce 24J TMA checklists into several modules that have been running for more than three years that currently do not offer TMA checklists. This will allow us to consider TMA submission rates, timeliness, attainment scores pre- and post-checklist implementation and retention. Students on these modules will also be surveyed at the end of each module.



Figure 1: Number of clicks on the VLE for S296 TMA01 and TMA02 checklists.

How do you feel about TMA checklists?

Please vote by adding a tick or email us on kate.fox@open.ac.uk/heather.fraser@open.ac.uk 😊

Snog:

Marry:

Avoid:

Poster 8

Agile development and implementation of a TMA catch-up activity for Stage 1 students



Paul Piwek, Cecilia Domingo & Richard Walker

Background Inspired by the DD102 tutorial sessions for students who miss a TMA cut-off, we explored a low-cost agile approach for Introduction to Computing and IT 2 (TM112) students.

Aim Trial the agile development and use of a TMA catch-up activity for students who missed the TMA cut-off.

Production The activity was developed end-to-end by the Module Team Chair, Associate Lecturer and PhD Student. Videos were recorded on Teams (edited with Audacity and DaVinci) and integrated with a VLE quiz as YouTube videos (with Transcripts and subtitles). Total one-off production effort for the reusable activity was about 7 person days.

Evaluation Uptake was low (28 students), but 86% of these students submitted their TMA. Feedback from a student (included with permission): *"I found these videos so encouraging and helpful, together with the e-mail from Richard offering the advice/information. I have been struggling through health issues, and on the verge of giving up on this module, but after watching the videos, I am going to try and submit something, and hope earn enough points to help pass the module. Thank you."*

For future presentations the focus will be on increasing engagement with the activity.



The Activity Students who haven't submitted their TMA approximately 10 days after the cut-off date are contacted by email with a message from a tutor encouraging them to engage with an interactive short activity, consisting of a 2 minute motivational video and a 20 minute video with tips and trick for salvaging a TMA:

Question 1 Not complete
Marked out of 1.00 | Flag question | Edit question
Welcome to the TMA catch-up activity. As part of this activity, there are two short recordings. Begin by listening to the first recording of just over two minutes.

Question 2 Not complete
Marked out of 1.00 | Flag question | Edit question
Continue to the second, and final, video of this activity, which is just over 20 minutes long:

Transcript (20.6 KB)
When you have finished with the recording, please confirm whether you have asked your tutor for an extension.

Select one:
 Yes, I have asked my tutor for an extension.
 No, I have not yet asked my tutor for an extension.

Check

Transcript (18.7 KB)
After you have watched the tips and tricks video, let us know whether you found the two videos helpful.

Select one:
 Yes, I found the videos helpful.
 The videos helped me a bit.
 No, I didn't find the videos helpful.

Check

Acknowledgements We would like to thank Rehana Awan for providing the inspiration for this work by sharing the DD102 experience with us. Thanks also to Soraya Kouadri for making the participation of Cecilia possible through the C&C Teaching Scheme for PhD students.

Poster 9



Understanding Passive Withdrawal Behaviour on S111

Maria Velasco, Vic Pearson and Linda Moore

Introduction

At the end of each S111 presentation, 12-18% of students remaining registered have had limited or no engagement with assessment. While not a new problem at level 1, it is difficult to resolve despite proactive efforts. Our approach firstly defines passive withdrawals, before triangulating general demographic, VLE engagement and assessment data, with information about individual student engagement/contacts (VOICE records, forum engagement, day school engagement data).

Defining passive withdrawals

Initially, "passive withdrawals" were assumed to be students that did not submit the emTMA (40% SCA component, no threshold) and did not pass. However, different ways of reporting withdrawals, plus a university deregistration process based on finance meant some students were withdrawn or deregistered after MRP, leaving 984 "passive withdrawal" students from five presentations (Table 1).

Table 1: Number of students considered when defining passive withdrawals

Presentation/ No of students	2020J	2021B	2021J	2022B	2022J	Total
No emTMA and fail	468	324	438	290	444	1964
Formal withdrawals	244	151	236	122	227	980
Deregistered post-MRP	53	45	66	41	32	237
Passive withdrawals	224	173	202	168	217	984

Identifying common assessment behaviours

Our approach grouped students to be investigated by their assessment behaviours (Figure 1). While group A did not submit any TMAs, 50% submitted one or more iCMAs, with 25% demonstrating random iCMA submission across the module.



Acknowledgements: We would like to acknowledge support from Conrad Bessant, Jonathan Evans and Simon Fletcher.

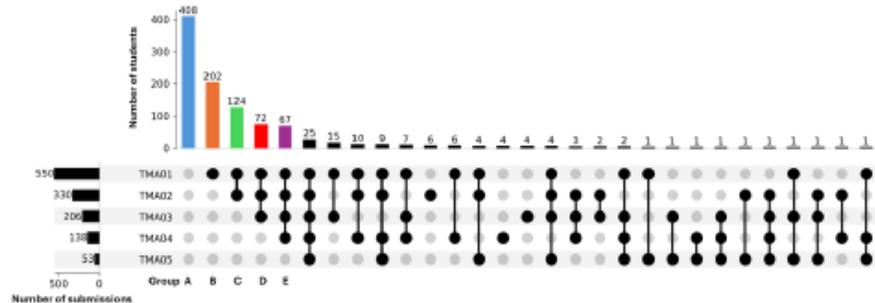


Figure 1: Engagement of passive withdrawal students with TMA submissions.

VLE engagement

With students exhibiting random iCMA submissions, we then interrogated the VLE engagement data. For each group identified in Figure 1, the data shows that while VLE engagement drops, in some cases it continues across the entire module (Figure 2).

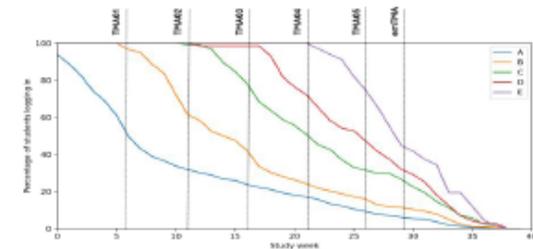


Figure 2: VLE engagement of groups identified in Figure 1.

Conclusions and next steps

These early findings show the complexity of the issue, demonstrating that both iCMAs and VLE engagement are not necessarily predictors of "passive withdrawal" behaviour. To understand this further, our next steps will explore demographic and individual student engagement/contact data.

Poster 10

Developing Algorithms With Peer Feedback

Ravi Rajani, Jason Clarke, Phil Hackett, Stephen Rice



Collaborative algorithm activity

Aims to create sense of community & model real-world interactions.

Research goal

Investigate suitability of activity for adoption in M269 assessments.

Methods

- Trial of activity with student volunteers (8 recruited).
- Questionnaire and email interviews to gauge student perceptions.
- Tutor reflective meeting to assess quality of student outputs.
- Data analysis to compare demographics and TMA scores (before and after) of sample compared to cohort.

Structure of activity

Students are given the same algorithm problem and must:

1. Share an initial solution – written in English – on OpenStudio.
2. Comment on algorithms by two other students.
3. Upload a revised algorithm based on feedback received.

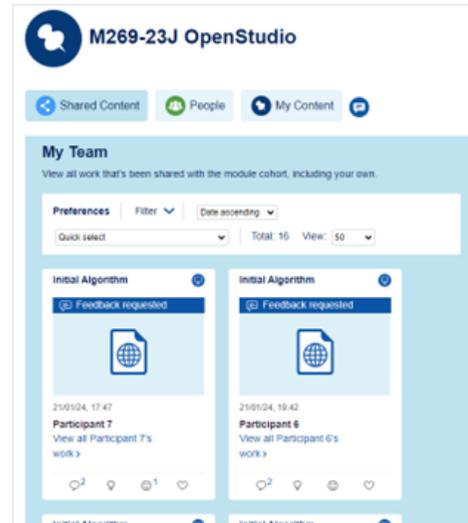
Survey

- Did the students enjoy the activity?
- Do students feel they learned something?
- Do students feel the activity will lead to better outcomes (grades/completion/employment)?
- Which aspects of the activity could be improved?



Employability skills

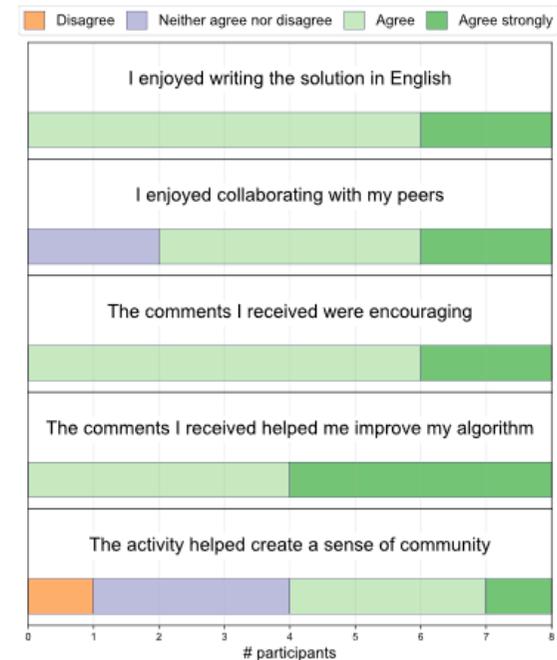
- Communicate technical concepts
- Critically evaluate others' work
- Give constructive feedback
- Learn from peer feedback



"I know this is a remote degree, but when it comes to a job interview, we will be talking not writing. So, I think talking should be included to help improve students' skills."

— Participant 1

* Disagree strongly not chosen



"It shows you that you're not the only one on the course, but you're learning alongside some smart and considerate people."

— Participant 5

Poster 11

Academic conduct referrals and students from underrepresented groups

Jill Shaw, Rehana Awan, Jim Gillen, Katharine Jewitt and Mark Slaymaker



The issue:

- ACOs in the School of Computing and Communications observed a variance in the level of Academic Conduct referrals for students in underrepresented groups.
- Butcher and Fowle (2019) found "OU data suggests that black students are five times more likely than white students to be the subject of academic misconduct cases."
- The data from the previous 4 academic years in the School of Computing and Communications as shown in Figure 1 above illustrates a trend in the levels of academic conduct referrals based on ethnicity.

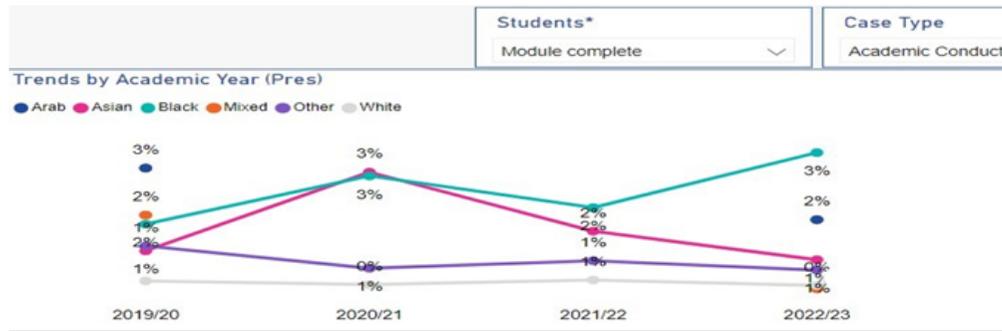


Figure 1: Academic Conduct Cases by Ethnicity in the School of Computing and Communications

Aims

- Investigate patterns in the demographics and referral data of students who are referred for Academic Conduct within the School.
- Review relevant literature to inform focus of primary research with key stakeholders.
- Identify improvements in Academic Conduct guidance and support for students in underrepresented groups.

Methodology

- Gather and analyse data of students referred to the ACOs in the School in terms of demographics.
- Review literature on academic conduct and integrity and underrepresented groups.
- Interview of Module Teams and students on their experiences of the academic conduct process.
- Analyse and evaluate the qualitative interview data.

Potential Outcomes

- Understand patterns of ACO referrals for underrepresented groups.
- Make recommendations on support and guidance to students in underrepresented groups on Academic Conduct.
- Develop proactive Academic Conduct resources that are sensitive to student backgrounds.
- Share findings of research with wider ACO community, Faculty and University.

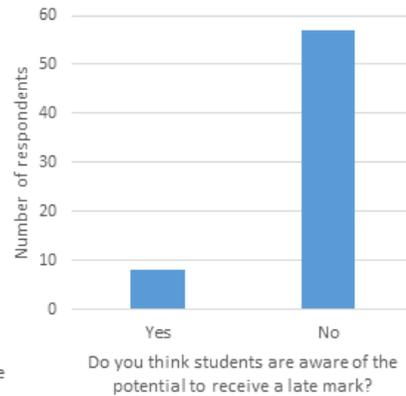
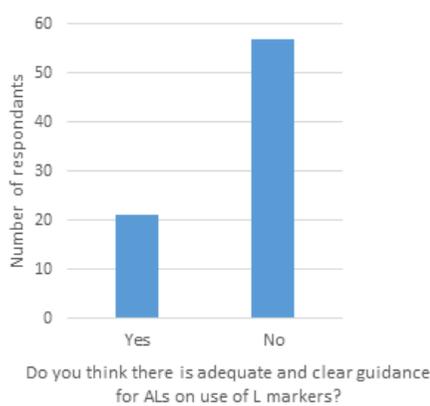


Poster 13

Phase 2: late markers: current usage and potential changes Fiona Moorman and Karen New



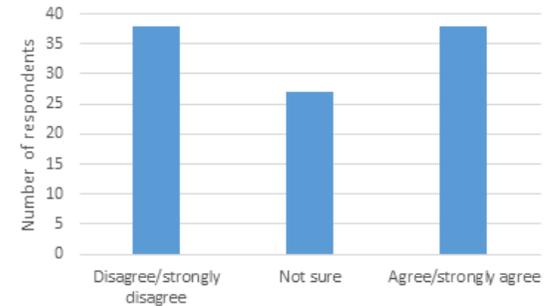
- * extends phase 1 which looked at application of late markers in STEM
- * online survey randomly selected ALs across University (>100 respondents)
- * thematic analysis to explore the qualitative findings
- * our findings suggest a **lack of consistent practice**
- * our findings suggest a **perceived lack of transparency** (for ALs and students)
- * our findings suggest **alternative models of application** (sliding scale, capped mark) of L markers might result in a fairer process.



Awareness of late markers



Do late markers have educational value in their own right?



What impact do late markers have on students?

Positive....	Negative...
Deterrent	Discourages
Doesn't help long term (catch-up)	Damages confidence
Learn from experience	Demoralising
Fairness and consistency	Damages relationship with academia
Forces reflection and better habits	Demotivating
Reality check	Mental health impact
Stops poor practice	Impact self esteem
Time management & communication skills	WD/defer (active or passive)
Responsibility and accountability	Devastating impact on grade
Keep to the rules	Adversely impact progress and retention

