Fit for the Future: Physiology Education and Teaching in the UK
14 - 15 April 2026 | Newcastle University, UK

Abstracts

PL02

Adapt to survive

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Physiology has long progressed through its capacity to adapt—scientifically, conceptually, and educationally. In an era defined by rapid technological change, evolving societal needs, and increasing competition for disciplinary space, physiology faces pivotal questions about how it should evolve to remain relevant and impactful. This lecture will examine how purposeful adaptation can secure the future of the discipline, highlighting the value of what I term disruptive physiology: a willingness to challenge established norms and to experiment with new approaches in teaching, research, and application, rather than relying on traditions that have shaped physiology for decades. Central to this adaptive process is the meaningful engagement of students as partners in curriculum design and pedagogical innovation. Their insights and lived experiences can challenge assumptions, broaden our perspectives, and catalyse approaches that better reflect the ways today's learners engage with scientific knowledge. At the same time, we must recognise the expanding landscape in which physiology operates. The Physiological Society's policy work—spanning global challenges such as climate change physiology, personalised physiology and healthcare, and the integration of artificial intelligence to solve complex physiological problems—underscores the imperative to ensure our teaching reflects both the current realities and future directions of our science.

The physiology education community must also strengthen its collective capability by fostering deeper collaboration across institutions, sectors, and career stages. Greater integration of clinical and industrial colleagues into physiological training will enrich learning, enhance relevance, and better equip graduates to contribute to a rapidly evolving biomedical ecosystem. Recent analyses undertaken by the Society have highlighted not only the societal importance of physiology but also its substantial economic impact; our educational strategies must therefore recognise and amplify these contributions.

Senior educators play an essential role in this endeavour by mentoring early career colleagues, modelling scholarly generosity, and embracing open, collaborative practices that build capacity across our community. Yet securing the future of physiology demands more than reflection: it requires action.

This lecture therefore issues a clear call to action for all physiology educators: to adopt a mindset of constructive disruption; to embed societal and policy driven priorities into our curricula; to work in genuine partnership with students, clinicians, and industry; and to collaborate more deliberately as a unified community. Through these commitments, physiology can adapt with confidence—remaining vibrant, resilient, and inspirational for the generations who will carry the discipline forward.

SA01

Failing – to learn: Building resilience and reflective capacity by actively failing

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Fear of failure in higher education often stems from comparison anxiety and limited exposure to low stakes, penalty free failure. Without opportunities to fail safely, students may default to risk averse behaviours such as relying on familiar sources, or AI as a font of knowledge, or conforming to peer thinking. In contrast, scientific practice and research is inherently iterative, shaped by rejected grants, inconclusive experiments, and unexpected results. Normalising this process helps learners recognise that progress emerges from repeated attempts rather than linear success.

Drawing on personal experience, sporting and other cultural analogies, and observed student behaviours, this work reframes failure as a constructive and necessary component of bioscience learning. By openly modelling our own squiggly journeys as educators, we foster a sense of community, authenticity, and shared growth. This approach supports students in navigating the perceived complexity of HE systems, assessment expectations, and peer comparison. Using biological analogies, I challenge the assumption that learning is linear or shortcut driven, instead highlighting the value of reflective practice and resilience in developing as scientists and learners.

SA02

Innovative teaching from microscope to metaverse

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As virtual reality (VR) and extended reality (XR) technologies become more accessible to universities, the major constraint on their wider adoption in higher education is shifting from hardware to content. In physiology and the life sciences, there remains a shortage of scientifically accurate, curriculum-aligned immersive experiences that move beyond demonstration and deliver authentic disciplinary learning.

At the University of Glasgow, sustained investment in XR for research and teaching has enabled many thousands of students to engage with immersive learning environments. These include UofG developed bespoke applications in molecular methods, gut physiology, infection, hypertension and cardiac myocyte function. More recently, collaboration with Zeiss has supported the development of virtual confocal and scanning electron microscopy training.

This presentation will outline a practical workflow for translating microscope-based datasets into VR experiences for head-mounted displays and will discuss insights gained over nine years of immersive content development for life-science education. Emphasis will be placed on the opportunities, limitations and future potential of XR as a platform for delivering rigorous, scalable teaching in physiology.

SA03

Developing a career in education

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Teaching focused career pathways in higher education recognise impact across a spectrum of academic pillars, including student learning, curriculum innovation, pedagogy, scholarship and institutional culture. This talk will explore the core components of building and sustaining a rewarding career as an education-focused academic. It will address the landscape of teaching focused roles and pathways, the development of a strong teaching identity, and the importance of professional recognition, including pedagogical qualifications. The talk will also examine leadership opportunities within education focused careers, strategies for building professional networks, and approaches to managing workload and wellbeing in teaching intensive roles. The aim of the talk is to help academics shape and progress their careers in education.

SA04

Promotion pathway for teaching and scholarship (T&S) colleagues

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Over the last 25 years, the establishment of teaching focused academic careers has been a challenging but worthy journey that has helped transform the shape of higher education. Historically academic careers were research centric pathways; however, teaching focused roles have evolved to provide meaningful recognition, progression, and leadership opportunities for educators who are committed to enhancing the education and learning experience of students. Here we will reflect on the challenges and opportunities encountered while navigating a Physiology teaching focused academic route. Key factors shaping this career journey include the development of a clear professional identity and progression path, the need to evidence excellence through the scholarship of teaching and learning, and the importance of contributing to curriculum innovation and educational leadership. Teaching focused academics play a critical role in advancing inclusive, student centred approaches and the acceptance of these roles is driving institutional change. Through our experience we will share, lessons learned and highlight the value of mentorship, strategic career planning, and building communities of practice in physiology to sustain impact and visibility. We hope to offer insights for inspiring and supporting physiology educators to ensure that educational excellence is both recognised and rewarded.

C01

Identifying student characteristics and engagement with personal development and opportunity uptake

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Achieving a good degree alone is not sufficient to ensure employability post-graduation. Undertaking additional opportunities, alongside academic studies, is essential in a competitive employment landscape. Universities offer a range of activities, including supernumerary modules, volunteering, part-time work, student voice representation, and involvement with research and enterprise events, allowing for skill development.

This study aims to analyse key student characteristics within two Schools at Newcastle University within the life sciences. By gaining this insight, investigation of student engagement with the personal development and career-supporting opportunities can then be studied. Data from 2015-2021 was collected to gain insight into the student population, including details on age, gender,

nationality, home postcode, POLAR4 status, disabilities or challenge group status, caring responsibilities, and for those who have graduated, degree outcome. Activities and opportunities investigated included; placement years, laboratory assistant roles, ncl+ award completion (in house badge), volunteering via the Student Union, vacation studentships, international exchanges abroad and University internships. These were then collated from across the University and Student Union with data sets linked via student number, whilst retaining student privacy.

A student survey further detailed on student demographics and characteristics, opportunity uptake, motivations, and inhibiting factors related to activity involvement. A total of 178 students responded to this survey and results will be presented, supporting the first set of data.

It is important to determine which student groups are represented, and if there are barriers that certain groups face, potentially impacting degree classification and graduate outcomes, work towards implementing support and initiatives will be undertaken.

Acknowledgements

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C02

Co-creation project: improving students' confidence in oral communication of scientific concepts

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Higher education increasingly emphasises embedding employability skills into the curriculum (Cheng et al., 2022), with oral communication an essential skill required by science graduates (Faber et al., 2024). However, students often express greater concerns about oral assessments (Huxham et al., 2012). Student feedback regarding the viva in Nottingham's 2nd year Neuroscience module "Neurons and Glia" is no exception, and highlights the need for more practice opportunities. Going beyond staff-led responses to student feedback, student-staff co-creation projects demonstrate benefits for both the student cohort and partners in developing curricula (Peart et al., 2023). Therefore, the aim of this project is, through co-creation, to develop a viva assessment workshop activity and assess its effectiveness at developing students' confidence in oral communication of scientific concepts through post-activity questionnaire and focus group data collection.

The activity, NeuroHeads!, co-designed by module co-convenor (Laura) and final-year neuroscience student (Amy), is an adapted version of the game 'Heads-up'. The words have been replaced with

module-specific concepts and students work as a small group to provide explanations of the concepts with correct answers earning points.

Questionnaire data (n=21) revealed all participants felt comfortable to participate and found the activity enjoyable and a useful tool for practicing oral communication. The majority (90%) also agreed it improved their confidence in speaking about scientific concepts.

The quantitative data demonstrates the effectiveness of the activity at developing students' confidence in oral communication of scientific concepts, with future qualitative data providing insight into the effectiveness of the activity for viva assessment preparation.

Acknowledgements

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C03

Student-led research projects to widen access to medicine

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Widening access to medicine for students from underprivileged backgrounds is an explicit aim of the 10-Year Health Plan for England[1], appropriately named 'Fit for the future'. Many programmes aim to ensure the medical profession is representative of the diverse populations it serves, such as BrightMed at Brighton and Sussex Medical School (BSMS). Core to BrightMed is the involvement of current medical students as facilitators and co-creators, whilst also assisting with the evaluation of the programme.

Student-led retrospective analysis of the 2021-2025 cohort illustrates that individuals from POLAR quintiles 1 & 2, and those receiving means-tested benefits were more likely to complete the programme and thus be eligible for contextual offers. Further BrightMed students overall had a positive experience of the programme, with many discussing their increased skills, confidence and knowledge. A unique benefit was the involvement of people with lived experience e.g. medical students and clinicians. Although the programme was time intensive, many valued the broad scope of content and varied teaching methods.

To understand which teaching methods were valued and effective, a session, which was designed and led by a student, revealed inclusion of innovative teaching practices (such as technology enhanced learning, interactive workshops and gamification) significantly increased the Brightmed students' understanding of higher education. Session feedback overwhelmingly indicated these methods increased subject knowledge and were highly enjoyable.

Combined, these results illustrate the value in empowering students as co-creators in a WP programme, designed to widen access to medicine. Many of the practices described are also applicable to physiology.

Acknowledgements

Authors would like to acknowledge the input from all of the student mentors and staff involved in the Brightmed programme for their input in the programme and helpful discussions around session design.

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C04

Co-Creating Change: Embedding Decolonisation and Inclusive Group Work in Bioscience Education

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This project explores student-led approaches to advancing two critical areas in higher education: decolonisation of the curriculum and inclusive group work. Working with four student co-creators and 2 staff members, we sought to address challenges identified through Listening Room discussions and module feedback within the School of Biomedical Sciences.

Students highlighted persistent misconceptions around decolonisation, often conflating it with general inclusivity rather than recognising it as an active process of challenging dominant narratives. Key concerns included Eurocentrism in curricula, citation bias, and deficit-based portrayals of the Global South. Participants called for greater representation of diverse voices, deeper cultural engagement in healthcare contexts, and staff modelling of decolonial practices.

Inclusive group work emerged as another priority, with international students reporting language barriers, cultural misunderstandings, and feelings of exclusion. Group dynamics were often shaped by dominant personalities, leading to marginalisation of quieter or neurodivergent peers. Segregation between home and international students was common, prompting calls for structured interventions such as buddy systems, mid-project feedback, and cultural competence training.

Our co-creation process focused on developing practical tools and strategies to embed these principles into teaching and assessment, particularly at level 5, in a module delivered through team work activities. The potential interventions include designing case studies to illustrate colonial legacies in health sciences and creating frameworks for equitable group collaboration. The project demonstrates how student partnership can drive meaningful change, fostering curricula and learning environments that are globally aware, inclusive, and socially responsible.

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C05

Vertical tutoring is useful, enjoyed, and engaging in undergraduate Sport & Exercise Medical Science

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Joint programmes in higher education expose students to multiple departments, staff, modules and experiences. However, gaps in service can remain whereby students report not ‘belonging’ to one particular group or another. At the University of Exeter, the BSc Sport and Exercise Medical Sciences (SEMS) programme combines sport science and biosciences, and initiated a ‘vertical tutoring’ (VT)

programme to prevent this. This is a peer-tutoring process that brings students together students from all years, rather than within single years, to discuss academic and non-academic concepts.

Following co-design with students in 2023-24, and successful VT pilot in 2024-25, a full VT programme was initiated in 2025-26. Quantitative and qualitative evaluation is undertaken, with data collated via online, anonymised forms. Likert scales and free-text responses evaluated usefulness, enjoyability, engagement, and recommendations for the future.

Across two sessions in 2025-26, a total of 27 feedback responses were received, nine from each of first, second, and final-year students. Students are receptive of the VT programme, whereby ratings for 'Agree' or 'Strongly Agree' being received in relation to usefulness (23/27, 96%), enjoyability (26/27, 96%), engagement (25/27, 92%), and recommending to others (26/27, 96%). Free text responses highlight students enjoy the VT process in general ("getting to feel like a community"), as well as academic ("getting to hear other people's study strategies") and non-academic discussions ("discussing extracurricular opportunities and where to find them").

In summary, VT is a useful and enjoyable process for developing community and sharing academic and non-academic content with peers in the SEMS programme.

C06

A framework for cross-institution capstone projects that develop key transferable skills

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Within Physiology and other Biosciences, the Capstone project is described as the pinnacle of the student experience at university allowing the mastery of acquired skills to be showcased. It is the traditional school of thought that the capstone showcases academic and scientific skills, but it also develops professional, digital and social skills. In recent years graduate work destinations have become significantly more diverse, a factor which has contributed to competition for vacancies. Despite substantial efforts by academic teams to produce talented, well-rounded graduates, employers highlight that many are not 'work ready' lacking key 'soft' skills, with graduates finding it a significant challenge to convey their skills to employers. We have developed a framework for collaborative Capstone projects, allowing the desired key skills to be refined and strengthened. Reciprocal visits to each institution allowed students to established common protocols for data collection and later share results which were reviewed and discussed. Student organised mid-project online meetings permitted further exchange of ideas and progress updates. Survey results reinforced the potential of the Capstone experience to draw together multiple key skills and

highlighted how the current collaboration had given an extra dimension to students' skillset. We aim to further expand this collaborative capstone experience network for Bioscience students across the UK and share templates for implementation across HEI's.

C07

Embedding sustainable research culture into undergraduate physiology education

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The School of Biosciences at the University of Sheffield is integrating sustainable practices into research training to cultivate environmental responsibility among undergraduates. We are achieving this through early training in basic sustainable lab practices, engaging students in sustainable lab initiatives, and embedding reflections on sustainable research practices into final-year capstone projects.

As part of our new curriculum in 2025-26, the Level 1 "Experimental Skills in Biosciences" module induction introduced sustainable laboratory practices. From their first week, students engaged with waste reduction, responsible disposal, and energy conservation. This proactive approach aims to normalise sustainable thinking and equip students with the habits necessary for environmentally conscious scientific practice. In subsequent practicals, areas where students can contribute to sustainability are highlighted.

We actively involve the Biosciences undergraduate sustainability group in rolling out sustainable lab initiatives. As the technical teaching team works toward Bronze LEAF (Laboratory Efficiency Assessment Framework) accreditation, students are assisting by creating instructional posters for our teaching labs. This collaboration empowers undergraduates to take responsibility for environmental stewardship.

Final-year capstone projects now require students to document sustainable practices. To support this, students participated in group tutorials to brainstorm strategies across diverse project types, including wet-lab, human physiology, bioinformatics, and science communication. Key themes identified include resource-efficient project planning, sustainable travel for community work, and optimised data storage protocols.

By embedding these sustainability principles throughout the curriculum and providing regular opportunities for reflection, we aim to develop physiologists who are both technically proficient and committed to a sustainable research culture.

C08

Research insights for more confident first year students

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Early exposure to authentic work environments is known to support student engagement, confidence, and employability, yet opportunities at Stage 1 are often limited. This presentation showcases the design, implementation, and evaluation of Research Insights, a voluntary research-based, work-shadowing initiative developed for Stage 1 biosciences students at Newcastle University.

Research Insights provides students 10 hours of flexible, work shadowing within an active research group. The research offered was lab-based, computational or pedagogical, enabling learning beyond the taught curriculum through observation of varied real-world research practices. To support meaning making and reflective learning, a bespoke Research Insights Handbook was developed, providing preparatory guidance, structured reflection, and support in articulating learning and personal development. Completion of both the shadowing and reflective components results in the award of a formal certificate that students are encouraged to engage with professionally via LinkedIn.

In 2025, 24 students completed the shadowing and 21 achieved full completion, including reflective practice and certification, the 2026 data will also be presented. Qualitative feedback indicates strong impact on students' understanding of research, confidence, and skills awareness. Students described the initiative as "a fantastic opportunity to experience real research", reporting that their "confidence has greatly improved throughout this experience." Importantly, participants enhanced their awareness of diverse scientific roles beyond the wet laboratory.

This presentation will provide Research Insight detail, advice and tools for this transferable project, and will highlight how structured early research exposure supports self-discovery and educational gain.

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Rebecca Ball
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C09

Insights from the University College Dublin Physiology Research Festival and Careers Symposium 2025

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The inaugural UCD Physiology Research Festival and Careers Symposium were designed to celebrate Physiology research and careers, support community building and enhance students experience within the UCD School of Medicine Physiology section.
The Physiology Research Festival gathered students, researchers and faculty to share research in an interactive setting. Fourth-year BSc Physiology students presented their 10-week research project findings. Masters, PhD, and post-doctoral researchers showcased their work in a poster session or in concise "My Project in 3min" talks, introducing undergraduates to diverse research areas. The event concluded with an awards ceremony celebrating excellence in oral and poster presentations and a community-led logo design competition.

The complementary Careers Symposium featured 4th-year students Research Project Design presentations to 2nd-year Science students, 3rd-year Physiology students, alumni, and staff, followed by a "Career Prospects" session led by alumni, and closing with a social networking event that launched a dedicated LinkedIn group to foster mentorship and professional connections.

The impact of these initiatives was measured through pre/post-event surveys, LinkedIn engagement, and alumni participation. Data reflect the key aims achieved: increasing visibility of the BSc Physiology programme to prospective students, supporting students' academic growth, raising awareness of UCD Physiology research opportunities, and showcasing various career pathways outside academia.

Overall, the Festival and Symposium inspired future graduates, and faculty were equally uplifted by the students' enthusiasm and engagement. It strengthened UCD Physiology community cohesion and laid the foundation for a sustained culture of research within our undergraduate curriculum, ensuring long-term impact on student engagement and professional growth.

Acknowledgements

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C10

From classroom to conference: Design of a team-based poster presentation assessment

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Traditional assessments often emphasise knowledge recall and rarely provide opportunities for students to apply knowledge in authentic contexts or develop professional skills such as communication and collaboration. This talk outlines a programme-level assessment implemented across a set of programme-specific modules with overlapping teaching (~300 students total), designed to integrate core physiological concepts with real-world application while simulating the experience of a scientific conference. Notably, this assessment uses teamwork as a vehicle for learning rather than the primary means of assessment.

Students were assigned to small programme-specific groups (4-5 students) and selected a topic from prompts aligned with their programme's learning outcomes. Each student produced an individual poster and flash talk on a distinct sub-topic. Presented sequentially, these talks formed a cohesive narrative that enabled students to appreciate the complexity of the topic. For example, students from one programme were asked as a team to select a neurological disease, then assign an affected neuroanatomical region to each team member. Each poster evaluated how pathology affected the region's structure and ultimately altered function. Dividing the topic in this way enabled students to appreciate how disease can affect anatomical regions differently, and how pathology progresses over time. Students received individual marks, with additional credit awarded for effective integration across posters.

This approach demonstrates how authentic assessment can engage students with the core concepts of physiology whilst enhancing their collaborative and communication skills. The authentic setting of a poster presentation simulates a real conference experience and prepares students for a range of future careers.

C11

Gender differences in engagement, stress, and academic priorities among sports degree students

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Following our previous research demonstrating that women outperform men on sports degrees (Bradburn et al. 2025), this study aimed to examine potential gender differences in academic preferences, engagement, and perceived stress within our student population.

Students completed a 55-item questionnaire assessing learning preferences, stress across the academic year, attendance, engagement, and the perceived importance of lifestyle factors. A total of 134 responses were included in the analysis. Gender was self-reported, with 69 women (51.5%) and 65 men (48.5%).

On 1-5 Likert scale, women rated the importance of university study in their daily lives higher than men (4.1 ± 0.6 vs. 3.8 ± 0.8, $p = 0.024$). Consistent with this, women also reported significantly greater stress during assessment periods compared with men (4.3 ± 0.8 vs. 3.8 ± 1.0, $p < 0.001$). There were no gender differences in preferences for lectures, seminars, or practical sessions ($p \geq 0.227$).

These findings suggest that women perceive university study as a more central component of their daily lives than men, which may contribute to higher levels of assessment-related stress. To contextualise these quantitative findings, follow-up focus groups were conducted to explore how gender shapes the student experience on sports degree programmes. Qualitative analyses are ongoing, and preliminary findings will be presented.

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C12

Assessing AI-generated feedback in simulation-based medical physiology teaching: prospects & risks

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Background:

Integrating physiological reasoning with structured clinical assessment remains challenging for medical students, and while feedback is central to this process, traditional faculty-led models are difficult to scale in simulation-based teaching. AI-generated feedback is becoming increasingly accessible, yet its educational value and risks remain insufficiently explored.

Methods:

An exploratory mixed-methods evaluation was conducted with undergraduate medical students undertaking simulation-based clinical physiology teaching using A–E (Airway–Breathing–Circulation–

Disability–Exposure) assessment tasks. Students completed scenarios using peer-reviewed resources, followed by repeat engagement supported by AI-generated feedback across five LLM platforms. Data was thematically analysed from questionnaires (Likert scale) and written reflections.

Results:

AI-generated feedback was perceived to support learning by clarifying physiological mechanisms, linking clinical findings to underlying processes, and providing structured explanations. 56% and 25% of students strongly agreed that AI tools incorporated relevant clinical physiological parameters, and improved identification of areas requiring further learning, respectively (mean scores of 4.13 and 3.00 out of 5.00). However, students highlighted risks including hallucinations, potential inaccuracies, and reduced reflective engagement due to the immediacy of feedback. Learners mitigated these risks through triangulation with formal teaching materials, peer discussion, and comparison across platforms, with effective use dependent on sufficient baseline knowledge.

Conclusions:

AI-generated feedback can act as a useful cognitive scaffold in simulation-based clinical physiology teaching but raises challenges related to trust, verification, and learner over-reliance. These findings emphasise the importance of explicit pedagogical framing and AI literacy to support safe and effective integration into future physiology curricula.

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C13

Exploring student learning and ethical views in an isolated tissue practical: A pilot study

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Tissue based practical work continues to play a key role in physiology and pharmacology education. As ethical considerations surrounding the use of ex vivo tissue continue to evolve, it is important to understand how students perceive the educational value and ethical acceptability of these sessions. This study aims to evaluate student experiences of a rat ileum organ bath practical.

An anonymous survey was distributed to students, including Likert scale and multiple choice questions assessing aspects of learning supported, ethical attitudes and preferences for potential alternative tissue types, as well as open text comments.

Students (n=11) rated the practical as valuable (64%), extremely valuable (18%) or neutral (18%) for their learning. The most frequently selected learning benefit was the development of practical laboratory skills (55%), followed by understanding pharmacological concepts (18%), while 27% selected “all of the above”. Ethical attitudes were largely positive: 82% were supportive of using ex vivo rat tissue when justified, while 9% selected “Uncomfortable (prefer alternatives)” and 9% “Neutral/Unsure”. Preferences for alternatives were varied: 36% favoured continued use of rat ileum, 27% preferred abattoir sourced mammalian tissue, 27% expressed no preference, and 9% preferred not to use any ex vivo tissue. Open text responses (n=5) noted difficulties with the initial setup, alongside positive reflections.

These findings indicate that students generally perceive the educational benefits of ex vivo tissue work as outweighing ethical concerns. They also reported increased confidence in both laboratory skills and pharmacological understanding, supporting the continued use of this practical within physiology and pharmacology education.

C14

Closing awarding gaps: addressing the "exam-experience gap" through targeted level 1 intervention

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To accommodate a rising number of students entering physiology and bioscience courses from non-traditional backgrounds, the School of Biosciences at the University of Sheffield launched a Level 1 intervention targeting the "exam-experience gap." While alternative qualifications support widening participation, they often leave students underprepared for the rigorous, high-stakes assessment of core biological content typical of the physiological sciences.

Academic staff worked with a PhD student GTA as a co-creator to design and deliver weekly "study recipes" to build repeatable academic habits, such as active retrieval, information synthesis, and disciplined time management. By teaching undergraduate students how to ‘self-assess’, the programme had the overarching aim of promoting metacognition, thus enabling students to build upon their academic success in future years. This staff-GTA partnership ensured the programme remained pedagogically sound yet accessible, leveraging the PhD student’s proximity to the undergraduate. Regular review and iteration ensures the programme responds to feedback and adapts to meet the needs of students.

The impact is measurable: the 2024 pilot boosted Level 2 progression by 12% and the programme is now formalised, with 2025/26 mock data showing many students exceeding 60% in core modules. Student feedback indicates significant gains in confidence, wellbeing and belonging

This session outlines how early, targeted intervention—underpinned by staff-student co-creation and a commitment to continuous refinement—can work towards closing awarding gaps and ensure equitable success in physiology.

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C15

Levelling up physiology for interdisciplinary cohorts: A scalable foundations approach

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Physiology is increasingly taught within broader biomedical and engineering programmes, where students enter with highly variable prior exposure to biological sciences. Supporting engagement and confidence in foundational physiology concepts is therefore a key educational challenge, particularly in the context of growing class sizes and constrained resources.

We evaluated a foundations-based teaching approach embedded within the early weeks of a first-year biomedical engineering programme. Three introductory lectures were designed to scaffold core biological concepts, normalise participation, and explicitly signpost independent learning pathways. In parallel, a dedicated virtual learning environment was developed using a structured "Start here / Recommended / Explore deeper" format. This included self-paced resources (videos, textbooks, web-based content), diagnostic quizzes with traffic-light feedback to guide study priorities, and end-of-topic quizzes to support formative self-assessment.

Student perceptions were evaluated using short post-session surveys combining quantitative confidence ratings and qualitative free-text responses. After the first foundational lecture, students (n=40) reported moderate confidence in Biological Molecules (mean 3.4/5) and Cells (mean 3.0/5). Following completion of all three lectures, confidence increased substantially among respondents (n=15), to 4.7/5 and 4.0/5 respectively. Confidence across additional foundational topics introduced later in the block was also high (all mean scores >4.0). Qualitative comments highlighted structured explanations, clear signposting, and the ability to identify personal knowledge gaps as key enablers of learning.

These findings suggest that combining targeted foundations teaching with structured, self-directed resources can rapidly improve student confidence and preparedness for physiology content within interdisciplinary programmes. This work illustrates a scalable, low-cost model for "fit for the future" physiology education.

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C16

Virtual reality enhances interview confidence and performance in biomedicine graduates

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Graduate employability is a key metric across all biomedicine and physiology-aligned programmes. However, many students struggle to perform at interviews, substantially decreasing their likelihood of gaining employment. Whilst many students are provided the opportunity to participate in practice interviews through careers services, these may be generic in nature and lack impact. Recent advances in virtual reality (VR) offer the opportunity for students to gain interview experience at scale whilst receiving personalised feedback with decreased academic workload. Therefore, this study aims to evaluate the impact of virtual reality on biomedicine student interview performance, behaviour and experience.

Students completed an in-person interview to determine their performance baseline. Students then conducted Bodyswaps VR mock panel interviews, followed by reviewing their performance and AI-generated feedback. Students then conducted another in-person interview to evaluate VR's impact on interview performance.

Overall, feedback was highly positive for the VR session (100 %), producing a positive impact on the students' knowledge of answering interview questions ($P < 0.05$), confidence in their body language ($P < 0.05$), and reduced students' anxiety about failing an interview ($P < 0.05$). Assessed interview performance was significantly enhanced following the completion of the VR interview session. Qualitative feedback revealed 80 % of students preferred the combination of the VR reality session and in-person interviews, whilst the remaining 20 % did not enjoy the VR session and preferred traditional in-person mock interviews.

Overall, these findings reveal that VR may offer numerous pedagogical benefits to improve student graduate outcomes and employability.

C17

Developing critical thinking and exam readiness through authentic essay exam writing practice

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With the growing use of large language models (LLMs) like ChatGPT, higher education faces challenges in maintaining academic integrity and providing authentic assessments. At the same time, several programmes have resumed in-person exams following COVID, creating a renewed demand for opportunities to help students prepare for closed-book, time-limited assessments.

This study assesses an in-person essay writing practice for Year 2 undergraduate bioscience students taking a haematology module. The summative exam includes a handwritten essay under timed conditions. For many students, this is their first experience with an in-person timed essay exam.

To support exam preparation, an optional in lecture exercise was created to closely simulate exam settings. Students were given the broad question theme in advance, with the precise question given on the day. They had 50 minutes to write the essay in class and were subsequently given an indicative grade and personalised feedback aimed at clarifying expectations and guiding revision.

Questionnaire feedback showed the practice increased students' confidence, strengthened their learning, and helped them develop efficient strategies for writing exam essays and managing time. Individual feedback was regarded as useful for increasing awareness of the expected depth and scope of understanding in this particular type of essay. Overall, the practice appeared to improve students' readiness ahead of the real exam.

In the broader context of curriculum design, this approach provides a practical response to LLMs expanding influence by emphasising the importance of process, academic integrity, and student responsibility while promoting authentic engagement and independent critical thinking.

C18

Authentic videos for authentic assessments: Live-action outperform animations for teaching pipetting

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Medical Science undergraduates at the University of Aberdeen have expressed low confidence in their pipette skills when preparing for authentic assessments. As part of tertiary education's digital transformation, animated videos are often being produced to illustrate course content and skills. For teaching of practical skills, we hypothesised that live-action demonstrational videos would be more useful than animations. This project aimed to create a short live-action pipetting video, gather feedback on its usefulness and preference versus an existing animated version, and explore views on future resources.

Student feedback and views were communicated via an optional anonymous feedback form. Students rated the video as useful (4.7/5, n=70), improved their confidence (Figure 1), rated the production quality of the video highly (4.61/5, n=70) and that production quality influences usefulness (4.24/5, n=70). Students preferred live-action demonstrational videos to animated videos (81% Live-Action; 1% Animated; 17% No Preference, n=70) and felt additional live-action videos would be useful (4.64/5, n=70) with the majority preferring these additional resources to be live-action (59% Live-Action; 31% Practical Technique Dependent; 6% No Preference; 3% Animated; 1% Didn't Want Additional Video Resources, n=70).

An important insight for physiology education is that students place a high value on well produced live-action videos as a resource for learning practical skills. With current technology, animated video resources are easy to produce and have appealing aesthetics, but student feedback is clear that for practical skills live-action videos are preferred.

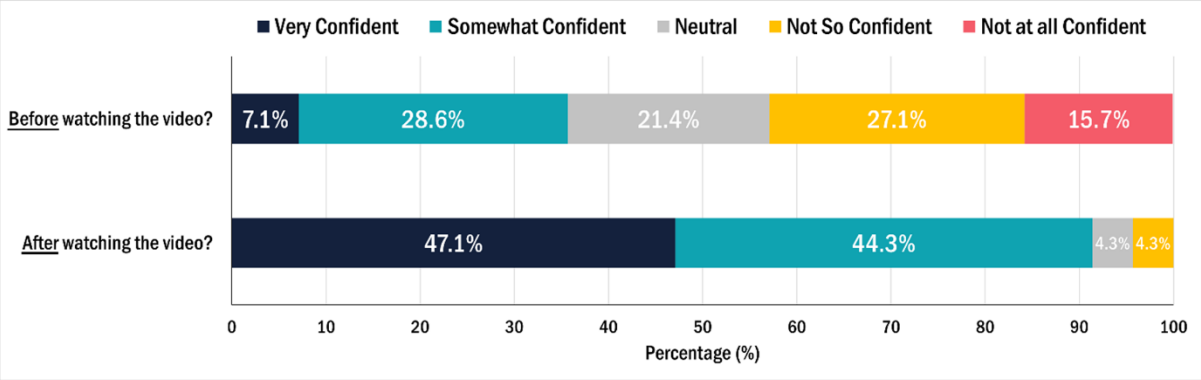

Figure 1 Live-action video demonstration improved student confidence in pipetting. *Students were asked "How confident are you in your ability to use and set a pipette?" before and after watching the video resource. n=70.*

C19

Bringing physiology to life through drama and roleplay

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Teaching physiology often requires students to engage with abstract, dynamic, and multi-step biological processes that can be challenging to visualise using traditional didactic methods alone. Drawing on sustained experience in undergraduate physiology education, this practice-based abstract describes the use of drama and role-play as an active learning strategy to support conceptual understanding of physiological mechanisms.

Based on teaching observations from physiology sessions delivered in low-resourced educational settings, including undergraduate teaching at Cardiff University, drama-based activities were used to encourage students to physically represent physiological processes such as circulation, respiration, neural signalling, and hormonal regulation. Students adopted specific roles (e.g. organs, cells, receptors, or signalling molecules) and enacted interactions through guided scenarios facilitated by the educator. The approach required no specialist equipment or financial investment and was adaptable to different class sizes.

Reflective observations suggest that drama and role-play were associated with high levels of student involvement, engagement, and peer interaction. Students appeared more confident in articulating physiological concepts following role-play activities and demonstrated improved ability to explain mechanisms using appropriate terminology. The approach also supported collaborative learning and enjoyment, contributing to a positive and inclusive learning environment. Importantly, drama-based

teaching enabled students to experience physiology as a dynamic and interconnected system rather than a static body of knowledge.

This abstract contributes to discussions on innovative and accessible approaches to physiology education by highlighting drama and role-play as a cost-effective, student-centred method for active learning. The approach is particularly relevant for educators working with limited resources, large cohorts, or diverse learner groups

Acknowledgments

I acknowledge the participation of my students in the role-plays.

C20

The Physiologist Activist; Transforming a physiology poster assessment with a sustainability lens

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Over the past several years we have engaged in developing student awareness of the United Nations (UN) Sustainable Development Goals (SDG's) and their link with Physiology via an authentic poster assessment. In it, students themselves select physiology topics related to one of the 17 UN SDG's, engage in independent research, collaborate in designing posters, and present their findings. Posters are assessed by both academics and peers. Semi quantitative and phenomenological investigation of this approach suggests that it fostered contextual learning and exemplified authentic assessment, enhanced engagement and increased SDG awareness (McGahon et. al., 2025).

More unexpected, however, was that the experience of interacting with each other in the creation and presentation of the posters was profoundly meaningful and therapeutic, with many leaving the class with a sense of mission and activism. Students reported feeling empowered to advocate for systemic change, addressing issues such as climate action and planetary health, gender disparities in healthcare, trauma, neurodiversity, and the interconnectedness of mind and body. Many of the posters effectively acted as a "call to activism" on sustainability, embodying Freire's (2000) "critical pedagogy", moving away from passive learning toward practices that foster dialogue, critical consciousness, and student agency.

Thus, using Glaser and Strauss's (1967) "Ground Theory" framework, we developed the hypothesis that authentic assessments can leverage physiology to be therapeutic and meaningful and create "Physiologist Activists". We are currently employing Likert-scale questionnaires combined with qualitative reflections to examine educator perceptions and the potential of physiology education to act as a catalyst for activism.

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C21

Creative writing in physiology: Teaching, assessing and publishing beyond traditional formats

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Life science students are often trained to write within established scientific conventions, which can limit creative thinking and discourage intellectual risk-taking. To broaden engagement with physiological concepts and communication, we embed an assessed creative writing activity within a final-year physiology course.

Through collaborative teaching with a creative writer, students explore physiology through diverse genres, including creative non-fiction, fictional narratives and poetry. While imaginative approaches are encouraged, factual writing is equally permissible, with emphasis on structure and language to make science accessible. Coursework is framed as a real-world simulation: writing for a hypothetical course "zine." This activity encourages creative exploration and deeper cognitive engagement with physiological content.

This approach aligns with evidence that writing activities support comprehension, reflection, and communication in physiology and science education (Cheng & Hoe, 2021), helping students make sense of complex physiological concepts and articulate them effectively to diverse audiences.

Building on this, we founded PhysiOdyssey, an open-access journal hosted on Glasgow Open Journals and developed in partnership with student interns, which provides a platform for publishing work that bridges science and creativity. It welcomes submissions from students and novice writers from both scientific and creative writing backgrounds, offering authentic publication opportunities in an inclusive, interdisciplinary space.

Our presentation will demonstrate how creative writing complements traditional physiology education, share examples of student work, and highlight co-creation through student authorship

and editorial internships. We invite the physiology education community to consider creative writing as a sustainable innovation, with opportunities for publication beyond traditional formats.

Acknowledgments

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Fi Hennicken

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C22

Whodunnit: Using a mystery story model to teach the logic story of scientific writing

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Students perceive academic writing as intimidating, so 92% use generative artificial intelligence tools to assist (Freeman, 2025). Although these tools offer benefits there is concern that their misuse or overreliance could erode key scientific writing skills, such as analytical and logical thinking (Deep and Chen, 2025).

To ensure training in evidence-based logical writing in the age of GenAI, I designed an interactive scientific writing tutorial using the narrative structure of a classical whodunnit mystery. Short story structure is dissected to identify the key evidence necessary to draw a conclusion supported by evidence. Students identify key evidence and red herrings using live polls. Parallels are drawn with the structure of a basic scientific paper, mapping the introduction, hypothesis, results, discussion and conclusion to the whodunnit model.

I use this approach in Level 3 (L3) Biomedical Sciences (~100 students) and level 4 (L4) Neuroscience courses (~60 students). Polling student attitudes about science writing at the start and end of the tutorial indicate improved student confidence by the end. Similarly, comparing word clouds at the start and end indicated more student positivity. L4 poll data for a cohort previously taking the L3 whodunnit tutorial showed improved confidence at the start of a related L4 writing tutorial session with further emphasis on scientific aspects.

Informal analysis suggests the approach is well received by students and it relieves some anxiety around scientific writing, which continues in the next academic year. Future developments could introduce the model before L3, or for industrial placement students.

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C23

Faculty feedback on new college-level guidelines for student use of generative AI software.

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[1]*University College Dublin, Ireland*

Student misuse of generative AI software is one of the key challenges currently facing third level education. Whilst University College Dublin has general university-level academic integrity policies in place, specific college-level AI use guidance was not available. In this pilot study, a large first year tutorial module was used to trial Science-specific AI use guidelines. The module contained 585 students, separated into 84 groups (i.e. 6-8 students per group), each with their own tutor and tasked with writing a literature review. Each tutor chose one of the 6 different levels of permitted AI use for their group, ranging from “zero use” to “no restrictions”. An ethically approved, anonymous survey was sent to all the tutors at the end of the module, consisting of seven questions and requiring ~15 minutes to complete. Despite the moderate 30% survey response rate (i.e. 25/84 tutors), it was found that a full range of levels had been used. Most respondents reported that the guidance was clear, helped discussion of AI use with their students and was generally beneficial 17/25 (68%). However, this varied significantly between subjects - Chemistry 0/5 (0%); Biology 13/15 (86%); Others 4/5 (80%). Faculty recommendations for improvements included (i) re-iteration of the pilot scheme across multiple modules, (ii) increased staff training, and (iii) showing students more examples of generative AI software limitations. Overall, most UCD Science faculty found the college-level guidelines useful but believed that this was only the first step in tackling the educational challenges of generative AI use.

Acknowledgments

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C24

Mini-projects for second-year students to prepare them for the final year research project

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Preparation for final-year projects and development of critical thinking is crucial for undergraduate student progression. Students typically have weekly laboratory sessions designed to develop core practical skills, often running as stand-alone sessions and/or following 'recipe-style' protocols, with less potential to develop a deeper understanding of the scientific method and hypothesis testing. In recent years, second year Biochemistry and Biomedical Science students have engaged in a 6-week mini research project to investigate antioxidant capacity in food and drink samples. Students have the freedom to explore foodstuffs that pique their interest and design their own research study accordingly, supported by relevant literature. These projects have ranged from some students obtaining samples from organisations such as Teapigs and the Bristol Fungarium, to comparing fresh versus processed foods. Working in pairs encourages active collaboration, with staff support around method development relating to sample preparation, and feasibility of planned experiments. All students performed the nicotinamide adenine dinucleotide (reduced)/nitroblue tetrazolium/phenazine methosulfate (NADH/NBT/PMS) superoxide scavenging assay, as well as a range of complementary assays including ferric reducing power (FRAP) and total polyphenol assays. The project culminated with students writing a laboratory report in the style of a research paper. This open-inquiry teaching model promotes autonomy, collaboration, critical thinking, troubleshooting and scientific writing skills, demonstrating the value of mini-projects in enhancing engagement and preparing students for their final year dissertations. The model is now being developed for a wider range of bioscience programmes in the school, including Microbiology & Immunology, Neuroscience and Pharmacology to develop discipline specific mini-research projects.

C25

Using NotebookLM to scaffold learning and research engagement in endocrine physiology education

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Teaching physiology and endocrinology requires supporting learners across a wide spectrum of prior knowledge, confidence, and academic skills. This abstract describes the implementation of

NotebookLM as a flexible, AI-supported learning tool across three cohorts of undergraduate biomedical and preclinical medicine students within endocrine physiology education. In preparing curated NotebookLM resources integrated within the Canvas VLE, the approach aimed to enhance confidence, promote active learning, and support progression toward independent, evidence-based thinking.

For fresher students, guided reading packs were developed using short research papers and summaries. NotebookLM-generated plain-language explanations, key-points, and question prompts which reduced barriers to engaging with endocrine research literature, supporting students' transition into higher education and evidence-based learning. For second-year students, the tool was used to generate self-test questions, flashcards, and revision materials from lecture handouts, slides and the respective syllabus section. This facilitated retrieval practice, supported spaced revision over the term, and addressed student demand for additional formative assessment opportunities. At third-year level, in advance of journal club seminars NotebookLM supported deeper engagement with complex research literature by producing alternative representations such as audio podcasts, video and visual formats, enabling students to focus on critical evaluation rather than decoding dense text.

Across cohorts, qualitative student feedback indicated improved confidence, earlier identification of knowledge gaps, and increased academic independence. For educators, the approach reduced time spent generating basic resources and alternative formats. Overall, NotebookLM functioned as a pedagogical bridge, supporting inclusive, active, and research-engaged learning in endocrine physiology education.

C26

Co-creation in neuroscience education: A student partner's reflections from NeuroHeads!

Amy Bennett[1]

[1]*University of Nottingham, UK*

Student-staff co-creation projects in higher education have previously demonstrated benefits not only for the taught student cohort but also for the partners themselves (Peart et al., 2023). Concurrently, as a final-year Neuroscience undergraduate, I shared the views from wider student feedback of the need for more practice opportunities prior to the viva assessment in Nottingham's 2nd year Neuroscience module "Neurons and Glia". As such, a co-creation approach was utilised to develop an interactive activity for the module assessment workshop, with the overall aim of improving student confidence in the oral communication of scientific concepts.

The developed activity, NeuroHeads!, was co-designed and delivered by the module co-convenor (Laura) and me and is a spin-off of the game "Heads-Up". This small-group activity enabled students

to work together to orally communicate module-specific concepts, with correctly guessed terms earning points for their team. Alongside co-developing the activity, an ethics application was also co-written to formally assess the effectiveness of NeuroHeads! through a post-activity questionnaire with focus group data collection planned for a later date.

Whilst participant outcomes will be discussed in the main NeuroHeads! study abstract, this student soap-box flash talk will focus on the student partners' perspective of developing NeuroHeads! through co-creation. The experience of contributing to the study design and delivery, working alongside the staff partner, and the benefits and drawbacks of engaging in a co-creation project (from broader skill development to barriers for success) will be discussed.

Acknowledgments

Dr Laura Rich (University of Nottingham) for the role of staff partner throughout this co-creation project and the review of this abstract.

University of Nottingham School of Life Sciences Ethics Committee for reviewing and approving the project ethics application.

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C27

PhysiOdyssey: An editorial internship bridging science and creativity in physiology education

Katie Lang[1]

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PhysiOdyssey is an academic, open access journal which translates human physiology into poetry, stories and artwork, promoting the accessibility of science beyond complex terminology and paywalls. As an editorial intern, I explored creative writing as a unique tool for physiology education and contributed towards the journal's wider impact.

I collaborated with editors from diverse academic backgrounds to review and edit submissions, applying critical analysis skills and gaining insight into interdisciplinary perspectives from a network of contributors. Furthermore, I co-hosted a creative writing workshop. I designed and led an activity to promote creativity as a learning tool within science and facilitated discussion to create an inclusive space for collaboration. Additionally, I developed a social media campaign to increase

engagement, including a haiku competition and creative posts, and encouraged students to contribute to the journal while speaking at an internship event.

PhysiOdyssey addresses the lack of interdisciplinary spaces for the intersection of creativity and science in academia (Kim et al., 2019). Translating science through creative perspectives requires a deep understanding of research and strong communication skills, improving physiology education. During my internship, I applied public engagement and science communication strategies to enhance accessibility and collaboration through creative writing. The journal now continues to grow towards its second edition. Continuing my internship, I aim to expand the journal to a broader audience and contributor base.

Acknowledgments

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C28

Physiological entrepreneurship: Encouraging creativity, life skills & aspirations for students

Deborah Madubuko[1], Hakimi BS[1], Marr J[1], Maurya DR[1], Dalvi PP[1], Thota SR[1], Meah MS[1]

[1]*University of East London, UK*

As second year undergraduate Medical Physiology students at the University of East London (UEL), we believe future physiology graduates should develop earlier in their degree, entrepreneurship and employability skills in addition to subject knowledge to enhance their future career options. Additionally, we believe in 'giving back' to society by engaging and raising the aspirations of those less privileged in the wider community.

Students are constantly exposed to influences such as fashion via digital media (Instagram, TikToK). This has inspired us to create a charity fashion show in April 2026, to raise money to educate impoverished young girls in Afghanistan since they are denied access to education. Despite our limited background, this challenge has enabled us to develop generic skills in leadership, teamwork, critical thinking, marketing and fund raising as well as practical skills such as graphic design and website development which will help us in our degree and employability.

Since November 2025, we have contacted many stakeholders, leading to real-world collaborations with students (undergraduate and postgraduate), and staff from within the University (School of Health, Sports, and Bioscience (HSB), School of Fashion and Design, Student Union) and external companies such as Mass Challenge UK for guidance and financial sponsorship.

This project has encouraged engagement and enthusiasm for physiology applications to future entrepreneurial ideas in wearable technology, temperature and hydration control in athletes. We believe we have given ourselves a head start in problem solving and communication skills needed to excel in business enterprise competitions like the 'Dragon's Den' at UEL.

C29

Student-led endometriosis-themed escape room for endocrinology and reproductive physiology education

Lauren Mcclafferty[1]

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To support the integration of innovative teaching approaches into a revised second-year Human Biological Sciences curriculum, I developed and piloted an educational escape room for endocrinology and reproductive education. At this stage, students are expected to move beyond factual recall and integrate knowledge across scientific disciplines. Active learning enables them to apply concepts in real-world contexts.

This activity formed the focus of my Honours project, developed in collaboration with academic staff who provided initial guidance on themes and learning outcomes. Together, we agreed that an escape room format would be an effective approach.

I selected the topic focus, researched escape room pedagogy, and independently designed the structure and puzzles. Endometriosis was chosen due to its multidisciplinary nature and underrepresentation within biological curricula, despite its widespread physiological impact. Framing learning around this condition addresses gaps in understanding while supporting representation of women's health within biomedical education.

A pilot study involved volunteer level 2, 3 and 4 Life Science students to explore feasibility and educational value. Student feedback indicated strong engagement and described the activity as a helpful way to connect concepts across disciplines. This was reflected through increased use of discipline-specific terminology and improved accuracy in knowledge-based assessments. Academic staff agreed that the activity aligned well with the learning objectives and offered flexibility for implementation within larger cohorts.

Overall, this work highlights the value of student-led resource development in physiology education. Drawing on recent learner experience, student co-creation can enhance relevance and engagement while producing scalable, curriculum-aligned learning resources.

Acknowledgments

My supervisor, Dr Katherine Price, for guidance throughout the project, and the students who piloted the activity and provided feedback.

C30

A student's perspective on artificial intelligence in education

Jenna-Mae Wilson[1]

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As a recent graduate, I am concerned about the potential negative impact of artificial intelligence on education. My first concern is that by taking shortcuts, students lose the opportunity to develop the skills that higher education is supposed to teach. My second is that students cannot assess the accuracy and quality of AI-generated answers, and may therefore learn misinformation as fact. My final concern is that AI-generated writing is unoriginal and inauthentic; students who use AI instead of writing themselves risk not being able to communicate their ideas effectively or be taken seriously. Overall, I suggest students be more cautious of using AI, and more aware of the risks.

C31

Research-Led Learning in Undergraduate Physiology: Authentic Wet-Lab and Symposium Assessment

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Background and Aims

Research-driven education is vital in medical and physiology curricula, supporting evidence-informed practice and developing students' scientific identity, analytical thinking, and communication skills. Embedding research culture early helps undergraduates engage in authentic disciplinary practices,

asking questions, interpreting data, and presenting findings. Assessment is central to this, aligning teaching with intended learning outcomes (ILOs) and building confidence for scientific and professional work. In response to student feedback on the limitations of traditional dry-lab formats, two complementary innovations were introduced in the third-year Epithelial Physiology (PY3803) course at the University of Aberdeen to embed research culture within the undergraduate experience: (1) a research-led wet-lab practical investigating the toxicity of methylimidazolium ionic liquids (M8OI), an emerging environmental contaminant linked to Primary Biliary Cholangitis (PBC), and (2) a symposium-style summative assessment simulating scientific conferences in academic, regulatory, and industrial contexts.

Summary of Work and Methods

A cohort of 47 students completed a structured sequence of research-led activities including a wet-lab practical, contextual workshops, a reflective post-lab seminar, a lab report, and a final group symposium as a summative assessment. In the laboratory, students performed a viability assay (MTT assay) to evaluate M8OI cytotoxicity in rat liver progenitor B-13 cells and hepatocyte-like derivatives (B-13/H cells). Consistent with Hedya et al. (2023), M8OI was approximately 13-fold more toxic to B-13 cells, attributed to transporter differences: B-13 cells showed elevated organic cation transporter 1 (OCT1), enhancing uptake, while B-13/H cells expressed higher P-glycoprotein (P-gp), increasing efflux and reducing intracellular accumulation. Students extended this mechanistic interpretation using published data on transporter expression, gene regulation, and metabolism, reinforcing links to epithelial transport teaching. The practical aligned with an ongoing research project, embedded sustainability principles (e.g., green chemistry), and highlighted industrial and regulatory relevance. Workshops supported key concepts and data analysis. Students submitted a scientific-style lab report and participated in a group symposium in which teams addressed applied scenarios, produced graphical abstracts, and delivered live presentations. An anonymous, voluntary post-symposium feedback survey (n = 36) captured student perceptions.

Results

Survey responses indicated strong support for the research-led practical and integrated assessment approach. Most students (86%) reported improved understanding of key concepts across epithelial physiology, pharmacology, and toxicology, and 89% agreed the symposium format promoted higher-order skills such as critical thinking, data analysis, and synthesis. The majority (92%) reported that preparing and delivering presentations strengthened scientific communication, teamwork, and graphical abstract design. 77% reported increased confidence in public speaking and scientific discussion, with the same proportion noting relevance to interviews and professional settings. Authenticity was recognised by 83%, and 92% valued integration of regulatory and commercial perspectives. Overall, 97% agreed that the assessment approach (including graphical abstracts and research-led problem-solving) aligned with module ILOs, and 75% considered the symposium more beneficial than traditional written assessments.

Discussion

Integrating a research-based practical with symposium-style assessment created an authentic, cohesive learning experience consistent with Biggs' constructive alignment and Kolb's experiential learning. The wet-lab developed technical and analytical competence grounded in physiological mechanisms, while the symposium strengthened collaboration, peer learning, and research communication. Student feedback suggests the approach increases motivation, supports deeper learning, and enhances employability readiness—key indicators of embedded research culture in undergraduate education.

Conclusion

Combining authentic research experiences with collaborative, presentation-based assessment can strengthen engagement, applied understanding, and transferable skills while fostering students' participation in research culture. This model offers a scalable, evidence-informed strategy to enhance physiology education and assessment.

C32

Co-creation and delivery of a sensory physiology practical on photoreception and the visual system

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Background: Physiology remains a fundamental pillar of medical education, yet focused teaching in this area has declined within modern curricula. Learning Outcome 3.3.1 of the Physiological Society Learning Objectives for Medical Graduates requires medical students to understand the types and properties of sensory receptors. Despite its clinical importance to the field of ophthalmology, students often find the transition from basic sensory transduction to clinical application challenging.

Aims: To co-create, deliver, and evaluate an interactive teaching activity designed to improve undergraduate medical students' comprehension of sensory receptor properties, with a specific focus on the visual system and ophthalmology clinical context.

Methods: This project utilizes a student-staff co-creation model, in which a medical student (AAAS) is leading the co-creation and planned delivery of a teaching intervention, supported by a peer (KB) and a physiology lecturer (PJM). Resources include pre-learning multimedia videos and a practical session designed in a station-based format, featuring an interactive model designed to simulate light transduction and the functional properties of photoreceptors, incorporating broader receptor concepts. Evaluation will follow a mixed-methods design, utilizing pre- and post-session quizzes to measure knowledge acquisition and surveys to capture qualitative learner experiences (Ethical Approval Reference: HYMS-24-25-087).

Summary: This project is currently in progress, with teaching intervention and data collection in March 2026. This presentation will outline the design, delivery, and evaluation of the activity, including analysis of survey responses and co-creator reflections. Feedback examples will illustrate any impact on physiology understanding and student confidence. Resources contribute to a series of physiology videos, in development with students as co-creators in physiology education.

C33

Impact of TBL on neurophysiology learning, retention, and metacognition

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Neurophysiology remains one of the most conceptually demanding areas of undergraduate biomedical education, with students often struggling to connect abstract concepts to real-world physiological functions. This proposal outlines a future project designed to evaluate the effectiveness of Team-Based Learning (TBL) combined with Design Thinking framework in enhancing both conceptual understanding and long-term retention of neurophysiology content among undergraduate medical students at Sultan Qaboos University, Oman. This is by shifting learning from passive memorization to more meaningful active application with deeper engagement, critical thinking, and higher adaptive skills.

The project adopts a quasi-experimental, mixed-methods design to compare outcomes between students engaged in structured TBL activities and those taught via traditional didactic methods. Quantitative data will include pre- and post-tests, as well as end-of-semester neurophysiology sub-scores to measure learning and retention. Qualitative data, collected through validated surveys and

focus groups, will explore student engagement, perceptions, and the development of metacognitive skills, which are students' awareness and regulation of their own learning strategies.

The metacognitive component is informed by the Design Thinking framework, which emphasizes student-centered learning and iterative approach. It is designed to support students in becoming reflective learners who can recognize gaps in understanding, intentionally plan study strategies, and continuously evaluate and refine their learning processes. The findings will inform evidence-based improvements in physiology pedagogy, particularly within multidisciplinary and diverse learning environments.

Findings from this study are expected to inform evidence-based approaches to physiology teaching that prioritize not only knowledge acquisition but also the development of adaptive learning skills. By integrating TBL with explicit metacognitive reflection, this project aims to advance the pedagogy of physiology through active, student-centered learning while embedding self-regulated learning practices essential for future health professionals.

Keywords: Team-Based Learning (TBL); Neurophysiology Education; Metacognition; Active Learning; Knowledge Retention; Health Sciences Education; Student Engagement

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C34

Student-led skin thermoregulation practical teaching at Hull York Medical School

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Background:

Physiology underpins medical education and practice, yet students often struggle to connect fundamental mechanisms and clinical application. To address this, a practical physiology session was developed and trialled at Hull York Medical School focussed on Physiological Objectives for Medical Graduates 1.2, encompassing concepts of homeostasis and allostasis within the context of skin function and dermatology. Skin is the body's primary site for thermoregulation, and dermatological conditions are common, affecting 60% of UK individuals .

Aims: To co-create, deliver and evaluate a teaching activity exploring healthy and disrupted thermoregulatory mechanisms for undergraduate medical students.

Methods: In this study, a medical student (KB) led co-creation and delivery of a clinically relevant physiology practical activity, supported by a peer (AS) and a physiology lecturer (PM). Students engaged with pre-learning multimedia resources before the session. Using infrared thermometers, students simulated pathophysiology conditions using heat packs, cold/hot water exposure and

exercise to mimic thermoregulatory changes characteristic of psoriasis, eczema, burns and acne respectively. Impact was assessed via pre- and post-session quizzes, online survey and review of student mind maps across four cohorts (N=74) (Ethical Approval Reference: HYMS-24-25-087).

Summary: Mindmap analysis revealed that students successfully synthesised core concepts, accurately linking pathophysiology to observed thermoregulatory disturbances. Quantitative results showed improvements in understanding heat trapping in psoriasis, eczema and burn models, however the acne exercise model showed no significant temperature change, indicating a need for future methodological refinement. Overall, the session effectively integrated clinical scenarios with practical physiology, reinforcing the application of homeostasis and allostasis principles.

C35

From Hillside to Clinic: Physiology career experiential teaching sessions for employability

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Students career aspirations in physiology are as varied and exciting as the subject itself, with primary career destinations of graduates revolving around health professions (43%) (Lee et al., 2025). Given the varied careers our students pursue, the experiences we provide as educators must match this, providing experiences which have applications beyond the classroom (Steele et al., 2020). Further, we must provide engaging and informative careers activities which directly link to a student's learning, in order to provide our students with the scope of possibilities from their studies, with the goal of positive graduate outcomes. Here, we assess the student perception of specialist experience sessions and the student perception of these sessions in demonstrating the application of physiology degrees and possible career pathways.

Students took part in two experiential learning sessions ran by practitioners from partnering organisations in Search + Rescue and Anaesthesia. Students were given background lectures on a career in each field, then trained in simulated work activities in emergency casualty care and surgical preparation. Students completed short anonymous surveys to assess perceptions of impact on career aspirations and the value of learning from the experiences. Students were overwhelmingly positive of these experiences and clearly linked the content to wider learning and career

development. Students also felt these were useful to add to their CV or professional platforms to evidence their experience.

Here, we provide a model of careers based learning not previously employed and show its direct benefits to students and practitioners and potential benefit to graduate outcomes.

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C36

Student-Staff co creation of teaching materials

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This project aims to evaluate co-creation of teaching materials between students and an academic member of staff based in a Veterinary course. Student-staff partnerships are well established in the literature, with both the benefits and drawbacks being well explored (Litte et al 2010). Benefits to staff in co-creation of teaching materials has been shown to support staff in constructing more equitable processes in the classroom (Cook-Sather, 2020) Benefits to students have been a gaining insight into the role of the educator as well developing interpersonal skills (Chandarana et al 2024). Barriers to student- staff partnerships can be the transient nature of students as they inevitably leave their courses for the next stage in their career and whether students may be view as being exploited due to the unequal power distribution between students and staff.

This project , therefore will co-create an educational self directed learning resource enabling students to learn more about brain anatomy. Follow creation of the resource, the creators will then be interviewed to evaluate the process and explore benefits and barriers to co-creation of learning resources.

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C37

Is it possible to provide enjoyment & relevance for students of all disciplines in the biosciences?

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Shared modules between degree programmes is increasingly common [1-4]. The new curriculum in the school of biosciences at University of Liverpool contains several shared modules by all eight undergraduate programmes, including BIOS203 is a new year 2 semester 1 practical module. BIOS203 starts with a whole organism and then examines tissue, protein and RNA and genes from that organism. Linking the different weeks together should allow for students to see how you'd take a sample of tissue from a whole organism and analyse in different ways. Enjoyment is known to be important for student learning. Learning is enhanced when students enjoy it [5,6]. In fact some argue "We must make learning fun; because if we are successful, our students will be impatient to run home, study, and contemplate–to really learn" [7,8]. Though whether enjoyment is possible for all students across all disciplines on a practical catering for many disciplines of bioscience is not known. Relevance is known to be important for student learning [9-11]. Explaining relevance is key in adopting a student-centred learning position and there are many approaches that can be taken to make learning relevant to students [12-14] . Whether relevance of this practical was understood by students across all disciplines is not known. Though early indications from staff-student liaison committee forums suggest that the relevance of the techniques were not always clear to all students from different disciplines. Surveys to students in year two will explore these issues. This work is currently pending ethical approval.

C38

Students' perceptions on using generative AI to support their academic writing

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The development of generative AI (genAI) is having a profound impact on higher education. Although it has raised widespread concerns about academic integrity and required teaching staff to redesign assessments, it also offers opportunities to enhance learning. For the past 3 academic years, we have allowed students to use genAI tools to support their academic writing on BI20B2 Physiology of Human Cells, a compulsory second year undergraduate medical sciences course.

We used large language models to generate academic writing samples for both an online academic writing lesson and a face-to-face lab write-up tutorial. Across all three cohorts, students accurately identified which introduction was AI-generated (87.8%, n = 276) and rated this as lower quality than the one written by us (median scores 2/5 vs. 4/5 respectively). Free-text comments included: “A [human] is clearer and more concise, B [AI] is too long”.

In 2024, 37.4% (n = 68) of students acknowledged the use of genAI to assist with their lab write-up, with the vast majority (75%) using ChatGPT. There was an increase in the proportion of students using AI tools in 2025 (45.9%, n = 90). While ChatGPT remained the most widely used tool (51.1%), students reported using a broader range of tools including Grammarly and Google AI Overview (4 tools in 2024 vs. 11 in 2025). Thematic analysis of tool uses, prompts entered and perceived usefulness is ongoing.

Students can be guided to use AI tools effectively and ethically if given an appropriate and structured framework to facilitate such usage.

C39

The use of ChatGPT to create time anchored MCQs in YouTube videos on the H5P platform:

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Background: Multiple Choice Questions (MCQs) are widely used throughout medical education, both in formative and summative settings. Embedded video questions (EVQ) have can show promise in formative assessment. Chat GPT has been used to make MCQs (mostly summative), but not EVQs. ChatGPT could help non-specialists create EVQs in a higher education setting, both for faculty and personal/communal use.

Objective: To compare speed and quality in creating formative EVQs between

a) Higher Education staff

b) Second year healthcare undergraduate students with the aid of ChatGPT o3.

Methods: Using standardised proformas both groups created EVQs for randomly allocated Hippo medics YouTube videos and recorded the time taken to create them. Questions are then blindly rated by study author who had no role in question creation using a modified version of the scale by Cheung et al.

Results: Results are ongoing, and progress will be presented at the conference.

Conclusion: At present our work is likely to show:

a) Empirical evidence to guide the feasibility of this strategy in the future of higher education

b) A clear example of student- staff co creation in the development of a research culture. All students are co-authors and have had paid time for this work.

Acknowledgments

Dr. Carol Price (University of Plymouth)

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C40

Improving student outcomes with purposeful assessment

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A current hot topic and preoccupation amongst UK universities is the amount of assessment our students are exposed to. Many institutions have rationalised and reduced the "assessment burden" on students to streamline and simplify assessment processes for both students and staff. This has sometimes led to word length prescriptions tied to academic credits for individual pieces of assessment. There is little evidence however available to prove that such changes have had a beneficial impact on student learning. Described in this work are two strategies that have demonstrably improved student marks at the module level and student outcomes at the course level.

Module level improvements have been gained by the implementation of a "practice testing" strategy (1) where students are exposed to a number of formative assessments prior to a formal summative assessment. results show that student summative marks align well with the level of their engagement in the formative tasks (69 +/- 7; 61 +/- 5; 44 +/- 5 % for full, partial and little engagement respectively.

At course level, an updated analysis of a small stakes summative assessment strategy (2) over 6 years reveals that engagement in a first year Academic Skills module is positively linked to "good degree" outcomes 2 or 3 years later.

This data presents a countervailing narrative to current attempts to reduce the amount of assessment encountered by our students.

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C41

Introducing students to the “ginger gene” - (MCR1) and melanogenesis - to improve genomic literacy

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As the largest segment of the healthcare workforce, nurses and other allied healthcare professionals (HCPs) are pivotal to clinical teams integrating genomics into patient care (Dewell et al, 2024; Coulson et al, 2025). Yet post-registration HCPs taking pathophysiology modules identified “genetics” as the most worrisome topic. Students’ lack of confidence and acute awareness of their limited knowledge of basic concepts such as one gene: one protein is striking.

Focus group discussions helped to identify that exploration of melanogenesis and MC1r receptor variation could help to provide a basis for improving genomic literacy, given the limited time available in module sessions. Mutations in membrane bound MC1R or variations in enzymes that are part of the signalling pathway of melanocytes can be related to patterns of gene expression, physiology of melanin and melanosomes, sensitivity to UVB, freckling, Vitamin D metabolism, albinism and risk of melanoma and other skin cancers (Chicorek et al, 2013; Bento-Lopez et al, 2023).

Few physiological systems are unaffected. Melanin's ability to scavenge excess radical species provided an opportunity for examination of molecular dysfunction, cellular damage and inflammation; prolonged oxidative stress and impaired wound healing provided plenty of discussion about ulceration, pain and next generation therapeutic solutions. Social applications of discrimination and stigma helped to keep the topic relevant to healthcare practice (Collis Harvey, 2015).

Feedback indicated that this early introduction to key concepts improved students' confidence with genomic concepts and their ability to understand pathophysiology articles crucial to their assessment.

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C42

Introducing clinical simulations to prepare level 4 Healthcare Science students for placement

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Simulation is a well-established approach in clinical education, widely employed in Health disciplines such as Nursing, Medicine, and Dentistry to provide students with safe opportunities to practice essential skills, often achieved through role-playing or the use of patient simulations. Our healthcare

Science students similarly require the development of a broad range of clinical competencies. For our current Level 4 Healthcare Science – Cardiac Science cohort, the National School of Healthcare Science requires completion of respiratory and sleep-related competencies, however, this year students were unable to secure placements in these areas. In response, the Programme Team shall deliver these competencies on campus.

Across a two-week period in May 2026, students will engage in case-based activities spanning cardiovascular, respiratory, and sleep science, making use of immersive virtual reality theatres, high fidelity patient simulators and roleplaying. The project aims to evaluate the impact of pre-placement simulation activities on students' confidence in clinical performance, perceptions of simulation as a tool for competency development, engagement, and clinical portfolio assessment outcomes.

Students will complete pre- and post-activity surveys using a 5-point Likert scale to measure changes in confidence applying theoretical knowledge, performing clinical techniques, enjoyment of the sessions, and perceptions of simulation in competency practice. Additional data will be collected on student satisfaction and Clinical Portfolio pass rates, comparing the cohort to previous years. Evaluation will employ Mann-Whitney U tests, proportional analysis, and thematic analysis of free-text responses.

C43

Challenges of Team-Based Learning in Post-COVID New Normal and HyFlex Medical Education

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Team-based learning (TBL) is widely used to teach physiology and other preclinical sciences, but the post-COVID shift to hybrid-flexible (HyFlex) delivery has challenged TBL's design principles in large, mixed-mode cohorts. This review examined whether TBL remains a viable approach in the HyFlex "new normal". Following the PRISMA guidelines, we reviewed literature from 2020–2025 describing in-person, online, hybrid, and HyFlex TBL in undergraduate and postgraduate medical education, focusing on preclinical physiology and related disciplines. Evidence suggests that well-designed TBL can match or improve short-term examination performance compared with lectures in both classroom and fully online formats. However, data on long-term retention and higher-order outcomes such as clinical reasoning and communication are limited and mixed. HyFlex implementations introduced substantial coordination and technology burdens. Mixed-mode teams reported inequitable participation, with remote students feeling peripheral and "students in difficulty" benefiting least. Maintaining fidelity to core TBL features (stable teams, readiness assurance, simultaneous reporting) while managing room technology and online platforms forced compromises in content coverage and assessment integrity. Comparative evidence indicates that, in

hybrid settings, case-based learning may better support integrative reasoning and expert feedback, while flipped formats offer greater flexibility. We argue that TBL should not be treated as the default for HyFlex physiology teaching. Instead, educators should adopt context-sensitive blended designs, reserving TBL for settings where structure and support can be maintained, and considering case-oriented or flipped approaches when hybrid constraints or learner needs make implementing classic TBL difficult.

C44

Piloting defensible standard setting in a new dental school from inception

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In many undergraduate programmes, fixed pass marks (e.g., 50%) are routinely applied to assessments without consideration of item difficulty or learner competence. This is particularly common in new medical and dental schools, where examination systems are still evolving. Zarqa University's new Faculty of Dentistry is initiating a project to embed defensible standard-setting practices from inception, focusing on two widely accepted methods: the Modified Angoff method for written exams and the Borderline Regression Method (BRM) for OSPEs.

This study will pilot both methods using recent assessments from a preclinical physiology course and a clinical practical exam. A panel of academic staff will receive training and participate in the standard-setting process. The resulting cutoff scores will be compared with the default fixed pass marks to illustrate how standard setting may affect pass rates and perception of fairness. Faculty perceptions on feasibility, fairness, and long-term adoption will be explored through short surveys and a facilitated discussion.

The project aims to contribute to the establishment of a culture of evidence-based assessment in physiology and related courses, moving away from inherited practices toward more defensible

systems. It also offers a model for other new programmes working to align with best practices in health professions education.

Ethical approval will be sought before commencement, and student data will be anonymised.

Keywords: Standard setting, Physiology education, OSPE, Assessment innovation

Acknowledgments

Zarqa University, Jordan

C45

Integrated and interdisciplinary teaching of physiology: a curriculum innovation proposal

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Background:

Physiology is a foundational discipline in medical and health-science education, yet it is often taught in isolation from related basic and clinical sciences. This compartmentalized approach can limit students' ability to integrate physiological concepts with clinical application. Contemporary educational frameworks emphasize integrated and interdisciplinary teaching as an effective strategy to enhance conceptual understanding, clinical reasoning, and long-term retention.

Aim:

This proposal aims to implement and evaluate an integrated and interdisciplinary teaching approach to physiology that aligns basic physiological concepts with anatomy, biochemistry, pathology, pharmacology, and clinical medicine.

Methods:

A system-based integrated teaching model will be adopted, wherein physiology content is delivered alongside related disciplines within each organ system. Teaching strategies will include interdisciplinary faculty-led sessions, case-based and problem-based learning, and active learning methods such as small-group discussions, concept mapping, and interactive quizzes. Clinical case scenarios will be used to reinforce physiological mechanisms and promote application of knowledge. Assessment will be aligned with integrated learning outcomes and will include case-based questions, integrated practical assessments, and formative evaluations with structured feedback.

Evaluation:

The effectiveness of the integrated teaching model will be assessed through student feedback surveys, analysis of academic performance, and faculty reflections on feasibility and educational impact.

Expected Outcomes:

The integrated approach is expected to improve students' understanding and retention of physiological concepts, enhance their ability to apply knowledge in clinical contexts, and increase engagement and active participation. It is anticipated that this model will better prepare students for clinical training by promoting interdisciplinary thinking and problem-solving skills.

Conclusion:

Integrated and interdisciplinary teaching of physiology represents a learner-centered and clinically relevant educational strategy. This curriculum innovation aligns with competency-based education and offers a practical framework for improving the quality and relevance of physiology teaching across medical and health-science programs.

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C46

Preparing physiology graduates for research practice through student-led experimental design

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Physiology laboratory practicals are essential for developing scientific skills, with experimental design as a key component. This study evaluates the educational impact of student-planned experimental design in an exercise physiology setting, on understanding of the experimental process, skill development and confidence.

The participants are undergraduate Medical Physiology and Biomedical Sciences students who have previously completed laboratory practicals using prescribed protocols with limited experience of planning experiments independently.

This practical involves healthy human volunteers and investigates the cardiorespiratory and metabolic costs of walking versus jogging at three treadmill speeds. Students are provided with the research question, available physiological equipment, and safety and ethical constraints associated with human exercise testing including acceptable treadmill speed range and exercise duration but not a step-by-step experimental protocol. Instead, they are required to plan key elements of the experiment, including hypotheses design, selection of treadmill speeds, organisation of participants, maximising and cost-effective use of resources, measurements, preferred conditions, replication strategy, and outline of data analysis. Academic support will be limited to clarification and feedback on feasibility and safety but avoiding help with design to ensure student ownership of the process. The planning process will be evaluated using a student questionnaire to gauge perceptions of learning, skill development, critical evaluation, engagement, motivation and confidence.
This study aims to provide evidence on the educational value of moving from protocol-driven to student-planned practicals. These experiences reflect real-world practice in physiology, clinical research, and health sciences, where professionals design, adapt, and evaluate protocols rather than simply follow instructions.

C47

Muscle Physiology Escape Box – An interactive teaching resource

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Introduction:

Implementation of gamification in teaching can increase students' motivation, engagement and critical thinking. An example is an educational escape box challenge, adapted from escape rooms, in which students collaborate to solve puzzles within a given time. We developed a muscle physiology escape box for third-semester "Applied Biology" students to present complex content in a game while promoting self-directed learning, critical thinking, problem-solving and teamwork.

Methods:

The escape box challenge was developed and integrated into the Physiology module from 2022 on. The challenge consisted of four activities aimed at unlocking a final box: A general muscle physiology crossword, a histology task focused on the neuromuscular junction, a card game illustrating

excitation-contraction coupling and a decoding wheel for the cross-bridge cycle. A Likert scale-type survey was conducted immediately after the challenge to determine how participants experienced the challenge.

Results:

Out of 254 students, 93.1% successfully completed the challenge in an average time of 47 minutes 16 seconds +/- 12 minutes 3 seconds. 195 students answered the feedback survey. Most students reported a positive effect on their understanding in muscle physiology. Specifically, 82% strongly agreed the challenge was enjoyable, 72% strongly agreed it was appropriate to cover the topic, 44% strongly agreed and 42% agreed it enhanced their learning. Additionally, 79% strongly agreed that teamwork was beneficial and 84% strongly agreed that they would like to have similar activities in class.

Conclusion:

In summary, gamification elements and interactive formats can make complex topics more accessible, support active learning and promote students' engagement.

Keywords: Education, Escape box challenge, muscle physiology

C48

Student Co-Creation, Delivery and Early Impact of an EMG Physiology Teaching Session at HYMS

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Background: Physiology is a key aspect of medical education and practice, however focussed teaching has declined in medical curricula in recent years. This includes electromyography, which links concepts in nerve and muscle anatomy, physiology and clinical cases such as muscular dystrophies, motor neuron disease and neuromuscular junction (NMJ) disorders. A recent audit of our medical school curriculum against the Physiological Objectives for Medical Graduates (PLOs) identified 2 key PLOs (5.10 and 5.12) relating to NMJ function and muscle electrophysiology for development.

Aims: To design, deliver and evaluate a novel teaching activity to improve EMG physiology teaching for undergraduate medical students through co-creation.

Methods: This project is in progress, to be piloted in March 2026. In this study, a medical student (AL) worked with a physiology lecturer (PM) to co-create and deliver an improved EMG practical activity. Pre-learning video resources were developed focussing on multimedia, coherence and

signalling principles of multimedia learning. Engagement is recorded through Blackboard virtual learning environment. Practical activities linking physical activity to muscle function in clinical contexts were developed to incorporate PLOs 5.10 and 5.12, to existing EMG teaching (Ethical Approval Reference: HYMS-24-25-087).

Summary:

This presentation will outline the design, delivery, and evaluation of the EMG activity, including quantitative and qualitative analysis of survey responses and co-creator reflections. Feedback examples will illustrate any impact of on physiology understanding. All resources contribute to a series of physiology videos in development with students as co-creators in physiology education.

Links to resources:

https://backyardbrains.com/pages/experiment-electromyography-emg-of-motor-movements

https://youtube.com/playlist?list=PLn9LSg_Xr34c36AeEtIoRtGys3EtLcPFf&si=n5BshkPn128QsDmU

https://youtube.com/playlist?list=PLn9LSg_Xr34fTvpQE2WK1zPt1wuaQjDc4&si=9itwfEVSS3gUUexX

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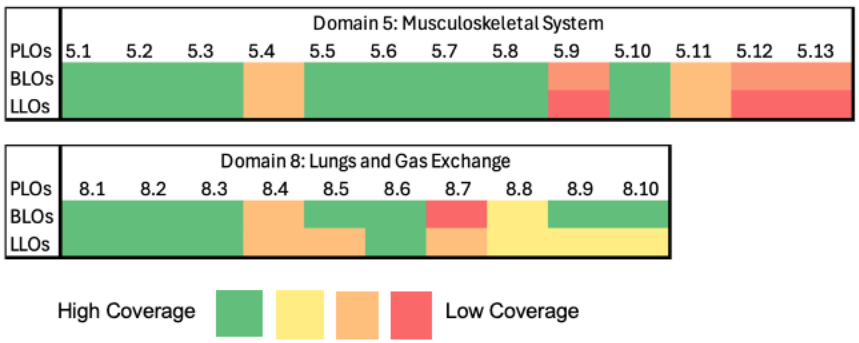

Figure 1. Heatmap representing audit of Physiological Society Learning Outcomes (PLOs) domains 5 and 8 against HYMS Block Learning Outcomes (BLOs) and Lecture Learning Outcomes (LLOs).

C49

Strengthening Student Partnership in Undergraduate Physiology through Team-Based Learning

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Contemporary physiology education in HE contexts faces intersecting challenges, including increasing student numbers, constrained resources, and the need to sustain meaningful student engagement while maintaining academic standards. Team-Based Learning (TBL) is a structured, student-centred approach that has been increasingly adopted within biomedical education; however, its application across diverse and resource-constrained teaching contexts remains uneven. This work synthesises existing literature to propose a transferable TBL framework for undergraduate physiology education.

Drawing on published studies in physiology and biomedical education, this review examines key components of TBL, including readiness assurance processes, collaborative problem-solving, and application exercises aligned with core physiological concepts and research-informed scenarios. The synthesis considers how these elements support active learning, and peer accountability.

Evidence across the literature suggests that TBL is associated with improved student engagement, enhanced student–staff interaction, and the development of transferable graduate skills such as teamwork, communication, and evidence-based reasoning. Studies further indicate that structured active learning approaches can support conceptual understanding of physiology and encourage students to view the discipline as inquiry-driven rather than solely content-focused. Importantly, the literature highlights the feasibility of TBL in settings characterised by large cohorts and limited teaching resources.

This paper contributes to current discussions on innovations in physiology teaching by offering an evidence-informed framework that supports student partnership and learning within undergraduate curricula. The proposed model is particularly relevant for education-focused academics seeking sustainable and inclusive approaches to physiology teaching in contemporary higher education.

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C50

A novel undergraduate practical investigating control of breathing

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Understanding the factors that drive changes in breathing is key for physiology students. A stimulating way to teach this is in a lab, with students as subjects. For decades we have run an undergraduate practical class in which students rebreathe through a bellows-type spirometer over 3-4 minutes. Here, the spirometer serves as a reservoir, used to mimic conditions of asphyxia, hypercarbia and hypoxia. By connecting the spirometer to a transducer (AD Instruments PowerLab)

we were able to measure changes in tidal volume and respiratory frequency, and correlate these with changes in expired air composition. This demonstrated that increased carbon dioxide concentration had a larger impact on breathing than reduced oxygen.

Unfortunately, our spirometers have been superseded (space constraints/ difficult to maintain) so the practical class was lost. Last year we devised a replacement practical in which we connected a small (5L or 10 L) Douglas bag directly to the AD Instruments flow head, so that students breathed air from the Douglas bag. Air from the flow head was continuously passed through the spirometer to measure real-time changes in air flow and also carbon dioxide and oxygen concentrations.

Students were able to successfully mimic conditions of asphyxia and hypercarbia (by filling the Douglas bag with oxygen). This experiment demonstrated clearly that both tidal volume and respiratory frequency increased under these conditions, together with increases in carbon dioxide and reduced oxygen. Students enjoyed the experiment and were able to explain their findings post-lab in a physiological context.

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Beyond the Lab: Using historical collections to enrich physiology education

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Nineteenth-century medical instruments may not seem relevant to 21st-century physiology education, but they can underpin authentic research beyond the lab. As degree-level research expands beyond the 'wet-lab,' educators are seeking ways to embed inquiry that is feasible, inclusive, and relevant. Laboratory-based honours projects are not always practical due to student numbers and resource constraints, and they do not suit all students' career aspirations. Sector guidance highlights the value of varied capstone experiences that develop skills beyond the traditional literature review (Lewis, 2024).

Historical project approaches are unusual in physiology education, making this model unfamiliar to most educators and offering a distinctive way to diversify honours projects. Building on prior supervision of a physiology project using historical texts, presented by the student at an international conference (Payne, 2024), this poster illustrates how historical medical collections can support research-based learning in physiology.

A case study demonstrates how artefact analysis and thematic review of medical literature were used to explore evolving perspectives on women's healthcare, connecting anatomy, physiology, and pathophysiology with social and cultural contexts. Facilitating access to collections and guiding research design enabled the student to develop transferable skills in project management, critical

appraisal, and interdisciplinary analysis. Additionally, this approach advances equity, diversity, and inclusion (EDI) in the curriculum: findings inform teaching on reproductive physiology by highlighting historical biases and their relevance to contemporary healthcare.

The poster will share academic and student perspectives on the learning experience, providing practical insights for educators seeking scalable alternatives to lab-based projects.

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C52

Piloting progressive exams to improve student success rates

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The Health Science Year Foundation Programme prepares students for a Health Science BSc and focuses on human physiology. Students include those from a widening participation background and different qualifications with varying levels of biology.

The Foundations in Bioscience module covering cell, respiratory and cardiovascular physiology can challenge students. Until 2023 it was assessed using one MCQ exam. In 2022 and 2023 32% and 37% of the students respectively failed their first sit of the exam. As a result, in 2024, three shorter progressive exams were introduced to encourage students to improve their understanding, revision strategies and ultimately their grades. The first two exams were worth 25% and the third exam was worth 50% of the final module grade. The students fed back that the multiple exams reinforced their learning, reduced stress and allowed them to alter their revision strategy if required. Overall, 8%

more students passed the module compared to 2023 and the average module grade increased by 11%.

To further support student learning and exam preparation this academic year a personalised, interactive e-book was introduced. The assessment was also reduced to two progressive exams based on student feedback and updated university regulations. Preliminary data shows 18% of students failed their first sit of the first exam. Overall analysis of this year's module results and potential benefits of the e-book will also be presented.

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C53

GenAI - implications for inclusive assessment design

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For many years I have been taking an authentic approach to assessment in my final year lecture modules, using team based coursework and open book, online examinations. The latter in particular allows students to focus on critical thinking and problem solving, rather than the assessment being a memory test. However, large language models, such as ChatGPT, have made it increasingly challenging to design appropriate open book exams that are "GenAI proof". As part of a new final year curriculum I am developing a new 20 credit advanced Physiology module, that aims to not only cover complex topics, but also develop student critical thinking and problem solving skills. The module will have a coursework and examination assessment. For the coursework, students will work in teams, using GenAI to identify a potential new drug treatment related to the module diseases. Their assessment will be pitching their drug idea to the head of a pharmaceutical company, drawing on the research literature to evidence their claim. The exam assessment will be moving to an open book, invigilated exam, with students allowed to bring notes into the exam. The exam topic will be released to students in advance, ensuring that the emphasis is on assessing their

problem solving skills. While the move back to an invigilated exam may feel like a backwards step, by structuring the exam in this way we are hoping to continue to provide an inclusive assessment, while ensuring we are able to assess whether students have met the learning outcomes.

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Cooking Up a "Secret Sauce" of Co-Creation

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Equity discourse in university education contends that it is difficult for a student to effectively learn unless they can see themselves represented in curricula (Ahmet, 2020). In successful international universities with broad cohorts, there has been a drive to decolonise/diversify curricula. We see the opportunity to decolonise by involving students in the conception and cocreation of their own curricula as a joyful, additive act. Benefits to the individual student are manifest, but also to the university and the discipline itself (McGahon et. al, 2024).

Three QUB case studies illustrate this. Collaboration with Student Voice Committee transformed an anthropomorphic data gathering practical into one which challenged the fundamental concept of "70Kg man" and was submitted to the Medical Schools Council of the UK as an example of best practice in decolonisation. Work from two student-led summer studentship projects gained publication (McGahon et. al, 2024, 2025). In the first, students were given a wide brief to identify gaps in the physiology curricula regarding protected characteristics and create resources to address these gaps. In the second, students were recruited to develop resources resulting out of our Sustainable Development Goals poster assessment.

Interrogating the reasons for this success, we hypothesise that modelling "profound positive regard" for colleagues and students is key as it brings to bear what Veck (2009) calls the transformative "attentive gaze" on students in which they feel recognised and given agency. The psychologic safety, thus established, is the essential component of what Amabile (2013) detailed as conditions for creativity within groups.

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C55

You are where you sit? The relationship between seating position, self-perception, and attainment

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Traditional format University teaching often relies extensively on didactic lectures, and thus a significant proportion of contact time is delivered in large lecture theatres. The relationship between engagement, lecture seating position, and educational attainment has been addressed across disciplines. Prior literature has suggested sitting towards the back of the theatre correlates with poorer exam performance(1,2,3). However, it is unclear whether already high-attaining students have biased preference for the front of the theatre or sitting at the front promotes engagement with the lecturer and material itself, leading to greater attainment. Moreover, even when accounting for prior attainment, some studies do suggest those at the back of the theatre may still be disadvantaged(4).

Preliminary work at the University of Sussex and Brighton and Sussex Medical School suggests, across Medicine and Life Sciences, there is significant heterogeneity in the perceived impact of seating position. Therefore, in a student-led project, we aimed to identify how the learning experience changes in relation to distance from the lecturer and investigate the relationship with both prior and prospective attainment. We addressed this via a combination of quantitative and qualitative surveys and analysis of educational attainment records. We predicted that irrespective of subject, increased distance from the lecturer would predict poorer prospective attainment even

when controlling for prior attainment. Further, we expected that student perceptions and attitudes towards seating position would moderate this relationship.

These findings hope to further the conversation and provide deeper insight on the relationship between seating position, self-perception and prior attainment within higher education.

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C56

Summative assessment of laboratory practicals and attendance

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Higher Education (HE) students often ask if the subject they're being taught will be included in an assessment and can the response to this can impact attendance. Students may consider lectures to be more significant in preparation for an end of module exam and choose not to attend laboratory practicals. This is also compounded when practicals arranged on a Friday afternoon. Short, summative tests can be used to increase attendance at laboratory practicals and achievement. The aim of this study was to investigate the effect on of removing short online tests following practicals and incorporating the questions into an online multiple-choice question (MCQ) exam at the end of a Level 4, Animal Physiology module to reduce the number of assessment points. Consultation with the students did not raise any questions or concerns about this change.

Attendance data for laboratory practicals in Semester 2 was collected in 2023-2024 during when the short online tests were in place. Due to high numbers of students (n = 103 and 102 respectively) each year, they were divided into Groups A and B for four laboratory practicals: osmoregulation, erythrocyte fragility, thermoregulation and heart rate, and animal behaviour. Following completion, the students took a short, online MCQ test (8-9 questions). Students took the exam offsite at a

specified date and time. The tests were online due to covid-19 lockdowns and guidance was provided on the use of AI. The questions were based upon Bloom's Taxonomy and assessed recall, in addition to numeracy, application and analysis skills addressed in the practicals for authenticity. The order the laboratory practicals varied in 2024-2025 and the questions placed in an end of module exam.

In 2023-2024, attendance of students at the practicals was 10 % higher than the following year in 2024-2025 when the short online MCQ tests were removed and placed in the end of module exam. Attendance declined if a laboratory practical occurred before or after directed study week, or a break but the two most popular practicals were osmoregulation and thermoregulation/heart rate. A comparison was made between the success of students answering the same six MCQ questions correctly in the tests and exam, and 50 % of these questions received a lower mark in 2024-2025 compared to the previous year.

Although external factors may affect attendance at laboratory practicals, it is likely that the removal of the short online tests, reduced attendance in 2024-2025 and student feedback will be analysed further. However, the average achievement in the end of module exam in 2024-2025 (71 %) was similar to when practical questions were incorporated than the previous year (69 %).

C57

Students and staff peer review enhancement of programmes

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Student voice, whether via student module evaluations, the national student survey, or student voice committees, plays an important role in the review and enhancement of programmes. Here we present recent initiatives in the School of Life Sciences to further the role of student voice in staff peer reflection activities, directly involving student voice representatives in observations of in-person cross-programme teaching and learning activities.

Paired with academic peer observers, students have an opportunity to interact with staff on a different level, allowing them to have a different perspective on teaching and learning activities. Ensuring that staff reviews happen across various program areas not only mitigates bias but also exposes educators to a diverse range of learning pedagogies and teaching approaches. This emphasis on diversity enhances the educational process by incorporating different perspectives and methodologies. Central to this approach is the pivotal role of student voice, which is actively integrated into staff peer observation processes. This approach has been positively received by the Student Voice Representatives. One student commented, "The peer review process is an interactive process which lets us better understand the student perspective. It is a great way to ensure that

teaching sessions can be commented upon in a safe and unbiased environment to express what students love about some sessions and some things they would prefer done differently. With many of the sessions co-observed with students, there's a tangible commitment to creating an inclusive and student-centred learning environment.