Advance HE

Enhancing assessment and feedback: A case study compendium

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Foreword

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Assessment is a cornerstone of higher education, serving multiple critical functions. It provides a mechanism for measuring student learning, informing teaching and curriculum development, and ensuring the quality and standards of programmes. Additionally, assessment data is essential for informing institutional decision-making, accountability, and external quality assurance processes.

In this series, directly aligned to the Advance HE Assessment and Feedback Symposium 2023, we bring together over a dozen examples of sector practice regarding assessment and feedback. The series continues to outline some of the ways in which institutions have undertaken the necessary navigation of these critical and multifaceted areas. Enhancing assessment mechanisms within Higher Education (HE) is a constant that we must continue to review. This series looks at a range of activity from across the sector that colleagues are implementing to improve outcomes for all students. Collectively these contributions seek to consider and suggest ideas and future developments for all of us working in learning and teaching in higher education to consider and showcase a variety of activity that can help enhance the success of our students through assessment and feedback practices.

Although it is widely acknowledged within the sector that assessment and feedback practices are pivotal to enhancing student learning, the complex interplay of factors such as rapid technological advancements, evolving student demographics, and economic pressures has necessitated a critical re-evaluation of assessment approaches. Given the substantial impact assessment has within HE it is essential to consider this in relation to the wider impact on student success. This encompasses not only improving learning outcomes but also addressing broader challenges such as retention, attainment, and inclusivity. Furthermore, assessment should be aligned with the development of graduates equipped with the skills and knowledge necessary to thrive in the 21st-century world.

To achieve this, a sophisticated understanding of the context-specific factors influencing assessment practices is essential. By rethinking and repositioning assessment strategies, processes, and practices across the sector, we can ensure that assessment remains fit for purpose in an ever-changing landscape. This involves clarifying assessment's role in meeting the demands of the 21st century and preparing the sector for future challenges.

Ultimately, assessment is an integral component of curriculum design. It has the potential to be a powerful catalyst of change, enabling students to develop the competencies required to succeed in both academic and professional life. By effectively harnessing the potential of assessment, higher education institutions can significantly enhance student outcomes and contribute to the development of a skilled and knowledgeable workforce.

This collection aims to build on existing scholarship, frameworks, tools, models, and examples of best practice and to showcase and discuss initiatives currently being tested across the HE sector, in a wide variety of institutions and disciplines. What is apparent across the series is that in today's landscape, passive engagement with assessment and feedback is insufficient; instead, empowering students to cultivate their own learning journey is paramount. This necessitates active learning experiences and authentic assessment methods that encourage students to take ownership of their learner journey and develop a personal responsibility for their education. This series highlights how transforming students from passive recipients of knowledge into active participants aims to improve their attainment and outcomes. Although we have presented the cases under the broad banners of innovative assessment, assessment and feedback in a digital era, authentic assessment and enhancing assessment and feedback practices, we want to be mindful that we could have categorised these initiatives under a number of different labels. There are a range of diverse approaches presented, often with overlapping threads that transcend these boundaries. What truly unites them is a shared purpose, that of enhancing student learning, outcomes, and ultimately success.

1. Innovative Assessment

1.1 Working in partnership to develop student-centred support for an innovative assessment

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Background

In this case study, we discuss the value of a partnership initiative between a module academic lead and the library academic skills team in the development of student-centred assessment support for an innovative assessment. During the academic year 2019-20, the module team on a compulsory undergraduate management module decided to replace the examination assessment with a more innovative assessment – an infographic. Infographics comprise both content (knowledge and information) and visuals (colours and images) that are presented in a considered manner that helps the reader understand the story being told (Comai, 2015; Toth, 2013; VanderMolen and Spivey, 2017). Infographics are a successful means of communication as they have visual impact that makes the information more memorable to the reader (VanderMolen and Spivey, 2017).

The decision to change the assessment method was based on both student and module team feedback. From our students' perspective, they disliked examinations not only because they found them stressful, but also because the students considered that examinations neither assessed their knowledge nor developed their skills. From the module team perspective, examinations did little to future proof our students' research and communication skills. As such, building on the trend towards using infographics in industry (Coffelt, Baker and Corey, 2016; Toth, 2013; VanderMolen and Spivey, 2017), an infographic assessment was introduced into the module to replace the examination.

It was anticipated that this decision would both enhance student engagement with the module and enhance their employability skills. Engaging students in innovative and novel approaches to learning and assessment, particularly through the adoption of technology-based tools, facilitates their retention of the subject matter (VanderMolen and Spivey, 2017). Furthermore, getting students to create infographics develops tangible communication skills such as critical thinking, gathering and citing information, synthesising data into charts and graphs, and being able to integrate content into a visual format (VanderMolen and Spivey, 2017). Students are likely to use these skills in their future jobs as companies are increasingly looking for students who can both analyse and present information effectively (Coffelt, Baker and Corey, 2016; VanderMolen and Spivey, 2017).

However, as part of the annual review process, after the first year of the infographic assessment, (academic year 2020-21), two challenges were highlighted. First, from the students' perspective they struggled with the technical aspects of putting together an infographic despite detailed written guidance being offered. Second, the module team identified that many of the infographics lacked visual impact, despite the team having used many industry examples as part of their teaching. For example, the student-produced infographics were either rather text heavy and missing colour and graphics, and / or were lacking in a coherent narrative; all essential components of an impactful infographic (Comai, 2015; Dunlap and Lowenthal, 2016; Toth, 2013; VanderMolen and Spivey, 2017). It was at this point that the module team engaged the support of the academic skills team.

Approach

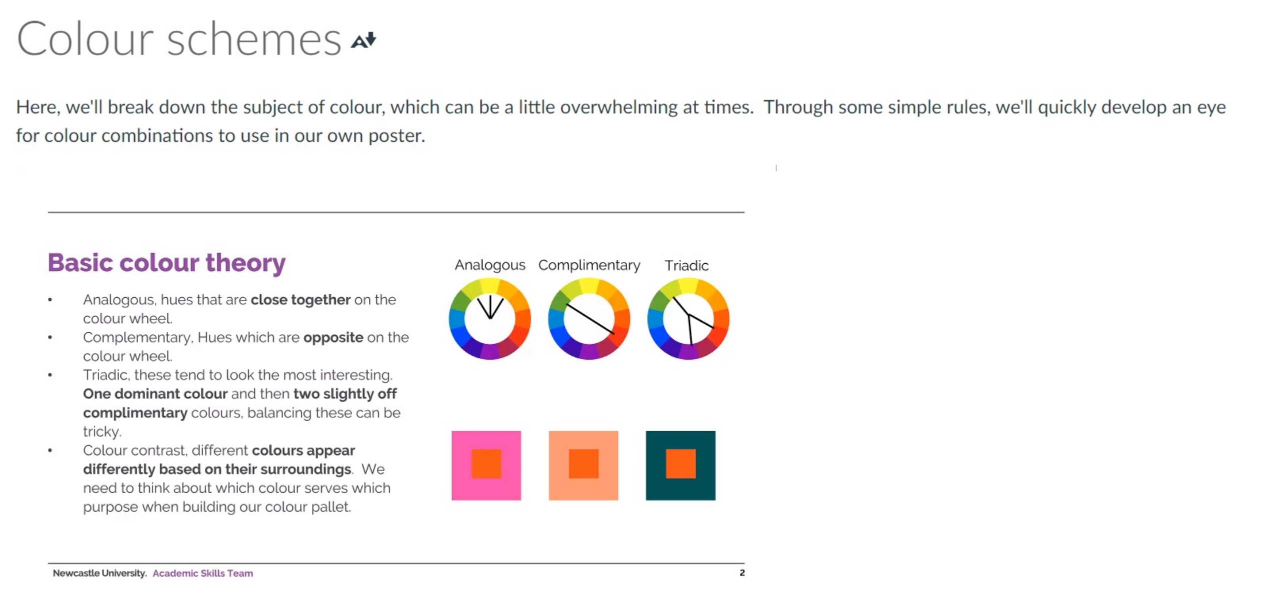
The academic skills team is based in the university library with a remit to support students from all stages of study across all faculties. The team works with learning developers, learning technologists and content creators to provide a range of engaging resources, including a variety of multimedia resources targeted at skills development (such as referencing), that module teams can embed into their module virtual learning environments. The module team had already worked with the academic skills team in delivering support to students around topics such as critical thinking, reading and writing assignments. We could see a further opportunity to work in partnership to create resources to support students with both the aesthetic design principles and the technical principles of creating infographics. To kick start the process, we discussed the module content, learning outcomes and assessment requirements. We then discussed the creative and technical issues the students had encountered when completing the infographic assessment. This enabled us to come up with a set of topic areas related to both creative design principles and technical construction principles.

We strongly encourage students to view approaching an assignment as a process (Wingate and Harper, 2021). Therefore, we wanted to make sure this was evident in the resources we created. As with other types of more traditional assignments (such as essays) we wanted to highlight that students go through a process of planning drafting, reviewing, editing and reflecting (Hayes and Flowers, 1980; Hayes, 2012). In addition, we wanted to stress that considering the task as a process would enable students to make key design decisions in a timely manner, and thus would reduce the likelihood of having to duplicate effort.

Scaffolding and providing models to support learning is also important in the learning process (Vygotsky, 1962) and is transferable to a range of learning resources and tasks (Gibbons, 2014; Taber, 2018). In the context of the infographic assessment support, we considered that this could be facilitated through 'work along' videos, where both screencasts and voiceover with PowerPoint were used to work through a model infographic example. In terms of accessibility and allowing for the wide range of abilities, both Canva and PowerPoint were used as options to create the infographic. Having the choice of software was important so that we could ensure barriers were lowered both in accessing and working through the videos to promote engagement with the assessment.

For each video, content was drafted and reviewed, and then scripts were created. Each video consisted of a PowerPoint presentation with a voiceover recorded using Recap software and then uploaded into Microsoft Streams. In addition, to illustrate the process of converting images to work in Canva, a screencast was created showing students the process of converting assets from one format to another. The resources were designed to take the students in a step-by-step manner through the various stages of designing an infographic, such as selecting a colour scheme, as illustrated in Figure 1 below.

Figure 1. Screenshot from the 'Colour Schemes' video resource



The videos were tested in tutorial sessions with the students, resulting in some enhancements. The final set of videos were embedded into the module tutorial sessions and were accessible to the students via the module's virtual learning environment. In total, 17 videos were created: seven covering the design principles, and 10 covering the technical construction aspects (four for PowerPoint and six for Canva). In terms of staff hours, one member of the academy skills team worked on the project to create and develop the resources for approximately 30 hours. The titles are summarised in Table 1 below.

Table 1. Summary of video titles

Design principles	Technical construction principles (PowerPoint)	Technical construction principles (Canva)
1. The process of making an Infographic 2. Visual style 3. Colour schemes 4. Composition and thumbnail sketches 5. Sourcing assets 6. Converting vector assets to work in PowerPoint and Canva 7. Proof reading	1. Working with Images in PowerPoint 2. Working with text in PowerPoint 3. Creating an infographic in PowerPoint 4. Exporting from PowerPoint	1. Introduction to Canva 2. More advanced controls in Canva 3. Bringing in external assets 4. Text principles in Canva 5. Creating an infographic in Canva 6. Exporting from Canva

The project timeline is summarised in table 2 below.

Table 2. Project development and implementation timeline

Academic year 2019-20	Academic year 2020-21	Academic year 2021-22
Decision taken by the module team to replace the examination assessment with a more innovative assessment method. Due to their increasing use in business and therefore the need for students to develop the requisite digital skills, an infographic was selected as an innovative means of module assessment.	New assessment guidance and structure put in place to situate the importance of infographics in a modern business context. Annual module review process identified that the students would benefit from more guidance both in terms of aesthetic design principles and the technical aspects of making infographics.	Work began with the academic skills team to develop the set of video resources. Video resources were developed and tested with the students.
	Initial discussions were held with the academic skills team regarding targeted assessment support.	The annual module review process highlighted both qualitative (in terms of overall design quality and impact) and quantitative (in terms of overall module grade) improvements.

Outcomes

The introduction of the infographic assessment component has had an overall impact on the average grade for the module. For example, in 2019-20, of a cohort size of 163 students, 49% of the students (80 students) were marked in the lower grade bands (<40/40-49/50-59) and 51% (83 students) within the higher grade bands (60-69/70+). However, in 2021-22, of a cohort size of 206 students, 32% of the students (66 students) were marked in the lower bands and 68% (140 students) marked in the higher bands. This has resulted in the overall average grade designation increasing from 2:2 to 2:1.

Furthermore, working with a specialist team who were experienced not only with the technology but also the nuanced design principles added greatly to the success of the project and helped to give the students realistic insights into the process and time required to design and construct infographics. The embedding of the video resources into the module have impacted student confidence to engage with the assessment. Indeed, the academic skills team's expertise and enthusiasm for design comes across strongly in the video resources. Additionally, feedback from the students indicates that: (1) they enjoy the visual nature of the resources; (2) having a series of short videos enables them to dip in and out of the resources as needed; (3) splitting the design elements from the technical elements enables them to start their assessment earlier in terms of creating a story board in advance of the technical aspects of arranging their infographic in PowerPoint or Canva.

Furthermore, the videos also had a great impact on the quality of the submissions. Students engaged with the guidance on flow and structure, colour schemes and use of graphic to produce some highly creative and informative infographics.

Although this case study relates to an undergraduate management module, the insights are transferable to both other disciplines and different levels of study. Based on the resources created for this module, the academic skills team have been able to create a self-enrol course which has been shared across faculties and has supported a wide range of students and academics to create and produce authentic assessments. Furthermore, the step-by-step process approach taken for this project has also been applied in supporting students with assignments involving digital creation (such as video pitches and WordPress reflective portfolios) across the university departments.

This support is timely since infographics have proliferated in the digital age and are widely used to communicate information across myriad disciplines and institutional contexts (Chaudhury, 2021; Jaleniauskiene and Kapseriuniene, 2023; Midway, 2020). As summarised by Jaleniauskiene and Kapseriuniene (2023, 192):

> "In this fast-paced world, individuals prefer shorter as well as quicker forms of communication and this makes infographics a popular form of communication. Given the aforementioned trends, educators can no longer neglect the need for a more frequent incorporation of infographics in higher education."

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1.2 Building community, supporting assessment

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Background

The popular press is awash with stories of academic misconduct being on the rise (Kendix, 2023) and of universities taking a tough stance to combat it (Weale, 2023). There is evidence to suggest instances of academic misconduct are higher among international students (Aftab, 2016; Bamford and Sergiou, 2005; McKie, 2019; Bertram Gallant, Binkin and Donohue, 2015). Living and learning in a new environment means international students face several academic, social and cultural challenges (Chien, 2016; Coneyworth, Jessop, Madden and White, 2020; Igwe, Rahman, Ohalehi, Amaugo and Anigbo, 2020). This places them at risk of engaging in academic misconduct.

And this was the case in the Faculty of Business and Law at the University of Portsmouth. International students constitute more than 80% of our taught postgraduate students, and around 95% of the students registered on MSc Business and Management and MSc International Business and Management. In 2021-22, 98% of the referred academic misconduct cases were from taught postgraduate students; 75% were from students on our MSc Business and Management and MSc International Business and Management courses. Cases of academic misconduct in the faculty had been growing at an alarming rate of 50% year on year, and in 2021-22 they reached a record level of 1,579. Such high levels were unsustainable – they were damaging for both students and staff, and the faculty could not continue to bear the administrative burden of investigating each case.

There are links between belonging and academic misconduct. Students who don’t feel valued as part of their institution’s community are at risk of engaging in academic misconduct (Tinto, 2017), whereas low performing students, who might usually be at risk of engaging in academic misconduct, are less likely to do so if they have a high sense of belonging (Finn and Frone, 2004). This is not surprising; belonging can reduce stress. Whether it is triggered by the academic pressure of assessment, family or peer pressure to do well, or an internal drive to succeed, stress is a key factor contributing to academic misconduct (Husain, Al-Shaibani and Mahfoodh, 2017).

Approach

This case study tells the story of Study Community – a module first delivered in 2022-23 for 750 postgraduate students on two courses (MSc Business and Management and MSc International Business and Management) at the University of Portsmouth with the express intention of reducing instances of academic misconduct, developing study skills, building confidence and developing a sense of academic community. Working on the premise that students who do not feel a sense of belonging are more likely to engage in academic misconduct, Study Community takes a compassionate approach to tackling assessment offences by offering a supportive learning environment and the opportunity to build belonging for a large, diverse group of international postgraduates.

It was important for Study Community to be perceived as a core element of the course rather than an optional drop-in, and so it was set up as a taught, hour-long, weekly timetabled module which appeared on students' timetables for the semester alongside other subject related modules. Students were expected to attend.

The module descriptor states its overall aim "to provide students with an opportunity to develop and practise the necessary skills to support their learning across the whole of their course", which is achieved through four learning outcomes:

1. To understand the skills required to be a successful masters' student
2. To implement critical thinking, reading and writing
3. To feel part of a community of students
4. To improve communication skills.

There were 180 workload hours allocated to write the module. The initial design was scaffolded on key findings from academic literature looking at successful transition to postgraduate study. We wanted module delivery in an informal atmosphere to facilitate the building of trust (see Coneyworth et al, 2020; Tobbell and O'Donnell, 2013). For this reason, it was set up as a zero-credit module with no assessment. In addition, it would be delivered by our Academic Skills Tutors rather than subject academics. The Academic Skills Tutors are non-disciplinary academics who are not involved in delivering any credit-bearing modules or setting and marking assessments. As such, their involvement was more likely to be perceived as supportive and non-judgemental.

Session content focused on building students' knowledge of key academic skills required of them – such as planning, structuring and paraphrasing. The way in which the content was delivered, such as small group activities and self-review quizzes, was designed to facilitate opportunities to build belonging and track development. In addition to building English language communication skills, this offered staff-facilitated peer to peer learning opportunities (see Tobbell and O'Donnell, 2013) along with self-reflection and creative thinking (see Matheson and Sutcliffe, 2018). After initial welcomes and introductions, the content of the weekly sessions was based around forthcoming assessments, broken down into three stages. The first stage was understanding the assignment – what was the assignment actually asking for? How were marks being awarded? What would a successful submission look like? The second stage looked at the tasks needing to be undertaken in order to complete the assignment – where would theory come from? What would be good sources of additional information? And the final stage considered what academic skills were required to successfully complete the assignment.

Outcomes

As is often the case in life, reality proved to be somewhat different to the plan and there were two key learning points. The first was that international students need time to settle into a new environment. The plan was to use the first week and part of the second week for introductions and general housekeeping information. However, the need for time and space to talk through personal experiences, or seek direction for addressing domestic challenges, became increasingly apparent. New to the local area as well as to the UK, students needed support to resolve a multitude of pressing domestic matters: how to find suitable rental properties rather than rely on B&Bs; how they might find out about toddler groups for their young families; which bus routes served local schools; how to register with a GP. Although these challenges might seem trivial, they were blockers to the students being able to study. Providing space to be able to talk through their domestic challenges meant the students felt valued; providing support to resolve the challenges helped the students to feel settled. Once they felt settled into their environment, they were able to focus on their studies. Where they could, the Academic Skills Tutors drew on their own local knowledge to suggest solutions to the students' domestic challenges. Where they couldn't, they were able to signpost students to a range of University and community services. And as students' own local knowledge began to grow, they were keen to share information to help each other. Although looking after the students' personal needs took significantly longer than planned, it was time well spent. Firstly, the interactions with their peers and with the Academic Skills Tutors facilitated the development of trust. And secondly, once their domestic needs had been met, the students were able to focus on their studies and the Academic Skills Tutors were able to use the Study Community sessions to support the students to develop their academic skills.

The second key learning point was the level of digital shock experienced by the students. So much of UK HE is predicated on digital literacy and, as a result, those who are unfamiliar with laptops, VLEs and Microsoft Office face significant challenges. As the content of the sessions turned to consider the academic skills required to complete their assignments, the lack of digital skills became apparent. The vast majority of the students were used to accessing the internet only through their mobile and so they were attempting to use their phones to write their assignments. While most students were happy using Word, few had previous experience of Powerpoint or Excel. And although a handful of the students were familiar with a VLE, none of the students felt confident to upload an assignment to Moodle. Developing the students' confidence to use the necessary platforms to prepare and submit their assignments took time, but it was helped by the trust that had been built between the students and the Academic Skills Tutors. The Tutors maintained the notion of Study Community being a safe space by showing the students how to use the short-term laptop lockers and guiding them through accessing the necessary software packages. They even created dummy submission boxes on the Study Community Moodle site to allow students to practise submitting their work.

Although the initial delivery of Study Community was rather more agile than planned, the results were pleasing. More than 50% of students attended at least 75% of the timetabled sessions; average marks increased across core modules, and academic misconduct referrals were halved to 800 in 2022-23. In addition, qualitative end of module student feedback overwhelmingly suggested the module had enabled students to develop belonging. Belonging developed through a sense of value:

> Study Community has boosted my confidence and supported me to study in a different way.
>
> The tutors have helped me to feel that I belong and they care about making sure I am ready to give my best to my assessments.
>
> The module has enabled me to feel a part of the University of Portsmouth community and has helped me to be successful in achieving my goals

And through self-efficacy:

> Study Community has encouraged me to develop my skills and has made it easier for me to adjust to life at Portsmouth.
>
> The tutors are really kind and help us to understand our assessments and feel more confident about being a student in a UK university.
>
> I have really enjoyed the Study Community seminars and without them, I'm not sure I would have been able to complete my coursework.

As with any new initiative, Study Community is constantly developing. The learning points from the first iteration were used to improve subsequent iterations. Alongside creating a directory of useful sources of individual and family support, Study Support now sets aside more time to support students to meet their domestic needs. And computer labs have been requested to allow for more hands-on practical experience of the digital expectations and actions required in studying at the University of Portsmouth.

Study Community is now in its third year and is delivered to students on multiple courses. We are looking forward to further developing and expanding the provision to benefit more of our international student community.

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2. Assessment and Feedback in a Digital Era

2.1 Changing the paradigm: rethinking assessment in the AI era

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Background

Since the launch of ChatGPT on 30 November 2022, a noticeable trend has emerged where students are increasingly using it or other AI tools to complete assignments and assessments. Faculty members in various teaching and learning settings shared concerns regarding the challenges associated with the potential of plagiarism, the accuracy and reliability of information generated by AI tools, and the possible grade inflation. Some faculty members also expressed a more optimistic outlook and argued that these tools could enhance students' learning experiences by providing quick access to vast amounts of information, encouraging independent research skills, and empowering students to engage with course material in more interactive and innovative ways.

In light of this debate, this case study documents an initiative in the design of a Level 7 postgraduate report assessment during autumn term 2023-24 academic year, involving 47 students in an accounting and finance subject. This initiative introduced the use of AI language generators in an assistive role, requiring students to incorporate AI-generated texts as appendices for reference in their submissions. Students were required to show the improvement from AI referenced contents in their submissions, to demonstrate their learning on the subject.

The primary objectives of this initiative were to address the following research questions (RQ):

RQ1: How can students be effectively guided to interact with AI systems, interpret, and analyse the results produced by these systems, thereby preparing them for their future workplace?

RQ2: How can the equity of students' learning experiences be ensured within the context of AI implementation?

RQ3: How can the use of AI-generated work as a reference be appropriately acknowledged to mitigate the risk of plagiarism?

By exploring these questions, the initiative aimed to shed light on the practical implementation of AI in education and its implications for student learning outcomes, equity and academic integrity. I developed this initiative with the guidance of the following policies and pedagogical theory.

Timely enough, QAA (2023), in its response to Department of Education consultation on generative artificial intelligence in education, stated its view on the role of generative AI in education evolving in the future. In the long term, AI will have transformative effects on education, with the widespread integration of AI tools presenting challenges in regulating their use in educational settings. As AI becomes increasingly prevalent in workplaces, education must prepare students for a future where human/AI collaboration is the norm. This shift raises concerns about defining plagiarism and academic misconduct to uphold the integrity of educational qualifications. Current approaches may quickly become outdated, prompting the need for a strategic shift in educational institutions to educate and train staff to support students in effectively using AI in learning. This shift should encompass initial training and ongoing professional development for educators.

In the same vein, based on the responses from more than 545 individuals and organisations, UK Government (2024) confirms that it will not be introducing AI legislation under this Parliament. However, legislation and mandatory requirements will follow in the long term, to address the risks of AI: "AI poses enormous opportunities for transforming productivity in the public sector." Since 2018, the UK has funded a £290 million package of AI skills and talent initiatives to promote accessibility of AI education and awareness nationwide, including establishing 24 AI Centres for Doctoral Training, collaborating with Innovate UK and the Alan Turing Institute to develop AI skills guidance, with plans to publish a final version and a full skills framework in spring 2024, while also investing in higher and further education to adapt the skills system to meet future needs prompted by AI advancements.

Mishra and Koehler (2006, p1029) formulated the Technological Pedagogical Content Knowledge (TPCK) framework, which highlights the intersection of (1) technological knowledge, (2) pedagogical knowledge, and (3) content knowledge in teaching, emphasising the importance of integrating these three types of knowledge for effective teaching with technology.

"TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones."

This case study follows the TPCK framework, to understand the effectiveness of teaching and learning, by instructing students to use generative AI technology in writing up their assignment.

Approach

This Level 7 report assessment requires the 47 students to propose sustainability initiatives for a listed company of their choice, of which the annual reports are publicly available with rich data. Students need to state the initiatives clearly, and to perform short-term and long-term financial analysis, budgeting and working capital risk assessments for the company. Regarding the use of generative AI, the following are the specific requirements:

> "You are required to use AI language generator (e.g. ChatGPT) as a research assistant where applicable to help you to contextualise the question and the possible draft report. However, any texts generated by any AI language generator in your research and analysis process are required to be submitted in an Appendix attached to your Report, which are not included in the word count nor being marked. You need to show the improvement in your final report, from the AI generated texts, to:
>
> 1. Include the page number of the referenced parts of the annual reports and other references that you used;
> 2. Summarise or paraphrase the AI generated texts to evidence your learning;
> 3. Correct the AI generated texts with reference to the academic references or the latest information that is missing from the AI used database.
> 4. Improve the expression, being more relevant to the question context with specific examples and the appropriate application of principles, standards or theories."

This report contributes to 60% of the overall assessment for this module, a topic in accounting and finance. The required word count is 2,000 words +/- 10%, excluding references and appendices.
In the lectures and workshops, students have been guided on using ChatGPT to get inspiration to answer similar questions. I provided examples of how to analyse AI-generated content, identify inaccuracies and irrelevant information, and to incorporate the module content to rewrite and improve the quality of the content. Considering this is the first year students are incorporating AI tools, varying levels of proficiency are expected due to differences in technological aptitude. As a result, the use of AI tools is not individually assessed in the marking criteria to avoid penalising students less adept in technology. Evaluation of referencing AI work is integrated into the general assessment of references and style, accounting for 10% of the total marks.

The above design of the report assessment instrument centres around the three research questions (RQs) outlined in this case study. To address RQ1, this assessment design conveys the learning-technology-by-design approach. The emphasis is placed on learning by doing, and less so on overt lecturing and traditional teaching. Design is learned by becoming a practitioner (of generative AI), albeit for the duration of the course, not merely by learning about practice (Mishra and Koehler, 2006). To address RQ2 and RQ3, students are ALL required to use AI language generator (such as ChatGPT) with guidance and support provided in class, which hypothetically allows all students to have an equitable learning experience in using AI technology, and it controls the plagiarism risks, such as students using AI but not reporting it. It is also hypothesised that students would try to explore the benefits of generative AI, in terms of interactive learning and ongoing feedback to improve learning (Baidoo-Anu and Ansah, 2023).

Outcomes

Surprisingly, only 25.53% (12 out of 47) submissions attached an appendix reporting the use of generative AI as required. Among these 12 submissions, only five of them documented detailed and relevant prompts used in the AI tools. Interestingly, there was one submission that clearly stated that "I have tried not to use the AI tools for this assignment, as I find the lecture and workshop materials are more relevant to the assignment."

Table 1. Descriptive statistics of the assessment results

	Report on using AI	No report on using AI	Detailed report on using AI
Average Mark	67.50	64.77	68.60
Median Mark	70	66	71
Mode Mark	70	68	71
Standard Deviation	5.76	6.52	6.02
Minimum Mark	56	50	58
Maximum Mark	75	75	73
Number of Students	12	35	5

Following the guidance of the TPCK framework, the key findings are as follows.

Relatively weak technological knowledge (TK) of the students on how to use generative AI to facilitate the learning and writing is identified. Contrary to the hypothesis, the majority of the students focused on applying financial analytical skills learnt on the module to make their work more relevant to the assessment requirements. For module convenors, if the assessment questions are designed in a manner that (1) condition to a specific context (such as a listed company of student's choice), (2) directly relate to the skills taught in the module (such as financial analysis), and (3) frame within a proposed scenario (such as creating a budget for the upcoming year with a specific sales growth rate), students may discover limited opportunities to use generative AI for assistance.

Students are also inexperienced in breaking down the tasks to seek help from AI assistants. As an educator, I am also on the learning curve with the students, to further develop the Pedagogical Knowledge (PK) with the students, in view of the weakness identified above. Students who are more aware of how to use AI tools to facilitate their studies (those who reported on using AI and those who provided detailed report on using AI) in general get higher marks than their peers. This is a good indicator in terms of AI tools play a positive role in facilitating students' Content Knowledge (CK) acquisition.

The findings revealed a limited adoption of generative AI among students, highlighting the necessity for advancing students' technological knowledge and educators' pedagogical methods to effectively integrate AI into learning environments, ultimately promoting equitable learning experiences and preparing students for the demands of future workplaces. Conversely, the findings inspire confidence in the module convenor by suggesting that the impact of AI can be managed through assessment design to mitigate the risks that students would be heavily reliant on generative AI. Notably, students who proficiently used AI tools achieved higher grades, signalling the potential advantages of AI in enriching content knowledge acquisition.

A proactive action plan is imperative to address these identified gaps and facilitate a more balanced integration of AI tools in education. In the forthcoming academic year, I would integrate more of the assistive role of AI tools in teaching to prompt students to actively engage with them, fostering their familiarity and proficiency, thereby enhancing their learning experience in this AI era. Additionally, the existing assessment design will be refined to enhance students' accountability in acknowledging the use of AI through a minor allocation of marks for referencing AI work. Moreover, there is a critical need to enhance pedagogical knowledge to collaborate with higher education educators effectively, thereby integrating AI tools into the curriculum. Providing continuous professional development opportunities for educators to stay updated on AI advancements and best practices in educational technology is essential for ongoing progress.

Looking ahead, as AI applications continue to proliferate, there is a compelling need to reexamine not just assessment design methodologies but also the learning outcomes at all educational levels to align with the evolving landscape influenced by artificial intelligence.

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2.2 Team-based learning in psychology – from online to hybrid approaches

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Background context

Since the Covid-19 pandemic, higher education institutions are increasingly embracing hybrid and online courses (Times Higher Education, 2023). Existing teaching approaches can be adapted for these modes of delivery, but we require evidence to establish their effectiveness. Furthermore, it is important that we make evidence-based design decisions when adapting these approaches.

Prior to the Covid-19 pandemic, we had successfully introduced in-person team-based learning (TBL) on two on-campus BSc Psychology modules: Clinical Psychology (Level 5) and Clinical Neurodevelopmental Science (CNS; Level 6) at King's College London. TBL is an innovative, evidence-based educational method that promotes active learning and collaboration among students (Michaelsen and Sweet, 2008). TBL takes a structured flipped learning approach in which students study topic content prior to class and are then tested on this content and required to engage in application activities in class.

We chose to use TBL because 1) it develops students' higher-order skills including analysis and application, which are both vital skills for future clinical psychologists (Michaelsen and Sweet, 2008); 2) it is well-suited to aid students in improving their reflective thinking abilities, a skill that is central to both modules (Hrynchak and Batty, 2012); and 3) the approach aligns with our teaching ethos that education should be student-led to encourage independent thought (Liu, Wang and Ryan, 2016).

However, the pandemic necessitated a shift to first delivering TBL sessions solely online and then to a hybrid format. This switch in format introduced several challenges that required pedagogical innovation, including: 1) ensuring the online approach is accessible; 2) reworking readiness assurance questions intended for closed book conditions which cannot be guaranteed when students are working remotely; 3) creating a group work experience akin to a TBL classroom; and 4) encouraging maximum engagement from all students. These challenges were further compounded by the fact that, before the Covid pandemic, there were scarce resources to inform online implementation of TBL. This case study discusses our adaptation of TBL for online and hybrid delivery and the theoretical rationale behind our design decisions.

Approach

Actions taken

TBL involves a three-part sequenced set of learning activities: a preparation phase, a readiness assurance phase, and an application phase. All phases required adaption for online and hybrid delivery (Figure 1). The adaptions were made by the authors (JF and FC) and implemented by the authors with Graduate Teaching Assistant support. There were 184 students on Clinical Psychology and 53 students on CNS during online delivery and 143 students in Clinical Psychology and 51 students in CNS during hybrid delivery.

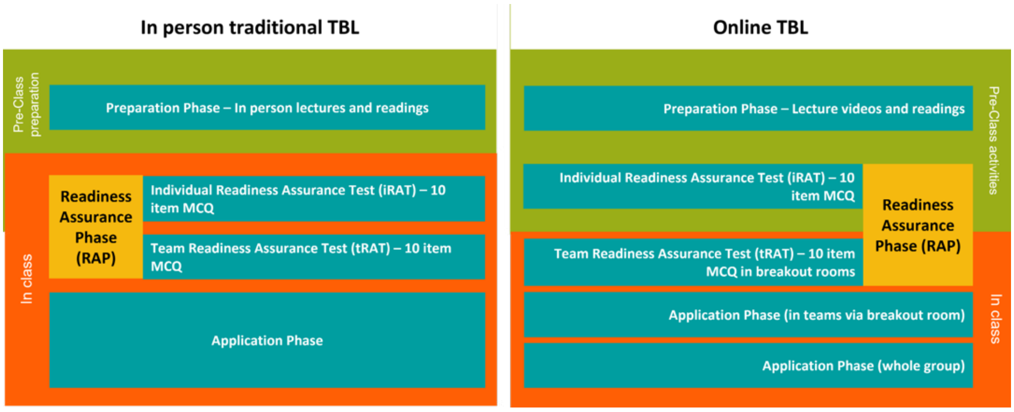

Figure 1. Adapting TBL for online delivery. The iRAT is shifted to pre-class activities and the application phase is split into a team discussion phase via breakout rooms and a whole group discussion phase. Hybrid delivery follows the in-person approach coupled with MS Teams meeting links and laptops.

Preparation phase

In this phase students learn new information by completing activities such as readings, lectures, or other e-learning assignments. Activities cover core knowledge and concepts required to engage in the later application phase. Importantly, activities are all completed before the live TBL session.

The main preparation resources on both modules were in-person lectures. With campus closed, these needed to be made accessible online. For each lecture topic we created a series of short videos. We condensed material that was ordinarily taught in a 1.5-hour lecture slot into three videos of approximately 20 minutes each. This duration was selected because more concise video has been associated with better student engagement (Wankat, 2002). Videos were hosted on our virtual learning environment (VLE) and students were able to access them asynchronously. This is advantageous for students in different time zones and also those with learning disabilities as it allows them to work through the materials at their own pace.

The videos were created using narrated PowerPoint in an accessible template to ensure they were appropriate for all learners. PowerPoint files were uploaded alongside videos so that students could go through the slides and make notes. Additionally, we provided transcripts to further improve the accessibility and inclusivity of the materials, thus addressing the challenge of ensuring accessibility. These asynchronous online video resources were so well received we retained them during hybrid-delivery. Developing these resources was the most labour-intensive aspect of the project, requiring approximately three to five days of work per topic.

Readiness assurance phase

To hold students accountable and ensure completion of the preparation phase, the live session begins with the readiness assurance phase (RAP) in which students complete two multiple-choice tests. First, they complete an individual readiness assurance test (iRAT). This is a 5-20 item multiple choice question (MCQ) test designed to test understanding of the preparation materials. Students then take the same test as a group, the team readiness assurance test (tRAT). Teams log their answers on immediate feedback assessment technique (IF-AT) scratch cards, where a star indicates the correct answer (Figure 2). The scratch cards allow for multiple attempts and provide groups with immediate feedback. This phase ensures students have the knowledge and understanding necessary to engage in the application phase.

In traditional TBL, both phases of the RAP are conducted in class. However, for online delivery we required that the iRAT be completed before the synchronous session. This allowed students greater flexibility on when to conduct the quiz and to make better use of class time. The quizzes were hosted on our VLE.

RAP questions are designed to test understanding and recall of the preparation material. During in-class TBL, the iRAT is taken under closed-book exam conditions. However, in online and hybrid classes, closed-book conditions cannot be reliably replicated. Hence, we moved to an open-book format with the following two changes. First, we introduced a time-limit of 10 minutes. Second, we reformulated the questions so that they assessed understanding and application rather than purely recall (the higher levels of Blooms Taxonomy). These changes disincentivised the use and reliance of search engines and notes to answer the questions. In both online and hybrid delivery of TBL, all students complete the iRAT within the 24 hours before the live session. The iRAT is the last asynchronous activity before the synchronous session begins.

The synchronous session begins with an introduction from the facilitators, outlining the lesson plan and objectives. Students are then divided into their groups to begin the tRAT. In online delivery, groups were assigned to MS Teams breakout rooms. In hybrid delivery, teams form around tables with remote learners joining via MS Teams on a laptop with a specific link for each team.

To replicate the IF-AT scratch cards, we used the ‘adaptive mode’ in Moodle quizzes which allows multiple attempts at the question before moving on to the next question (Figure 2). One student is instructed to share their screen and log the answers during the team discussion. In online delivery, the facilitators ‘drop in’ on the breakout rooms to check how teams are doing and clarify any content.

Facilitators also move teams onto the application exercise phase. The redevelopment of this phase took approximately one day per topic.

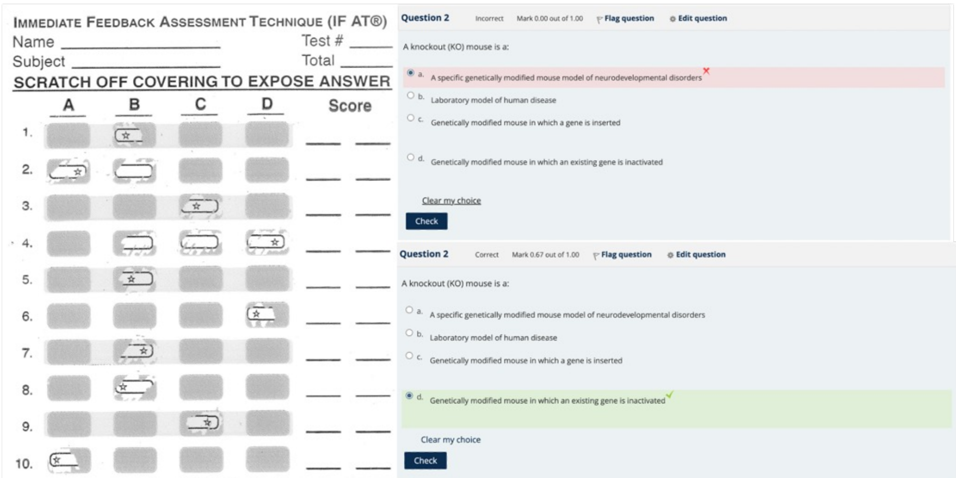

Figure 2. Left: the Immediate Feedback Assessment Technique (IF-AT) scratch card. Teams get multiple attempts to choose the correct answer, indicated by a star. Right: Moodle quiz in adaptative mode providing immediate feedback.

Application phase

In this phase, students work in teams to apply course content to a series of problems, called application exercises. Problems are based on real-world scenarios and require course content to choose a best solution out of options provided. Each problem is presented and discussed sequentially. Teams simultaneously report their answer using laminated response cards and the teacher facilitates a whole class discussion to explore the possible answers before moving to the next problem. Each problem typically has multiple potential correct answers to ensure engaging discussion.

In online delivery, students stay in their breakout rooms and move onto the application exercises once they have finished the RAP. The questions and available answers are displayed in a PowerPoint presentation that one team member screen-shares. The team discusses each question and notes down their answers. All teams then join the main MS Teams link where the facilitator goes through each application exercise question, asking the teams to simultaneously report their answers. As in standard TBL, the facilitator then leads a group discussion before moving to the next application exercise. Therefore, we created a group working experience that mirrors the in-person TBL session. Furthermore, the facilitator encouraged responses from all teams and encouraged students to respond either verbally or via the chat. We noted that this inclusive approach increased engagement. In hybrid delivery, we followed the traditional procedure with additional use of MS Teams meeting links and laptops to allow remote students to engage better with the classroom discussions. The redevelopment of this phase was mostly administrative and took approximately two hours per topic.

Outcomes

Main findings

The main outcome of this work was that TBL in both online and hybrid format was well received and did not negatively impact grade performance. Students' responses to both online and hybrid TBL were very positive. Responses on the feedback survey (n=25) indicated that 100% of respondents agreed or strongly agreed with the statements *"I am satisfied with the resources provided", "The workshops are a useful learning experience", "The workshops are interesting and engaging" and "Overall, I am satisfied with the workshops".* Students' qualitative responses to the sessions were also positive (Box 1).

Box 1. Student feedback collected from end of module feedback survey.

Student feedback

> "I think they [the workshops] were incredibly eye-opening and insightful and I truly appreciate all the thought and effort put into planning the experience for us."

> "I really liked the workshops – I think they were a fantastic way of doing online classes because they were something a bit different to all of the other classes we've had. I could tell that a lot of thought has been put into how to make this module engaging".

On both modules, overall EvaSys scores improved from their pre-pandemic levels and this improvement was maintained during hybrid delivery (Figure 3).

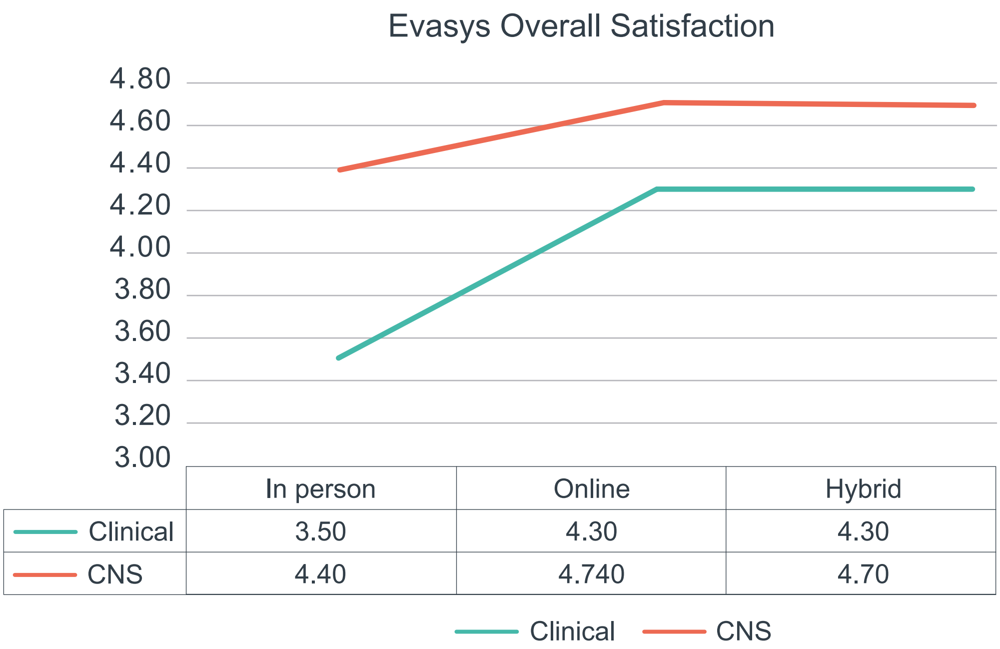

Figure 3. Evasys overall satisfaction

Measures of academic performance also indicated that the move to online and hybrid delivery did not negatively impact grades. On Clinical Psychology the average grade of the relevant assignment increased from 60.5% (pre-pandemic) to 64% during online delivery. For unrelated reasons the assignment changed format during the hybrid delivery year, therefore comparisons are not valid. On CNS the relevant assignment increased from a pre-pandemic 69.50% to 70.2% during online delivery and 71% for hybrid delivery. While these changes are modest, they indicate that online and hybrid delivery did not impact negatively on grades.

Key messages and transferability

The key message from this work is that TBL can be adapted for online and hybrid delivery and that it is received well by students with no negative impact on grades. These results indicate that, with careful consideration, in-person flipped learning teaching approaches may be successfully adapted for online and hybrid delivery. Given the rise in flexible learning, these results indicate that TBL can be successfully used in hybrid and online formats.

Next steps

Future work should establish if student satisfaction and grade performance can be maintained while scaling up online and hybrid delivery. Furthermore, a more detailed analysis of student feedback (such as via focus groups) is warranted to identify specific aspects of online and hybrid formats that are most beneficial and challenging. This can inform further refinements to the approach.

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2.3 Developing feedback literacy for first year students using a peer review exercise

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Background

The National Student Survey (NSS) highlights that the Assessment and Feedback theme scored the lowest satisfaction (average around 66%) over the last five years for undergraduate students studying in the School of Biosciences at the University of Kent. The 2023 NSS data shows that only 57% of students indicated that feedback had helped them improve their work. We know that many of the students within the School of Biosciences and across the sector (Evans and Waring, 2011) do not engage with feedback and hence miss out on an opportunity to improve their work (Table 1). To respond to this specific need, we designed a formative first year peer review assessment using the Turnitin® PeerMark resource that aimed to offer students a better understanding of what feedback is at higher education and how it can be used it to improve their work. This initiative recognises the diversity of our student intake (a wide range of different backgrounds and Level 3 qualifications) to ensure that all students can acquire the skills around feedback literacy, which are necessary in order for them to reach their full potential while studying at university. Within STEM subjects, active learning has been found to enhance student engagement and performance in assessment (Freeman et al, 2014).

Table 1. Responses from students when asked “When your assessment is marked do you...”. Students were able to select more than one answer

Answer (n=111)	Responses to the question (%)
Only look at the mark on KentVision	15
Only look at the mark on Moodle	50
Look at the mark and individual feedback on Moodle	50
Use the feedback when writing your next assignment	**31**
Attend a lecture discussing group feedback if offered	28
Do not look at marks or feedback	1
Number of Students	12

Peer review is defined as "an arrangement whereby students evaluate and make judgements about the work of their peers and construct a written feedback commentary" (Walker, 2014). Student curiosity and learning can be stimulated by watching others and seeing examples of their work. A structured novel approach was developed to integrate peer review with subsequent revision of work and then formative marking and feedback from the academic adviser. This approach built on the feedback literacy model (Carless and Boud, 2018). A student seeing the work of others can gain unique insights into the different approaches that can be used to answer a question or problem, including content, style and presentation. Giving feedback to others is challenging and requires a working knowledge of the marking criteria to identify areas of strength and weakness in the context of the assessment. This helps students to gain a better understanding of the value of feedback and how work is assessed at university, together with the ability to critically judge their own work and that of others. Therefore, students are better prepared and committed to engage with feedback once they receive it and to use it to their advantage for future assessments.

Approach

The "Understanding Feedback" assessment was delivered through the Division of Natural Sciences' academic advising programme, which offers all students academic and personal development during their time at university and is embedded into a dedicated academic advising module. The formative non-credit bearing assessment ran over a 12-week period during the autumn term and was split into four parts (Figure 1 and Table 2). We recognised the need for students to engage with understanding feedback from the outset of their degree, therefore integrating this assessment in the first term enables first year students to actively learn and participate in the process. It gives students the tools to maximise the benefits of feedback at the earliest opportunity and actively supports the diversity of a student's learning needs. The assessment was strategically designed to enable students to realise the importance of feedback and that in higher education it can come in many forms; not just comments written on their work by the marker. The overall learning outcomes for this assessment were: demonstrating to students how to benefit from feedback, make judgements on work created by themselves and their peers, reflection and managing effect of receiving feedback (Figure 1), and finally taking action. All of these form the fundamentals of feedback literacy (Carless and Boud, 2018). Engagement of academic staff was paramount for the successful dissemination of the assessment to students; all academic staff were supported throughout the assessment through clear instructions provided via the academic advising staff updating the Moodle page and email communication. PowerPoint presentations, PDF exemplars and templates were created for staff to use in tutorials to generate a consistent structure which positively influenced the participation of all academic staff in the assessment.

Figure 1. Graphical representation of the first-year student peer review exercise

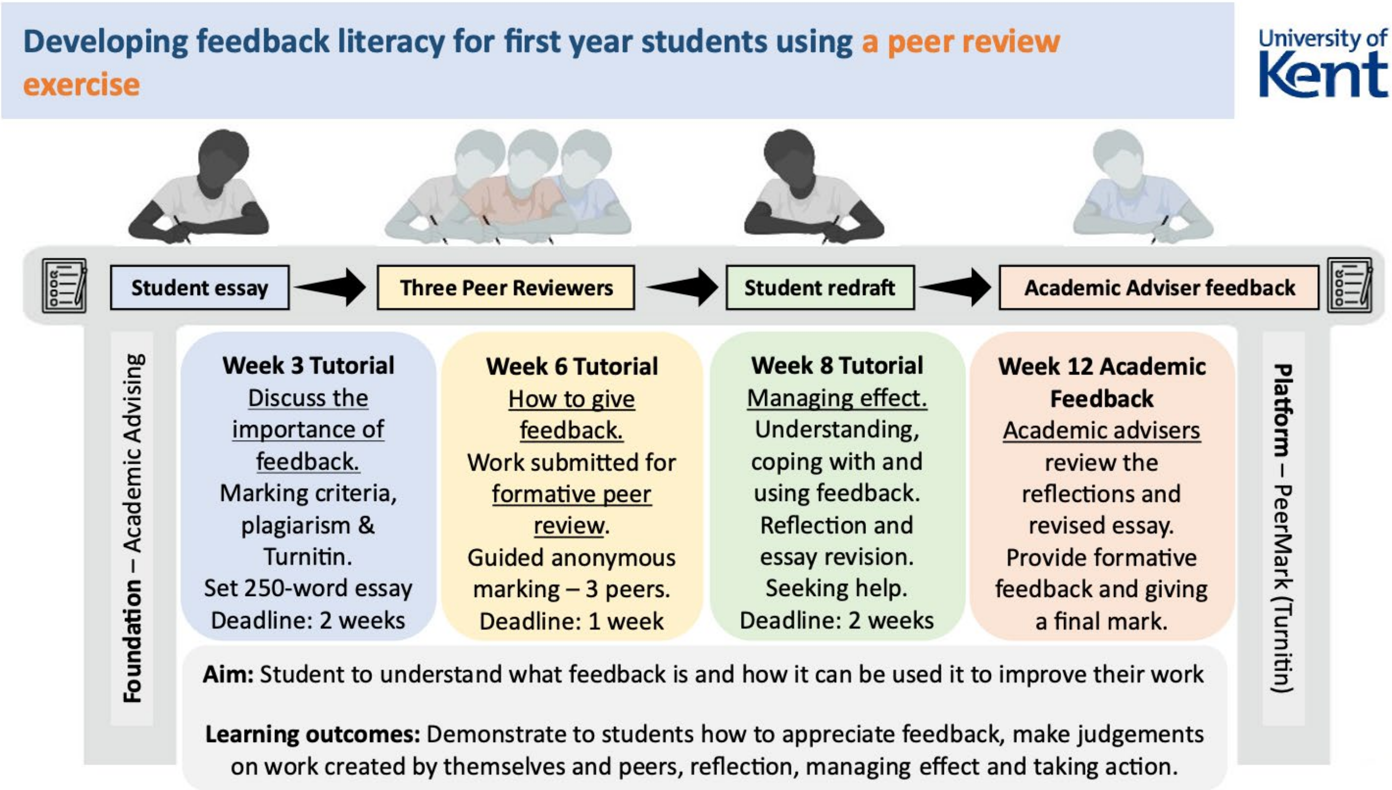

Table 2. Timeline, engagement type, action and outcomes for the first-year peer review exercise

Part	Timing (week of term)	Engagement type	Action	Outcome
1	3	Tutorial	Discussion of importance of feedback, formative assessment set	Understanding of what feedback is at higher education, how to access it on VLE
2	5	Turnitin	Students submit their formative assessment	Understanding on how to upload work and identify similarity scores
		Turnitin PeerMark	Release of the peer review	Students review three other peers' work anonymously using standard marking criteria
3	6	Turnitin	Students receive their peer review feedback	Students review their feedback from peers and understand where to find feedback in Turnitin
	8	Tutorial	Discussion on managing affect, revision of the formative assessment set	Students gain an understanding how to cope and use feedback to improve their work. Opportunity to revise and improve their work.
4	10	Turnitin	Students submit their formative assessment	Submit their revised assessment for feedback from their academic adviser.
	12	Turnitin	Academic advisers release formative feedback based on if the assessment was summative.	Students gain an experience and understanding of academic marking at higher education prior to a summative assessment.

In the third week of the autumn term an initial group tutorial was led by the academic skills development coordinator, who discussed the importance of feedback with the students and set the task where students were required to write a 250-word essay answering a specific bioscience-related question. Students were offered guidance on how to incorporate figures, the textbooks to use to find relevant information, as well as being introduced to the School's standardised marking criteria so that they understood how their work would be judged and marked. Students were instructed on how to submit their essays to PeerMark (Turnitin®). PeerMark is high-quality resource offering an innovative and imaginative way to enable students to see the work of others and give feedback anonymously. Overall, 96% of the student cohort (n=220) in the School of Biosciences submitted the initial essay. Furthermore, in a follow-up survey, 70% of students found writing the essay a useful task.

Once all students had submitted their essay, the peer review was opened, in which each student was given the opportunity to review three of their peers' pieces of work and offer constructive feedback on how the essay could be improved. This approach complements findings in the literature that feedback received from multiple peers has been shown to improve the quality of students' revised work when compared to feedback solely from either a single academic or a single peer (Cho and MacArthur, 2010). Peer reviewing was guided using a structured approach (Table 3) along with standard marking criteria for the stage of study; each review was carried out anonymously where peer reviewers were chosen at random by PeerMark and 89% of students in the cohort participated with the peer review process. In the student survey, students indicated that the following aspects of the peer review process were useful: (i) comparing their work to others (70%), (ii) giving feedback to their peers (80%) and (iii) obtaining feedback from their peers (70%).

Table 3. Three questions peer-reviewers were asked to comment on when reviewing fellow students' work. All answered were open comment box formats set at a minimum of 40 words

Review questions	Guided feedback
1	How good is the presentation? Has the work been well presented? Are there any recommendations you can make for improvement (such as use of paragraphs, subheadings, spelling and punctuation errors, quality of layout and ease of navigation, visual appeal, etc)?
2	Has a diagram been included? If so, how useful was it to you as a reader? Are there things about the diagram you particularly like? Are there things you feel could be improved (such as labelling, legend or title, quality of drawing, etc)?
3	How well does the essay address the question? For example, does it demonstrate a good level of understanding? Does in contain all the necessary information (or are there things missing)? Is it written clearly and is easy to understand? Does it contain adequate detail? Does it contain any irrelevant or unnecessary information?

Post peer review, students were offered time to reflect on the comments made by their peers. Students often find engagement with feedback challenging, especially when the feedback is perceived as negative. Therefore, during a tutorial session in the eighth week of term, students discussed how best to manage the effect of receiving feedback, including how to deal with the negative emotions (often affecting mental health and resilience) that can result from receiving critical feedback. Wider discussions at this time also included how peer review is a normal process in science and used to enhance quality of research grants, research papers, etc, and therefore we all need to deal with challenging feedback at times. Students were then advised on how to reflect on and use feedback to improve their work. Students were encouraged to take action by making a list of modifications they could use to submit a revised essay in the tenth week of term and 83% of the student cohort submitted a revised essay to Turnitin®. Interestingly, 80% of students indicated in the student survey that they found the feedback from the peer review process useful for revising their essays, indicating the assessment was an excellent tool for students to obtain feedback.

The revised essays were then reviewed by the student's academic adviser. Academics offered formative feedback and an overall numerical mark in-line with the marking criteria by the end of term (Week 12), enabling the students to engage with and learn from feedback before the first summative assessment in their programme of study. By embedding this assessment into the academic advising structure, it ensures that all academic staff are involved in talking to their tutees about the importance of feedback and what good feedback should look like. This is likely to have a positive influence on the practice of all academic colleagues. Furthermore, most staff were not previously aware of the PeerMark software in Turnitin®. 80% of students reported that the feedback obtained from their academic adviser on the revised essay was extremely useful, this demonstrates a positive engagement of staff with improving student learning at a critical stage in the student's development.

Outcomes

The Understanding Feedback Assessment described here offers pedagogical innovation by encouraging students to be more self-critical of their work and demonstrates a positive impact on student learning by making students more aware of the opportunities around them to gain inspiration and ideas on how to improve their work. It has been found to provide an enriching student experience and this would not have been possible for such a large group without exploring new technologies. The former was specifically noted in the feedback from academic advisers *"Most of my tutees engaged really well with this assessment and found it interesting…"* and *"…this assessment is very interesting especially for stage 1 students, and it definitively gave a really good idea of how feedback works at HE (all new for them) …"*. Enhanced student learning has been observed in students who actively engage with peer reviewing, where students often find feedback from peers more accessible (Falchikov, 2013) and academic advisers indicated that "…students felt it was a useful assessment. Good timings for this. Great to not only receive feedback but to have the opportunity to respond to it and improve the essay".

The success of this assessment as judged by the high level of student engagement and positive feedback has led to it being disseminated within other Schools in the Division of Natural Sciences. Although the student work set in the School of Biosciences was initially a short essay, it has evolved to incorporate data analysis. This demonstrated that the format will also work for other types of assessment, such as practical reports and problem-solving assessments, thereby allowing flexibility for any programme. It has also been introduced into a divisional foundation year, thereby enabling the students to enhance their feedback literacy skills at earlier entry points in their degree.

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2.4 Advanced Response Systems in Mathematics Education

Innovating Classroom Assessment and Feedback

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Background

Traditional methods of implementing formative assessments have not proven effective in gathering the comprehensive information required for the continuous monitoring and evaluation of all students' progress (Black et al., 2004). This limitation exposed the critical need for innovative approaches that support learning by providing timely feedback to inform future learning practices (Black & and Wiliam, 2010). In response to this challenge, Classroom Response Systems (CRSs) have emerged as a digital and more interactive platform for formative assessment (Shon & and Smith, 2011; Schell et al., 2013; Mayhew et al., 2020). Also known as student or audience response systems, CRSs can improve student engagement and facilitate real-time feedback (Caldwell, 2007; Gauci et al., 2009). Educators can efficiently adapt their teaching strategies based on evidence collected by the CRS and address students' needs (Shulman, 2005). Moreover, these systems allow students to share their answers anonymously, encouraging participation (Freeman et al., 2006). They also increase collaboration in problem-solving activities, promoting social interactions in the classroom (Masikunis et al., 2009).

In this paper, we discuss two case studies that explore the potential of advanced Classroom Response Systems for assessment and feedback within the Maths for Social Sciences module at King's Foundation – a one-year module designed for international students wishing to pursue undergraduate degrees at King's College London or other UK universities. The case studies presented use simple activities to ensure clarity and accessibility, without imposing unnecessary mathematical complexity. Our aim is to enhance classroom practices by integrating CRSs to support formative assessment, ensure timely feedback and promote active engagement. We chose the free, web-based platform Desmos Classroom for its capabilities to efficiently collect data, facilitate analysis and streamline the delivery of feedback.

Instructors can create interactive activities using the Desmos Classroom website designed for teachers (https://teacher.desmos.com/). Students join an activity through a shared link or unique code, with no need to create an account or sign in. Alternatively, instructors can assign activities to a specific group of students. Students then access all the assigned activities for that group at their convenience using the student Desmos Classroom website (https://student.desmos.com/).

Instructors benefit from a wide range of preexisting Desmos Classroom activities that can be easily copied and edited. Each screen in an activity consists of items such as text notes, free-response boxes, maths response boxes, multiple-choice questions, graphs, media and more. Using the teacher dashboard, instructors monitor student answers in real time, control which screens students can access, pause the activity, and synchronise students to a specific screen. Instructors also have the option to anonymise student names. The student view is used to present the activity, while the teacher view is used to share student answers, provide feedback, and create on-the-fly slides with snapshots of students' answers.

Approach

This research was carried out from November 2021 to November 2023 and involved three distinct cohorts: 2021-/22, 2022-/23 and 2023-/2024. Each cohort consisted of approximately eighty-five85 students aged between 17 and 19. Participants were divided into five seminar groups, each comprising 15-18 students from various nationalities and educational backgrounds. Some students faced language difficulties, and many were accustomed to a more passive classroom experience. This diversity also extended to wide differences in maths ability and academic commitment. Each interactive activity required took one person between five and thirty minutes to set up, depending on the complexity of the task and the specific features being used.

The Maths for Social Science module follows a flipped learning approach, requiring students to complete asynchronous tasks before attending weekly seminars. Given varying levels of prior knowledge, seminars begin with a series of questions to gauge students' understanding. This allows instructors to build on their existing knowledge and adjust the instruction accordingly. To illustrate this method, we examine four tasks designed to assess students' understanding of statistical measures of location. Student names were anonymised using the teacher dashboard, so they felt comfortable answering the questions. In the first task, students were asked to identify the mode of a data set through a multiple-choice question. As most students answered the question correctly, the class was encouraged to reflect on the insights offered by the mode and provide examples where it serves as a useful measure of location.

The second task focused on calculating the mean for a small data set. In this screen, immediate feedback was incorporated into the maths response box using the Desmos computation layer functionality. This targeted feedback helped students develop error detection skills and encouraged self-assessment. After completing the task, students accessed a hidden screen containing the solution. The next task tested whether students were able to find the median for the same data set. Anticipating that some might overlook the need to order the data set, specific feedback reminded students if they entered the middle value without ordering the values.

After revealing the solution screen, students were prompted to reflect on how the method would be adapted for determining quartiles instead of the median. In the final task, students discussed a question in pairs and were asked to explain their reasoning. Student responses were shared anonymously to encourage participation and promote different problem-solving approaches. Students found reassurance in comparing their answers with those of their classmates, realising they were not alone in their thinking. The various answers were used to start a guided discussion, allowing students to examine each response.

To address students' difficulty in connecting mathematical ideas and their graphical representation, we used Desmos Classroom activities to help them visualise and explore abstract concepts. In our second case study, we assessed students' understanding of the equation of a straight line through five activities designed by Natalie Vernon from Mathematics Education and Innovation (MEI). In the first activity, students were asked to sketch a straight line with a positive gradient passing through the point (0,2). The platform enabled them to quickly experiment, leading to various answers, with approximately half of the class sketching lines meeting the criteria. The responses with the correct gradient but missing the intersection point or featuring the horizontal line y=2 were selected and examined to address students' misconceptions. In the second activity, students examined six graphs passing through the point (0,2) and selected those with a positive gradient, explaining their choices. This question revealed the different strategies employed by the students to identify graphs with positive gradients, demonstrating their clear understanding and eliminating the need for further discussion.

In the next activity, students had to explain in free text the effects of changing the gradient from -0.5 to 2 in the graph of a linear equation. While most students understood that the y-intercept would remain the same, their answers lacked clarity regarding how the graph would change. This revealed the need to enhance their understanding of how the coefficients in a linear equation affect its graph. In the following activity, students manipulated a point on the graph to obtain a line with a specified gradient, providing a hands-on opportunity to investigate the connection between the gradient of a line and its points. A significant number of students answered incorrectly. So, the different graphs were examined to reinforce students' understanding of the gradient as the change in the y-coordinates relative to the change in the x-coordinates of any two points on the line.

The final task involved a card sorting activity where students matched the graphs of lines with their respective equations, applying knowledge from the previous tasks. By working in groups, students practiced the vocabulary and concepts they had learnt. This approach promoted meaningful discussions among the students and helped assess their understanding. At the end of the seminar, students were asked to share three key concepts from the session via the CRS. The responses were consistent, with most students mentioning words such as gradient, slope, and intercept. It was encouraging to observe that these fundamental concepts had been effectively conveyed and retained by the students.

Outcomes

The use of a Classroom Response System (CRS) has enabled the effective implementation of formative assessments across three cohorts. The system proved appropriate for gathering accurate evidence of the abilities of all students in the classroom. This real-time data supported the instructor to make well-informed instructional decisions and tailor seminars to meet the specific needs of individual students. The variety of assessment methods provided valuable insights into student comprehension across a spectrum of learning objectives. The immediate feedback enhanced students' awareness of their strengths and weaknesses, with students reporting that the CRS tasks helped them identify previously unclear concepts and address misunderstandings. A student, for instance, noted that these activities enabled them to work through mistakes and achieve a better understanding of statistical measures of location.

The interactive elements incorporated into formative assessments captured students' attention and enriched the overall classroom experience, as evidenced by students' comments that the interactive slides kept them engaged. The manipulation of points and lines enabled students to make connections between graphical representations and abstract mathematical concepts. The CRS promoted the participation of all students, including those less confident, with one student remarking that they felt safe answering questions. The instructor observed that it encouraged students' active involvement with the learning process, ensuring that every student had a voice and a role in the classroom.

The flexibility of the system to accommodate different learning paces helped the instructor to manage classes with unevenly distributed abilities. It facilitated collaborative activities and peer interactions, promoting a deeper understanding of the material. Notably, the CRS increased student engagement in the assessment process by creating opportunities for self-reflection, peer review and constructive debate. Students noted that the activities were enjoyable and fun, one even described the seminars as "fantastic".

To effectively implement formative assessments, a systematic approach was needed to ensure the usefulness of the data collected by the CRS. This involved establishing clear learning outcomes and carefully selecting relevant activities. Potential student responses and questions were anticipated in preparation for on-the-fly instruction and immediate feedback. In the classroom, the instructor not only monitored student work but also strategically emphasised solutions supporting key mathematical ideas to achieve the learning outcomes. Additionally, they identified connections among student answers to promote purposeful discussions. As a result, the deliberate actions of the instructor and active student engagement contributed to create a dynamic and stimulating learning environment.

By reducing the social pressure associated with making mistakes in front of their peers, Classroom Response Systems provide a safe environment for students to learn without fear of intimidation or embarrassment. To further develop this work, we intend to refine the feedback mechanisms and the instructional strategies to promote students' responses as valuable learning resources.

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3. Authentic Assessment

3.1 Reflecting Industry through Assessment

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This case study will discuss how an authentic assessment was undertaken with students being the interviewer rather than the interviewee, to reflect a real-life scenario between clients and advisors within the financial planning industry. The study will outline the process followed to make the assessment unique while also aligning it to the learning outcomes. The benefits to the students and unit teaching team will be discussed, focusing not only on the outcomes achieved in relation to the grades, but also the additional employability skills students were able to obtain through the assessment process. The challenges faced with this form of assessment will conclude the case study, along with next steps for the future development of this assessment.

Background

This case study focuses on a Level 6 unit, Advanced Financial Planning, and the importance of reflecting industry while enhancing the skills of the students that are relevant to industry roles. The unit had been redesigned following a curriculum review and therefore gave an opportunity to provide students with an element of assessment that was different to the other units at Level 6 and further enhanced their employability skills. The challenge posed was how could an element of assessment be created that was relevant, unique and not an exam but fulfilled the specific five-unit learning outcomes? It was identified that two of the main skills that were vital to the success of being a Financial Adviser were excellent verbal communication and active listening (National Careers Service, 2024). While it is possible to assess communication through a presentation, the challenge was ‘how would we be able to assess listening?’ It was therefore decided that we would have an interview roleplay as an assessment but instead of taking a traditional route of interviewing students, we flipped this around so that the students would be the interviewer rather than the interviewee. Listening and having an appreciation of the other person’s perspective is a skill that prepares students for real life after university. Taking on the role of the interviewer meant that students needed to listen, focus, think on their feet, and react appropriately to the responses of the person they were interviewing (Clapman, 2020). This interview technique is supported by Manzoor et al (2012) as, within the medical field, roleplays are viewed by students as an effective learning method and are an invaluable way of imparting knowledge, attitudes and skills in students.

Approach

A total of 27 students were provided with a brief of their clients to give a true representation of the financial planning industry. The student’s task for the interview was to undertake an initial meeting with their clients, after first receiving their client’s initial questionnaire to understand what their aims and objectives were for their future. The brief omitted the information we wanted the students to uncover during the interview. After the interview the students would be provided with the information they should have found out. This was used to form the second element of assessment, which required them to produce a comprehensive financial plan for their client.

Students received the brief in week one of the unit, with the interview planned to take place in week five. Over the course of the unit, one tutorial each week was then dedicated to providing students with the skills they would need to perform well in their interview. These sessions included activities on active listening interviewing techniques; interview questions; discussions on open and closed questions and time to practice.

As well as ensuring that the students were prepared, preparation also needed to be given to the tutors who were undertaking the role of the clients in the role play. Tutors were provided with the full brief that students would be receiving after the interview and a meeting was held with all tutors to provide clarity on who they were and the answers they should be giving to the students. It was impossible to script the whole interview, but questions that may be asked were discussed so that the answers from each interview would be similar. In the academic year 2022-23, four members of staff were used in the role of the clients and in the current academic year 2023-24, six members of staff were used. This change was implemented to ensure that more staff were exposed to this assessment type.

Students were asked to choose their interview slot in week three for a time in week five. Allowing students to choose their own time meant they were able to work around their schedule and ensured that we had a high level of engagement. Slots were created using existing lecture and tutorial times for the unit and the hours before and after those to align with other commitments students may have.

For the actual interview, students were asked to dress smartly, as would be expected from a Financial Advisor in such a situation, and bring with them one sheet of A4 with prepared questions. Having notes available meant that we knew the student was prepared. However, as stated by Neco jobs (2023), it also ensures that the students have organised their thoughts and have a calm mind before the interview, which would enhance their performance. Each interview slot was 20 minutes, which allowed time to enter the room, a 10-minute interview and then for the marks to be awarded before the next student was interviewed. A prepared rubric was used to assess the students and written feedback was also given on the positives and what could have been improved on in the interview.

Outcomes

One of the benefits of this type of authentic assessment is that marking and moderation could take place simultaneously due to the presence of two tutors being the clients. This meant that although additional time was used to undertake the assessment, the additional time for marking was not required. The impact of this type of assessment was shown in the results. There was a significant level of high scores with 89% (26/29) of students receiving good honours in 2022-23, compared to 61% in 2021-22 under the old degree programme, which used a more traditional form of assessment, and outperformed the average across the university for good honours (77.4% in 2022-23). We also saw 100% attendance at the interview from all students, as they were able to pick the date and time of their assessment from slots that were made available.

For 2023-24, 89% (24/27) of students received good honours in their interview, showing a consistency in results from the previous year. Attendance dropped to 96% (27/28), with one student applying for an evidenced extension.

Other benefits that were identified to this form of authentic assessment included the focus on employability skills – it prepared students for their actual job interviews and gave them a chance to discover how nervous they would be. One of the key indicators highlighted in the written feedback was for students to try to relax as the nervousness caused them to rush and lose their train of thought. It was also all their own work, there were no concerns over ChatGTP or plagiarism and all students presented their ID card on arrival to identify themselves as they would do in an exam setting. With discussions currently ongoing regarding assessment, as discussed at recent conferences, where students write assignments and then follow up with a five- to ten-minute chat to authenticate their work, does this form of interview assessment eliminate having to do both a written piece of work and then a discussion to verify they produced the written work?

While there are benefits to this type of assessment others could use to develop into their own practices, there were also some challenges other institutions would need to be aware of such as availability of lecturers and the time taken to conduct the interviews. Depending on the number of students, the amount of time could be difficult to manage. However, this time would also be reflective of the time taken to mark a written assignment.

What has been clear over the last two years is that we have managed to maintain a high standard of assessment by using interviews. However, if the cohort were to increase, is it sustainable to have such a high proportion of staff time taken up in the actual interviews? We are therefore considering the use of actors to play the role of the clients. While this may seem a logical approach and is one taken within the medical profession, marking and moderation would still need to take place and therefore tutors would be required in this process. Does this mean the interviews need to be recorded on video or would a tutor need to be in the room? While both are valid options, tutors would still need to be heavily involved in the process.

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3.2 A new tool to quantify authenticity of your assessments

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Background

In the current education system, where technology is constantly evolving, we need to keep up to date with the ways we assess our students' work. In the current Fourth Industrial Revolution, technology plays an important role in most graduate jobs, and this has only been heightened by Covid-19 (Whalley et al, 2021). With the rise of generative AI, educators must take into account modern technology, such as ChatGPT, when designing assessments (Mhlanga, 2023). Historically, many educators used a traditional form of assessment. This can be described as a type of curriculum design around a narrow set of learning objectives where assessment requires absorption and faithful reproduction of knowledge but not necessarily to critique and use it in relevant ways – also known as "write another essay". This is often related to rote learning, recall of knowledge and not necessarily the application of learning.

In more recent years, educators have started to use more applied assessments, termed authentic assessments. Gulikers, Bastiaens and Kirschner, (2004, 69) define authentic assessment as: "An assessment requiring students to use the same competencies, or combinations of knowledge, skills, and attitudes that they need to apply in the criterion situation in professional life". More recent research has emphasised the importance of realism, cognitive challenge and developing evaluative judgement in students as part of an authentic assessment (Pitt and Quinlan, 2022). Peer evaluations can be used to develop these evaluative judgement skills and communication skills in students. When implementing realism, simulation-based assessments or case studies that can contextualise knowledge can be used to address this. To ensure students are cognitively challenged, assessments that have an oral component can be used.

Gulikers et al (2004) developed a five-dimensional framework for authentic assessments consisting of authentic assessment task(s), physical or virtual context, social context, authentic assessment result and authentic criteria. The assessment task is the actual task students are asked to carry out. The physical or virtual context is the physical space where students do the assessment. The social context is the social environment students are part of when completing the assessment. This looks at how collaborative the assessment is as well as whether there is individual competition. The assessment result is the actual product or performance students are graded on. Finally, the authentic criteria are the criteria used to assess the students. We used this framework to develop a tool which can be used to assess the level of authenticity of assessments at programme-level irrespective of the programme and subject of study. For this, we started with our own programmes: BSc Psychology and BSc Biomedical Sciences in the Department of Life Sciences at Brunel University London.

Approach

In BSc Psychology, a wide variety of assessments are used (for example, synoptic essays, reflective accounts, oral presentation, “traditional exams” (multiple choice questions/essays), “traditional essays”, lab reports, poster presentations, dissertations (empirical research project), “applied” coursework). The BSc Biomedical Sciences uses an integrated programme assessment (IPA) approach. This results in fewer assessments that require students to integrate knowledge between modules. The IPA design uses a variety of assessment types to ensure the development of skills (data analysis, presentation skills, critical literature review, career development portfolios) as well as a progression of assessments from level to level.

Our goal was to use the qualitative descriptions of the Gulikers et al (2004) framework and develop an easy-to-use questionnaire that would allow any educator to quantitatively measure the authenticity of the assessments on their programme. To do this, we developed 17 statements based on the framework. For each assessment, one has to evaluate the assessment using a 5-point Likert-type scale from 1 “Not at all”, 2 “A little”, 3 “Somewhat”, 4 “A lot”, to 5 “Extremely”, with the option of using “Not applicable” (given a value of 0, so as not to contribute to overall score) – see Figure 1. This was done for all assessments in the two programmes. In the first six months of the project, we developed the items then tested and validated them. In the subsequent six months, we used the scale to assess authenticity of the two programmes.

Figure 1. The 17 Likert-type statements used to evaluate each assessment

Please evaluate the assessment on the following statements: *

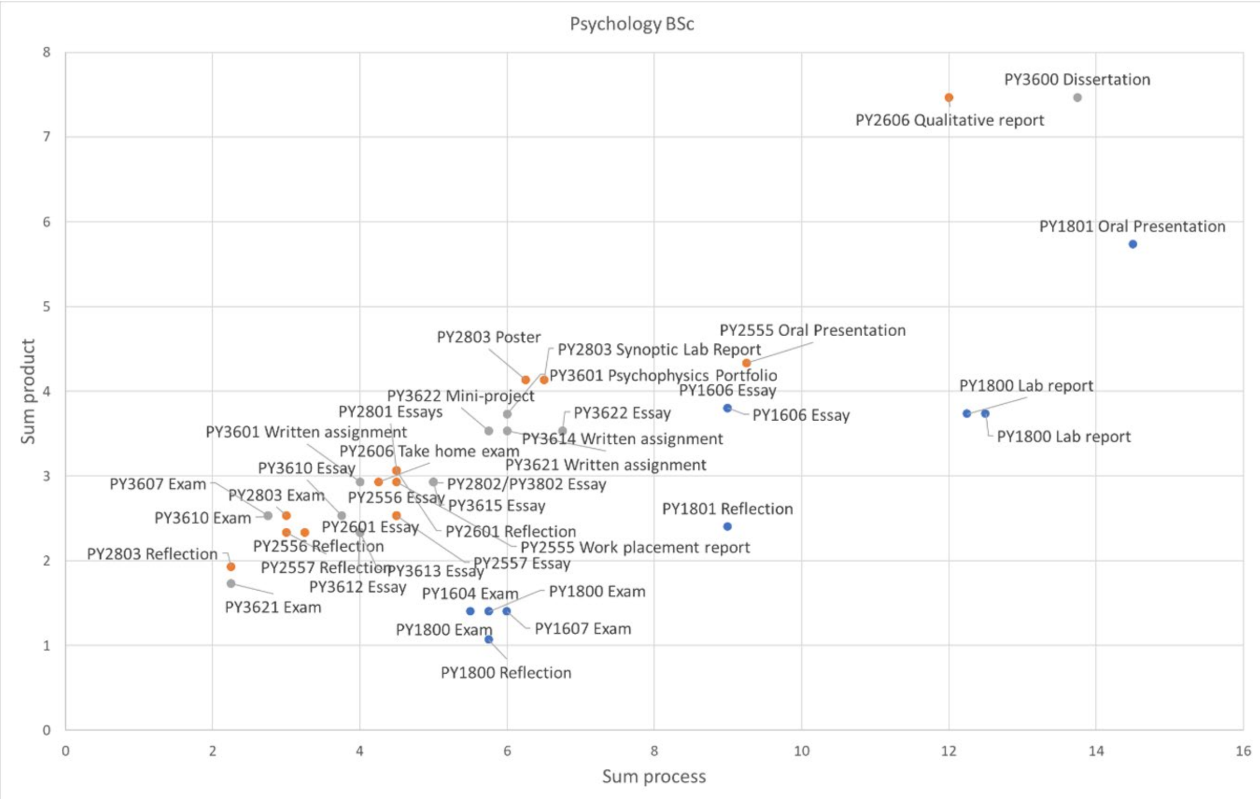
	Not at all	A little	Somewhat	A lot	Extremely	Not applicable
1. Resembles authentic learning task but in a new situation. Contextualised: Resembles or replicates real-life professional situation or task.	☐	☐	☐	☐	☐	☐
2. Integrates knowledge, skills and attitudes. Contextualised: A task that requires integrating knowledge with skills and/or attitudes.	☐	☐	☐	☐	☐	☐
3. Resembles complexity of the real-life situation. Contextualised: A task that is as complex as in a professional setting.	☐	☐	☐	☐	☐	☐
4. Resembles ownership of the task in real life. Contextualised: Individual control over the parameters of the task.	☐	☐	☐	☐	☐	☐
5. Assessment resembles reality. Contextualised: The assessment takes place in a physical location that is like a workplace.	☐	☐	☐	☐	☐	☐
6. Assessment resembles number and kind of resources available in real-life situation.	☐	☐	☐	☐	☐	☐
7. Time for assessment resembles that in the real-world situation (does not rely on unrealistic or arbitrary time constraints). Contextualised: Duration of assessment resembles that in the real-life situation. Please consider both duration of task; time spent actively doing the task and the time window given to perform the task.	☐	☐	☐	☐	☐	☐
8. Assessment resembles the social context in which the task takes place in real life.	☐	☐	☐	☐	☐	☐
9. Collaborative assessment includes social interaction.	☐	☐	☐	☐	☐	☐
10. Collaborative assessment includes positive interdependency.	☐	☐	☐	☐	☐	☐
11. Collaborative assessment includes individual accountability.	☐	☐	☐	☐	☐	☐
12. Individual assessment stimulates competition.	☐	☐	☐	☐	☐	☐
13. Assessment is a quality product or performance that students can be asked to produce in real life.	☐	☐	☐	☐	☐	☐
14. Assessment should be a demonstration that permits making valid inferences about the underlying competencies. Contextualised: Most important elements of final task have been produced. Professional task not fully completed to the point where a client would be pay for it or it would be published.	☐	☐	☐	☐	☐	☐
15. Assessment is a full array of tasks and multiple indicators of learning in order to come to full conclusions. Contextualised: A multi-task professional assessment.	☐	☐	☐	☐	☐	☐
16. Assessment requires students to present work to other people (oral or written form).	☐	☐	☐	☐	☐	☐
17. Criteria are set and made explicit to learners beforehand.	☐	☐	☐	☐	☐	☐

To visually display the results, and to simplify the data for a programme-level approach, we collapsed the 17 items into two dimensions: Product (task, assessment result and assessment criteria) and Process (physical context and social context). Put simply, process is how the students complete the work and product is the work submitted for assessment.

Outcomes

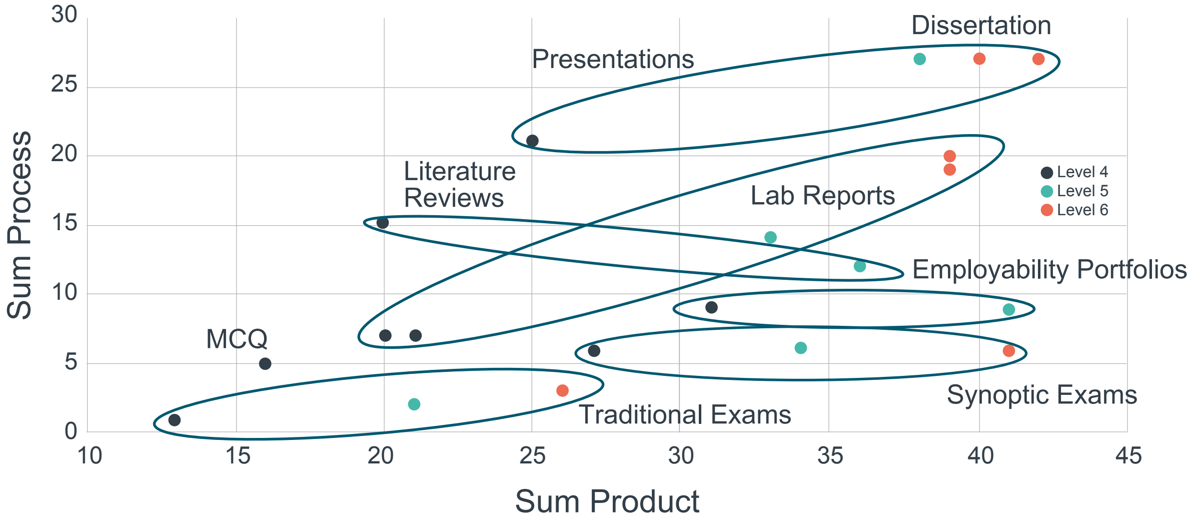
Using the two dimensions of “Product” and “Process”, one can map all assessments in a 2D graph. This allows a simple way to visualise the pattern of assessment authenticity across a large number of assessments. Figure 2 shows the authenticity of the assessments in the BSc Psychology programme. From this, the first thing to note is that, on a programme level, there is still work to do to enhance the authenticity of the assessments. When looking in more detail at each level, we can see that Level 4 shows the best results in terms of authenticity and diversity, as there is a good spread for both product and process. At Level 5, there is one assessment that scores high on both product and process (the qualitative report). The other assessments seem to be clustered in the lower quadrant of product and process, ie more traditional assessments. For Level 6, the story is similar to Level 5 where, in this case, the dissertation is very authentic as students need to conduct their own empirical project. All other assessments are clustered in the lower quadrant. At Level 6, students need to choose four out of 14 modules and these assessments were all designed by the individual module leaders in silo, which could explain the trend in the graph. The programme team is using this graph to identify assessments where authenticity could be enhanced and targeting them for tweaks. Our focus is on Levels 5 and 6, to ensure a more even spread of product and process in relation to the authenticity of the assessments. This will form the basis of discussions with colleagues in the next three months to revise assessments for the next academic year.

Figure 2. Mapping of product vs process of the assessments in the BSc Psychology programme



For Biomedical Sciences, the picture looks quite different (Figure 3). From a programme-level perspective, the assessments become increasingly authentic as the student progresses through the programme, year on year. This is true for each of the different types of assessment used (even traditional exams increase their score on product when moving from Level 4 to Level 6).

Figure 3. Mapping of product vs process of the assessments in the BSc Biomedical Sciences programme



The framework has been used in a variety of workshops with academics from different disciplines. During the workshops, attendees used our tool and it sparked many interesting conversations. Attendees found the tool useful and intriguing and have already started using it to tweak their assessments. By using this 2D framework, minor changes in assessments targeted to the appropriate dimension can increase the authenticity of assessments in a positive direction. Such changes include promoting realism in the process under which the assessment is taken, increasing the cognitive challenge associated with the work and including a strong element of evaluative judgement or reflection. We do not argue that all assessments should be 100% authentic but that a range of assessments of different types within a programme may be an ideal arrangement. This is particularly important because it equips our graduates with a broad toolkit of transferable skills.

Measuring how authentic an assessment is, and using this to enhance the teaching and learning experience of students is a novel approach. As this is quite a new development, the outputs are yet to be identified. However, we have already begun discussions with our colleagues to design more authentic versions of their existing assessments. Through this process we have discovered that there are a number of ways an assessment can be tweaked to increase its authenticity within the existing module outlines. This therefore does not require any modification through the Quality Assurance modification policy, nor does it infringe on external regulatory or accreditation requirements.
For example, adding an oral presentation element to the poster submission in Level 5 or changing a traditional essay into a forensic case study boosts authenticity in both product and process directions when checking with our tool. Finally, our next step is to consult with the University's Quality Assurance Team to see how our tool can be embedded in in the design and review of taught programmes.

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3.3 Making tests more authentic in Biosciences

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Background

This case study is an example of how a test-based assessment was redesigned on the principles of authentic assessment. The context here is a practical assessment within a 20-credit FHEQ Level 6 module called Medical Microbiology, a core module for the BSc Biomedical Science degree at the University of East London (UEL). Every year we have approximately 60-80 students taking this module.

A common feature of tests is the timed nature of the assessment. There are several formats for tests, including in-person or online mode and open or closed book tests, and they often include multiple choice, essays, structured practical and clinical skills assessments as a means of assessing theoretical or practical concepts. In a recent study, Hobbins et al (2022) evaluated 455 assessments across 62 healthcare courses and found that 63% of student marks were derived from tests, thus highlighting their dominance. However, notable in this study, tests were found to be less authentic compared to coursework when evaluated against the authentic assessment principles as proposed by Villarroel, Bloxham, Bruna, Bruna, and Herrera-Seda et al (2018).

Authentic assessment is defined as a “form of assessment in which students are asked to perform real-world tasks that demonstrate meaningful application of essential skills and knowledge” (Mueller, 2005, 1). The BSc Biomedical Science course at UEL is accredited by the Institute of Biomedical Science (IBMS) and one of the goals is to train students to be competent biomedical scientists. This practice requires graduates to be ready with several skills and attributes, including competency in different laboratory methods, analytical and problem-solving skills, teamwork, attention to detail and good written communication skills (Biomedical Scientist, nd). To achieve authenticity in this context, one could consider replacing tests with coursework such as group work tasks, critical appraisal reports, presentations, dissertations etc. However, the issue here remains that not all learning outcomes are amenable to coursework assessments. Moreover, with the rise of generative AI, there can be a reluctance to replace tests. Hence, alongside diverse assessments, it is also imperative to consider how tests could be made more authentic. This case study aligns with this need and describes the approach adopted in redesigning one such test within Biosciences.

Approach

In this section, I will be approaching the redesign of the practical assessment through the lens of authentic assessment as proposed by Villarroel, Bloxham, Bruna, Bruna and Herrera-Seda et al (2018). The redesigned assessment was conceptualised by the module leader (myself) and implemented with support from the course leader and the technical services team of our department. This was introduced in the autumn term of 2022 and was refined during its second iteration in 2023.

Based on a systematic review, Villarroel, Bloxham, Bruna, Bruna and Herrera-Seda (2018) identified three conceptual domains for authentic assessment, namely realism, cognitive challenge and evaluative judgment. Realism in authentic assessment refers to the presence of a “real context” and a task similar to what one would encounter in employability. The authors further advise that to create authenticity on this principle, educators should reflect on what typical working looks like in employment. As the redesigned practical assessment aligns with the laboratory practice of infectious disease, I was aiming for an assessment which reflects an integration of different skills, as would take place in a real-world practice. This includes practical skills in processing different clinical samples using common microbiological methods, clinical reasoning skills and communication of results to colleagues and clinicians. This reflected a major change to the previous assessment, which included short answer case-based questions. While this assessed some reasoning skills, it did not provide an opportunity to assess the integration of different elements (Table 1).

A key element of laboratory diagnosis of bacterial infections is the diagnostic workflow over 24-72 hours consisting of sample processing and interpretation. With the integration being the focus, I chose to mirror the Day 2 of sample processing. It was also important to acknowledge the level of study. In lower levels, such as Levels 4 and 5, we have skill-based assessments, but they focus on singular skills as opposed to assessing the integration of skills.

Table 1. Comparing previous and redesigned assessment

	Previous assessment (2022 and before)	Redesigned assessment (2023 and after)
Duration	60 minutes	60 minutes
Timeframe within module	End of module	End of module
Location	Online or exam/test room	Teaching laboratory
Format	Short-answer questions based on cases	Questions based on a clinical case and processing involved in a microbiology laboratory
What is/are provided to students in the test?	Exam booklet	Culture media streaked with a clinical sample Clinical vignette Reagents and equipment (such as microscope) Exam booklet
Skills assessed	Clinical reasoning (limited to identifying pathogenic species)	Clinical reasoning (extended to assessing the clinical significance of culture findings) Communication with different audiences Laboratory work Critical reasoning

With realism in focus, the redesigned assessment was delivered in the practical laboratory and centred around an infective syndrome such as skin infection, urine infection, gastroenteritis, or bacteraemia. Students were provided details of the patient with a clinical summary. On their assigned benches, they were also provided with relevant microbiology results such as culture plate results, test reagents and equipment such as a microscope; and this served as a proxy for the real microbiology laboratory. The exam handbook also contained the standard operating procedures and diagnostic workflows used in a laboratory. Thus, the intention was to reduce the emphasis on rote learning and use tools, as would be available in a laboratory. Furthermore, all common reagents were provided on student benches, encouraging students to make decisions on which reagents would be required in each scenario. The main assessment was a real-time report that was generated by students under the timed test conditions. Questions such as “Detail your observations of different methods and tests that you employed to identify the bacteria” and “Provide a concise informative report to the clinician” assessed the ability to communicate results to fellow biomedical scientists and clinicians respectively.

The redesigned test was delivered in the autumn term. In this typical 12-week term, the assessment was delivered towards the end of the module. The main redesign was undertaken during the summer preceding the autumn term. The conceptualisation and implementation typically required one to two weeks of staff time and included liaising with technical staff, and logistics such as timetabling and developing support elements including realigning practical sessions to the assessment.

The second element of authentic assessment is the presence of a cognitively challenging task that assesses higher-order thinking, as would normally be required in the workplace (Dawson, Carless and Lee, 2021). The assessment is expected to include elements where students can demonstrate how knowledge is applied. To achieve this, high weightage was given to questions which required students to critically discuss their findings and the processes adopted including the appropriateness of the methods, quality standards and explanations of the decision-making process.

The final dimension of authentic assessment is evaluative judgment. This refers to processes such as formative feedback, self-evaluation and reflection that help students understand what a good performance in an authentic assessment looks like (Villarroel, Bloxham, Bruna, Bruna and Herrera-Seda, 2018). For my module, I found this to be an important consideration, as authentic assessments can often reflect the messy nature and uncertainties in real-world practice (Ajjawi et al, 2024), and this can be disconcerting to students. Often students would ask me, “what if I did not get the right result in the laboratory? Would I fail?” To this end, I developed new assessment criteria and exemplars were provided to students. In addition, the practical sessions were redesigned and based on similar case situations as the exams. Interrupted briefings through various points of the practical also helped students appreciate the thought process of biomedical scientists at each stage of diagnostics of infectious diseases. Another element many students highlighted as being useful in exam preparation was the inclusion of a mock exam. The mock exam was held a week before the main exam and involved a similar set-up. Feedback following the mock exam provided means for self-evaluation of performance.

Outcomes

Overall, the new assessment was received positively by students. In the module evaluation questionnaires, students stated that they enjoyed the practical sessions, felt supported with the additional resources and found it relatable to a real-life scenario. The latter comment specifically highlights the value that students place on such assessments. As a module leader, I found that students were motivated and the engagement was better. In terms of the overall performance, the pass rate and mean mark was similar to previous years (89% vs 90% pass; 60.7 vs 58.2 mean mark). As an estimate, each test script took 25 minutes to mark, including providing feedback. Given the challenging nature of assessment, this demonstrates that student performance is unlikely to differ, provided adequate support systems are incorporated.

While desirable, there are also limitations to authentic assessments that were relevant to my context and I would like to highlight some of them here. One of the limitations of authentic assessments is that they often mirror a very specific employment area (Ajjawi et al, 2024). As I mentioned earlier, my redesign was reflective of the life of a biomedical scientist in the laboratory diagnostics of infectious diseases. From this angle, I am aware that not all students in a BSc course would be aiming for this career. However, I believe that this limitation can also be addressed at the programme level by ensuring there are diverse authentic assessment experiences. Another limitation is constraints related to space and staff time (Dinning, 2018). In my experience, one of the areas which can often be overlooked in designing assessments is the time required to realign teaching sessions to the new assessment strategy. Additionally, with the low staff numbers, providing individual feedback to students becomes a challenge. Finally, in this initial redesign, the primary stakeholders were limited. For future years, my plan is to also include students and employers as partners in assessment design.

In summary, this case study brings into focus the need for more authenticity in test situations given that it is the dominant and preferred mode of assessment in specific scenarios and subject areas. The three principles of authentic assessment – realism, cognitive challenge and evaluative judgement – provide a pragmatic framework to guide the design of tests to achieve higher authenticity.

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4. Enhancing Assessment and Feedback Practices

4.1 Delivering 'better assessment' through a whole institution, community-led strategic innovation approach

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Background

The University of Chester routinely achieves National Student Survey satisfaction scores for assessment and feedback in the top quartile nationally. While this could be a cause for celebration, the number of students deferring assessment and the number of students failing assessment at the first attempt remained a concern. Our external examiners and accrediting bodies praised our rigour, standards of assessment and feedback practices. However, many teaching staff and students reported excessive workloads and stress respectively. There was a feeling that assessment could be better.

Cowan (1998) is attributed with describing assessment as the engine that drives student learning: his metaphor is often cited to emphasise the importance and centrality of assessment within higher education. Extending the metaphor, assessment, like an engine, comprises a complex set of processes (Elliott, 2023). For example, and developing the ideas presented in Elliott, we suggest it includes purposeful, peer-reviewed design, academic support for students to successfully accomplish assessment tasks, management of assignment submissions and grades, marking, feedback and moderation, reporting outcomes to students and other stakeholders, continuously monitoring and evaluating students' success and maintaining stakeholders' satisfaction with assessment practices, policies and systems.

The multiplicity of assessment processes is mirrored by the variety and number of people involved or interested in higher education assessment practices. Supporting assessment is a core part of most academic staff roles and for very many professional services staff in faculty-based and central roles. External stakeholders such as regulatory and professional bodies that accredit courses, and employers that recruit graduates, are interested in assessment practices that provide valid and reliable judgements of students' knowledge, skills and competencies. And, of course, students themselves look to assessment to be, among other things, fair, inclusive and effective preparation for their futures.

Owing to the complexities and intricacies of assessment, and the number of stakeholders and differing perspectives, a whole-institutional approach can seem daunting and "leaders of educational change might be wise to avoid tackling assessment" (Forsyth and Sweasey, 2020,129). It is perhaps not surprising that assessment reform is often approached locally and integrated with wider educational review – for example, programme-level quality reviews or through learning design approaches to initial course design. These usually incorporate employer or regulatory body stakeholder views and, potentially, students too. There are also specific assessment and feedback review methods at programme level, for example TESTA, which collect and respond to students' experiences (Jessop, 2023). However, when we looked to define and then deliver a whole institution 'better assessment' educational change initiative, we struggled to find evidence from the literature or in practice elsewhere that used multiple perspectives from diverse stakeholders, including the wide range of higher education staff involved in assessment, to challenge and change whole institution assessment and feedback practices. We turned to the literature of business, product design and the environment – our background disciplines. We developed a process that melded the elements of organisational effectiveness, design thinking and ecosystem thinking. In the next section we describe our model for whole institution, community-led strategic change – the Strategic Innovation Forum.

Approach

A Strategic Innovation Forum (SIF) is a mechanism to tackle complex issues or 'wicked problems' which have no single or obvious solution. We used it to create our institution-wide better assessment action plan. What would stakeholders agree should be in our action plan for better assessment to deliver improvements to student continuation, completion and progression, and to improve student and staff wellbeing?

We formed a cross-disciplinary and cross-function academic leadership group to drive the assessment review and reform process in our university. We sought sponsorship from the University's DVC and Provost, who encouraged widespread engagement with the project and were open-minded to receive change proposals. They provided further reasons for the work as they wished it to also (i) evaluate the impact of pre-pandemic changes to assessment procedures, (ii) identify and apply lessons learnt from changes to assessment made during and after the pandemic, and (iii) review the assessment regulations for fitness for purpose. Later, the widespread availability of generative artificial intelligence (GenAI) tools such as ChatGPT became an additional driver for our work.

With that in place, the following set of actions were undertaken across a period of 18 months.

Stage one, month one, setting the initial parameters

+ Establish consensus at the University's Education Committee on five proposed key tenets, or principles, (see Table 1), identified from widely recognised desirable features of assessment, that our future actions to improve assessment must deliver. The tenet, or principles are:
  – 1. Inclusive and fair
  – 2. Effective and efficient
  – 3. Authentic and engaging
  – 4. Supports student futures
  – 5. Encourages academic integrity.

Stage two, months two to seven, the ideation and consultation period

+ Invite students, student representatives, employers, academic and professional services staff to a range of different events (based on varied collaborative inquiry techniques such as strategic conversations, a hackathon and a world café) to explore 'what if' and 'how might we' design-thinking prompts to challenge the status quo and propose actions that would deliver the key tenets for better assessment.
+ Lead a working group of senior managers to propose, review and theme a series of institution-wide actions (the action plan) for delivery the following academic year. Each item was the subject of consultation and agreement through the University's deliberative committees and processes.

Stage three, months eight to eighteen, testing and evaluating actions

+ Locate responsibility for evaluating the action plan with the Centre for Academic Innovation and Development (CAID) and oversight with the Education Committee via receipt of a mid-year report (month 13) and an end of year report (month 18). Evaluation focuses on the outputs, outcomes and impacts of each of the actions in relation to student satisfaction, specific student outcomes and we were particularly mindful to consider student and staff wellbeing (Jones et al, 2021).
+ Evaluate the effectiveness of the SIF as a whole organisation, community-led strategic change process and its effectiveness to address future University-wide challenges.

Community engagement through the consultation and ideation phase was a critical component of the SIF. During the series of ideation events, consultation and deliberative processes to devise the action plan, more than 200 different staff, students and employers were involved in the process of exploring how to improve assessment to better deliver on hopes to improve student success and student and staff wellbeing. Through this period the intention was to empower people to be agents of change and constructively challenge conventions as we collectively explored new possibilities. Building a strong sense of agency among our community at stage two was felt to underpin the success of phase three when changes were being delivered by a variety of people under a common evaluation framework – we wanted to be sure of the widest commitment to change.

Outcomes

The key output from the community engagement work was a 10-point institutional action plan that was agreed and ready for delivery in the following academic year. The actions (see Table 1) were broad-ranging and were related to process and administration, to assessment design and pedagogy and to drive improvements in student and staff experiences. They also responded to external drivers, such as the widespread availability and impact of generative artificial intelligence (GenAI) on higher education (Potter et al, 2023). They enabled creative and experimental approaches, for example a local pilot of pass/fail ungrading at Level 4 in one department's single honours programmes; a topic of widespread internal interest and curiosity.

Table 1. Ten-point action plan for better assessment

	Proposed action	Proposed benefits	Tenet/principle
	Process and administration		
1	Changes to late work penalty and minimum component mark	Reduced likelihood of need for reassessment and resits.	Inclusive and fair, Effective and efficient
2	Early upload of provisional marks to SITs, linked to data dashboard (Power BI) and students' progress reviews	Actions arising from data insights could improve continuation and completion.	Effective and efficient
3	Full review of assessment regulations	Simplification, improved effectiveness and efficiency.	Effective and efficient
4	Pilot pass/fail (ungraded) at Level 4 in Art and Design	Improved continuation, satisfaction and student learning. Encouraging risk taking in creative practice.	Authentic and engaging
5	Guide to Good Assessment	Staff learning and innovation in practice.	All five principles addressed
6	Programme-level mapping of assessments to graduate outcomes/ professional skills development	Improved continuation, satisfaction and student learning.	Support student futures
7	Review (and where needed revision) of assessment components to assure academic integrity in post-GenAI environment	Clarity of assessment purpose and cautiously embracing GenAI.	Encourages academic integrity, support student futures
	Stakeholder experience (staff and student)		
8	Programme assessment grids show students the distribution of assessment across the year	Improved continuation, satisfaction and student learning.	Inclusive and fair, encourages academic integrity
9	Moodle baseline extended to Assessment – new templating for each module	Improved continuation, satisfaction and student learning.	Effective and efficient
10	Updating of assessment brief instructions	Clarity of assessment purpose and cautiously embracing GenAI.	Encourages academic integrity

Outcomes of the work included a sense of achievement in driving forward change in areas hitherto considered intractable. One senior professional services colleague commented,

> "I've made several attempts …… over the years so am delighted and grateful that the Better Assessment project has helped this [change to assessment regulation] get through!"

A Chester students' union representative wrote on receipt of the draft action plan,

> "I have also welcomed the focus on Better Assessment this year, from the Education Committee away half-day and the strategic conversations with students I have seen a lot of progress with this initiative. The action plan has some great actions too, … and I believe these actions will really help students at the University.
>
> Thank you for your continued work ... to make assessment more inclusive, effective and authentic."

At the time of writing, the evaluation of the action plan in time for the mid-year report (month 13) is underway. In addition to exploring the impact of the 10 areas of work in terms of their proposed benefits outlined in Table 1, the actions are also being appraised for their contribution to the wellbeing of staff and students, for example, by providing clear communications around assessment (Upsher et al, 2023) and reduced workload as a result of fewer students being involved with reassessment. The SIF has been adopted as a vehicle for future whole organisation, community-led strategic change by the University. Money has been set aside to fund further, future community engagement on another 'wicked problem' or hot topic where innovation and change is needed to drive improvements to student outcomes and / or student and staff wellbeing and experiences.

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4.2 Advocating student confidence: a case study to demonstrate how feedback methods can be used to create an accessible and supportive learning environment

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Background

The Legal Practice Course (LLM) is a master's-level qualification but also a professional programme undertaken as part of the qualification process by aspiring solicitors. Professional Legal Skills feature heavily on the programme and one of those skills modules is advocacy. Our experience of teaching advocacy has been significant, with members of the module team teaching the skill from as long ago as 2006 and invariably we see that students find oral skills assessments intimidating. So, in 2021 when we undertook a complete re-design of the module, we took the opportunity to reflect on our feedback practices and adapt the culture of teaching this particular skill in an attempt to boost student confidence.

Advocacy training historically follows the 'Hampel Method'. This has traditionally been considered successful but has been criticised because the feedback given to the learner is predominantly negative and there is very little room for praise, encouragement, discussion or exploration (Davis and Welsh, 2017). Hampel does not strictly apply to HE teaching, but the principles of the method tend to be followed and it's the way that most advocates, and therefore most advocacy teachers, have themselves been trained. This was, in our view, problematic.

During the advocacy sessions and assessment on the module we role play a court hearing, the student makes an application, and the tutor takes on the role of the judge and then gives oral feedback to the student. This is designed to create authentic learning activities and assessment (Frey, 2012 and Koh, 2017). However, teaching advocacy in this format can create an intimidating environment. This may be at least partially because tutors can be influenced by the concept of what Jerome Bruner labelled as 'Folk Pedagogies' (Bruner, 1996), which means teaching in a manner that the tutor thinks is appropriate, based on how they were taught rather than on any peer reviewed research or literature. Most tutors, therefore, will have been taught in a rigid and intimidating environment and will have encountered aggressive judges who can humiliate the advocates before them. This means that, understandably, a tutor may wish to ensure the students are robust. While it is important that, over time, the students do build resilience, it was felt that we could more effectively scaffold the activities so that the students felt confident and supported to explore and develop their own expertise.

Students do usually have their own ideas as to what effective advocacy looks like, either from observing court hearings or even from TV and film, and Kolb (1984) poses that "knowledge is continuously derived from and tested in the experiences of the learner". One of the dangers of this type of learning is that those students who may have contacts in the legal professions or have undertaken work experience in the sector are likely to feel more at ease in the simulated court environment than those whose only frame of reference does simply come from popular culture. Our experience is that those more experienced students for whom the process is already somewhat de-mystified tend to come from more affluent backgrounds. This creates an issue with inclusivity and access as in this type of authentic assessment it may be argued that those from disenfranchised backgrounds are further put at a disadvantage.

Our experience was that when the students lack confidence they 'play the role' and copy others, and to a degree that is actively encouraged by the Hampel Method. This kind of learning appears, on the face of it, to be experiential but the danger is that the process is simply for the tutor to "change the behaviour of the student rather than to facilitate the process of learning" (Davis and Welsh, 2017). All experiential theory emphasises the process of learning as opposed to the behavioural outcomes. As the classes are so practical they are perceived automatically to be examples of 'active learning' but the rigidity of the teaching can mean that the activity is very tutor led as the students are not facilitating their own learning (Rotgans and Schmidt, 2011). Feedback, therefore, often becomes a tutor's monologue with little to no engagement from the students.

Approach

We aimed to try to change the culture of the module a little to create a less rigid approach as we felt that the students could meet the learning objectives just as effectively in a more supportive environment. In order for students to develop their own expertise, the tutor must be able to see that each student has an individual learning approach (Biggs, 1997; Entwhistle and McCune, 2006). Accordingly, we wanted to support this individuality and to allow each student's individual style to enhance their delivery of the submissions they are making, and to develop innovative approaches.

We initially decided to make small practical changes. The module runs over four weeks in the summer term and when planning the preparatory materials we significantly relaxed the guidance for staff and students on court dress, particularly on what was appropriate for female advocates to wear as the previous guidance was outdated and not inclusive. We gave significant weight to discussing the requirements in one of the pre-recorded 'lectures' that we have always used as part of the preparation. The aim of this was to remove the onus on giving feedback on dress away from the tutor conducting the session, with the result that feedback could be concentrated instead on the student's substantive performance.

We also developed changes around the appropriate style of feedback as the danger is that using an intensive, negative method of feedback discourages the students. We held a meeting with the module teaching team to discuss the proposal for change. Historically we have also asked several questions during the submissions to replicate judicial intervention and we decided to reduce the interventions in the early sessions and to only ask questions if it would be realistic to do so, which is actually more authentic, rather than for the sake of questioning. Before the tutor's feedback, we would also ask the student to reflect on their own performance and then ask another student to give feedback based on the assessment criteria.

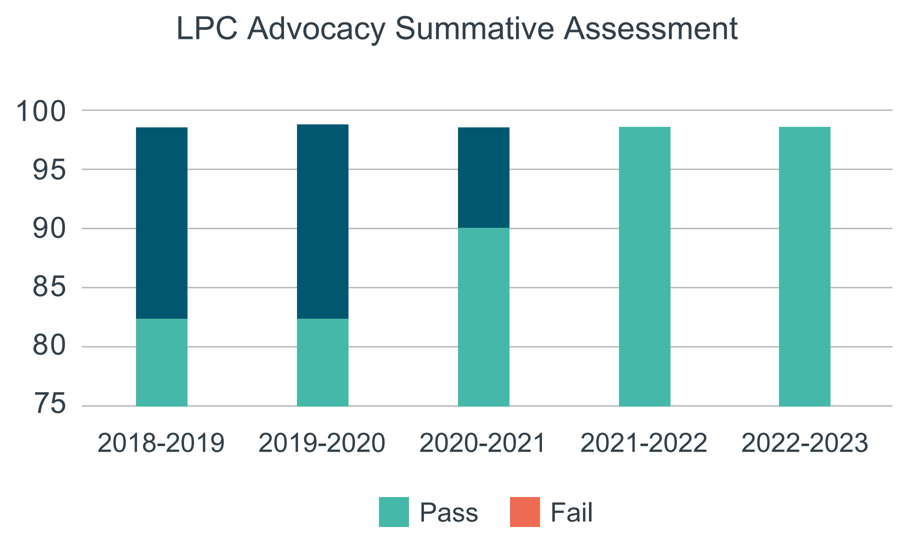
This project has now run over the 2020-21, 2021-22 and 2022-23 teaching and assessment cycles. The time commitment to this part of the module review was minimal and simply required discussion and consensus among the teaching team followed by 'tweaks' to the teaching materials.

Outcomes

Following these small changes, we noticed that the students were still able to meet the learning outcomes and interact effectively with the judge. We witnessed real engagement with feedback, it became less one-sided and more of a dialogue (Nicol, 2009).

There was positive student feedback following the re-design and although there were concerns from other colleagues that this gentler approach may affect the summative assessment performance, there was no issue with this. Our external examiner in 2021 commented on the improvement in summative performance and the range of ability in the cohort. In fact, we have experienced an uptick in summative results and in 2022 and 2023 we had no fails across the module, which has never happened before.

Figure 1. LPC advocacy summative assessment



This brings us back to the issues of accessibility and folk pedagogy. We must ask ourselves what we seek to achieve here: is it to produce cookie cutter lawyers who think and behave as those who came before them or are we aiming to develop innovative lawyers of the future. If the answer is the latter, then it seems that building confidence and self-belief is as important as the substantive content of the classes and the improvement in the feedback cycle is critical in improving the student's skills and therefore performance in assessment. Looking forward we will be discussing this with other module teams who deliver skills subjects to explore the possibility of developing and testing this theory more widely.

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4.3 Setting the standard: using multiple choice tests to enhance feedback and reliably evaluate student performance

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Background

This case study reflects on:

+ the use of summative multiple choice tests (MCTs) in law
+ the strategy used to assess Cardiff's undergraduate law students by MCTs in the 2022-23 academic year.

Before the Solicitors Qualifying Examination (SQE) was implemented in 2021, Cardiff's summative LLB assessments mainly comprised traditional written examinations or coursework. Such examinations are commonly used in undergraduate programmes to evaluate and differentiate student performance across traditional degree classifications. MCTs, on the other hand, "*do not… promote creativity, exploration, argument, or engagement with wider social issues, nor are they well suited to assessing communication skills beyond basic levels*" (Moore and Price, 2021). The effectiveness of MCTs to test higher order thinking has been doubted, with traditional assessments regarded as more intellectually rigorous (Case and Donohue, 2008, 372). In 2008, Marshall observed that MCTs were not generally encouraged as summative assessments in law (Marshall, 2008, 265).

The SQE provided impetus to reflect on our undergraduate assessment strategy. Soon, all graduates wishing to be admitted as a solicitor will have to pass the SQE. Part 1 of the SQE requires candidates to answer 360 multiple choice / single best answer questions in approximately 10 hours. Such questions are designed to test "*fundamental legal principles and rules appropriately and effectively… to realistic client-based and ethical problems and situations*" (Solicitors Regulation Authority, 2024).

In response to these developments, while not seeking to design a SQE preparation programme, the aim was to provide LLB students with an introduction to professional assessment methods by assessing partially through MCTs. We recognised that MCTs have other potential benefits. They can also be used to enhance the student experience by providing expedited feedback: our compulsory module cohorts can exceed 500 students, so written examinations have a 20-working day feedback policy. Using automated marking through software platforms, such as Blackboard, may help provide more timely and detailed feedback/feedforward opportunities for students, while simultaneously reducing the marking burden. By diversifying our assessment strategy, a more inclusive approach to assessment may also be facilitated: the Bridge Group, for example, is "*…satisfied that single best answer tests, conditional on enough care and attention being paid to question setting and cultural context, are as objective an evaluation methodology as possible…*" (The Bridge Group, 2020, 9).

MCTs also allow evaluation of a broad range of content.

Review of pedagogy supporting MCTs

Diversifying to incorporate MCTs at a programmatic level required a robust pedagogic rationale. MCTs are now used as an assessment method for qualification by both the Solicitors Regulation Authority and the Bar Standards Board. A criticism of MCTs is that they may be limited to the recognition of basic factual knowledge (lower order thinking), whereas more traditional forms of assessment, such as essay writing, require higher order thinking. When introduced into undergraduate assessment, where student performance is evaluated in relation to traditional classifications, with 70%+ representing first class honours, testing only lower order thinking could create issues with grade inflation: what we termed the ‘awarding problem’. This contrasts with some professional assessments, such as the SQE, which tend to distinguish between competent and not competent candidates: simply put, pass or fail.

Our view is that it is possible to design multiple choice questions which test higher order thinking. This is supported by our review of pedagogic literature in the field. Indeed, this has been argued in relation to ‘accurately and reliably’ assessing the content of the Qualifying Law Degree – albeit in relation to a professional law programme (Fry, Crewe and Wakeford, 2013). This point has also been argued in relation to law programmes in the United States (Case and Donohue, 2008). Multiple choice questions which test higher order thinking are more difficult to design than pure knowledge/recall questions (Aiken, 1982). Well-designed multiple choice questions in law go beyond testing “*esoteric topics, isolated facts, or the ability to cite cases*” (Fry, Crewe and Wakeford, 2013, 236) and instead test a student’s application of “*fundamental legal principles to realistic fact patterns*” (Fry, Crewe and Wakeford, 2013, 236). This is achieved by providing a ‘vignette’ or ‘stem’:

> “Questions that contain no vignettes, merely asking examinees “What’s the rule?” or “What’s true?”, are testing surface learning – the examinees’ recall of isolated facts (“recall questions”). Recall questions can often be answered by turning to a single paragraph in a textbook. They reward examinees who have simply memorised the material, but who might not be able to apply or interpret it.” (Case and Donohue, 2008, 377)

A review of the literature also indicates that MCTs can aid with assessment for learning: research has shown that taking MCTs requiring higher order thinking can produce learning that improves subsequent performance (for example, McConnell, St-Onge and Young, 2015).

It is not possible to assess at the pinnacle of Bloom’s Taxonomy using MCQs/SBAs as students will not demonstrate creation of new or original work. For an undergraduate programme, this means that the proportion of assessment by MCT needs careful weighting. Nevertheless, our review of the literature indicates that it is possible to design questions which test higher order learning up to and including evaluation. This requires well-designed questions that are scenario based, requiring students to critically analyse a factual scenario, and apply relevant legal knowledge to that scenario.

Higher order learning appears to be particularly well tested through SBA questions, where students are required to select the best advice out of a range of potentially correct options: this requires students to compare and contrast opposing answers and make a judgement. This is the methodology adopted by the SQE Part 1 (Solicitors Regulation Authority, 2024).

The approach taken: LLB (Hons)

Prior to 2022-23, only a limited number of our modules had assessed by a proportion of MCT. Before implementing MCTs more widely, a strategy was developed to help achieve consistency, rigour and fairness to students. The strategy embraced five compulsory modules and five optional modules.

The strategy was developed partly by reflecting on the approach of those modules with prior experience and, particularly, by drawing on the pedagogy outlined above. The average results of tests in modules already using MCTs varied from below 60% to above 80% – the latter being inconsistent with more traditional assessment results. Tests with lower average marks tended to use more problem-based questions, requiring application. The strategy used the pedagogy to develop a 'house style' form of MCT, ie problem-based questions requiring critical analysis of factual scenarios, and application of relevant legal knowledge/principles to those scenarios, in order to select the most accurate option presented in a time-restricted environment. As the LLB assesses undergraduates, we did not replicate SQE1. Key differences included using 'open book' assessments, undertaken through the Blackboard platform. Blackboard is the virtual learning platform used by our undergraduates, and the medium used for many MCT formative questions. Blackboard also allows automated and expedited marking and feedback to students, and compiles a range of statistical data for staff, including how effective each question is at differentiating student performance. We also allowed a proportion of factual recall/pure knowledge style questions to be used in Level 4 MCTs. Examples of the styles of question used are contained in the Appendix.

The strategy ensured MCTs were not simply an evaluative tool, but a critical scaffold in the learning activities of each module, thereby helping to achieve constructive alignment and feedback mechanisms. A staff writing workshop was delivered, which focused on writing problem-based questions in the house style.

Example of approach taken: Land Law MCT, January 2023

Land Law was assessed by MCT for the first time in 2022-23. This is a compulsory 30-credit module at Level 5. The test contained 20 questions, sat in 40 minutes. The test, and its resit, was written by one member of staff. All questions were problem based and presented to the module team for scrutiny, comment and editing; during this process, particular care was taken to include problem questions of varying difficulty in order to differentiate student performance across traditional degree classifications.

To ensure an MCT differentiates between students of differing abilities, it should contain a range of questions. Standard setting, as part of the internal scrutiny process for approving examinations, is therefore vital. There are several approaches to this, one of the most common being the Angoff method (Plake and Cizek, 2012). This involves rating each question in the MCT based on whether a borderline candidate would get it right. A rating between 7 and 10 would suggest most borderline students would get it right, a rating between one and four would suggest few borderline students would get it right. The ratings are done by a panel of subject experts individually considering the questions. The panel then meets to compare gradings and discuss any significant differences – for example, where there is a standard deviation of two or more. Members of the panel then change their gradings if they are persuaded by others. Finally, the grading for each question is worked out by averaging each panel member's marks. However, standard practice with the Angoff method is to set the pass mark depending on the ratings; this is an approach adopted on some professional assessments, but is not something that would easily fit with traditional undergraduate degree classifications.

We took the following approach to differentiate performance. We included:

+ eight 'easy' questions (so 40%, equivalent to a pass);
+ five to six 'medium' questions (up to 70%);
+ five to six 'hard' questions (>70% and into higher first class performance).

Difficulty was differentiated according to the complexity of the principle(s) tested, the complexity of the question stem, and the relative accuracy of the answer distractors. This process necessitates the involvement of module experts, ideally testing the questions under assessment conditions, followed by frank discussion and careful editing. For Land Law, the writing and editing process took more than two weeks to produce two tests. All students sat the same questions, presented in a random order. Following the test, we then used Blackboard's statistical data to review how effective the overall test, and each individual question, was at differentiating student performance. Blackboard's 'Item Analysis' tool pools questions as follows:

Easy: greater than 80% of students answered the question correctly.

Medium: between 30% and 80% of students answered the question correctly.

Hard: fewer than 30% of students answered the question correctly.

Outcomes

Table 1. The overall statistics for the first Land Law MCT

Statistics for Land Law MCT, January 2023. 462 submissions.	
Average mark: 63%	**Median mark 60%**
Using these metrics, the MCT was judged a success: an average mark of 63% is broadly in line with examining board expectations for this module based on student performance in previous years, when assessed entirely by 'traditional' assessments.	
In this test, the % accuracy ranged from 100% accuracy to 20% accuracy. The decile mark range with the greatest proportion of students was 60-69% (124 students/27% of the cohort).	

These results indicate it is possible to write individual questions and overall MCTs which differentiate student performance and achieve average marks in line with those of more traditional examinations. The statistics of individual questions demonstrated that student performance did not always match our initial categorisation. Notwithstanding the care taken over standard setting, it is almost inevitable that there will be questions where module teams calibrate incorrectly and students find a particular question harder or easier than expected. Due to the traditional classifications used at undergraduate level, a small number of such questions can have a significant impact on the award profile of the test.

To mitigate this risk, our future approach will be to standard set tests by reflecting on the statistics of previous tests and assess how well each question, and the distractors within them, differentiate student performance (Fry, Crewe and Wakeford, 2013, 238; Race, 2007, 48). Over time, a bank of questions may be established from which an appropriate selection may be used for each test, and each test should become more reliable and quicker to design. This means summative MCT questions and answers cannot be released to students – generic cohort feedback on performance must be constructed to ensure it is supportive to student development without compromising the integrity of future tests. Nevertheless, we would still caution against using MCTs as the sole assessment method for a module.

Across the LLB more broadly, adopting a more problem-based approach helped one module achieve results more consistent with those of traditional assessments: before the strategy, its average mark was over 80%; in 2022-23 this average reduced to approximately 60%. Some modules still had average MCT marks significantly higher than those usually found in traditional assessments. Going forward, our strategy will be developed to ensure a greater focus on standard setting, using statistics, as part of MCT design. However, based on our experience, this is a process which will require refinement over a period of time.

Appendix: Example Contract Law questions – Level 4

Q1: Pure Knowledge / Recall

Which one of the following statements most accurately represents the principle of remoteness of damage?

A The claimant is able to recover damages for all loss caused by the breach of contract, regardless of how distant the loss from the breach.

B The claimant is able to recover damages for all loss caused by the breach of contract, provided such loss was in the reasonable contemplation of the parties at the time the contract was entered into.

C The claimant is able to recover damages for all loss caused by the breach of contract, provided the party in breach has expressly accepted responsibility for the risk of that particular loss occurring in the event of such a breach.

D The claimant is able to recover damages for all loss caused by the breach of contract, provided the party in breach does not deny accepting responsibility for the risk of that particular loss occurring in the event of such a breach.

Notes: At Cardiff, Contract Law is a Level 4 module. As a Level 4 module, we consider that some pure knowledge / recall questions are appropriate, and this is an example of such. As part of the scrutiny and standard setting process for the Contract Law MCT, this was set as an Easy standard question. Following completion of the test, Blackboard statistics confirmed that the question was answered with 87% accuracy across 420 students. Blackboard categorises Easy questions as those having an accuracy rate of >80% and therefore suggests this question should be reviewed. A question of this standard is appropriate, provided it is set alongside questions which test at higher levels of the taxonomy.

Question 2: Problem based

Delta Ltd has entered into a contract with Gamma Ltd. Delta Ltd entered the contract following a misrepresentation made to it by Gamma Ltd. Delta Ltd believes the misrepresentation may have been a fraudulent one, but Delta Ltd may not be able to prove this. The misrepresentation has caused Delta Ltd loss. Delta Ltd wishes to sue Gamma Ltd for the greatest amount of damages possible.

What claim should Delta Ltd make?

A A claim for damages the tort of deceit.

B A claim for damages under s2(1) Misrepresentation Act 1967.

C A claim for rescission under s2(2) Misrepresentation Act 1967.

D A claim for damages under the principle in *Hedley Byrne v Heller* (1964) AC 465.

Notes: This question obtained 58% accuracy across 326 students. Questions with 30% to 80% accuracy are classified by Blackboard as Medium difficulty.

A very similar question to this was used in a previous test, the results of which also indicated Medium level of difficulty. This makes standard setting future tests more straightforward. Based on student performance, this appears to be firmly in the 'Medium' category of question.

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4.4 “How do you know, who says so?” Enhancing feedback practices for undergraduate student nurses

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Background

This piece reports on preliminary exploratory work aiming to enhance assessment feedback practices specifically for first year undergraduate nursing students. The focus is twofold: enhancing how written feedback is *provided* and how it is *received* by students, and subsequently improving student satisfaction and assessment literacy.

The case study discussed is generated from a post-1992 higher education institution (HEI) renowned for its significant role in providing health, social care and medical education in North-west England. The BSc Nursing programme (all fields: learning disability, mental health, adult and child) has the largest student enrolment within the faculty, with more than 700 students annually across two intakes, one in January, and another in September. The programme is delivered as a non-modular (year of study) modified concept-based curriculum with an authentic assessment strategy.

The University is proudly rooted to its history, and the role it plays in supporting social justice through widening access and participation initiatives. The student population is diverse; 77% of students have one or more underrepresented characteristics. These include being the first in their family to attend university, declaring a disability, residing in areas with an index of multiple deprivation (IMD) score of 1-4, identifying as care leavers or declaring their ethnicity as ‘not white’. The diversity of the student body is significant in relation to feedback, as first-year undergraduate student expectations of feedback are influenced by their experiences in further education (Ryan, Henderson, Ryan and Kennedy, 2021). Students may enter the BSc Nursing programme with a wide range of qualifications from further education (FE), or via our fast track course, where traditional entry qualifications are not typically required.

Previous education does not always adequately prepare students to engage in academic literacy in higher education (Klarare et al, 2022). In undergraduate nursing programmes a mismatch in expectation and student ability is apparent, Student nurses report feeling unprepared, having not anticipated the academic focus and expectations, nor the increasing demands and complexity experienced across the programme (Mitchell et al, 2021), particularly in relation to academic writing proficiency (Jefferies et al, 2018). Difficulties with academic writing were evident, with the summative written assessment first-time pass rate (FTPR) falling below institutional expectations. This posed a risk to student retention as achievement of summative assessment is required to enable progression, and academic failure impacts confidence and motivation, which in itself poses a risk to retention (Meens, Bakx, Klimstra and Denissen, 2018). An early formative written piece was introduced in the first year of study to support students’ assessment and feedback literacy; while improvement of the average pass mark was observed, the FTPR remained broadly unchanged. This may accord with the findings of Orsmond and Merry’s (2010) study where high achieving students were better able to use feedback to self-regulate their own self-improvement while non high achieving students were less likely to regard the feedback as directly relevant to their own individual learning. Evaluative judgement skills are necessary for lifelong learning; feedback must be student-centred to ensure that students are able to understand and use it in future assessments (Sadler, 2010).

Contemporary conceptualisations of feedback move beyond the notion of information transfer toward an active and engaged state of sense making (Carless, 2015). However, there is a historic disconnect between what markers and students perceive to be effective and useable feedback (Ajjawi et al, 2022; Giles, Gillbert and McNeill, 2014; Robinson, Pope and Holyoak, 2013). Markers acknowledge that academic terminology is not always readily understood by students (Koh, 2010), the disconnect occurs in the lack of shared language and the apparent difficulty in decoding this terminology with students. Students need to understand feedback and be receptive to, and motivated by, its content (Derham, Balloo and Winstone, 2022). While this had occurred for some of our students, we questioned whether the current feedback mechanisms were inclusive, or if some student groups may be facing risks to their equality of opportunity. Boud and Molloy (2013, 702) go as far as to state that “if there is no discernible effect, then feedback has not occurred”; as we had not significantly impacted the FTPR with the introduction of the formative written piece, we questioned whether feedback had occurred – *for all?*

Approach and intervention

Currently, undergraduate students enrolled on the BSc Nursing programme are required to submit one piece of summative academic writing per academic year. Upon submission, they receive a numerical mark and are provided with written “overall” feedback aligning with the learning outcomes of the assessment using a levelled marking criterion. Through discussions with students and the thorough moderation process that ensues marking, discrepancies were observed in the frequency and volume of commentary, and in the language used both in quickmarks and open-text feedback provided to students.

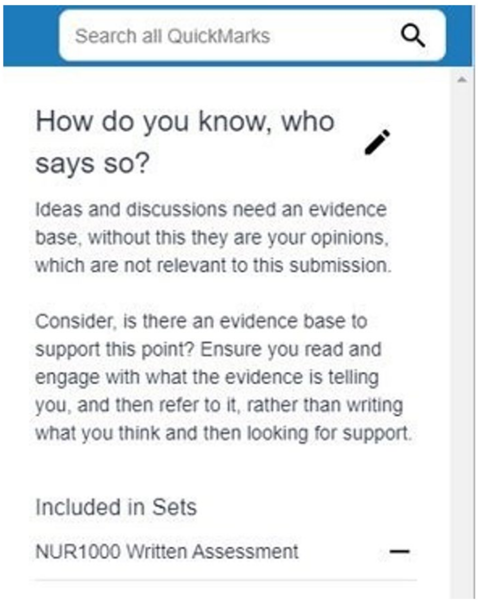
This case study focuses solely on the written assessments of first-year undergraduate nursing students. Those who fail to attain a pass grade (40% or higher) are granted an opportunity for resubmission. Students are invited to participate in “resubmission support workshops” led by the written assessment leads. Resubmission support workshops form part of a suite of supportive measures to promote retention. Workshops are scheduled within the timetable to encourage attendance, voluntary strategies are poorly attended, with those most at risk for retention the least likely to participate (Mitchell et al, 2021)

The first authors (EE and HS) spent time engaging with several students across different cohorts in their first year on the BSc Nursing programme, during their time as written assessment leads (assessment leads are nominated individuals who take a lead on assessment tasks within each year of study). These interactions occurred during resubmission support workshops, which were conducted in a tutorial style with no more than 50 students, where informal discussions preceded more structured workshop activities. Throughout these discussions, the concept of feedback literacy was highlighted as a significant barrier to student achievement. Evidence suggests that a lack of feedback literacy may not only reduce student motivation and academic confidence (Koh, 2008), but also has the potential to adversely affect students’ overall experience of the programme.

Students disclosed struggling to interpret “academic language” and jargon; evidence suggests students disregard feedback when they struggle to understand what it means (Sutton, 2012; Weaver, 2006). In conversation, students highlighted unfamiliar academic terms which were used as feedback on their written assessments, they discussed an inability to de-code their meanings independently: *“It’s like they’re speaking a different language, how am I supposed to know what any of that even means?”.* Through in depth-discussion and exchange, several common phrases or terms that markers used, such as “unsubstantiated” and “unsupported”, were de-coded and distilled in collaboration with students into more student centred and understandable phrases such as, *“How do you know, who says so?”* This emphasised the need for a student-centric approach to feedback to support the development of feedback literacy.

To address the apparent disconnect between usable feedback for students and the comments received from internal moderators, the first authors held calibration meetings with the marking team. During the calibration meetings, the authors introduced a standardised set of quickmarks, which was shared with each marker, for use within the year of study. This set of quickmarks was developed by loosely analysing the content of previous submissions and resubmissions and the “free text” comments provided by markers on the written assessment. General quickmarks used student-centred language and included co-produced quickmarks such as *“How do you know, who says so?”* enhanced with descriptors to further facilitate understanding and develop students feedback literacy (Figure 1).

Figure 1. An example of the “quickmark” developed in discussion with students



Outcomes

This descriptive, small-scale, exploratory work has enabled a deeper understanding of the academic literacy requirements specific to first-year undergraduate student nurses at a widening access and participation university in the UK. Initial discussion with students brought attention to the existing written feedback processes that were perceived as inadequate in providing students with “useable” information for their development, which students experienced as being unsupportive.

Building on this initial insight, the authors are conducting ongoing, more structured content analysis of feedback throughout the programme, and in different years of study and cohorts, aiming to collaboratively develop additional supportive resources. The authors hope to co-develop with students a glossary of marking terms to be used by both students and markers to foster a unified, student-centred approach and ensure consistency and improve clarity in assessments.

First year undergraduate students now participate in markers’ workshops, working in small marking teams to mark and provide written feedback on anonymised, previously submitted written assessments, with varying grades. The marking workshops are facilitated by a member of the year of study marking team. This exercise mirrors the staff (markers’) calibration meetings, where the group develop a shared understanding of how the levelled marking criteria is applied to the learning outcomes. Students gain clarity of understanding of how marks are awarded and, through providing feedback for another student, develop assessment and feedback literacy. This engagement opportunity, whereby students work in much smaller groups than in lectures, encourages open and constructive ongoing dialogue between markers and students (Mackintosh-Franklin, 2021) with the aim of lessening the reported disconnect between markers’ and students’ perceptions of written feedback (Giles et al, 2014). It provides opportunity for students to understand what markers are looking for, and in turn provides further opportunity for students to discuss their thoughts, perceptions and needs relating to written assessment feedback and assessment literacy with markers. This provides an ongoing development opportunity for the marking team to engage directly with the cohorts’ ‘student voice’ to support them to provide more student-centred feedback that guides them towards improvement and ensure the most effective feedback (Giles et al, 2014). Specific in-text feedback commentary, including some which were co-developed with students, is now provided on student submissions with the use of Turnitin and quickmarks and is encouraged within the marking team.

As previously noted in the literature, developing a robust feedback practice in the best interest of students and staff, under time and workload constraints, can be difficult (Carless, 2015). The authors assert the perspective that putting greater effort and emphasis into formative tasks and supporting feedback literacy to positively impact student outcomes can be considered a redistribution of workload, and one that aligns with our professional and institutional culture, values and ethics.
The cohort (intervention group) are yet to submit the written assessment, so the authors are unable to report the impact of the intervention and demonstrate conclusively that the approach will yield the desired impact on FTPR.

The proposed evolution of this study is to generate a glossary of learner-centred co-produced feedback and measure its effect, engaging students as “active players” in feedback processes (Winstone and Boud, 2020). This will contribute to the existing, conceptual literature. While this case study relates to nursing students, discussion is applicable to all disciplines, particularly first year undergraduate cohorts and highlights the need to be continuously developing assessments to be student-centred and effective.

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Our strategic goals to enhance confidence and trust in HE, address inequalities, promote inclusion and advance education to meet the evolving needs of students and society, support the work of our members and the HE sector.

We deliver our support through professional development programmes and events, Fellowships, awards, student surveys and research, providing strategic change and consultancy services and through membership (including accreditation of teaching and learning, equality charters, knowledge and resources).

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