

University of Wales Trinity Saint David



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Trinity Saint David

# Portfolio

Effective Teaching and Assessment in Higher Education  
(UNHE7009)

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## 1 AI Declaration

PG Cert tHE – The use of Generative Artificial Intelligence (AI)- Declaration.

MODULE CODE: UNHE 7009

ASSESSMENT COMPONENT: Portfolio

STUDENT NAME: Ryan James

STUDENT NUMBER: 0751093

### Use of Generative AI in Assessment

|              |                                                                                                                                                                                                 |                                                                        |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| RESEARCH     | For this assessment, you can use Generative AI to support you in research, including searching for bibliography, using tools to summarise, compare and interrogate materials.                   | Yes <input checked="" type="checkbox"/><br>No <input type="checkbox"/> |
| STRUCTURE    | For this assessment, you can use Generative AI to support you in structuring your submission, including creating a draft argument structure, identifying parts and headings, etc.               | Yes <input checked="" type="checkbox"/><br>No <input type="checkbox"/> |
| PROOFREADING | For this assessment, you can use Generative AI to check your own text/creation for grammatical and syntactical mistakes, including rephrasing of your own work within specific standards.       | Yes <input checked="" type="checkbox"/><br>No <input type="checkbox"/> |
| WRITING      | For this assessment, you can use Generative AI to create text for submission.                                                                                                                   | Yes <input type="checkbox"/><br>No <input checked="" type="checkbox"/> |
| CREATIVE     | For this assessment, you can use Generative AI to create creative materials, such as images.                                                                                                    | Yes <input type="checkbox"/><br>No <input checked="" type="checkbox"/> |
| PROGRAMING   | For this assessment, you can use Generative AI to create and check code.                                                                                                                        | Yes <input type="checkbox"/><br>No <input checked="" type="checkbox"/> |
| NONE         | For this assessment, you are not allowed to use <b>any</b> type of Generative AI support. This includes research support, structure support, writing/proofreading support and creative support. | Yes <input checked="" type="checkbox"/><br>No <input type="checkbox"/> |

### AI Acknowledgement

I confirm that I have not presented any AI generated materials as my own work in this portfolio.

However, I acknowledge that I have used or may have used the AI in the research , and proof reading of my portfolio

The details are provided below:

ChatGPT, Prompt: please proof read the following document giving points on how to adjust to first person from engineering report style.

Grammarly was used for minor grammatical corrections.

## 2 Teaching and Learning Statement

### 2.1 My role

I teach engineering at the university, focusing mainly on undergraduate and MSc students. My lectures cover control systems engineering and electronics two, fields that constantly evolve and challenge the way we understand technology. I love breaking down complex systems into something accessible, helping students grasp not just the how, but the why. In class, I blend theory with practical examples, encouraging hands-on learning wherever possible. I'm passionate about seeing students connect the dots between equations and real-world applications. Watching them grow from unsure beginners to confident engineers is easily the most rewarding part of my job.

### 2.2 How I came into higher education

I never really enjoyed school. It always felt like a place where I didn't quite fit, and eventually, I left after my GCSEs. For years, I thought education just wasn't for me. But as I got older, something shifted. I realized I wanted more, more knowledge, more challenge, more opportunity. Going back to study as a mature student was daunting at first, but it turned out to be one of the best decisions of my life. This time, I was there because I wanted to be. I found a real love for learning, and I finally felt like I belonged.

### 2.3 What is different about HE

University was different: it was hands-on, practical, and full of purpose. I loved solving real problems and being creative, and for the first time, learning felt exciting. The treatment from lecturers is more focused on encouraging independent thinking to solve problems rather than passing national exams.

What made it even better was the people. Everyone had chosen to be there, driven by their own goals and passion. That shared energy made the experience inspiring. It wasn't like school — it was a place where we pushed each other to succeed.

### 2.4 Challenges for Engineering HE students

As a Lecturer in Engineering, I have consistently worked to create inclusive, learner-centred environments that respect the diverse needs of students (V1). My teaching philosophy is rooted in the understanding that students learn in different ways and arrive with a wide range of prior experiences. I strategically adapt my approaches to ensure all learners—whether they are first-generation university attendees, international students, mature learners, or those with additional needs—can thrive.

I actively use evidence-informed approaches to guide my practice (V3). Drawing on both pedagogical research and engineering education literature, I incorporate models such as VARK to cater to diverse learning preferences (K1). My sessions are intentionally multimodal—using visual tools (e.g., flowcharts, diagrams), auditory supports (e.g., discussions, recorded content), structured notes for read/write learners, and lab-based or design challenges for kinaesthetic engagement (K2, A2). I regularly evaluate the effectiveness of these approaches through student feedback and reflective practice, ensuring that my strategies remain responsive and relevant (K3).

Within the context of engineering education, I recognise that moving from structured school learning to the analytical, self-directed learning expected at university can be a significant transition. Many students struggle with applying theory to complex, real-world problems that lack definitive answers. I address this by designing scaffolded learning experiences that gradually increase in complexity and uncertainty. These include open-ended design projects and systems-thinking tasks

that challenge students to justify assumptions and learn from failure—essential skills in engineering practice (K1, A2).

In my leadership role, I advocate for inclusive teaching practices at the programme level. I've worked closely with colleagues and disability support services to embed proactive adjustments into our curriculum. These include pre-distributed materials, flexible assessment formats, and the integration of assistive technologies. I also champion alternative assessments, such as oral presentations and project-based evaluations, which allow students with different strengths to demonstrate their understanding meaningfully (A4).

My support for learners extends beyond the classroom. I hold regular open office hours, use digital platforms for accessible communication, and foster an open-door culture. I encourage students to share feedback, advocate for their own needs, and engage in their own learning journey. This holistic approach empowers them not only academically, but personally and professionally.

In conclusion, I bring a strategic, reflective, and research-informed approach to teaching and learning in higher education. My commitment to inclusive, effective practice is underpinned by ongoing critical evaluation and a deep respect for the individuality of each learner.

### 3 Microteach Reflection

#### 3.1 The session's topic

The session was on: “An introduction to DC Motor electromagnetism”, the topics covered were:

- What is a DC motor
- Direct Current and Alternating Current
- Electrical Units
- Permanent Magnets
- Electromagnetic Basics
- Fleming’s Hand rules
- DC motor Commutator Basics

#### 3.2 What went well from colleague feedback

The positive feedback showed, praising a learners in class answers to questions demonstrating support helping to guide learners (PSF 2023 A4).

Also, respect individual learners and diverse groups of learners by making sure topics were understood before continuing based on feedback and adapting activities to suit different learning styles including visual aids such as Gifs for visual learners and open discussions for verbal learners (PSF 2023 V1).

#### 3.3 What should be improved from colleague feedback

Feedback that too much material was covered in the short space of time which if it was in front of students rather than colleagues may have been too challenging, this shows improvements are needed in approaches to teaching and/or supporting learning, appropriate for subjects and level of study (PSF 2023 K2).

Some of the slides were too busy which can be distracting, the theoretical principles should have been separated from the mathematics which can often help in engineering not to confuse students (PSF 2023 K1).

#### 3.4 Future steps from colleague feedback

Improvements to PowerPoint creation can be made through evidence-informed approaches, such as Mayer’s Cognitive Theory of Multimedia Learning, which suggests using minimal text and relevant visuals to enhance learner engagement and retention (PSF 2023 V3).

Applying flipped learning or scaffolded discussion can slow down the lecture, creating an environment that allows for a focused, manageable number of topics per lecture, promoting deeper engagement and understanding (PSF 2023 A2).

I can improve my lecturing by engaging with current pedagogical research and developments in my subject area, ensuring my teaching remains relevant, effective, and responsive to the evolving needs of my learners (PSF 2023 K3).

## 4 Reflective report of a teaching intervention cycle

### 4.1 Problem identified

#### 4.1.1 How I approach module delivery

As a lecturer, I am always attentive to the diverse ways students engage with learning, especially in modules filled with complex electrical engineering topics (PSF 2023 V1). It becomes clear early on that not all learners approach the material in the same way. Some grasp abstract concepts quickly, while others need more time and support to build a solid foundation. I see the signs moments of hesitation, varied levels of confidence, and different strategies for tackling problems. I respect these individual differences and understand that a one-size-fits-all approach is not enough.

Supporting and guiding learners' means being flexible in my teaching. I offer multiple explanations, practical demonstrations, and real-world examples to make the material accessible (PSF 2023 A4). I encourage questions and create a classroom environment where all learners feel safe to express their difficulties without fear of judgement. During lab sessions, I make a point of checking in with students individually and in small groups, tailoring my guidance based on their specific needs. For some, it's about breaking down the maths; for others, it's connecting theory to practice (PSF 2023 k1).

#### 4.1.2 Learners becoming disengaged during the module

As the module progresses, I notice a gradual decline in student attendance. In the early weeks, lectures and lab sessions are well-attended, but as the topics become more challenging, particularly in the more technical areas of electrical engineering, fewer students consistently show up. Some seem discouraged by the complexity of the material, while others may struggle with balancing their workload across different modules. This drop in attendance is concerning, as it often signals that learners are finding it harder to stay engaged and may need additional support to stay on track.

#### 4.1.3 Results in Learners missing out on key foundation topics

The drop in attendance sets many learners behind, as they miss out on key fundamentals that future topics build upon. Without a strong grasp of the basic principles, students often find it increasingly difficult to engage with more advanced material later in the module. Gaps in understanding accumulate quickly, leading to greater frustration and a lack of confidence. This not only affects their performance in assessments but also limits their ability to apply core concepts in practical and professional contexts beyond the classroom.

#### 4.1.4 Bimodal exam results for the cohort

Poor attendance often leads to a bimodal distribution in exam results, where a clear divide emerges between students who consistently attended and engaged with the module and those who did not. This pattern aligns with constructivist learning theory, which emphasizes the importance of active, continuous engagement in constructing knowledge. Learners who attend regularly are more likely to build understanding incrementally, participate in formative activities, and clarify misconceptions early. In contrast, those with poor attendance miss crucial scaffolding opportunities, as described by Vygotsky's Zone of Proximal Development (Xi and Lantolf, 2021), where guidance from instructors supports learning just beyond the student's current ability. As a result, assessments reveal a sharp split: one group performs well, having built a strong foundation, while the other struggles, lacking essential conceptual grounding.

## 4.2 Comparison with other similar assessed modules

The module is assessed by exam at the end point, comparing the results and attendance of the cohort with another similarly assessed module provided the following insights:

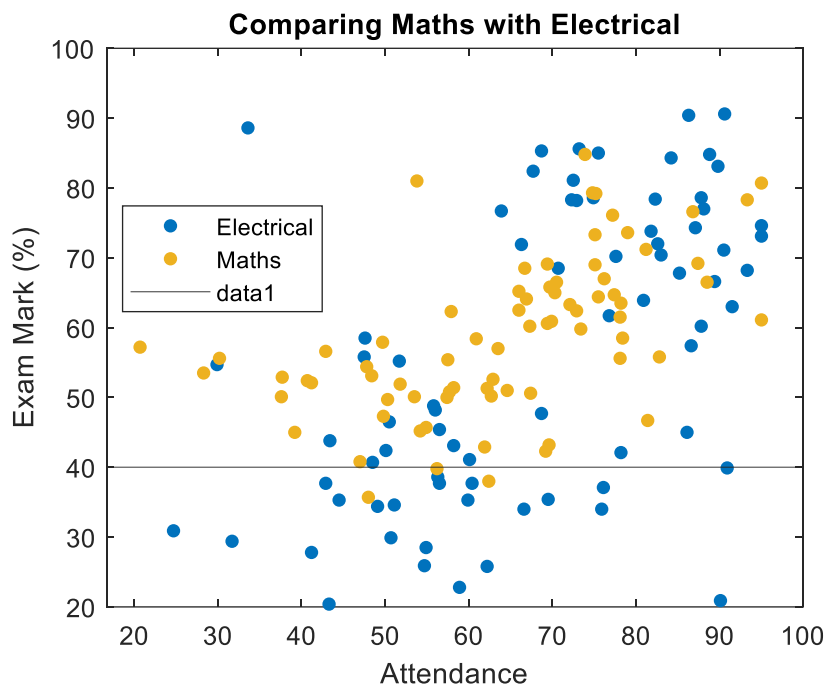


Figure 1 Scatter plot of exam marks and Attendance for the Electrical module in question compared with the Maths Module

As can be seen in figure 1 there is a definite split in the blue electrical attendance and module mark when compared with the yellow maths module there are also considerably more electrical failures indicated as below the data1 line.

### 4.2.1 Initial conclusions

I observe that both subjects show a broad positive trend: students with higher attendance generally achieve higher marks. This reinforces what we know from educational research, Tinto's (1993) student integration theory (Karp, Hughes and O'Gara, 2010), for instance, supports the idea that regular attendance strengthens both academic achievement and a sense of belonging. Recognising these trends helps me adapt my support for learners with differing attendance patterns (PSF A4, K1).

While both subjects show this general pattern, I note that in Electrical Engineering, the data points are more tightly clustered, suggesting a stronger link between attendance and success. In contrast, Maths marks appear more widely spread across attendance levels. This may indicate that students in Maths can sometimes succeed with more independent study, whereas Electrical Engineering might rely more on participation in structured, guided sessions (PSF K2, A2). This reflects Chickering and Gamson's (1987) emphasis on "time on task" (Prinsloo, 2017) and aligns with (Kolb, Boyatzis and Mainemelis, 2014) experiential learning theory, especially relevant for practice-oriented subjects like engineering.

### 4.2.2 Caution on analysis

I must be careful not to over-interpret the differences between subjects. Maths may lend itself more to self-paced study, while Electrical Engineering might require more in-person guidance. Recognising that students learn in varied ways and that different disciplines support learning differently helps me uphold the value of respecting diverse learner needs (PSF V1, K1, K2).

I also consider that other variables, such as cohort size, the accessibility of resources, or the teaching style of the instructor, may be contributing to the patterns I observe. These factors remind me of the importance of critically evaluating my practice and its outcomes rather than relying on surface-level data comparisons alone (PSF K3, V3).

### 4.3 Further Analysis

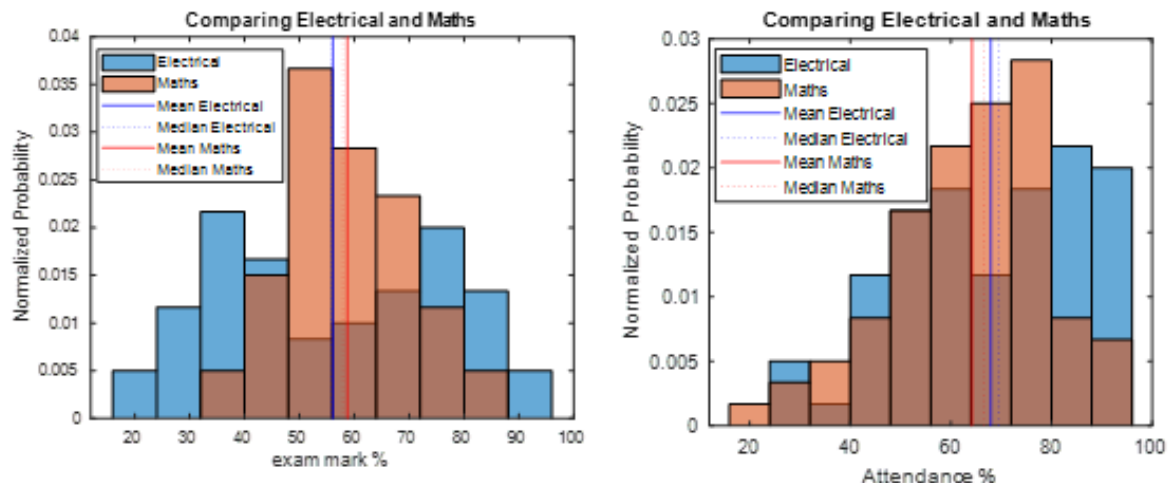


Figure 2 Showing normalised histograms for Marks and attendance for both Maths and Electrical

In the exam mark histogram, I see that Maths students have a more concentrated distribution, with a clear peak around the 60–65% range. In contrast, Electrical Engineering marks are more widely spread, ranging more evenly from about 30% to 90%. The mean and median for Electrical are both lower than for Maths, suggesting not just a wider variation, but also a slightly lower average performance overall.

This difference makes me reflect on how learners might be experiencing these two modules differently. It prompts the question: *Is the assessment in Electrical Engineering aligned with how students best learn that content?* (PSF K1, K2). If a substantial proportion of students are achieving low marks despite high attendance, it may indicate that the teaching or assessment methods need review.

From a pedagogical standpoint, Biggs' theory of constructive alignment reminds me to ensure that learning outcomes, teaching activities, and assessments are coherently linked. If Electrical Engineering relies heavily on applied assessments or in-class demonstrations, then students who don't grasp these quickly might struggle disproportionately (PSF K2, V3). This wider performance spread might indicate a need to diversify teaching approaches to better accommodate different learning styles and prior knowledge (PSF V1, A2, A4).

When I examine both Maths and Electrical Engineering together, it raises questions about whether the teaching and assessment methods in Electrical Engineering are pedagogically appropriate. The strong correlation between attendance and exam performance suggests that success may depend too heavily on one off performance that is related to that module's attendance, potentially disadvantaging learners with different needs or circumstances. This observation prompts me to critically evaluate whether the current approaches in Electrical Engineering sufficiently support diverse learners and learning styles (PSF V1, K1, K2). It reinforces the importance of using evidence-

informed approaches and scholarship to adapt teaching practices in a way that promotes inclusive, effective engagement for all students (PSF V3, K3, A2).

This analysis encourages me to reflect critically on my teaching practices and support strategies. While comparing data across modules can reveal useful insights, I must remain rooted in an evidence-informed approach and mindful of disciplinary nuances and student diversity. Using these reflections, I aim to improve how I design and adapt learning environments and support mechanisms, ensuring they are equitable, appropriate, and responsive to the needs of my learners (PSF A2, A4, V1, K1, K2, V3).

#### 4.4 Research on intervention methods

Improving student attendance and academic performance requires a multi-faceted approach grounded in pedagogical research and a commitment to inclusive, evidence-informed practice. Studies have consistently shown that building a strong sense of community and belonging within the classroom can positively influence attendance. (Appleton *et al.*, 2018) emphasises the importance of academic and social integration in student retention and engagement, suggesting that strategies such as collaborative learning, peer support schemes, and active learning techniques can encourage participation (PSF V1, K1, A2). Similarly, Chickering and Gamson's (Chickering, bulletin and 1987, no date) principles of good practice in undergraduate education advocate for frequent student–faculty interaction and prompt feedback as means of fostering motivation and persistence. Structuring teaching environments that promote regular contact and active engagement can be particularly effective for diverse student cohorts, who may feel marginalised or disconnected from traditional teaching models (PSF A4, V1).

Flexible learning opportunities, including blended and asynchronous resources, have also been shown to support attendance and performance by accommodating different learning needs and life commitments (PSF K2, A2). Research by Thomas (Foundation and 2012, 2012) reinforces the idea that institutions should address structural and cultural barriers to engagement, suggesting that inclusive teaching practices—such as diverse assessment types, accessibility in materials, and clear expectations—are crucial to improving outcomes (PSF V1, K1, V3). Furthermore, encouraging metacognition through reflective activities and formative feedback supports deeper learning and empowers students to take ownership of their progress (PSF A4, K3).

Within this broader pedagogical framework, replacing a single high-stakes end-of-module exam with multiple open-book online quizzes has emerged as a particularly effective strategy. These quizzes, spaced throughout the module, promote regular engagement and distributed practice, which has been shown to enhance long-term retention (Roediger and Karpicke, 2006). The format also reduces test anxiety, supports diverse learners by allowing flexibility in time and setting, and encourages the application of knowledge rather than rote memorisation (PSF V1, K2). This approach aligns with principles of formative assessment and self-regulated learning (Nicol, education and 2006, 2006), providing timely feedback and opportunities for growth. By integrating this method into course design, educators can create more inclusive, engaging, and pedagogically sound learning environments (PSF V3, A2, K3).

#### 4.5 Current module restrictions

The current delivery of the module is shaped by several structural constraints, including the size of the student cohort and the extensive, predefined content that must be covered within a limited timeframe. These factors create challenges in implementing more flexible or personalised teaching methods. Additionally, due to accreditation requirements tied to the programme, particularly those mandated by professional bodies, the use of written assignments as a primary form of assessment is

not a viable option. The accrediting framework demands objective, measurable outcomes that align with specified learning competencies, making it essential to retain structured, standardised assessment formats. As a result, the module design must strike a balance between ensuring comprehensive content coverage, managing large-scale delivery, and maintaining assessment methods that meet external accreditation standards—while still respecting diverse learners and aiming to foster engagement through evidence-informed practice (PSF V1, V3, K1, K2).

#### 4.6 Chosen intervention

Research into improving student attendance and academic performance has consistently highlighted the value of aligning assessment strategies with how students best learn. Traditional single end-of-module exams often disadvantage students who struggle with high-pressure assessments, offer limited formative feedback, and fail to capture incremental learning (PSF K1, K3). Numerous pedagogical studies now advocate for more continuous, inclusive, and formative assessment methods that are better suited to a diverse student population (PSF V1, V3).

One particularly effective approach is the use of multiple open-book online quizzes throughout a module. Research by (Nicol, education and 2006, 2006) on formative assessment and self-regulated learning supports the idea that regular, low-stakes testing encourages engagement, reinforces knowledge retention, and provides timely feedback—all of which contribute to improved learning outcomes. These quizzes reduce assessment anxiety and reward sustained effort rather than last-minute cramming, aligning more closely with how students build understanding over time (PSF K1, K2).

Furthermore, this approach respects individual learning needs by offering flexibility—students can complete quizzes at their own pace, in accessible environments, and with the support of learning materials (PSF V1, A4). Open-book formats shift the focus from memorisation to application and critical thinking, which is particularly relevant in disciplines that value problem-solving and real-world application (PSF K2, A2). Studies such as those by (Roediger and Karpicke, 2006) show that repeated retrieval practice enhances long-term retention more effectively than single, summative assessments.

Implementing multiple online quizzes also creates regular touchpoints between the student and the module, promoting better attendance and engagement overall. When students know they are assessed consistently and fairly across the term, they are more likely to stay engaged and motivated (PSF A2, A4). These methods can be underpinned by evidence-informed design using learning analytics to tailor support to those who may fall behind (PSF V3, K3).

In conclusion, shifting from a single high-stakes exam to multiple open-book online quizzes reflects a critical, research-informed evolution in practice. It promotes fairness, supports diverse learners, and aligns with the principles of effective, inclusive, and reflective teaching practice as outlined in the Professional Standards Framework (PSF V1, V3, K1, K2, K3, A2, A4). This assessment model not only improves academic outcomes but also cultivates a more supportive and engaging learning environment.

#### 4.7 Intervention

I implemented a change to the assessment structure of a large undergraduate module I led. The module had previously relied solely on a final, high-stakes closed-book exam. Through analysis of student outcomes, feedback, and attendance patterns, I identified that this assessment format contributed to increased anxiety and reduced engagement throughout the term. Drawing on

pedagogical literature and institutional guidance, I redesigned the assessment strategy by replacing the final exam with three evenly spaced, online open-book quizzes.

This decision was grounded in my engagement with scholarship and evidence-informed practice (PSF V3). I drew particularly on the work of (Nicol et al., 2006), who emphasise the role of formative assessment and feedback in supporting self-regulated learning. (Roediger and Karpicke, 2006) research on the testing effect further informed my decision, as it demonstrates how spaced, low-stakes assessments enhance long-term retention. By shifting from a summative endpoint to a series of quizzes, I enabled students to consolidate learning over time and apply knowledge in a more authentic, lower-pressure format (PSF K1, K2, K3).

Throughout the process, I remained mindful of the diverse needs of my learners (PSF V1). Many of the students were balancing study with part-time work, caring responsibilities, or managing mental health challenges. The online quizzes were open-book and asynchronous within a 72-hour window, offering flexibility while maintaining academic rigour. This structure reduced anxiety and promoted inclusivity, allowing students to engage with the content in a way that suited their circumstances and learning preferences (PSF A2, A4).

Because the module is tied to professional accreditation, I ensured the redesigned assessments still aligned with defined learning outcomes and competencies. I critically reviewed existing exam questions and reformulated them to test applied knowledge, problem-solving, and interpretation—skills valued by accrediting bodies. This ensured the change met both pedagogical and regulatory standards (PSF K2, K3).

I supported learners by providing clear guidance from the outset. In Week 1, I shared the rationale behind the change and provided sample quiz questions to build confidence and transparency. I also created formative practice opportunities using the VLE so that students could become familiar with the format and receive immediate feedback on their progress (PSF A2, A4).

Following implementation, I collected student feedback and analysed engagement data. Attendance and participation improved compared to previous years, and students reported feeling more supported and less anxious. This intervention demonstrated how critically evaluating existing practice and engaging with educational research enabled me to improve outcomes and foster a more inclusive and effective learning environment (PSF V3, K3).

## 4.8 Results of intervention

### 4.8.1 Attendance

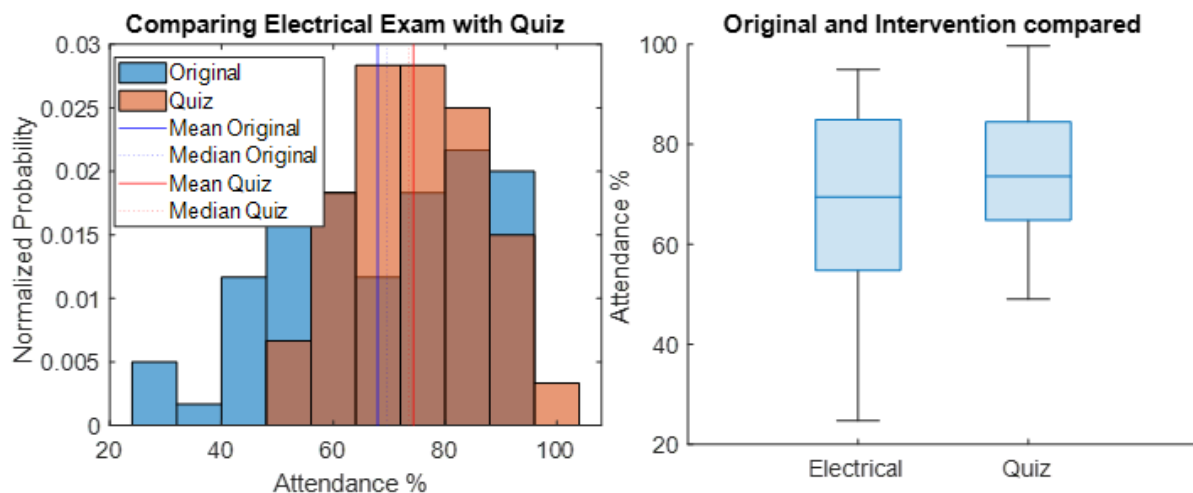


Figure 3 results of intervention Attendance Histogram and Box plot

The visual comparison provided in the histogram and boxplot illustrates a clear improvement in student attendance after implementing the intervention that replaced a single end-of-module exam with three open-book online quizzes. This positive trend offers strong support for the pedagogical rationale behind the assessment redesign and aligns with a range of PSF 2023 dimensions.

#### 4.8.2 Histogram Analysis

The histogram shows a shift in attendance distribution from the original exam-based module (blue) to the quiz-based intervention (orange). The attendance profile under the quiz model is less skewed and more centred around higher attendance percentages, with both the mean and median attendance increasing. This suggests that students were more consistently engaged across the semester when assessment was continuous and distributed, rather than concentrated at the end. This aligns with (Chickering et al., 1987) principle of encouraging “time on task,” which emphasises the importance of regular student engagement for deep learning (PSF K1, K2, V3).

#### 4.8.3 Boxplot Analysis

The boxplot reinforces these findings: the median attendance in the quiz group is visibly higher, and the interquartile range is narrower, indicating more consistent attendance across the student cohort. Notably, the lower quartile in the original exam format is significantly lower, suggesting that a subset of students disengaged early or sporadically. The intervention appears to have addressed this by supporting learners with more frequent, manageable assessment points, promoting regular participation and learning (PSF A2, A4).

#### 4.8.4 Pedagogical Implications

From a pedagogical standpoint, this intervention demonstrates how evidence-informed changes to assessment design can respect and support the needs of a diverse student population (PSF V1, V3). Replacing a high-stakes exam with regular open-book quizzes enabled more equitable participation, reducing pressure while reinforcing understanding through distributed practice—an approach supported by (Roediger and Karpicke, 2006) work on the testing effect. Students with work, caregiving responsibilities, or anxiety around traditional assessments benefited from the flexibility and reduced stakes of online quizzes (PSF K1, A2).

Furthermore, this change encouraged me to engage in critical evaluation of my teaching practice, using both student feedback and attendance data as indicators of engagement and inclusion (PSF K3). This shift also fostered a more inclusive environment, where all students had a better chance of staying connected to the module throughout its delivery, rather than concentrating effort and stress at a single point in time.

#### 4.8.5 Marks

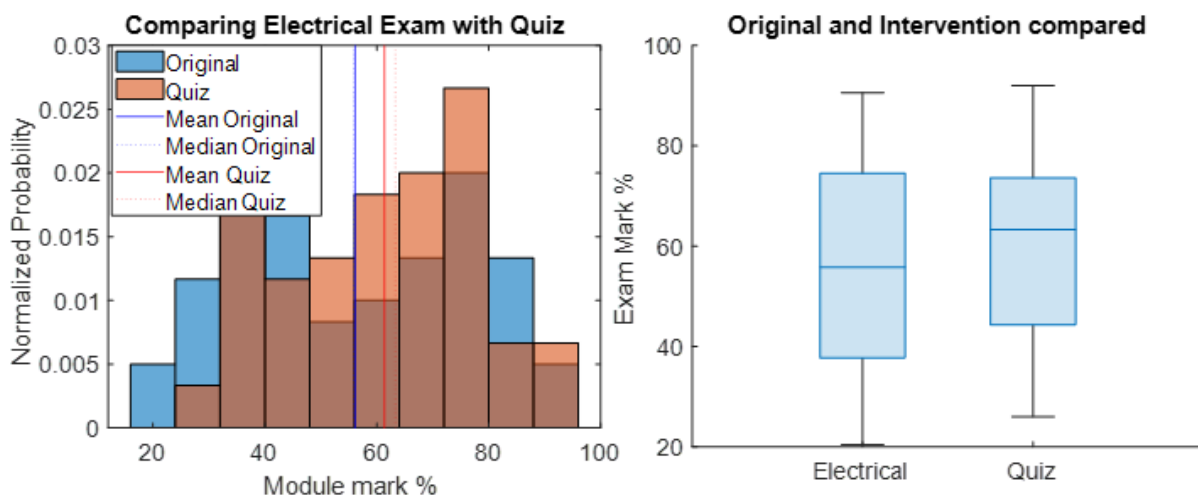


Figure 4 Results from intervention Marks Histogram and box plot

The intervention improved student marks, as shown by the histogram and boxplot. The quiz group achieved a higher mean and median, with more students scoring in the 70–80% range compared to the original exam format. The distribution is more positively skewed, indicating overall performance gains. This suggests that regular, lower-stakes assessments supported sustained learning and reduced pressure, aligning with research on retrieval practice and formative feedback (PSF V3, K1, A2), while also better supporting a diverse range of learners (PSF V1, A4).

#### 4.9 Reflection of intervention

A key factor in the sustained improvement in attendance observed during the intervention was the predictable rhythm of assessment created by introducing open-book quizzes every four weeks. By ensuring that students were consistently aware of an upcoming assessment, I established a structure that maintained their motivation and engagement across the entire module. This approach leveraged the principle of “time on task” (Chickering et al., 1987), where regular deadlines help students organise their learning and attend more reliably, knowing that their effort contributes directly to ongoing assessment outcomes (PSF K1, A2).

The continuous presence of an impending assessment fostered a sense of accountability and relevance, which helped counter the common mid-semester dip in attendance often seen in exam-only modules. From a learner support perspective, this structure also provided frequent opportunities for feedback and self-evaluation, enabling students to track their progress and make timely improvements (PSF A4). This format respected the diverse needs and study habits of the cohort, particularly those who benefit from structured pacing rather than last-minute high-pressure exams (PSF V1, K2).

#### 4.10 Module feedback

Following the assessment intervention, module feedback significantly improved. Students reported reduced anxiety, greater clarity in expectations, and increased satisfaction with the continuous assessment format. Semester review surveys reflected higher overall engagement, with many praising the fairness and structure of the quizzes, highlighting improved motivation and confidence throughout the module experience.

#### 4.11 Further work

The research brought up other methods with will hopefully be implemented where applicable over time:

- Use flipped classroom strategies, providing pre-recorded content and using contact time for applied problem-solving.
- Embed reflective journals to promote metacognitive awareness and help students track their learning journey.
- Offer scaffolded tutorial support targeted at lower-performing students, based on quiz analytics.
- Develop inclusive learning materials, such as multimodal content (video, text, diagrams) to support diverse learners (PSF V1).
- Use learning analytics dashboards to proactively identify disengaged students for early intervention (PSF A4).

## 5 Observation 1 (myself observing a colleague)

### 5.1 PGCert tHE OBSERVATION FORM -PSF 2023



| Details of the Observation                                                                                                                                                                                                                                                                                                             |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Observee                                                                                                                                                                                                                                                                                                                               | Kerry Tudor                         |
| observer                                                                                                                                                                                                                                                                                                                               | Ryan James                          |
| Date of the Observation                                                                                                                                                                                                                                                                                                                | 13, February, 2025                  |
| Campus / Location                                                                                                                                                                                                                                                                                                                      | Swansea IQ                          |
| Date, Time, Duration                                                                                                                                                                                                                                                                                                                   | February 2025, 11 am- 1 pm, 2 hours |
| Subject Speciality                                                                                                                                                                                                                                                                                                                     | Workshop and Practice               |
| Type of activity                                                                                                                                                                                                                                                                                                                       | Lecture                             |
| <b>This observation will contribute to the participant's portfolio of evidence to satisfy the assessment of the PGCert tHE and should be undertaken by an experienced academic colleague or professional colleague. Observation by a fellow participant on the programme is not permissible as a means of authenticating practice.</b> |                                     |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Teaching/Support preparation [A1: Design and plan learning activities/programmes]</b><br><i>i.e. Preparation, selection and organisation of content. Choice of teaching/learning methods.</i>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Comments</b> The learning activities based on the composite materials PowerPoint are well-designed, engaging, and relevant. They clearly link theoretical concepts with real-world applications, especially in the automotive sector. The integration of sustainability and recycling enhances critical thinking, while diverse manufacturing methods provide a comprehensive understanding. Excellent planning and content alignment throughout.                                                                                                                                                       |
| <b>Teaching [A2: Teach and/or support learning through appropriate approaches and environments.]</b><br><i>i.e. Beginning class, introduction, continuity with other sessions, students' prior knowledge. Clarity of presentation. Pace. Attitude to the subject matter. Use of appropriate reinforcement. Ending the session – summary, future work etc. Technique and Aids: General apparatus – board, data projector, use of handouts. Was effective communication achieved? Was there good student–teacher rapport? Were the aims/outcomes achieved? Appropriateness of teaching/learning methods.</i> |
| <b>Comments</b> The lecturer used highly effective teaching approaches, creating an interactive environment by working through the mathematical examples live with students. This supported active learning and reinforced complex concepts. The clear explanations and real-time problem-solving encouraged                                                                                                                                                                                                                                                                                               |

engagement and deepened understanding, especially in applying theory to fibre composites in practical contexts. The filling out of the equations and solutions made the pace of the class acceptable for all the students and accessible.

**Effective Learning Environments [A4: support and guide learners /V1 Respect individual learners/diverse groups of learners]**

*i.e General class atmosphere, level of participation, attention, and interest. Student attitude and ability to carry out classwork. Were learning problems identified and overcome? Awareness of individual needs. Attitude to students.*

**Comments**

The lecturer showed excellent awareness and sensitivity by discreetly supporting students who seemed to struggle, ensuring no one felt singled out. Through subtle checks for understanding, patient repetition, and varied explanations, the lecturer created an inclusive and supportive learning environment. This thoughtful approach fostered student confidence and encouraged participation, making the session accessible and engaging for all learners, regardless of their pace or level of prior understanding.

**Assessment [A3: Assess and give feedback for learning]**

*i.e Formative/summative assessment examples , Question and answer technique. Other evaluation procedures, class management, instructions to students005C.*

**Comments**

The lecturer's question and answer technique effectively fostered strong class engagement, encouraging active participation and critical thinking. By posing open-ended and targeted questions, she created opportunities for students to articulate their understanding and apply concepts. Her responsive dialogue allowed her to assess comprehension and adapt explanations in real time, ensuring clarity and reinforcing learning across the group. This interactive approach kept students attentive and involved throughout the session.

**Core Knowledge**

- K1 How learners learn, generally and within specific subjects
- K2 approaches to teaching and or/supporting learning appropriate for subjects and levels of study.
- K3 Critical evaluation as a basis for effective practice.
- K4 Appropriate use of digital technologies / resources.
- K5 requirements for quality assurance, enhancement and implications for practice

**Comments**

The lecturer effectively supported diverse learning styles by incorporating numerous images and diagrams, which greatly benefited visual learners in understanding complex composite structures and processes. Additionally, she provided clear, step-by-step mathematical guidance, ensuring that learners who found numerical content challenging could follow along and grasp key calculations. This balanced approach enhanced overall comprehension and made the session inclusive and accessible to all students.

**Professional values**

- V1 Respect for individual learners /diverse groups of learners
- V2 Promote engagement and learning and equity of opportunity for all to reach their potential.
- V3 Use scholarship, research or professional learning, or other evidence informed approaches as the basis of effective practise.
- V4 respond to the wider context in which higher education operates, recognising implications for practice.
- V5 Collaborate with others to enhance practice.

**Comments**

The lecturer skilfully referenced real-world industry applications and current research developments throughout the session, which greatly enhanced student engagement. By connecting theoretical content to practical uses in sectors like automotive manufacturing, she demonstrated the relevance and value of the material. Discussing emerging trends and sustainability challenges also sparked curiosity and encouraged learners to think critically about future developments in composite materials.

**Examples of good practice:**

This lecture demonstrates good practice through clear structure, relevant content, and visually engaging slides. It balances theory with practical examples, includes real-world applications, and integrates sustainability themes. The use of diagrams and step-by-step mathematical problems supports diverse learners, promoting understanding and encouraging active engagement throughout the lecture.

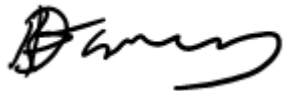
**Action points:**

To further support visual learners, consider adding GIFs and animations that demonstrate key processes such as fibre alignment, stress loading, and composite manufacturing. Dynamic visuals can enhance understanding of complex concepts, maintain student attention, and make abstract ideas more tangible, promoting deeper engagement and improved retention of information.

**For Observee**

**Write a short statement to address Area of activity [A5] .Decribe how this observation will enhance your practice.**

Through CPD, I can explore digital tools to integrate GIFs and animations into teaching materials, enhancing visual communication of complex topics. Workshops or online courses on multimedia in education can equip staff with skills to create engaging content, supporting diverse learning styles and improving student outcomes across technical subjects.

|                                                                                                                                                                                                               |                                                                                   |       |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|------|
| Observer .....                                                                                                                                                                                                |  | ...   | Date |
| Observee ...                                                                                                                                                                                                  |  | ..... | Date |
| <b>PGCert PARTICIPANTS</b>                                                                                                                                                                                    |                                                                                   |       |      |
| <b>On completion of the peer observation reports for each module, compose a short reflective paragraph on your observation experiences for inclusion in your portfolio along with the observation sheets.</b> |                                                                                   |       |      |

## 5.2 Observation 1 reflection

Reflecting on the lecture the session demonstrated clear alignment with V1 by showing respect for individual learners and diverse groups. The lecturer effectively supported different learning styles, using visual aids, industry examples, and real-world applications to promote accessibility and engagement. This inclusive approach recognised and valued the varied needs of learners within the classroom.

In relation to K1, the lecturer showed a solid understanding of how students learn both generally and within the specific context of composite materials. The use of practical examples, visual resources, and step-by-step mathematical explanations supported comprehension and reflected an awareness of the cognitive challenges some learners may face with technical content.

Aligned with A2, the teaching environment was supportive and interactive, incorporating varied methods such as questioning and visual prompts. However, while allowing students time to respond is a valuable technique, the lecturer occasionally waited too long for answers. This slowed the session's momentum and affected student focus. Adapting this by using techniques like think-pair-share or guided questions could enhance responsiveness and engagement.

Finally, in line with A4, the lecturer discreetly supported struggling learners without drawing attention, fostering confidence and inclusion. This demonstrated thoughtful guidance and a genuine commitment to learner development.

## 6 Observation 2 (colleague observing me)

### 6.1 PGCert tHE OBSERVATION FORM -PSF 2023



| Details of the Observation                                                                                                                                                                                                                                                                                                             |                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Observee                                                                                                                                                                                                                                                                                                                               | Ryan James                                     |
| Practice Advisor / Expert peer observer                                                                                                                                                                                                                                                                                                | Dr Kerry Tudor                                 |
| Date of the Observation                                                                                                                                                                                                                                                                                                                | 12 <sup>th</sup> March 2025                    |
| Campus / Location                                                                                                                                                                                                                                                                                                                      | Waterfront Campus, IQ102                       |
| Date, Time, Duration                                                                                                                                                                                                                                                                                                                   | 12 <sup>th</sup> March 2025, 3pm – 5pm (2 hrs) |
| Subject Speciality                                                                                                                                                                                                                                                                                                                     | ACEB7007 Hybrid Powertrain and Control         |
| Type of activity                                                                                                                                                                                                                                                                                                                       | Lecture                                        |
| <b>This observation will contribute to the participant's portfolio of evidence to satisfy the assessment of the PGCert tHE and should be undertaken by an experienced academic colleague or professional colleague. Observation by a fellow participant on the programme is not permissible as a means of authenticating practice.</b> |                                                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Teaching/Support preparation [A1: Design and plan learning activities/programmes]</b><br><i>i.e. Preparation, selection and organisation of content. Choice of teaching/learning methods.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Comments</b><br><p>The slides were made available on TEAMS prior to the session, allowing students to access them on their personal laptops as well as view them on the main screen during class. The lecturer ensured clarity in how the material connected to the coursework, helping students to see the relevance of the session content. The slides were well-presented, with a clear and logical organisation of information, supported by effective use of visuals to enhance understanding. Additionally, the teaching method employed was appropriate for the module level and catered well to the diverse range of students in the class.</p> |
| <b>Teaching [A2: Teach and/or support learning through appropriate approaches and environments.]</b><br><i>i.e. Beginning class, introduction, continuity with other sessions, students' prior knowledge. Clarity of presentation. Pace. Attitude to the subject matter. Use of appropriate reinforcement. Ending the session – summary, future work etc. Technique and Aids: General apparatus – board, data projector, use of handouts. Was effective communication achieved? Was there good student–teacher rapport? Were the aims/outcomes achieved? Appropriateness of teaching/learning methods.</i>                                                 |
| <b>Comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

The session began with a useful recap of the previous week's topics, incorporating questions to gauge students' understanding and reinforce key concepts. Clear links were made to prior work, effectively demonstrating how the current theory connects to earlier practical activities. This helped students see the relevance and application of what they had previously completed. There were references to their MATLAB script throughout the lecture; while some students had clearly reviewed it in advance, it was not always evident whether all students were familiar with the material being discussed. Strong connections were also drawn between the lecture content and the coursework, providing valuable context. I particularly appreciated the revision of key equations at the end of the session, including an explanation of how these equations are commonly used in industry. The lecture concluded with a thorough recap, again linking back to previous weeks, reinforcing continuity and aiding student comprehension.

**Effective Learning Environments [A4: support and guide learners /V1 Respect individual learners/diverse groups of learners]**

*i.e General class atmosphere, level of participation, attention, and interest. Student attitude and ability to carry out classwork. Were learning problems identified and overcome? Awareness of individual needs. Attitude to students.*

**Comments**

There was a positive and engaging atmosphere in the class, with the majority of students actively participating when prompted. Many students were observed taking notes, either on paper or electronically, indicating their engagement with the material. Complex topics were explained clearly using well-chosen examples, and additional clarity was provided by drawing directly on the slides to illustrate key points. The lecture featured a well-balanced combination of graphs, equations, and written explanations, accompanied by insightful discussions on how the equations were derived and the origins of the values used. The lecturer appeared to have a strong rapport with the students, fostering an open and supportive learning environment. While a few students were occasionally talking, this was well-managed and did not disrupt the flow of the class.

**Assessment [A3: Assess and give feedback for learning]**

*i.e Formative/summative assessment examples , Question and answer technique. Other evaluation procedures, class management, instructions to students005C.*

**Comments**

Students were encouraged to actively engage by attempting example problems during the class. While questions were occasionally posed and then answered by the lecturer, there was a clear effort to involve students in the problem-solving process. When students provided incorrect answers, the lecturer responded effectively, quickly identifying where the misunderstanding had occurred and guiding students to reflect on their approach. This immediate and constructive feedback helped students develop a deeper understanding and learn from their mistakes in a supportive environment.

**Core Knowledge**

- K1 How learners learn, generally and within specific subjects
- K2 approaches to teaching and or/supporting learning appropriate for subjects and levels of study.
- K3 Critical evaluation as a basis for effective practice.
- K4 Appropriate use of digital technologies / resources.
- K5 requirements for quality assurance, enhancement and implications for practice

**Comments**

The session made strong and effective links to other modules, highlighting how prior knowledge gained in those areas is relevant and applicable. Specific examples were used to demonstrate these connections, helping students see the continuity in their learning. Additionally, the lecturer clearly illustrated how concepts introduced at lower levels are now being expanded and developed further, providing students with a sense of progression and a deeper understanding of the subject matter. There was good use of the limited technology in the room and the resources were designed in such a way to allow for additional notes to be added via the interactive whiteboard.

**Professional values**

- V1 Respect for individual learners /diverse groups of learners
- V2 Promote engagement and learning and equity of opportunity for all to reach their potential.
- V3 Use scholarship, research or professional learning, or other evidence informed approaches as the basis of effective practise.
- V4 respond to the wider context in which higher education operates, recognising implications for practice.
- V5 Collaborate with others to enhance practice.

**Comments**

The content was clearly explained in relation to its relevance across various areas of the industry. Practical examples were provided to illustrate how the concepts apply in real-world settings, helping students understand the importance and applicability of the material beyond the classroom. This approach not only reinforced the theoretical knowledge but also highlighted its significance within an industry context. The lecturer showed respect for all students, no matter their query or response to questioning. There was evidence of good practice throughout the session and the students appeared to find the session informative and engaging.

**Examples of good practice:**

Everyday examples were used effectively throughout the lecture, making the material accessible and engaging for students from all backgrounds. This approach helped to simplify complex concepts and ensured that everyone could relate to the content. Despite being in a new room with less-than-ideal technology, the situation was handled calmly and professionally, ensuring that any technical difficulties did not disrupt the flow of the session or impact the learning experience.

**Action points:**

To further encourage student participation, it would be beneficial to leave questions open for a longer period, giving students more time to formulate and share their responses. For example, when covering the closed-loop control system, rather than writing the answer on the board yourself, you might consider inviting a student to come up and write the equation, promoting greater engagement and interaction. Additionally, incorporating a brief Q&A session at the end of the lecture, along with a quick assessment or summary activity, could help consolidate students' understanding and provide an opportunity to gauge their learning from the session.

**For Observee**

**Write a short statement to address Area of activity [A5] .Describe how this observation will enhance your practice.**

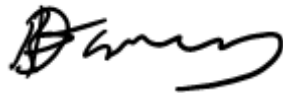
To enhance my practice through continuing professional development I shall watch webinars on feedback timings, I will allow more time for student responses to promote deeper thinking and engagement. I'll also involve students in demonstrations, such as writing equations, and introduce end-of-session Q&A and summary activities to consolidate learning and assess understanding more effectively. These strategies will help create a more interactive and student-centred environment.

Observer



Date 19/03/2025

Observee .....



Date 19/03/2025

**PGCert PARTICIPANTS**

**On completion of the peer observation reports for each module, compose a short reflective paragraph on your observation experiences for inclusion in your portfolio along with the observation sheets.**

## 6.2 Observation 2 reflection

Reflecting on the feedback, I recognise how my practice demonstrated respect for individual learners and the diverse group in my class (V1). By providing slides on TEAMS prior to the session, I gave all students—regardless of learning preferences or access needs—an opportunity to engage with the material in a way that suited them. I also ensured clarity and relevance, linking lecture content to coursework and other modules, helping students make meaningful connections across their learning (K1).

I used a variety of teaching methods to cater to different learning styles and subject-specific needs (K1, A2). For example, I integrated visual aids, written explanations, and everyday analogies to simplify complex engineering concepts. This multi-modal approach helped make abstract theories more accessible and demonstrated my understanding of how learners in this subject grasp content differently. Drawing on the slides during the lecture also helped reinforce key points visually and kinaesthetically.

To support learning actively, I encouraged students to participate in example problems and used questioning to prompt discussion (A2). While some questions were answered by me, I see the value

in allowing longer pauses for students to think and respond. This is an area I will develop further, as suggested in the action points.

My approach to guidance was evident in how I addressed incorrect answers (A4). Rather than dismissing them, I used mistakes as teaching moments, guiding learners to reflect and self-correct. This helped foster a supportive environment where students felt safe to engage and take intellectual risks. The positive classroom atmosphere and active note-taking further indicated that learners felt respected and well-supported throughout.

Going forward, I will build on this by integrating more student-led activities and using quick assessments at the end of sessions to check understanding and guide future learning.

## 7 Observation 3 (colleague observing me)

### 7.1 PGCert tHE OBSERVATION FORM -PSF 2023



| Details of the Observation                                                                                                                                                                                                                                                                                                             |                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Observee                                                                                                                                                                                                                                                                                                                               | Ryan James                                |
| Practice Advisor / Expert peer observer                                                                                                                                                                                                                                                                                                | Mark Sandford                             |
| Date of the Observation                                                                                                                                                                                                                                                                                                                | 24 <sup>th</sup> March 2025               |
| Campus / Location                                                                                                                                                                                                                                                                                                                      | Swansea IQ                                |
| Date, Time, Duration                                                                                                                                                                                                                                                                                                                   | 24 <sup>th</sup> March 2025, 3pm, 2 Hours |
| Subject Speciality                                                                                                                                                                                                                                                                                                                     | ACEB7007 Hybrid Powertrain and Control    |
| Type of activity                                                                                                                                                                                                                                                                                                                       | Lecture                                   |
| <b>This observation will contribute to the participant's portfolio of evidence to satisfy the assessment of the PGCert tHE and should be undertaken by an experienced academic colleague or professional colleague. Observation by a fellow participant on the programme is not permissible as a means of authenticating practice.</b> |                                           |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Teaching/Support preparation [A1: Design and plan learning activities/programmes]</b><br><i>i.e. Preparation, selection and organisation of content. Choice of teaching/learning methods.</i>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Comments</b><br>Printed handouts provided. Prompt start. Explained relevance of past learning and how that learning will be developed a planned and logical progression. Students encouraged to join -in by filling in gaps in handouts. References could be included on slides to sign post students to additional resources to support/ enhance their learning. Kept well to timing.                                                                                                                                                                                                                  |
| <b>Teaching [A2: Teach and/or support learning through appropriate approaches and environments.]</b><br><i>i.e. Beginning class, introduction, continuity with other sessions, students' prior knowledge. Clarity of presentation. Pace. Attitude to the subject matter. Use of appropriate reinforcement. Ending the session – summary, future work etc. Technique and Aids: General apparatus – board, data projector, use of handouts. Was effective communication achieved? Was there good student–teacher rapport? Were the aims/outcomes achieved? Appropriateness of teaching/learning methods.</i> |
| <b>Comments</b><br>Explained point of learning, including other tutors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Looked to check understanding.

Researched what will happen during the class.

Good fast pace, requires total concentration.

Led from the front.

Use of PowerPoint, added annotations.

Additional use of white board to copy delivery.

Relevant examples were expanded.

**Effective Learning Environments [A4: support and guide learners /V1 Respect individual learners/diverse groups of learners]**

*i.e General class atmosphere, level of participation, attention, and interest. Student attitude and ability to carry out classwork. Were learning problems identified and overcome? Awareness of individual needs. Attitude to students.*

**Comments**

Small Masters (H2c) group. Seven students.

Quiet thoughtful environment.

Good level of student involvement.

Could have given more time to allow less able students to keep up.

One student arrived 30 mins late, no fuss.

Provided with handout & current position.

**Assessment [A3: Assess and give feedback for learning]**

*i.e Formative/summative assessment examples , Question and answer technique. Other evaluation procedures, class management, instructions to students005C.*

**Comments**

The module assessment method was mentioned and why this lecture is relevant/applied. Some questions and answers completed mainly through students working out maths on supplied worksheet.

**Core Knowledge**

- K1 How learners learn, generally and within specific subjects
- K2 approaches to teaching and or/supporting learning appropriate for subjects and levels of study.
- K3 Critical evaluation as a basis for effective practice.
- K4 Appropriate use of digital technologies / resources.
- K5 requirements for quality assurance, enhancement and implications for practice

**Comments**

Plenty of focus on the maths that is key to the topic.

Good practice on current references to research in the field

**Professional values**

- V1 Respect for individual learners /diverse groups of learners
- V2 Promote engagement and learning and equity of opportunity for all to reach their potential.
- V3 Use scholarship, research or professional learning, or other evidence informed approaches as the basis of effective practise.
- V4 respond to the wider context in which higher education operates, recognising implications for practice.
- V5 Collaborate with others to enhance practice.

**Comments**

Good use of interactive whiteboards to allow all learners to see in class work

Using a calculator emulator was good practice for diverse learners to follow exactly how to enter the problems into their own calculators

**Examples of good practice:**

Use of PowerPoint – esp annotations

Use of whiteboard

Good entry and exit discussion for the lecture

**Action points:**

Not the most exciting subject.

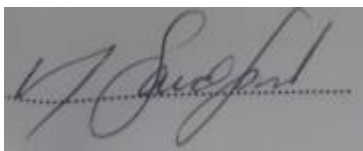
Consider adding animations or video to support examples of learning. Break up the session.

Provide references for further reading.

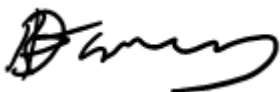
**For Observee**

**Write a short statement to address Area of activity [A5] .Decribe how this observation will enhance your practice.**

To enhance practice through continuing professional development, I'll explore engaging strategies like animations and videos to support learning. I'll also incorporate session breaks and offer further reading references to enrich understanding and maintain participant engagement in future sessions.

**Observer .**  .....

**Date** 24<sup>th</sup> March 2025

**Observee .....**  .....

**Date** 24<sup>th</sup> March 2025

**PGCert PARTICIPANTS**

**On completion of the peer observation reports for each module, compose a short reflective paragraph on your observation experiences for inclusion in your portfolio along with the observation sheets.**

## 7.2 Observation 3 reflection

Reflecting on the feedback I received from my observed lecture, I was pleased to see that many aspects of my teaching practice were positively highlighted. The recognition of my use of annotated PowerPoint slides, interactive whiteboards, and calculator emulators speaks to my effort to respect and support diverse learners (V1) by offering multiple modes of representation. These tools allow students with varying preferences and needs to engage with the material effectively.

I've been mindful of how learners absorb new mathematical concepts (K1), especially in a subject that may not immediately spark interest. By using structured handouts, prompting active participation, and providing real-world examples, I aimed to make abstract ideas more accessible and relevant. I appreciated the comment that the lesson had a clear, logical progression and that

prior learning was appropriately built upon, as this reflects my commitment to using scaffolded, purposeful approaches (A2).

Supporting all learners remains a priority for me, and while the feedback noted good student involvement and thoughtful classroom dynamics, I acknowledge the suggestion to allow more time for less able students to keep up. This is an important reminder to balance pace with inclusivity (A4). Additionally, I plan to act on the advice to include references on slides and consider using video or animation to further enhance engagement.

Overall, the feedback has strengthened my understanding of how to adapt my teaching to meet the diverse needs of learners. I remain committed to creating supportive, stimulating environments where all students feel guided and able to succeed.

## 8 CPD Reflection 1

Attending the CPD session on “Teaching Intelligent Control Systems with MATLAB and Simulink” was a professionally enriching experience that allowed me to enhance both my subject knowledge and pedagogical approaches within the context of higher education (HE). The session directly supported my development across several dimensions of the UK Professional Standards Framework (UKPSF), particularly Areas of Activity A1, A2, and A5, Core Knowledge K1 and K2, and Values V2 and V3.

The training deepened my understanding of intelligent control algorithms, particularly fuzzy logic and neural networks, and their implementation in MATLAB and Simulink. This enhanced subject knowledge (K1: The subject material) significantly improves the currency and relevance of the examples I can provide to students. Applying this to teaching, I can now integrate simulation-based case studies that more closely reflect industry practice, thus supporting A1 (Design and plan learning activities) and A2 (Teach and/or support learning).

From a pedagogical perspective, the hands-on nature of the session demonstrated effective strategies for engaging students in active learning. I was particularly inspired by how the CPD integrated problem-based learning with simulation tools—something I plan to replicate in my modules. This relates directly to K2 (Appropriate methods for teaching and learning in the subject area) and supports student-centred learning aligned with V2 (Promote participation in higher education and equality of opportunity for learners).

One of the most impactful elements was seeing how intelligent systems could be introduced incrementally—starting from rule-based systems, building up to adaptive and learning-based control. This scaffolding approach is essential for supporting students from diverse academic backgrounds, making complex content more accessible. This aligns with A5 (Engage in continuing professional development in subjects/disciplines and their pedagogy) and V3 (Use evidence-informed approaches and outcomes from research, scholarship and continuing professional development).

Furthermore, the CPD emphasized the value of integrating assessment within simulation tasks, encouraging formative assessment strategies. This provides timely feedback, which enhances learning and supports K2 and A3 (Assess and give feedback to learners). I plan to implement more frequent formative assessments in my modules using Simulink-based mini-projects to allow students to iteratively test their understanding.

Importantly, the session fostered a community of practice, where ideas and teaching practices were shared. Hearing how colleagues incorporate MATLAB into flipped classrooms or peer instruction encouraged me to rethink the structure of my teaching delivery to promote active engagement (A4: Develop effective learning environments and approaches to student support and guidance).

Overall, this CPD was highly relevant to teaching in HE. It provided both conceptual clarity and practical tools that will allow me to foster a more inclusive, effective, and engaging learning environment. The insights gained will not only benefit my teaching but also empower students to connect theory with practice—an essential skill in engineering education.

## 9 CPD Reflection 2

Attending the CPD session on “MATLAB Teaching with Live Scripts” offered an insightful opportunity to enhance my teaching practice in undergraduate engineering education. The session focused on using MATLAB Live Scripts as an interactive pedagogical tool, promoting a more engaging and transparent approach to teaching programming and technical computing. This aligns closely with several dimensions of the UK Professional Standards Framework (UKPSF), especially Areas of Activity A1, A2, A3, and A5, Core Knowledge K1 and K2, and Values V2 and V3.

Live Scripts provide a seamless blend of code, output, and explanatory text within a single interactive document. For undergraduates, particularly those at earlier stages of their degree, this approach can demystify programming and analytical processes. It supports A1 (Design and plan learning activities) by enabling structured, self-paced learning experiences that cater to a range of ability levels. I now plan to redesign introductory MATLAB lab sessions using Live Scripts to scaffold students’ progression from basic syntax to more complex problem-solving tasks.

The live demonstration of how to present lecture material interactively resonated with my existing challenges in engaging large undergraduate cohorts. By allowing students to run code in real-time and immediately see the outcomes, Live Scripts support A2 (Teach and/or support learning) and help break down the abstract barriers students often face with programming and data analysis. This approach also fosters deeper learning and aligns with V2 (Promote participation and equality of opportunity), as it provides a more inclusive format for learners with different learning styles.

The session also highlighted the potential of Live Scripts in formative assessment—allowing students to test their understanding within the teaching materials. This directly relates to A3 (Assess and give feedback to learners) and K2 (Appropriate methods for teaching, learning and assessment in the subject area). I was particularly inspired by the idea of embedding self-assessment quizzes and visual output sections within Live Scripts to provide immediate feedback. This will be a valuable addition to my teaching toolkit, supporting active learning and continuous student reflection.

Moreover, the CPD emphasized the value of reusability and consistency in digital content delivery. By developing a repository of Live Scripts, I can ensure a coherent student experience across sessions and academic years. This reinforces A4 (Develop effective learning environments and approaches to student support and guidance) and offers a more flexible learning environment where students can revisit content outside of scheduled sessions.

Engaging in this CPD also contributed to my own professional growth (A5), prompting reflection on how technology-enhanced learning can evolve traditional delivery methods. The use of Live Scripts is grounded in both technical innovation and pedagogical theory, echoing the UKPSF Value V3 (Use evidence-informed approaches). The session included case studies from other institutions, which broadened my understanding of best practices and encouraged me to contribute to a wider teaching community.

In summary, this CPD has given me practical tools and conceptual insights to better support undergraduate learning through MATLAB. The integration of Live Scripts into my teaching will not only improve accessibility and engagement but also foster a deeper, more autonomous learning experience for students.

## 10 CPD Reflection 3

Attending the CPD session on “MATLAB Grader” significantly enriched my approach to assessing undergraduate students in engineering and computing disciplines. The session focused on using MATLAB Grader as a platform for creating auto-graded coding assignments, which directly supports effective and continuous student assessment. This aligns well with the UKPSF 2023, particularly Areas of Activity A1, A3, A4, and A5, Core Knowledge K2 and K4, and Values V1, V2, and V3.

One of the key takeaways was the ability of MATLAB Grader to facilitate formative and summative assessment in a scalable, automated way. Through real-time feedback and structured tasks, students can continuously track their progress, which fosters self-regulated learning (A3: Assess and give feedback to learners). For educators, the immediate visibility into student performance allows early identification of those who are struggling—a crucial intervention point in undergraduate education. This supports V1 (Respect individual learners and diverse learning needs) and V2 (Promote participation and equality of opportunity), as the platform enables timely, data-driven support for students who might otherwise remain unnoticed.

The session highlighted how MATLAB Grader integrates seamlessly into virtual learning environments (VLEs), supporting the creation of structured, trackable assignments aligned with intended learning outcomes. This directly contributes to A1 (Design and plan learning activities) and K2 (Appropriate methods for teaching, learning and assessment). I now plan to implement weekly auto-graded exercises in my introductory MATLAB module, ensuring that students stay engaged and receive regular feedback without adding to staff marking workload.

What stood out was how MATLAB Grader supports differentiated learning. By allowing for varying levels of difficulty and incorporating hints or scaffolding, assessments can be tailored to support weaker students while still challenging high achievers. This aspect of inclusive teaching practice aligns closely with V2 and K4 (Use and value of appropriate learning technologies). I appreciated the demonstration of how to embed formative checkpoints that help build student confidence gradually, particularly useful for first-year undergraduates transitioning into higher education.

Another important aspect was the analytics and reporting capabilities of MATLAB Grader, which offer a powerful tool for academic staff to monitor student engagement and performance patterns. This allows for evidence-based pedagogical decisions (V3: Use evidence-informed approaches), and enables early interventions—such as follow-up emails, tutorials, or one-to-one support—for students who show signs of disengagement or repeated incorrect submissions. These insights support A4 (Develop effective learning environments and approaches to student support and guidance) by ensuring that students receive targeted help based on real performance data.

Engaging in this CPD session also supported my own ongoing professional development (A5), encouraging reflection on how emerging technologies can transform not just teaching but assessment culture in HE. The session’s practical focus, combined with pedagogical discussion, offered a holistic view of how MATLAB Grader can bridge the gap between teaching, assessment, and student support.

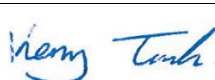
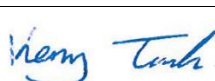
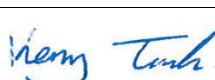
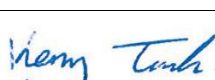
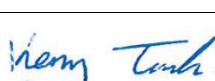
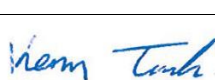
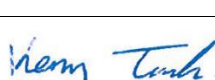
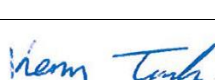
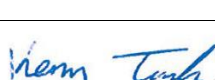
In conclusion, integrating MATLAB Grader into undergraduate teaching will improve the frequency and quality of feedback, allow timely identification of struggling learners, and support inclusive, data-driven educational practice. It is a clear step toward more responsive, student-centred learning in STEM education.

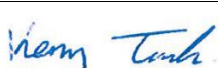
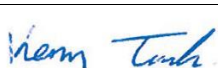
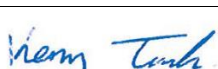
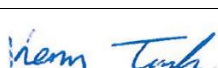
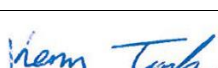
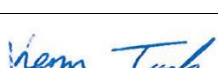
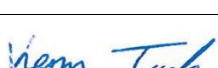
## 11 Evidence of teaching hours

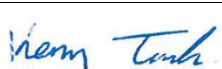
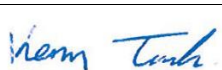
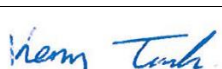
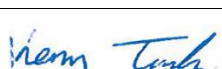
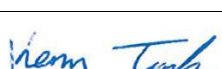
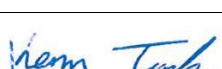
### 11.1 Post Graduate Certificate in Teaching in Higher Education (PG Cert tHE)

#### Evidence of teaching hours log

|                       |                    |
|-----------------------|--------------------|
| Candidate: Ryan James | Campus: Swansea IQ |
|-----------------------|--------------------|

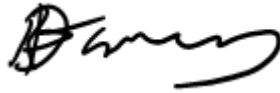
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| 13/01/2025 | ACEB7007 Hybrid Powertrain and Control | 2           |  |
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| 27/01/2025 | ACEB7007 Hybrid Powertrain and Control | 2           |  |

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| 03/02/2025 | ACEB7007 Hybrid Powertrain and Control    | 2 |    |
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| 20/11/2024 | ACEA7005 Engine Performance and Emissions | 2 |  |

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| 27/11/2024 | ACEA7005 Engine Performance and Emissions | 2 |    |
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| 29/11/2024 | ACMA5001 Control and Automation | 3                   |  |
| 06/12/2024 | ACMA5001 Control and Automation | 3                   |  |
| Hours =    | Hours Carried Over=             | Total Hours<br>=100 |                                                                                     |

Participant's signature.....



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Practice Advisor's signature ...



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