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Professional Portfolio 1

Effective Teaching & Assessment in Higher Education (UNHE7009)

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

MODULE CODE: UNHE 7009

ASSESSMENT COMPONENT: Portfolio

STUDENT NAME: Andrew Noble

STUDENT NUMBER: 1651201

Use of Generative AI in Assessment

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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 ☒ No ☐
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 ☒ No ☐
WRITING	For this assessment, you can use Generative AI to create text for submission.	Yes ☐ No ☒
CREATIVE	For this assessment, you can use Generative AI to create creative materials, such as images.	Yes ☐ No ☒
PROGRAMING	For this assessment, you can use Generative AI to create and check code.	Yes ☐ No ☒
NONE	For this assessment, you are not allowed to use any type of Generative AI support. This includes research support, structure support, writing/proofreading support and creative support.	Yes ☒ No ☐

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:

I acknowledge the use of ChatGPT (<https://chat.openai.com/>) on 29 April 2025 to proofread my work for structure, grammar, and presentation using the following prompt:

- 1. Please check the following document for structure, grammar, and overall presentation.*

I confirm that I have not presented any AI-generated content as my own original work. I further confirm that I have retained copies of my drafts, notes, and other materials created before and after the use of AI tools, which I am prepared to provide as evidence if required.

Statement on Teaching & Learning

Having come into Higher Education (HE) as a mature student, and now teaching within a HE institution, it is noticeable to me how the different types of students and their learning preferences are having an impact on how successful module delivery can be.

It is my belief that, students will take very different approaches to being in full time, non-compulsory education, leading to marked differences in their response to teaching styles. Commonly I find that the mature students are the ones that make a more concerted effort to engage with the course content, as well as being more forgiving of the delivery method. This may well be due to their prior experience, often having had full time employment prior to starting their degree, meaning that they adapt better to the changing requirements of different modules, as well as adapting better to the different approaches that can be taken in content delivery by different lecturers. This hypothesis would be supported by the research by (Gregersen & Nielsen, 2023), where it is noted that mature students display many advantageous traits for success in higher education. This was certainly the category that I found myself in when I was going through my degree and has been the general trend I have encountered amongst out mature students. Contrastingly, it seems more common to find a much broader range of approach taken by the younger students, those who are coming directly from compulsory education into university. My experience has shown that many of them will have a high level of commitment and be very adaptable to the situation, whereas many others in recent years have proven to be less independent in their learning style, requiring much more specific guidance, with very clear direction needed.

These differences in approach can be characterised as the Surface and Deep approaches to learning (Biggs, J., Tang, C., & Kennedy, 2022). Commonly I have found a trend amongst the younger students to take a 'surface' approach, where they are attempting to complete the required tasks by the fastest route possible, requiring the minimum input from themselves. Sadly, this then has a detrimental impact on their understanding of subjects, especially where students are less interested by the content of a module, they will often take this surface approach. In engineering, where we develop topics year on year, this often can lead to problems for students, where they have bypassed critical learning points at the previous level, to complete the assessment and pass, but are now incapable to completing the tasks at the next level because they did not suitably learn the previous content, leaving them at a

significant disadvantage. Conversely, those who take a 'deep' approach, where they fully engage with the content and make significant effort to learn the required materials, will have more consistent performance in assessments throughout the degree as they hold a better fundamental understanding of the content.

Because of this split in approach from students, which I put down, in large part, to how enthused they are by the content of a module, I have found that a lot of consideration needs to be given to the way content is created and delivered. This also must account for the different learning styles that are encountered amongst the student cohort. (Othman & Amiruddin, 2010) discuss several concepts of learning style, one of the primary ones being the VARK model, where the different styles are defined as:

Table 1 - VARK Model Learning Styles

• Visual – Learners who absorb information better when it is presented in a visual format (graphs, charts etc.).	• Aural – Persons who receive information better when delivered 'heard or spoken'.
• Read/Write – Learners who prefer information conveyed to them through written text.	• Kinesthetic – Learners who prefer practical based learning activities. Laboratory based sessions, practical demonstrations, simulations etc.

Within the engineering department, I have found a notable increase in learners who would be characterised as kinesthetic and visual learners. This is possibly being driven in recent years, due to the increased intake of students who have come from vocational courses at Further Education (FE). We do still see a good number of students who would be classified as being the more traditional Read/Write learning style, although I find that the percentage split is diminishing recently.

Creating content that is suitable for all learning styles, and maintains engagement from all is challenging, if not impossible. With the current emphasis in the HE sector on student numbers, both in recruitment and retention, there is a greater demand placed on lecturers

to ensure that the content they deliver is maximising engagement, and therefore retention, but also appealing to as many learning styles as possible, whilst meeting the technical and regulatory requirements of the course. Personally, I find this to be a particularly challenging proposition, however I do find that the challenge means that the content I deliver, as well as my skills as a lecturer are having to be constantly evolved, which is probably for the betterment of all involved.

Micro-Teach Reflection

Session Location: Swansea IQ Campus

Session Topic: Introduction to Risk in Engineering

Given that the session was intended as an introduction to a topic, the content was tailored in a way that covered the topic area in simplistic terms initially, if the audience would have a minimal understanding of the context. The intent behind this was to ensure that the audience would be able to grasp the concepts without having to get too high level and possibly alienating certain parts of the group (A1, A2, K1, K2, V1, V2). The comments received showed that the content was generally well constructed, although the format and presentation of some slides could have been more visual and engaging which may have helped convey the information better. Taking this on board, I will look to adjust in future to how the slides are created, with less reliance on text and more visual aids (A2).

There was a point of deliberately engineered interaction with the audience, in the form of questioning to help ascertain engagement and understanding, which was noted as good practice, but it was also pointed out that there could have been more interaction with the audience, although it was a short session, to ensure anyone not following could be brought up to the same point (A3, A4). It was also noted that the order in which some information was conveyed could have been confusing to some learners, and in future I will look to contextualise some of the theoretical information with more examples to suit different learning styles (Othman & Amiruddin, 2010) (K1, V1).

The session proved very useful to get peer feedback on my teaching style, and highlighted areas that can be improved upon in future content development, despite its concise nature, which will be valuable in enhancing my ability to achieve high standards in delivery (A5, K3, V3).

Teaching Intervention Cycle 1

Introduction

This section critically reviews a teaching intervention cycle for the *Motorsport Dynamics* module. *Motorsport Dynamics* is a highly analytical module, primarily assessed through a written examination, and aims to develop key skills and fundamental knowledge essential for students pursuing careers in the motorsport and engineering sectors. The application of theoretical principles within the module equips learners with competencies valued by employers, reinforcing the importance of delivering content in a way that maximises student engagement and understanding.

Previous iterations of the module have resulted in a broad range of student performance, highlighting potential inconsistencies in the effectiveness of teaching strategies. The intent will be to identify areas of weakness using data from student module reviews and targeted observations to determine a more successful approach to delivery of the module.

In accordance with UKPSF, this intervention will focus on refining pedagogical approaches to accommodate diverse learning styles, ensuring inclusivity (V1, V2), and optimising instructional design (K2, K3).

A structured approach will be adopted to critically assess the current teaching framework, identify key areas of weakness, and implement evidence-based improvements (K3, A5). This process will involve aligning learning activities with UKPSF principles, hopefully fostering an environment where students are supported through varied teaching methodologies and enhanced resources (A1, A4). The primary metric to evaluate the success of this intervention will be student attainment, with a focus on measurable improvements in performance and engagement (V3).

Initial Delivery Approach

The Motorsport Dynamics module is delivered throughout the semester, covering all content that will be assessed in the final written examination. No single lecture can be identified as the most critical to student success, as each session builds upon foundational knowledge and contributes to overall understanding. The teaching methodology remains consistent

across all lectures, meaning that an assessment of the strengths and weaknesses of the approach can be made based on singular lectures and applied to the whole semesters worth of delivery.

The primary mode of instruction is face-to-face lectures conducted on campus, with supporting materials such as lecture slides being uploaded to Microsoft Teams after each session. Revision materials used to help students prepare for the examination are primarily the use of past-papers and solutions, being released to students via Microsoft Teams.

The initial delivery approach is predominantly theory-based, focusing on direct instruction with limited interactivity. Concepts are explained in a structured manner, using formal mathematical derivations and static visual aids. The following lesson plan illustrates this standard approach for a session on Gear Systems, demonstrating how content is typically presented within the module:

[Lesson Plan: Gear Systems in Motorsport Engineering](#)

Lesson Plan: Gear Systems in Motorsport Engineering

Module: Motorsport Dynamics

Level: 5 (Second Year Undergraduate)

Duration: 2-hour lecture

Delivery Mode: Lecture-based (theory-focused)

UKPSF Alignment: A1, A2, K1, K2

Learning Outcomes

By the end of this session, students should be able to:

- *Understand the fundamental principles of standard gear systems, compound gear trains, and epicyclic (planetary) gear systems.*
- *Analyse the mechanical advantages, torque distribution, and efficiency of different types of gear arrangements.*
- *Calculate gear ratios for simple gear trains, compound gear trains, and epicyclic gear systems.*

Lesson Structure

Introduction (15 minutes) – Overview of Gear Systems

- *Definition of gears and their function in mechanical power transmission.*
- *Importance of gearing in high-performance motorsport applications (e.g., acceleration, efficiency, torque control).*
- *Overview of three primary types of gear arrangements to be covered:*
 - *Standard gear trains (simple gear trains and compound gear trains).*
 - *Epicyclic (planetary) gear trains.*

Core Content (90 minutes) – Theoretical Framework

1. Standard Gear Trains (30 minutes)

- *Explanation of simple and compound gear trains.*
- *Basic gear ratio equation*
- *Compound gear trains – multiple gears on the same shaft and their effect on gear ratio calculations.*
- *Practical applications in motorsport, such as manual transmissions and differential gear trains.*

2. Epicyclic (Planetary) Gear Trains (30 minutes)

- *Components of an epicyclic gear system:*
 - *Sun gear*
 - *Planet gears*
 - *Ring gear*
 - *Carrier*
- *Key gear ratio equation for epicyclic systems*

- *Torque and speed distribution in different configurations (fixed ring gear, fixed sun gear, etc.).*
- *Comparison with standard gear trains in terms of efficiency, weight savings, and packaging advantages.*

3. Advantages and Limitations (30 minutes)

- *Comparison of standard, compound, and epicyclic gear systems:*
 - *Power density (space-saving designs in epicyclic systems).*
 - *Smooth power delivery in epicyclic and compound gear trains.*
 - *Mechanical efficiency and potential energy losses.*
 - *Heat dissipation and lubrication challenges in complex gear arrangements.*

Conclusion (15 minutes) – Summary & Recap

- *Key takeaways from the lecture:*
 - *Standard gear trains – simple, effective, widely used in manual transmissions.*
 - *Compound gear trains – useful for higher torque applications, such as rally car transmissions.*
 - *Epicyclic gear trains – compact, efficient, found in automatic and hybrid transmissions.*
- *Recap of fundamental equations and concepts.*

Resources & Materials

- *Lecture Slides: Containing definitions, equations, and diagrams of all gear systems.*
- *Whiteboard: For step-by-step mathematical derivations and gear ratio calculations.*

Reflection on Initial Delivery Approach

The initial delivery of the Gear Systems lecture followed the standard approach used throughout the *Motorsport Dynamics* module, with theoretical content being presented in a structured, lecture-based format. While no formal assessment had been conducted at this stage to monitor student understanding, there were early indications that aspects of this approach may not be fully effective for all students. The importance of engaging students in learning through a variety of teaching methods to ensure inclusivity for different learning styles was an area of concern with this delivery approach, which was an area noted by Exposition & 2014 (n.d.) in their research in effective delivery methods in STEM subjects (A2, K2, V1, V2, V3).

One of the primary indicators of success for this lecture should be whether students have met the intended learning outcomes. Observation of student engagement suggested that while many students appeared to grasp the concepts, this understanding was not universal across the cohort. However, without formative or summative assessment at this stage, it was difficult to accurately determine the depth of understanding among students (A3). The lack of any structured formative assessment limited the ability to identify struggling students early and provide targeted support. Bennett (2011) discusses at length, how formative assessment can be a crucial tool in ensuring high student attainment, although in the context of compulsory education rather than HE. The lack of this in the current version potentially detrimental to the module success.

Another issue identified was limited engagement during delivery. The lecture primarily involved theoretical explanation, followed by an analytical worked example at the end. However, there was minimal student interaction throughout, which may have led to passive learning rather than active engagement. The absence of student involvement in problem-solving or discussion meant that students had fewer opportunities to consolidate their understanding, which could contribute to misconceptions or knowledge gaps (K2, V2).

Furthermore, the reliance on students following on-screen notes and written board content may have been an exclusive approach for some learners, particularly those who benefit from different modes of learning (V1). For example, visual learners may have struggled with the

heavy reliance on text-based explanations without sufficient graphical representation of gear mechanics, while kinesthetic learners may have benefited from handling physical models or using interactive simulations to reinforce conceptual understanding (Othman & Amiruddin, 2010). Additionally, students with processing difficulties or note-taking challenges may have found it difficult to follow explanations in real-time while simultaneously trying to interpret mathematical derivations.

A key takeaway from this session is that the inclusion of more worked examples throughout the lecture—not just at the end—would provide multiple benefits:

- Enhancing conceptual understanding through step-by-step problem-solving.
- Encouraging student participation by inviting learners to attempt calculations before solutions are explained.
- Providing informal formative assessment opportunities by gauging student responses and adapting explanations accordingly (A3).

In summary, while the initial delivery method was effective in covering theoretical content, it had room for improvement. Moving forward, an updated approach incorporating more interactive worked examples, diversified content presentation, and structured formative assessment opportunities were hoped to enhance student engagement and attainment.

Reflection on Feedback and Results

Student feedback for the module was collected through module review questions at the end of the semester. The responses highlighted several concerns regarding the clarity, pacing, and accessibility of the content. Key recurring themes from student comments included:

- *"Difficult to follow"*
- *"Application not clear"*
- *"More revision material"*
- *"More examples"*
- *"Lots to take in, pace of lectures."*

These comments suggest that students found aspects of the delivery method challenging, particularly in terms of comprehension, application, and workload management during lectures. The UKPSF emphasises the need for teaching approaches that support understanding and engagement (A1, A2). However, the feedback suggests that the existing format lacked interactivity and application-focused content, which may have contributed to difficulties in student learning.

One of the most frequently mentioned issues was the lack of worked examples and revision materials. This aligns with the reflection on initial session delivery, where it was noted that minimal student engagement and limited formative assessment opportunities could hinder deeper understanding and identification of these issues early enough. The UKPSF highlights the importance of using appropriate teaching and assessment methods (K2, A3), ensuring that students are actively involved in the learning process rather than passively receiving information. The absence of interactive elements may have led to knowledge retention issues and difficulties in applying theoretical concepts to practical scenarios, depending on the learners individual style (Othman & Amiruddin, 2010) (V1, V2).

Figure 1 shows a histogram of the results distribution that resulted from the formal examination at the end of the semester.

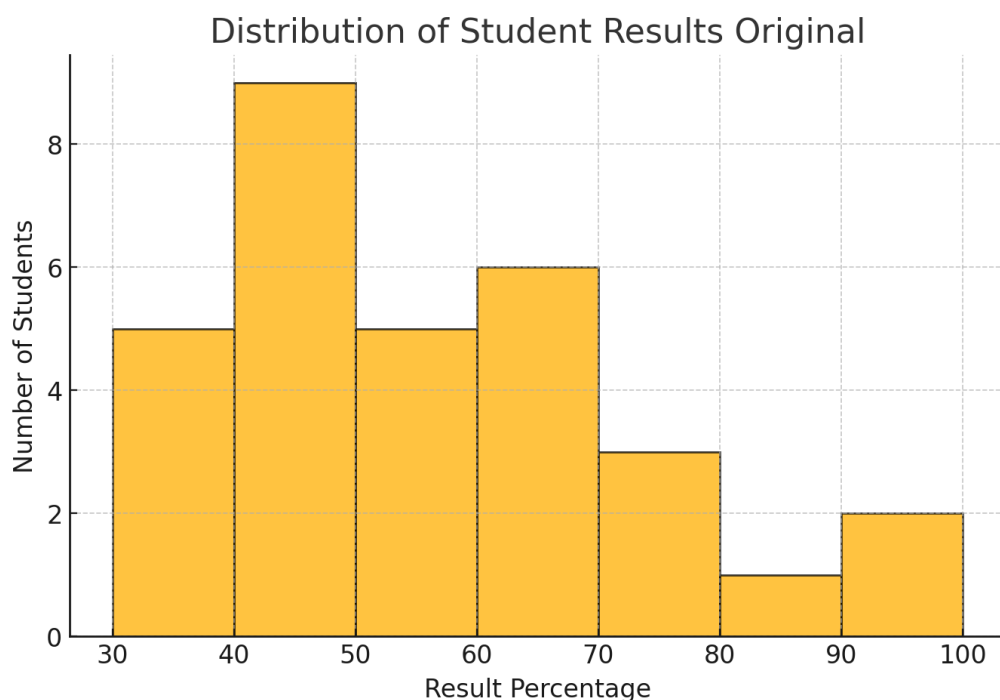


Figure 1 - Initial Approach Results

The student results further reinforce the concerns raised in the module review. The distribution of marks was wide, with five students falling below the pass boundary, indicating that a significant portion of the cohort struggled to achieve a satisfactory understanding of the material. The general distribution of results showed that most students attained marks below 70%, with a large concentration between 40-50%. While some students performed well, the high proportion of lower scores suggests that the existing delivery style may not have been effective for all learning needs (V1, V2).

The lack of formative assessment and engagement opportunities within lectures could have contributed to these results, as students may have had limited chances to assess their own understanding before the final examination (A3).

Based on both the qualitative feedback and the quantitative results data, adjustments to the delivery method were made to better engage learners and improve attainment. The inclusion of more worked examples, structured revision materials, and opportunities for formative assessment could help address the challenges students faced. Additionally, modifying the pace of lectures and incorporating interactive elements may support students in gradually building their understanding rather than feeling overwhelmed by dense theoretical content (K3).

Changes to Delivery Methods

The current '*chalk and talk*' delivery method has proven to be unsuitable for effectively engaging students and supporting their learning. Feedback from students indicates that the lack of interactivity, contextualisation, and structured revision materials has created barriers to understanding (K3). To address these issues, a revised approach to delivery will be implemented, aligning with UKPSF principles, particularly in areas of effective learning and teaching methods (A1, A2), inclusivity (V1, V2), and appropriate assessment strategies (A3, K2).

Incorporating More Worked Examples and Formative Assessment

One of the most significant changes will be the increased use of worked examples during lectures. This adjustment will allow for real-time monitoring of student understanding, enabling the lecturer to adapt the teaching pace and allocate additional time to more

complex areas when needed (A2). By engaging students in problem-solving activities throughout the lecture, the approach will encourage active learning rather than passive notetaking. This will facilitate formative assessment opportunities, allowing students to gauge their own understanding before summative assessments as well as enabling the lecturer to monitor student understanding and adjust delivery as required.

Contextualising Content & Scaffolding Learning

Student feedback suggests that content is often perceived as abstract and disconnected from real-world applications. To improve engagement and comprehension, the module will be revised to better contextualise theoretical content, drawing connections between concepts and real-world motorsport engineering applications. This will enhance student motivation and comprehension, as learners will be able to relate new knowledge to pre-existing understandings of systems and processes. Additionally, stronger links to previously taught modules will be incorporated, ensuring that students can scaffold their learning and build upon foundational knowledge (Ruiz-Jaramillo et al., 2015)(K1).

Enhancing Accessibility & Supporting Diverse Learning Styles

Recognising the diverse ways in which students process and retain information (V1), the revised delivery will accommodate a wider range of learning styles:

- Graphical representations will be integrated more frequently to support visual learners, ensuring that key concepts are reinforced through diagrams, animations, and schematic breakdowns of mechanical systems.
- Printed notes will be made available to support students who struggle with fast-paced board-based teaching, ensuring that those who prefer reading-based learning styles have clear, structured materials to follow.
- Lecture slides will be released in advance so that students can follow along on their laptops during lectures. This will mitigate challenges posed by room layout and help students focus on the explanation rather than scrambling to copy whiteboard content.

Improving Content Structure & Delivery

Currently, multiple topics are combined into a single presentation, making it difficult for students to navigate and review specific sections efficiently. A key modification will involve:

- Breaking down the module into distinct topics with a dedicated PowerPoint presentation for each area.
- Reducing reliance on text-heavy slides and focusing on key concepts, worked examples, and solutions (K2).
- Developing revision-friendly materials that clearly organise and summarise key information.

This change will enhance the clarity of content and align with best practices in higher education (V3).

Developing New Revision Materials

To better prepare students for summative assessments, additional revision materials will be developed beyond traditional past papers. A MATLAB-based question bank will be produced for lecturer use, allowing for a range of revision materials to be created.

The intent of the question bank being produced in a coded language such as MATLAB, is that it will allow for easy manipulation of questions, meaning that many suitable questions can be generated, along with solutions, with ease compared to a traditional question writing method. Additionally, the MATLAB script can then be used to generate the exam questions, meaning that the format of revision questions will be directly aligned to the format of the examination students will later sit. However, to ensure that the revision material is not too targeted, the randomisation capabilities of MATLAB can be used to ensure that students will never receive a revision question that is the same as an exam question. This will ensure they have covered multiple variations of each question type and format before the final exam, providing a more comprehensive approach to revision (A4).

An example of a section of this MATLAB script is shown in Figure 2.

```

3 % Set randomization ranges for variables
4 m = randi([1000, 1500]); % Mass in kg
5 g = 9.81; % Gravity constant (m/s^2)
6 crr = rand()*0.02; % Rolling resistance coefficient (0 to 0.02)
7 rho = rand()*0.6 + 1.0; % Air density (1.0 to 1.6 kg/m^3)
8 Cd = rand()*0.3 + 0.2; % Drag coefficient (0.2 to 0.5)
9 A = rand()*1.5 + 1.0; % Frontal area (1.0 to 2.5 m^2)
10 V = randi([20, 50]); % Velocity (20 to 50 m/s)
11 Tmax = randi([150, 300]); % Maximum torque (150 to 300 Nm)
12
13 % Compute rolling resistance
14 rr = m * g * crr;
15
16 % Compute aerodynamic resistance
17 ar = 0.5 * rho * Cd * A * V^2;
18
19 total_res = rr + ar;
20
21 % Display results
22 fprintf('Mass: %d kg\n', m);
23 fprintf('Rolling Resistance Coefficient: %.3f\n', crr);
24 fprintf('Air Density: %.2f kg/m^3\n', rho);
25 fprintf('Drag Coefficient: %.2f\n', Cd);
26 fprintf('Frontal Area: %.2f m^2\n', A);
27 fprintf('Velocity: %d m/s\n', V);
28 fprintf('Max Torque: %d Nm\n', Tmax);
29 fprintf('Rolling Resistance: %.2f N\n', rr);
30 fprintf('Aerodynamic Resistance: %.2f N\n', ar);
31 fprintf('Total Resistance: %.2f N\n', total_res);

```

Figure 2 - Example of MATLAB Revision Script

Applying STEM-Specific and General Higher Education Best Practices

While these changes are tailored to a STEM subject and the type of learner that is commonly found in a STEM department, they are based on wider good practice themes found in higher education:

- Interactive learning through examples and real-world applications emphasises active engagement (Fei et al., 2024).
- Providing diverse resource formats (printed notes, visuals, and digital slides) ensures inclusivity and accessibility (V2).
- Tracking student understanding through formative assessment ensures a feedback loop that supports continuous improvement (A3).

By implementing these changes, the module will hopefully better engage learners, improve knowledge retention, and enhance student attainment.

Updated Delivery Approach

Considering the changes and adaptations that are discussed in the previous section, a revised lesson plan for the same content was developed, shown below.

Updated Lesson Plan: Gear Systems in Motorsport Engineering

Module: *Motorsport Dynamics*

Level: 5 (Second Year Undergraduate)

Duration: 2-hour lecture

Delivery Mode: Lecture-based (theory-focused with formative assessment)

UKPSF Alignment: A1, A2, A3, K1, K2

1. Learning Outcomes

By the end of this session, students should be able to:

- Understand the fundamental principles of gear systems and their function in mechanical power transmission.
- Analyse different types of gears, their advantages, and applications in motorsport and automotive engineering.
- Calculate gear ratios, torque transmission, and efficiency in simple, compound, and epicyclic gear trains.
- Apply gearbox theory to solve real-world engineering problems related to vehicle dynamics.

2. Lesson Structure & Time Allocation

Introduction (15 minutes) – Overview of Gear Systems

- **(5 min)** *Definition and function of a gearbox* – How speed and torque are converted.
- **(5 min)** *Importance of gears in motorsport applications* – High-performance gear systems in F1, Rally, and endurance racing.
- **(5 min)** *Types of gears and their applications:*
 - Spur (simple, but noisy)
 - Helical (smooth, quiet operation)
 - Bevel (changes direction of rotation)

- Rack and Pinion (linear motion conversion)
- Worm and Wheel (high torque conversion)
- Epicyclic (high power density)

Core Content (90 minutes) – Theoretical Framework with Worked Examples & Formative Assessment

1. Gearbox Theory: Gear Ratios & Torque (30 minutes)

- **(10 min) Gear Ratio Calculation** – Explanation with formula
- **(5 min) Worked Example 1:** A simple gear train. Students calculate the gear ratio and discuss its impact on speed and torque. *(Formative Assessment Check: Ask students to solve a similar example in pairs and share answers.)*
- **(10 min) Torque-Speed Relationship** – Introduction to the power equation
 - How changes in speed affect torque.
- **(5 min) Worked Example 2:** Students calculate output speed and torque. *(Formative Assessment Check: Ask students to attempt a variation with different numbers and share answers.)*

2. Gear Trains (30 minutes)

- **(10 min) Simple vs. Compound Gear Trains** – Explanation and advantages of each system.
- **(10 min) Worked Example 3:** A compound gear train. Students calculate the overall ratio. *(Formative Assessment Check: Lecturer pauses and asks students to predict the output speed before solving together.)*
- **(10 min) Worked Example 4:** A compound gear train problem where students must determine the final torque. *(Formative Assessment Check: Randomly select a few students to explain their approach to peers.)*

3. Epicyclic (Planetary) Gear Trains (30 minutes)

- **(10 min) Introduction to Epicyclic Gear Trains** – Sun, planet, ring gears and their roles.
- **(10 min) Worked Example 5:** Given an epicyclic system with a fixed sun gear, students calculate the gear ratio when the input is through the planet carrier. *(Formative Assessment Check: Ask students to attempt another variation with a fixed ring gear.)*

- **(10 min) Worked Example 6:** A real-world automatic transmission case study - students discuss why epicyclic gear trains are used in hybrid race cars. (*Formative Assessment Check: Group discussion where students compare epicyclic vs. standard gear systems.*)

Conclusion (15 minutes) – Summary & Recap

- **(5 min) Key takeaways** – Gear ratio principles in standard, compound, and epicyclic gear systems.
- **(5 min) Summary Discussion:**
 - How torque, speed, and efficiency relate to gear design.
 - Why different gear types are used in different motorsport applications.
- **(5 min) Formative Assessment Wrap-Up:**
 - Quick quiz (3 questions on gear ratios & efficiency calculations).
 - Q&A session for clarification.

3. Resources & Materials

- **Lecture Slides:** Covering theory, formulas, and examples.
- **Whiteboard/Chalkboard:** For step-by-step calculations.
- **Student Handout:** Pre-worked solutions for reference after class.

4. Assessment & Feedback

- Formative assessment points integrated into each section.
- Final 5-minute quiz to reinforce concepts covered in the session.
- Encouragement for students to attempt additional problem sets post-lecture.

Summary of Adjustments

- Worked examples are now structured with clear time allocations.
- Formative assessment points are included at each stage to gauge student understanding.
- Students will engage in prediction tasks, problem-solving, and discussions to reinforce learning.

(A2, A3, V1, V2).

Review of Updated Delivery

Following the implementation of the revised session delivery, the response from the next cohort was notably positive. The structured integration of worked examples, formative assessment points, and improved lecture materials contributed to a more engaging and effective learning experience.

Improved Student Engagement and Learning

One of the most significant improvements was the inclusion of more worked examples, which helped reinforce learning at each stage of the lecture. By actively engaging with problems throughout the session, students were able to gradually build their understanding rather than being presented with a single example at the end.

Additionally, the introduction of formative assessment points during the lecture allowed for a real-time understanding of student progress. The ability to identify gaps in knowledge and adjust the teaching pace accordingly ensured that difficult concepts could be revisited, promoting an adaptive and student-centred approach (A3).

Collaborative Learning & Accessibility Improvements

The revised slides, which were better structured and made available in advance, contributed to improved accessibility for students. Many students opted to follow along on their laptops, which led to the formation of small working groups. This collaborative learning environment encouraged peer-to-peer support during worked examples, further reinforcing student engagement and self-directed learning (V2).

Assessment Outcomes & Performance Improvement

Figure 3 shows the histogram overlaying the results from updated delivery method versus the original.

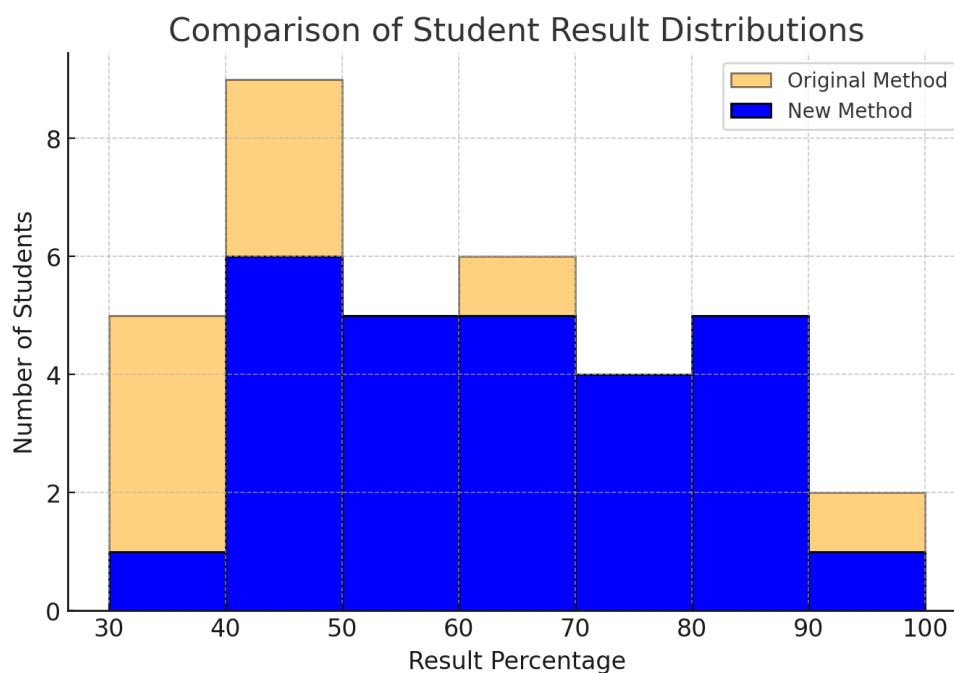


Figure 3 - Revised Approach Results

The quantitative data from student results indicates a marked improvement in attainment, with the average mark increasing by almost 10% compared to the previous cohort. The distribution of grades also shifted, with more students achieving marks at the higher end of the grade boundaries, and only one student failing the assessment. These improvements suggest that the revised delivery method contributed to more effective knowledge retention and application.

However, despite these gains, there is still room for improvement. A portion of students continue to score below 60%, indicating that while the changes have benefited many, further refinements may be necessary to support students who struggle with the material (V2). Additional support mechanisms, such as targeted revision resources or tutorial sessions, could be explored to further reduce the number of students falling into the lower grade brackets.

Challenges in Data Comparison

While the data suggests an improvement in attainment, direct comparisons are difficult due to variations in cohort size and student competencies. The differences in individual learning styles and prior knowledge mean that it is challenging to attribute all improvements solely to the teaching modifications. Nevertheless, the positive reception of the revised approach,

combined with quantitative improvements in results, strongly suggests that the changes had a beneficial impact on student learning.

Conclusion & Next Steps

The introduction of formative assessment worked examples, and improved accessibility has enhanced student engagement and performance. Moving forward, further refinements can be explored, including:

- Additional targeted support for students struggling to reach 60%.
- Continued iteration of assessment strategies to monitor engagement levels.
- Further enhancements to revision materials and practice question banks.

These changes will help to further refine the module and ensure that all students, regardless of background and learning style, have the best opportunity to succeed.

Evaluation of the Process

The process of revising the module delivery demonstrated the importance of adaptability in teaching methodologies, particularly when catering to a diverse student cohort with varied learning styles. The structured inclusion of formative assessment points and student interaction opportunities proved effective in enhancing engagement and allowing real-time adjustments to teaching, reflecting UKPSF's emphasis on dynamic and reflective practice (A5).

While the overall impact was positive, the evaluation also highlighted limitations in direct data comparison due to differences in cohort size and student backgrounds. This serves as a reminder that while quantitative improvements in attainment are important, qualitative measures such as student feedback and observed engagement are equally valuable in assessing the effectiveness of teaching modifications.

Ultimately, this process has reinforced the need for continuous reflection and adaptation in teaching practice. By systematically reviewing delivery methods, integrating student feedback, and evaluating performance data, future iterations of the module can continue to be refined to enhance student success and create a more inclusive, effective learning environment.

Reflective Report on Lesson Observation 1

Lesson observation forms for all 3 observations can be found in the appendix of this document.

Date: 06/03/25

Observed: Dr Kerry Tudor

Observer: Andrew Noble

Module: Automotive Materials & Sustainability

Level: 6

No. Attendees: N/A

Lecture Topic: Vehicle Emissions Standards

As part of my continuing professional development, I observed a lecture delivered by an experienced colleague, Dr. Tudor. The session was conducted in a hybrid format, with most students present on campus and a smaller number joining online via live stream. This was particularly valuable to witness, as hybrid delivery is something I have not yet incorporated into my own teaching practice. Observing this in action allowed me to reflect on both the opportunities and challenges of such an approach (A5, K2, K3).

One of the key takeaways from this session was how seamless and disruption-free the hybrid setup was. The recording allowed students—particularly those engaging asynchronously—to revisit the lecture and access content that may not have been included on the slides. This is significant, as like Dr. Tudor, I tend to rely more on verbal delivery to explain and contextualise material beyond what is presented visually. Observing how recorded sessions can complement such an approach has led me to reconsider my stance on lecture streaming and its potential to enhance accessibility and support diverse learning needs (A2, A4, K3, V1, V2).

Historically, I have had reservations about whether recording lectures might negatively impact in-person attendance. However, this session demonstrated that a recorded option does not necessarily reduce physical attendance, with only a small number of students

opting to join online. This has shifted my perspective, and I am now seriously considering integrating lecture recording more regularly to provide additional support for students (A4, V1, V2).

However, the observation also highlighted the technological challenges inherent in hybrid delivery. For example, embedded video audio did not work, and student questions in the room were not picked up clearly by the microphones. This suggests that while hybrid delivery has clear pedagogical value, it also depends heavily on reliable technological infrastructure, which must be considered before wide implementation (K4, A4).

One of the most impressive aspects of Dr. Tudor's delivery was the high level of student interaction. The informal tone of the session encouraged students to participate actively asking questions, attempting answers without fear of being wrong, and engaging in dialogue throughout. This contributed to a more inclusive and responsive learning environment, and the fluidity of this interaction showed that such participation was not only welcomed but embedded into the delivery style (A2, A4, K2, V1, V2, V3).

This was particularly enlightening for me, as previous feedback on my own lectures has noted a lack of interactivity and formative assessment. Seeing how Dr. Tudor facilitated natural dialogue while maintaining flow has provided me with practical strategies to adapt my own sessions. I now have a clearer understanding of how interaction can serve both as a means of engagement and as informal formative assessment, allowing for real-time insight into student understanding (A3, V3).

Reflective Report on Lesson Observation 2

Date: 13/3/25

Observed: Andrew Noble

Observer: Dr Kerry Tudor

Module: Advanced Motorsport Dynamics

Level: 7

No. Attendees: 7

Lecture Topic: Design of Experiments

The observed lecture formed part of a Level 7 Motorsport module that I have been delivering for three years. Positioned toward the end of Semester 2, this lecture is intended to introduce experimental design approaches that will assist students with their coursework. Due to the small cohort size (maximum of 10 students), attendance was reasonable (7); however, the absence of some students prompted reflection on how accessible the session was for those who could not attend (A4, V1). The importance of this is further reinforced given that around 50% of the cohort are international students. This may have been a good case for conducting the session as a hybrid, or recorded session for accessibility.

The observer and I both noted that while the content was clearly presented and well contextualised, there is an opportunity to enhance engagement and accessibility. Specifically, I recognised that recording the lecture and adapting the slide content could support both non-attendees and diverse learning preferences (A2, K3, V2). To address this, I plan to develop two sets of slides in future iterations: one optimised for live delivery, and another containing more explanatory detail for independent study and revision (A1, K2).

This year, I made conscious changes to the lecture content, removing sections that previously lacked contextual relevance or failed to engage. In their place, I introduced materials that were more directly aligned with the Motorsport discipline, supported by visual aids and examples that were meaningful to the students (A1, A2, K2, K3). Feedback

from the observer highlighted that these improvements were successful in enhancing both content quality and delivery, and that the session maintained a high professional standard.

Despite this, a key area identified for further development was the limited opportunity for student interaction and informal assessment during the session. The lecture leaned heavily on a traditional 'chalk and talk' approach, which I acknowledge can inhibit engagement and deeper understanding for some learners (A2, V1, V3). Reflecting on this, I see clear potential to embed formative assessment within the session, particularly by using the PC lab environment to enable a practical task. This would involve students using the software tools being discussed, giving them the chance to apply theory in context while offering me a way to gauge their understanding informally (A3, A4, K2).

Going forward, I will adapt this session to include an interactive, task-based component that capitalises on the facilities available. This will not only enhance engagement but also enable me to assess student learning in real time, ultimately contributing to improved outcomes (A3, K2, V1). These changes reflect my continued commitment to evidence-informed practice and to developing inclusive, effective learning environments (V3).

Importantly, I will maintain the clarity, contextual relevance, and strong subject knowledge noted positively by the observer, as these remain core strengths of my delivery (A2, K1).

Reflective Report on Lesson Observation 3

Date: 03/04/25

Observed: Andrew Noble

Observer: Dr Gregory Owen

Module: Introduction to Automotive Engineering

Level: 4 (Foundation)

No. Attendees: 11

Lecture Topic: Introduction to Vehicle Dynamics

The observed session was delivered as part of a series of 'guest' lectures from academic staff, each covering areas aligned with their specialist knowledge. As such, the session was not required to build upon previous lectures or form part of a continuous narrative. Nonetheless, I took care to contextualise the content with examples relevant to the students' streams of study, as I believe that tailoring content in this way increases its relevance, accessibility, and student engagement (A1, A2, K2, K3, V1).

Given that students from three different programme streams were in attendance, achieving this level of contextualisation was more complex. However, the observer noted that the content was well-designed and presented, with praise for the quality of the visual materials and the clarity of verbal delivery. This positive feedback confirms that my efforts to maintain high standards of presentation and contextual relevance were effective, and this is an approach I will carry forward to other modules and lecture deliveries (A1, A2, K1, K2).

I was also pleased that the observer recognised the delivery style, specifically the use of appropriate humour and an informal tone. This is a deliberate strategy I employ to make the learning environment feel more inclusive and to reduce barriers for students who may be hesitant to participate in a more formal setting (A2, A4, V1, V2). Creating a welcoming and less rigid classroom atmosphere supports interaction, question-asking, and ultimately enhances learning.

However, the observer also noted that many students were not actively taking notes during the lecture. While the slides were visually engaging and shared online, I acknowledge that encouraging students to take their own notes can support deeper processing of the material and create a personalised resource for revision. Reflecting on this, I intend to adapt future lecture delivery to include intentional pauses and prompts for notetaking and potentially slow the delivery pace to support this process (A2, K3, V1).

Another key area for development highlighted by the observation was the absence of formative assessment opportunities. Without these, it is difficult to evaluate whether students are engaging with and understanding the content during the session. In response, I plan to introduce brief, low-stakes formative assessments, such as in-lecture questions or short interactive tasks, to check understanding in real time. This not only enhances engagement but also allows me to adjust teaching dynamically based on student responses (A3, A4, K2, V3).

Overall, while the session achieved many of its goals—particularly around contextualisation and presentation—this observation has provided valuable insight into areas for enhancement, specifically around interaction and formative feedback.

Evaluation of CPD Event 1

Date: January 2025

Event: 'Teaching with MATLAB' Mathworks Online Training

As an academic teaching within the engineering department, a key part of my role involves supporting students in using a wide variety of technical software. One of the most widely adopted tools across our engineering curriculum is MATLAB, which is used for simulations, data analysis, and mathematical modelling. Given its importance, I identified a need to develop my proficiency further—particularly with a view to enhancing the learning experience for students who struggle with traditional programming formats. This led me to complete a MATLAB CPD course designed for educators, which provided valuable pedagogical and technical insights aligned with the teaching requirements of my modules.

Enhancing Learning Design and Supporting Student Learning (A1, A2, A4, K2, K3, V1, V2)

One of the key takeaways from the training was the use of Live Scripts—an alternative to traditional script-based programming in MATLAB. Live Scripts combine code, visual outputs, and explanatory text into an integrated document. This shift supports multimodal learning by enabling learners to engage with visual aids, contextual explanations, and interactive outputs all in one place. For students who are typically overwhelmed by lines of code, this more accessible format supports cognitive load reduction and deeper understanding (Mayer, 2009).

Since completing the course, I have begun converting previously used MATLAB scripts into Live Scripts within my modules. This change aims to provide inclusive learning opportunities for students who have different learning preferences or are less confident with coding (V1, V2). By improving the accessibility and clarity of the content, I hope to allow students to focus more on the conceptual understanding rather than on syntax alone, thus aligning the use of tools with pedagogic intent (Laurillard, 2012).

Introducing Formative Assessment Through MATLAB Grader (A3, K2, K4, V3)

Another key learning point was the introduction of MATLAB Grader, a platform that allows educators to create automated assessments with instant feedback. Previously, formative

assessment in my modules has largely been manual observation during lectures or in the form of informal questioning. With MATLAB Grader, it is possible to create interactive assessment content that provides immediate results and tailored feedback, including hints that guide students toward the correct method. This aligns well with the pedagogical value of formative feedback in developing independent learning (Nicol & MacFarlane-Dick, 2006).

The system also enables monitoring of student progress throughout a module, allowing me to intervene earlier and adapt teaching in response to emerging misconceptions (A3, K2, K3, V3). These features will not only support individual learners but also provide me with a data-driven approach to module evaluation and enhancement.

Commitment to Professional Development (A5, K3)

This CPD event was extremely useful to developing my knowledge and teaching methods, ensuring they remain relevant and responsive to both student needs and technological changes in the discipline (A5). It is also aided in enhancing the digital aspect of my teaching, in line with sector-wide goals around digital literacy and blended learning as outlined in a report from JISC (2024).

Although implementing these new approaches requires a substantial upfront time investment, I believe they will provide long-term benefits in terms of both student learning and the reusability of teaching resources.

Evaluation of CPD Event 2

Date: February 2025

Event: Incorporating Immersive & Digital Technologies Training – UWTSD Swansea

As part of the ongoing curriculum review within WISA, I had the opportunity to attend a Continuing Professional Development (CPD) event focused on the use of digital technologies in education. This training, delivered by the team responsible for digital learning integration, took place in the Immersive Room located at Y Fforwm on the IQ campus. The event provided an overview of the digital capabilities available to educators, particularly those supporting interactive, multisensory, and spatial learning experiences.

The Immersive Room itself is equipped with panoramic projection screens and audio-visual technology that makes the space a dynamic learning environment. During the session, several examples of alternative teaching practice were demonstrated. Notably, content from conventional presentation formats had been restructured and spatially reimaged to suit the immersive display. This conversion was not only visually interesting but also created greater opportunities for active and experiential learning, supporting different learning preferences, particularly those who benefit from visual or kinesthetic modes of learning (Othman & Amiruddin, 2010).

The session highlighted how adapting learning environments and technologies can better match how students learn (K2). Presenting complex or abstract material in this immersive format may help overcome traditional barriers to understanding, which is especially relevant in engineering and design-based disciplines. As Laurillard (2012) discusses, the use of digital media can facilitate greater student engagement when aligned with effective pedagogical design.

Despite its benefits, the session also revealed some limitations. Due to the physical size of the Immersive Room, student group sizes must be kept small. This constraint means that multiple iterations of the same session may be needed—an important consideration for curriculum planning (A1, A2, V1). However, this challenge also presents an opportunity. Smaller groups can foster more interactive and personalised teaching, creating a safe space

for students who may find large lecture settings intimidating, as noted by Youssef et al. (2023) (V1, V2).

From a practical perspective, not all the content I teach in engineering directly lends itself to this immersive format. However, for niche or conceptually challenging topics, such as dynamic systems, simulations, or complex data visualisation, this could provide a powerful alternative to traditional lecture delivery. This training has encouraged me to explore blended learning strategies where immersive technologies are used to complement more conventional teaching formats (K4). The CPD session demonstrated how technology-enhanced learning can shift us away from passive content delivery and toward more active and participatory pedagogies, even in STEM fields where traditional formats still dominate (Fei et al., 2024).

Moving forward, I plan to look at where it would be appropriate to collaborate with the digital learning team to identify specific modules or sessions where this technology could meaningfully enhance student learning outcomes. While the investment of time in reformatting content is significant, the potential benefits in engagement, comprehension, and retention could make it a worthwhile pursuit.

Evaluation of CPD Event 3

Date: April 2025

Event: 'What is Team Based Learning' – *Team Based Learning Collaborative* – Online Resource

A colleague highlighted the concept of Team-Based Learning (TBL) to me during another training event earlier in the year, mentioning that it might be a valuable approach worth investigating for use within a STEM field. As such, further investigation and learning was conducted on the subject, using resources available online from the Team-Based Learning Collaborative (A5, K5, V3).

TBL is an approach to module delivery that involves students being formed in groups, which they remain in permanently for the duration of the module. This allows for small working groups to be always active during the module, fostering a different approach to the traditional 'chalk and talk' type of delivery where the emphasis is very much on the individual student to keep pace with the content and be responsible for their own understanding (K2, A1, A2). Research has shown that group-based learning can foster deeper cognitive engagement and improve academic outcomes through peer teaching and collaborative problem-solving (Efthymiou & Sidiropoulos, 2023).

The extremely interesting thing that was highlighted to me about TBL was that the approach generates a significant level of interaction and exchange between students during lectures (K3). There are many benefits to this approach, helping students feel more included and extend their peer groups, which can be beneficial to their overall attainment and wellbeing (V1, V2). There are also possible issues with this however, in that those students who feel anxious about working in groups, or having these forced interactions, might find the approach to be detrimental to their learning and potentially reduce their attendance (K3, V1). This would be something that would have to be weighed up prior to embarking on the conversion of a module to a TBL-type delivery method. Studies caution that poorly managed group work can lead to disengagement, especially for introverted or underconfident learners (Chang & Brickman, 2018).

TBL does rely heavily on intermediate assessment points throughout the delivery of the module. This is in both the formative and summative assessment format (A3, K2). This gives interesting scope to allow for monitoring of the attainment of the groups during the progress of the module. It is suggested that a good method for this is to assess the students as individuals at the start of the module, or at the start of a major topic introduction, then assess them again soon after as a group. This allows for empirical data to show if the group learning environment is being conducive to improving student attainment (K5, V3). Kaya et al. (2025) found that the varied assessment formats in TBL environments often lead to increased overall comprehension and application of material.

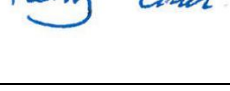
Given that in my modules, there are not as many assessment points as would be ideal, this could be a very effective way of introducing them, whilst at the same time promoting a collaborative learning environment that helps the students achieve better results (A1, A3). Again, this poses potential risks, as when monitoring the group results, it will be difficult to determine what the individual student's understanding is since the assessment is the collaborative output of the group (K5). This could lead to individuals being able to 'hide' within the group with a substandard level of understanding. It is possible that pairing this with some form of peer-assessment might be a suitable compromise so that individual contributions to the groups can also be monitored (A3, V2). Peer evaluation, when integrated carefully, has been shown to increase accountability and engagement in team learning (Double et al., 2020).

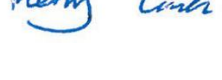
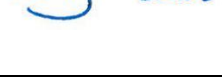
In summary, whilst the concept of TBL is a very interesting one, the practicality of incorporating it into my teaching practice is a complicated issue (A1, A5). Modules would need to be completely redesigned along with the associated content to suit this delivery method, although the potential benefits that this could bring for certain modules and cohorts may be worth the investment (K5, V3).

Teaching Hours Evidence

Candidate: Andrew Noble

Campus: Swansea-IQ

Date	Session Details	No of Hours	Practice Advisor's Signature
8/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 1)	2	
9/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 2)	2	
9/10/24	ACEA7002 – Advanced Motorsport Dynamics	2	
11/10/24	ACHA4005 – Academic Skills (Group 1)	2	
11/10/25	ACHA4005 – Academic Skills (Group 2)	2	
15/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 1)	2	
16/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 2)	2	
16/10/24	ACEA7002 – Advanced Motorsport Dynamics	2	
18/10/24	ACHA4005 – Academic Skills (Group 1)	2	
18/10/24	ACHA4005 – Academic Skills (Group 2)	2	

22/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 1)	2	
23/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 2)	2	
23/10/24	ACEA7002 – Advanced Motorsport Dynamics	2	
25/10/24	ACHA4005 – Academic Skills (Group 1)	2	
25/10/24	ACHA4005 – Academic Skills (Group 2)	2	
29/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 1)	2	
30/10/24	ACHA6010 – Structural Design & Fluid analysis (Group 2)	2	
30/10/24	ACEA7002 – Advanced Motorsport Dynamics	2	
1/11/24	ACHA4005 – Academic Skills (Group 1)	2	
1/11/24	ACHA4005 – Academic Skills (Group 2)	2	
Hours =40	Hours Carried Over=0	Total Hours = 40	

Participant's signature.....Andrew Noble.....

Practice Advisor's signature 

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Appendix

Lesson Observation Form 1



Details of the Observation	
Observee	Dr Kerry Tudor
Practice Advisor / Expert peer observer	Andrew Noble
Date of the Observation	22/04/25 (Recording, originally delivered 06/03/25)
Campus / Location	Swansea IQ
Date, Time, Duration	06/03/25 11:00-12:40
Subject Speciality	Automotive Materials & Sustainability
Type of activity	Lecture, Classroom based
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.	

Teaching/Support preparation [A1: Design and plan learning activities/programmes] <i>i.e. Preparation, selection and organisation of content. Choice of teaching/learning methods.</i>
Comments - Well presented slides that supported the verbal discussion well - Slides were not too text heavy, meaning information was clear to read

- Verbal delivery carried more information than was on slides, giving additional information to expand on themes mentioned throughout
- Data was used effectively to help support the discussions, with tables and figures used well on slides where relevant.
- Embedded videos were on presentation to give more information, some were not played during lecture but present for students to access in their own time, this is a good way of pointing them to the right information.
- Audio from the videos does not work on the recording, must have only worked in the room.
- Additional slides were included which were not presented, but contained extra information for students to look at in their own time, very good idea.

Teaching [A2: Teach and/or support learning through appropriate approaches and environments.]

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.

Comments

- Lecture started with a brief discussion of how the content to be delivered in this one linked to the themes developing through the module, making it clear to the students the relevance.
- Presentation was clear visually and verbally which was good. This good level of clarity would have been useful to the students, especially those of different learning styles.
- The tone of the delivery was excellent, it was clear and direct, without being too strict and rigid, creating a more informal environment which likely helped promote interaction with students.
- The recording of the lecture was limited to the PowerPoint and audio, no camera view of the room for students not present to feel 'included', however this was still a valuable and appropriate resource for students to review at later date.
- Content was well contextualised to the areas of study for the students, with well chosen examples that helped reinforce the points being made as well as likely helping students better understand what may have been some abstract information at times.
- Equipment in the room did not always pick up student voices well, so when they asked questions or answered them, the recording does not pick it up clearly (or at all sometimes).

Effective Learning Environments [A4: support and guide learners /V1 Respect individual learners/diverse groups of learners] <i>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.</i>
Comments • Students appeared attentive and engaged with the lecture which was good to see. • Good level of interaction was shown with the students, there were several points where questions were posed to the cohort and answers were received quickly from different students, showing a good level of engagement amongst the group. • Where answers were incorrect, or not forthcoming, the correct answer was given in a way that would not have been demeaning or off putting to students. • Students were following up on discussions and asking unsolicited questions which shows a very high level of engagement during the lecture.
Assessment [A3: Assess and give feedback for learning] <i>i.e Formative/summative assessment examples , Question and answer technique. Other evaluation procedures, class management, instructions to students005C.</i>
Comments • There was a very good level of interaction with the cohort throughout the lecture, mainly in the form of questions posed to the group. These were answered by different members of the cohort meaning that there was good opportunity for assessing the progress of the group. • The formative assessment type was used here very effectively, without feeling like the lecture was being interrupted by, or split into sections with distinct assessment points, this was very interesting to review. • Those students who joined the online meeting did not engage, nor were they directly questioned, so difficult to assess their engagement.
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 content was generally heavily contextualised, due to the nature of the topic, and effort was made to ensure that examples were given which were specific to the different streams (Automotive, Motorcycle & Motorsport) in the room given that the applications have very different requirements. • Some very interesting points that were raised in the verbal discussion was not on the slides at all, which may mean students miss it when reviewing later, although the recording does cover that off. • The use of visual aids, videos and text combined very well to create an appropriate set of resources for the lecture suitable for the level of study.
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 lecture had a professional, but natural and fluid delivery to it, making it conducive to a good learning environment. • The open engagement that seemed to be promoted during the session was very good, creating an environment where students felt happy to engage and respond. • Directly posed questions were a good way of promoting this engagement, but clearly the way the lecture and module has been delivered to date meant that students were happy to ask questions unsolicited.

Examples of good practice:

- Good quality slides with excellent use of visual information and embedded videos to help support the verbal discussion.
- Appended slides were a good idea to give extra information for students that did not form part of the delivered lecture.
- Engagement with eh cohort was excellent and made the who lecture much more interactive, likely meaning students would follow along better as well as providing formative assessment opportunities.

Action points:

- Engagement with the online students was not able to be monitored.
- Audio from the videos did not work on the recordings, as well as the microphones not picking up student questions and responses well at all.

For Observee

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

Observer Andrew Noble

Date 22/4/25

Observee

Date

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.

Lesson Observation Form 2

PGCert tHE OBSERVATION FORM -PSF 2023



Details of the Observation	
Observee	Andrew Noble
Practice Advisor / Expert peer observer	Dr Kerry Tudor
Date of the Observation	26/03/25
Campus / Location	SA1 Campus, IQ Building, IQ108
Date, Time, Duration	26 th March 2025, 11am to 12.30pm
Subject Speciality	Advanced Motorsport Dynamics
Type of activity	Lecture (based in a computer room)
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.	

Teaching/Support preparation [A1: Design and plan learning activities/programmes <i>i.e. Preparation, selection and organisation of content. Choice of teaching/learning methods.</i>
Comments

The class began with a clear discussion of the agenda, outlining how the session would transition from theoretical concepts to motorsport-specific applications. PowerPoint slides were effectively used to support the lecture and were also made available on the TEAMS channel, allowing students to follow along on their own devices. The lecture flowed well and followed a logical structure, making it easy for students to track the progression of topics.

However, the session primarily relied on a traditional "chalk and talk" approach, with limited variation in teaching methods and minimal student interaction. Despite this, it was evident that the session was thoughtfully designed to provide students with a comprehensive range of information, equipping them with the knowledge needed to apply concepts effectively in their coursework

Teaching [A2: Teach and/or support learning through appropriate approaches and environments.]

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.

Comments

The class began with a straightforward introduction to the topic of Design of Experiments, providing a clear foundation for students as they were introduced to new material. This topic was effectively linked to the second piece of coursework, reinforcing its relevance within the broader module. While the subject stood alone and did not require prior knowledge, it would have been valuable to first gauge students' familiarity with the concept to better tailor the level of detail and engagement.

The PowerPoint slides contained basic, easy-to-read information that was expanded upon during the lecture. However, the slides lacked variety and visual content, which may have impacted

student engagement, especially during more abstract discussions where images could have aided understanding.

The session took place in a computer room—an environment better suited to other parts of the module—which may not have been ideal for this topic. Despite this, students were initially attentive and not visibly distracted by the computers. However, as the session progressed, there appeared to be a decline in engagement, and few students took notes, despite additional verbal information being provided and the session not being recorded.

One highlight was the clear explanation of the difference between simulation and physical testing, which helped solidify a key concept. Overall, the lecture successfully delivered the intended content, and students should now have a better understanding of how to approach the associated coursework.

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

This session, the final one of the module, was delivered to a small group of five students. Although one student arrived 15 minutes late and had to be admitted by the lecturer, the brief interruption did not significantly affect the flow of the session.

A touch of humour was incorporated into the presentation, which the students seemed to enjoy and respond to positively. However, there was no opportunity for student participation during the session, which was a missed opportunity to further engage the group, especially in such a small setting.

Despite this, the class remained attentive and respectful throughout, and the overall atmosphere was positive, with students appearing happy and appreciative by the end of the session.

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

There was a noticeable lack of opportunities for student interaction or engagement during the session. At no point were students asked questions or encouraged to share their opinions or prior knowledge, which limited their involvement and made it difficult to assess their understanding of the material.

Even though the topic was new to most of the class, incorporating moments to prompt reflection or discussion could have helped gauge their baseline understanding and foster deeper engagement. As a result, there were no activities or informal assessments integrated into the session to support active learning. While students were invited to ask questions at the end, the only query raised related to the coursework deadline, suggesting potentially limited academic engagement during 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

During the session, there was a useful mention of how some of the software tools students had encountered elsewhere in the programme could be applied to support their understanding of this subject. However, it would have been beneficial to list these tools on the slides for reference, especially for students reviewing the material later.

When presenting theoretical concepts, the lecturer made a clear effort to relate the content to motorsport-specific examples, effectively demonstrating how the topics were relevant to the students' area of study and helping to reinforce the real-world application of the material.

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 language and terminology used throughout the session were of a high professional standard, reflecting a clear respect for the students and their status as Master's level learners. The lecturer also provided valuable industry context, highlighting how various approaches are applicable beyond motorsport, broadening students' understanding of the subject's wider relevance. Discussions included references to industry organisations and relevant testing regulations, with thoughtful consideration given to their impact.

Additionally, the session offered a strong exploration of the academic frameworks available for Design of Experiments, demonstrating how these can be effectively applied to the module content. At the end of the session, a student approached the lecturer with a question and was met with respect and patience, receiving a thorough response without being rushed, further reinforcing the supportive and professional tone of the session

Examples of good practice:

A high number of well-chosen examples were provided throughout the session, specifically tailored to the students' areas of interest, which helped to make the content more engaging and relevant. The lecturer demonstrated an impressive depth of knowledge that was highly relevant to both the topic and the overall programme, contributing to a strong and credible delivery of the material.

Action points:

Incorporating more student engagement, such as through Q&A sessions or interactive activities, would have been beneficial for enhancing participation and deepening understanding. The lecture relied on a consistent teaching method throughout, which, while effective for some, may not have fully accommodated the diverse learning styles of all students, potentially limiting engagement for those who benefit from a more varied approach.

Additionally, there was no formal process to assess students' understanding at the beginning or end of the session, which could have provided valuable insights into their comprehension and helped guide further instruction.

For Observee

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

The feedback received from the session observation has been useful, as the external perspective of how the session was designed and delivered has given insights that I would otherwise not have considered. It was pleasing to see that the session delivery and approach was generally sound, and the information regarding the diversity of visual material as well as incorporating more interaction from students is valid, and something that I will develop further in future lectures.

Observer ...

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Date 31/03/2025

Observee Andrew Noble.....

Date 13/3/25

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.

Lesson Observation Form 3



Details of the Observation	
Observee	Andrew Noble
Practice Advisor / Expert peer observer	Dr Greg Owen
Date of the Observation	03/04/25
Campus / Location	IQ
Date, Time, Duration	1pm – 2.30pm
Subject Speciality	Introduction to Vehicle Dynamics (Foundation)
Type of activity	Lecture (11 students)
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.	

Teaching/Support preparation [A1: Design and plan learning activities/programmes] <i>i.e. Preparation, selection and organisation of content. Choice of teaching/learning methods.</i>
Comments The lecturer provided a powerpoint presentation which was of a very high standard, clear and had a mixture of text and diagrams, not too wordy with lots of verbal explanation given around the material which clearly showed the lecturers in-depth subject knowledge in this area.

- The lecture contained a degree of mathematics and this being a foundation level class it is essential that the analytical content is combined with diagrams, explanations etc to make it pertinent and accessible. The lecturer did this extremely well by combining text, diagrams, equations.
- I may have missed some explanation but was the aerodynamic lift force arrow supposed to be pointing down or is this another name for down force?

Teaching [A2: Teach and/or support learning through appropriate approaches and environments.]

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.

Comments

- The lecture was clearly introduced, the lecturer ascertained which streams each of the students was on and this allowed the lecturer to make the subject content pertinent to their specific stream of study.
- An area of consideration is formative assessment. How do you know that the students are understanding the content? Could Q&A help, asking students what they know prior to introducing the subject to gauge their initial understanding. These techniques will aid you

in understanding what they understand (and what they don't understand) and it will also aid you in keeping students on-task if they think that they could be asked to participate (not that this was an issue with this class but good practice to consider).

- You're a very interesting lecturer because your understanding of the material is at a very high level and you can also give real-life examples and all of this makes it very easy for students to sit back and listen to what is an interesting story. I refer to a previous point, how do they benefit from this experience in terms of note taking, recordings etc?
- Good and well-placed humour. This makes it an easy going atmosphere which is conducive to learning.
- Good practice to refer the content to the kit in the workshops, makes the content tangible and something they can engage with giving a good blend of theory and practical.

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 majority of the class arrived on-time and a very small number arrived late.
- All students were attentive although I did not see students take notes so my question is how do they benefit from your in-depth explanations of the subject matter?

Assessment [A3: Assess and give feedback for learning] <i>i.e Formative/summative assessment examples , Question and answer technique. Other evaluation procedures, class management, instructions to students005C.</i>
Comments • This is the area I would suggest to focus upon. There are many opportunities in this session to engage students with Q&A, discussion and for people to give anecdotal experiences of when they have experienced this. After the session, students stayed behind to ask questions and discuss the topic which would have been great for the other students to have heard.
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

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**Examples of good practice:**

Excellent subject knowledge

Excellent slides

Interesting delivery that was pertinent to their interest and stream of study

Great narrative around notes to make the subject extremely interesting

Action points:

Formative assessment

Note taking for students.

For Observee

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

The observation has highlighted some very good aspects of the delivery and the lecture preparation/content, which is highly encouraging. This good practice is something that I will continue to take forward in this module and others, making sure that the slides are of good quality and that the verbal delivery expands on the context and carries a good, professional delivery to help reinforce the subject knowledge.

Primary area for concern here is the lack of assessment opportunity, as a means of ensuring that the students are fully engaged with the content. This is something to be reviewed in future, with considerations of appropriate points that this can be worked into the lecture.


Observer(Greg Owen)

Date 03/04/25

Observee Andrew Noble.....

Date 03/04/25

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.