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# Mastering Engineering: Empowering Students to Be Competitive

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**Institution:** Technological University Dublin

**Platform:** Mastering Engineering

2025



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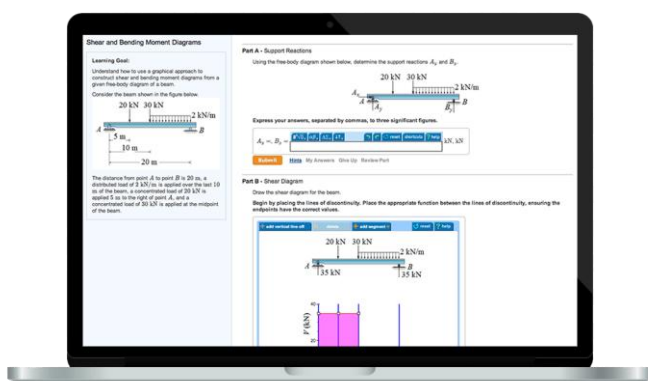
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*Gerard Nagle, lecturer*



## The Course

As a lecturer at Technological University Dublin, School of Mechanical Engineering in Ireland I teach a four-year undergraduate course in mechanical engineering with a cohort size of **80 to 90 students**. I teach Fluid Mechanics, where students delve deep into this aspect of mechanical engineering for the first time.



## The Textbook

I chose [Hibbeler's textbook](#) because the questions are practical and well-illustrated, making it easier for students to **visualise** and understand the problems. Hibbeler's book includes many **diagrams** that helped clarify the concepts. Additionally, the problems are **practical engineering issues** rather than purely academic ones, which I found better suitable our needs.

One of the advantages of using Mastering Engineering is that the textbook comes as an **e-textbook**, which eliminates the need to rely solely on physical copies from the library.



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*„The flexibility of Mastering Engineering allows students to work at their own pace, encouraging consistent engagement.”*

### Why Mastering Engineering?

The **Fluid Mechanics module** has historically been challenging for students due to their **unfamiliarity with the concepts**. Feedback indicated that students struggled with the unknown aspects of the subject. Inspired by changes during COVID, we explored new teaching methods and found that Mastering Engineering by Pearson could help address these difficulties.

To enhance engagement, we restructured the module assessment from an 80% exam and 20% labs scheme to **60% exam, 10% Mastering Engineering, 10% Matlab, and 20% labs**. This included making Mastering Engineering a **weekly homework assignment** to ensure **consistent engagement** with the material throughout the semester.

### Addressing Challenges

To **bridge the gap** between theoretical knowledge and practical lab experience, I aimed to introduce more **interactive elements** into the module using Mastering Engineering. This platform offers various question types to engage students effectively and provides **data** on average time spent on questions worldwide, helping allocate weekly homework.

The flexibility of Mastering Engineering allows students to work at their own pace, encouraging **consistent engagement** and reinforcing their understanding throughout the semester.



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## Credit, Integration and Communication

We allocated **10%** of the overall module credits to Mastering Engineering, **integrating** it into our LMS. Pearson introduced the system in the first week. I assigned four homework sections, alternating weekly between Mastering Engineering and Matlab, with assignments due by the end of Sunday and **auto-graded** by Mastering Engineering.

To keep students informed, I set up **recurring reminder emails** through our LMS. Once the students got into the rhythm, most of them kept up with the schedule and even reminded me if I was late posting assignments, which helped keep me on track as well.

## About Mastering Engineering

From my experience with Mastering Engineering, a key highlight was the option to **provide hints** for each part of a question without students losing credit, helping them succeed. The platform **automatically grades** assignments, giving students a detailed performance breakdown.

My favorite features include the **e-textbook** and the **average time** to complete questions. The e-textbook ensures that all students have access to the required material, allowing me to set specific **pre-reading tasks**, while the average time feature provides a **global benchmark**, helping me gauge an appropriate workload for students.

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## Benefits for Lecturers

I found the following significant benefits in Mastering Engineering:

- Seamless LMS **integration** and technical **support** from Pearson
- Offers a large **set of questions** for varied learning needs
- Ability to create **custom questions** tailored to student requirements
- Provides **valuable feedback** to students for continuous improvement
- Capability to **monitor student performance** effectively
- **Clear assignments** that led to fewer requests for clarification from students
- More **“Aha!” moments** from students, enhancing engagement and understanding



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***„After lectures, students often stayed to discuss material, turning these sessions into impromptu tutorials where we worked through questions together.”***

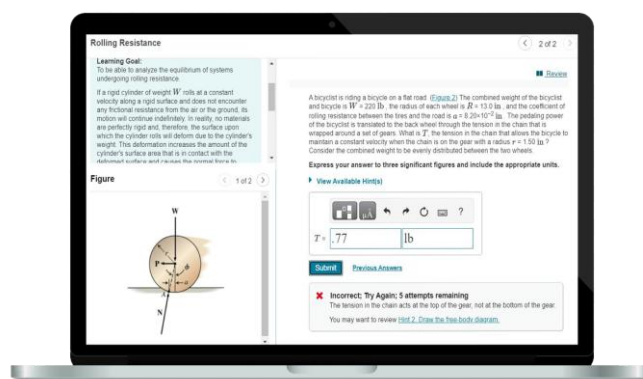
## Benefits for Students

The **feedback** on Mastering Engineering was **generally positive**. One of the key advantages was the ability for students to view statistics and **compare** their performance with that of their peers, which proved helpful for **self-assessment**.

***An interesting observation was how competitive the students became with each other.***

They were eager to solve the questions and compare their progress, fostering a sense of **healthy competition** that led to increased engagement.

Before using Mastering Engineering, I rarely had students asking for clarifications. However, after its introduction, students frequently **approached me with questions**, which indicated they were actively working on their assignments and engaging with the material.



## Student Engagement

Using Mastering Engineering enhanced student engagement by promoting **active learning** and fostering **group study**. After lectures, students often stayed to discuss material, turning these sessions into impromptu tutorials where we worked through questions together. These interactions helped students **grasp difficult concepts** and encouraged a **positive competitive spirit**.

Witnessing students' **"Aha" moments** as they understood new concepts was incredibly rewarding. A survey revealed overwhelmingly positive feedback, with students likening their **determination to finish** the course to completing a quest similar to a video game.



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## Student Results

When I integrated Mastering Engineering, I conducted a **controlled experiment** with six past paper questions to ensure consistency.

**By the end of the year, student performance improved by 10-20%, with the only change being 2-3 hours of bi-weekly homework in Mastering Engineering.** This increased engagement led to better outcomes.

The platform's **tracking feature** proved invaluable in identifying and supporting non-participating students, ensuring they received the necessary assistance to stay on track.

## Insights for First-Time Users

Mastering Engineering has proven to be both **practical and beneficial**. Despite initial GDPR-related work, Pearson's support efficiently handled technical queries, earning praise from our IT team.

Integrating the textbook with my notes and lectures created a **cohesive learning experience**. The platform ran smoothly, and minor issues were quickly resolved. The dashboard provided valuable insights into student engagement and performance, helping me track progress and identify areas for improvement.

Click to get more information on  
[Mastering Engineering](#)

