



Pearson

MyLab Math at the University of Newcastle

Building a strong foundation and
increasing confidence in
mathematics for science students

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Key Findings

In this diverse cohort of chemistry students studying mathematics, the introduction of MyLab Math in 2016 supported a positive teaching and learning experience by:

- providing a safe, supportive, familiar online environment for students to access and practice mathematics, free from judgement or critique
- supporting wellbeing - decreasing stress levels previously evident in the cohort by increasing the opportunity to access practice and feedback
- delivering high average scores across a wide range of individual subject knowledge and motivation levels - regardless of previous attainment levels
- enabling automated marking of 750 assessments contributing to 50% of the course mark thereby freeing up instructor time, allowing more time for research whilst also providing valuable class analytics

About the Product

Pearson MyLab Math is an online homework, tutorial and assessment product designed to improve learner outcomes and results for higher education students. It is designed to foster learning through interactive content, guided practice and step-by-step support.

Title in use: Croft Mathematics for Engineers 4e

Summary

Introductory Physical Chemistry is taught at Year 1 undergraduate level by Professor of Chemical Physics, Werner A Hofer, to approximately 150 campus students. There is no prerequisite for students to have an A-level in mathematics so this single semester course was designed to deliver a fundamental understanding of mathematics for scientists. Considering the relatively high amount of mathematics involved in studying chemistry, it was designed to bring all students up to the same A-level standard.

“We have students who have done A levels and they’re bored...and then we have others who are really stretched because they haven’t done anything like mathematics in the last three years or so...” Professor Werner A. Hofer

“If (students) are in a classroom situation and presented with the mathematics, that really stretches them, it’s much easier for them to go home, in their flat, on their computer, and look at it for themselves”

Professor Werner A. Hofer

Product Implementation

MyLab Math was implemented in the course in 2016, although Professor Hofer began teaching it in 2018 having stepped back into teaching from his role as Dean. He was tasked with continuing to provide the appropriate level of learning and practice in mathematics to all students.

Before implementing MyLab Math in 2016, studying mathematics had been a source of stress for students and this presented a significant teaching challenge when it came to supporting, motivating and engaging a large cohort of students with the subject. Conversely, those students who came to the course with A-level mathematics found they were covering familiar ground having previously studied it at school and became disengaged by the content.

Students were set five assignments each with a couple of days window to complete and lasting approximately 20 minutes each. Given that this resulted in 750 pieces of assessed work, automated marking allowed Professor Hofer more time for research activities, and provided valuable analytics on class performance.

The marks from the Lab contributed to 50% of the students' final mark on the course with assessments set from around lecture 5 in the course and running in parallel with lecture content. The final assessment was around lecture 15.

Given that use was compulsory, for credit, registration was mandatory and all students received access codes for MyLab Math funded by the faculty at Newcastle University.

Pearson worked together with academic staff to ensure that students understood and signed into the resource in the very first lecture, they completed a task or simply played around in the system to encourage familiarity with the new system. Professor Hofer referenced the assessments throughout his lectures in order to remind students to access the resource.

Why did the University fund access to MyLab Math for their students?

- **Challenge:** The course was unpopular and stressful for students therefore it was difficult to motivate students and teach effectively
- **Solution:** The Faculty agreed that MyLab Math was the best tool to get students to engage and commit at the right level to enable learning
- **Impact on teaching:** MyLab Math automated marking, allowing more time for research whilst also providing valuable class analytics. It delivered consistently high scores alongside good levels of student satisfaction

Instructor Experience and Perception

Engagement and motivation: Professor Hofer felt that without MyLab Math, students' stress levels would be much higher when it came to learning mathematics and he felt there would be more apprehension in lectures. In his opinion, students would have been less engaged with the lectures if they only had access to his lecture problems as a formal way to practice and apply their understanding. He felt that the opportunity to explore topics further or reinforce understanding of the week's lecture allowed him to cater for all abilities and interests in a safe, non-judgmental space. This motivated students and allowed them to feel more confident participating in his lectures.

Professor Hofer found using MyLab Math to be a positive experience both for him and for his students. He found the system easy to work with and simple to implement saying *"basically I took the course, I did my lectures, and then I said, now you have this assignment, you have to complete it by Tuesday, and they were roughly covering the same stuff that I did in the lecture"*. It enabled him to cater for a wide range of needs and offer support to the students who needed it most, engaging with those who found the content particularly challenging.

Achievement: In order to encourage participation, to motivate students and to help them embed their learning through practice, the questions provided on MyLab Math were relatively straightforward and students were allowed two attempts at answering the questions. As Professor Werner said, *"the aim of this module was to get them up to speed in mathematics"* and the students were successfully doing so, gaining average marks of around 95% (which then had to be rescaled in order to align with University guidelines with a maximum median of 75%).

Most importantly though, MyLab Math had successfully delivered as a way to level the playing field for these students because a high median mark meant that **all** students were performing reasonably or very well, both those students who had and those who did not have an A-level in mathematics.

"Let me stress it: it would be very difficult for me to teach this module if I didn't have this resource."

Professor Werner A. Hofer

The high median mark achieved on this course demonstrated that all students were performing reasonably or very well **without reference to prior mathematical achievement or individual ability**



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Student wellbeing: Considering that this cohort were chemistry students, many of them considered mathematics to be unconnected to their study. However, chemistry relies on mathematics to a large extent, something many students had not realised before they began their studies. In fact, many also came with a negative perception of the subject formed from their experiences at school. This meant students were immediately concerned, often finding it hard to understand and many felt unhappy at the prospect or challenge of re-engaging with mathematics. As many of them questioned why they had to study mathematics, there was an inherent problem motivating students.

“We have to motivate the students and MyLab Math is part of the motivation.”

Professor Werner A. Hofer

Student Experience and Perception

Students enjoyed the flexibility and ease of access which MyLab Math provided. In feedback to Professor Hofer they said they appreciated the amount of practice and found it easier to learn, whilst removing stress.

“I’ve had feedback actually on this course, this year, and they all said it’s great to have this facility to learn it in this way, and it’s also great that they can try twice, so they can make a mistake and then they can go back and correct it. And all of that can’t be done, really, in a classroom situation.” Professor W. A. Hofer

Employing technology enabled learning suited the modern approach students take to their studies and allowed them to interact as, when and how they wanted to in a constructive environment. Professor Hofer explained that when he asked about MyLab Math in lectures all the students were quite happy about it...

“...because they can play with it and they are used to it – from their phones and all their gadgets they have – they’re used to this web environment, and that’s sort of a playful thing, it takes the stress out of the mathematics. And in this way, they learn much easier.” Professor Werner A. Hofer

Students returned their end of module evaluation at a good rate of 31% (50 out of 150). Students were positive about MyLab Math, happy with the system itself and two clear benefits were repeated throughout the feedback:

1. **Practice.** Students liked to be able to do something more than once, having the chance to correct their mistakes and receive feedback on their answers.
2. **Removed stress.** Professor Hofer said that students found it very helpful to be able to do the work on their own where “no one was really watching them and criticising them, so they could really get up to speed in their own time.”

The students confirm Dr. Hofer’s observations. They report that the system engaged them in manageable, supportive practice whether they were A-level students or not, and allowed them to link their learning to the course content:

“Although I have done A-level maths, completing the practice questions for topics like integration was very helpful. For concepts that were new to me, I did the quizzes more than once and most of the time, the automated feedback for certain questions [was] beneficial. I also liked how when I couldn’t answer a question, the automated box broke it down into small and relatively easy steps.” Student – Newcastle University

“I thought that the MyMathLab system was a good platform for helping with the maths...due to it having practice questions for all of the areas of maths taught for the duration of the course. I think that the system is well designed and easy to navigate to the desired content...”

“...I would recommend MyMathLab to other students who need to brush up on maths.” Student – Newcastle University

“I would definitely recommend it to other students as a useful aid in learning, or just improving on their maths.”

**Student,
Newcastle University**

Conclusion

MyLab Math supported a sense of wellbeing in students, easing the stress some associated with the study of mathematics. It was received positively in part due to the flexibility and accessibility of the system, in part due to the safe environment in which students could practice a subject – especially a subject in which they might lack subject knowledge and/or feel to be somewhat alien to their degree.

MyLab Math enabled Professor Hofer to deliver content in a familiar, enjoyable format and it also automated marking for a large cohort, saving the teaching staff time and providing valuable analytics on class performance.

In combination, the resource therefore contributed to a positive, motivated cohort able to achieve good grades without being disadvantaged by a lack of prior mathematical knowledge.

Next Steps

The question for 2019 is not whether they will use MyLab Math again, but whether the questions on the system are too easy or if it addresses the challenges and outcomes and therefore does the job it should do. Achieving such high median marks is unusual and so it seems likely that they will include more complex questions.

In that way, the resource will continue to function as a leveler, a motivator and a source of security. It will also, however, challenge students to apply their knowledge at a higher level. Overall, *“MyMathLab and how we set it up will definitely stay as it is”* on the course because Professor Hofer is clear on the positive impact it has had on his students’ wellbeing and ability demonstrate and apply their learning.