

# Möbius

## Maplesoft and the University of Waterloo

### Challenge

How can schools provide **effective online education** for students in science, technology, engineering, and mathematics (STEM) courses?

### Solution

**Möbius is an online courseware system from Maplesoft that is focused especially on the needs of STEM courses. Möbius is built on the notion that people learn by doing.** In Möbius, students can explore important concepts using interactive applications, visualize problems and solutions, and test their understanding by answering questions that are graded instantly. Throughout the entire lesson, students remain actively engaged with the material and receive constant feedback that solidifies their understanding.

The University of Waterloo (UW), one of the largest institutions in the world for STEM education, has been working closely with Maplesoft to bring dozens of courses and outreach programs online using Möbius.

### Outcomes

- **Adoption:** Approximately 8000 students and 120,000 outreach participants are expected to use Möbius this year through UW courses and outreach programs.
- **Student Success:** While Möbius has not been in use long enough to draw statistically significant conclusions, available data and anecdotal evidence are very positive. Examples include:
  - University of Waterloo: The use of Möbius is coincident with the best performance by Calculus students in more than ten years, with improvements in averages, pass rates and withdrawal rates.
  - Chalmers University of Technology: 92% of students who took the final exam in a course that used Möbius passed, compared to 61% in the previous year.
- **Analytics:** Möbius provides tools for analyzing student performance, which can be used to determine student understanding as well as measure the effectiveness of the content itself.
- **Access:** Through Möbius, students can access high quality education without being limited by geographic or schedule constraints. For example, UW is actively investigating the use of Möbius to reach under-served indigenous communities.
- **Return on Investment:** UW has experienced many benefits to using Möbius, including giving students more, faster feedback while reducing the time teaching assistants spend grading. They also reach substantially more students and teachers through their outreach programs than was previously possible.
- **Affordability:** Möbius can be used instead of a textbook, for significantly less cost to students. UW saved students, cumulatively, approximately \$150,000 in just a single course by replacing textbooks with digital assets in Möbius. Taking courses online also reduces or eliminates transportation and living expenses.

### Learning Impact Awards Finalist

#### Category:

Evolution to Next Generation Digital Learning Environments



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