MasteringEngineering

University of Gaziantep, Turkey

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LEARNING OUTCOME

These University of Gaziantep lecturers have implemented MasteringEngineering for summative assessment and also **encourage students to use the eLearning materials in the system**. They believe, although can't prove, that the use of MasteringEngineering has contributed to a **30% increase in final grades**.

Course

Solid Mechanics

Textbook in use

Mechanics of Materials, 8th edition
Hibbeler

Type of data collected

During this period

Course design

The Department of Civil Engineering at the University of Gaziantep has an annual intake of approximately 80 undergraduate and 80 postgraduate students. All second year civil engineering students take solid mechanics as a core course during their third semester which lasts for 16 weeks.

The students' previous knowledge and experience is varied, as some students will not have studied any mechanics modules within their physics course(s), whereas others may have studied at intermediate level. Prior to 2011, this course was taught in a very traditional manner with 4 hour-long lectures per week supported by bi-weekly homework. Unfortunately it suffered from relatively poor examination results and mediocre student feedback compared with the other courses. We identified the following issues to be addressed:

- The traditional lecture format allows for little interaction with large classes and no opportunities for collaboration with other students.
- Students cannot always attend lectures and need flexibility due to work, family or lifestyle; many are from non-English speaking backgrounds or have special learning needs.

To address some of these issues, in 2011-12, we radically changed the delivery of the course by implementing web-based technology. For this, we introduced MasteringEngineering.

Assessment

The course comprises lectures, supervised training and self-study. The primary aim of the teaching is to encourage and support the students' self-study. Emphasis is put on the use of MasteringEngineering. Students take two mid-term exams, 7 homeworks and quizzes (which make up 20% of the final grade) and one final exam. All homeworks and quizzes are delivered using MasteringEngineering.

Implementation

We use MasteringEngineering as a study tool to complement face-to-face lectures. All students are required to purchase a MasteringEngineering access code. More than 90% of students purchase a code; the university and bookstore help the remaining 10% to obtain access.

After the lecture the students are required to develop their own understanding by studying the course material which is available online within MasteringEngineering. A rich suite of e-learning material is provided. Once the students feel that they have a reasonable understanding of a chapter, they are required to do a MasteringEngineering assignment which consists of between 5-10 problems selected from the MasteringEngineering problem library.

Students are required to submit their weekly assignments by 11.00pm on Monday. There were 7 homework and quiz assignments which in total were worth 20% of the module marks.

Course results

The majority of students believed MasteringEngineering helped them to achieve better results in their units. More than 75% of students believed using the technology made it easier for them to learn.

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We have little statistical evidence available to make judgements about the effectiveness of MasteringEngineering but do believe that it allows students to review and add points that they may have missed, to their lecture notes. Indeed, when we compared the last 2 terms' grades (when using MasteringEngineering) with the previous terms, there has been approximately a 30% improvement in the students' final grade.

Conclusions and lessons learned

- Technical support for staff and students is necessary to ensure they can use new technologies; pedagogical support is necessary to ensure effective integration of MasteringEngineering into the course; and learning support is necessary to ensure students make the most effective use of the tools provided.
- Universities will need to provide support and encouragement for their use of technologies in learning and teaching. Professional development is essential to enable staff to explore these new technologies and appreciate how they support the learning and teaching process.
- Students appreciate the flexibility in access and support for learning offered by MasteringEngineering, while also viewing lectures as important to their learning. They found lectures motivating, they valued contact with the lecturers and their peers and they found the visual aids helpful. Importantly, the use of MasteringEngineering did not necessarily exclude lecture attendance. Indeed, some students indicated that they often 'double up' by attending lectures and listening to the recordings.

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- MasteringEngineering will change the way students learn and teachers teach: students used the tools to help revise for exams, review complex materials, work at their own pace and place of convenience, pick up on things that they missed in class, go back and take comprehensive notes after the lecture so they can concentrate on what is happening in the lecture.

References

M. Gosper, D. Green, M. McNeill, R. Phillips, G. Preston and K. Woo "The Impact of Web-Based Lecture Technologies on Current and Future Practices in Learning and Teaching",

http://www.cpd.mq.edu.au/teaching/wblt/overview.htm, April 2008.