MasteringPhysics

Kuwait University, Kuwait

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LEARNING OUTCOME

With a huge cohort of over 2500 physics students and many lecturers managing the teaching, Kuwait University used MasteringPhysics to **more easily support student learning** and also to apply more consistency in the grading across the cohort. Students prefer the online homework and **grades have increased**.

Course

Physics 101, Physics 102, Physics 121, Physics 122

Textbook in use

University Physics, 12th & 13th editions
Young and Freedman

Type of data collected

Lecturer observations and student feedback

During this period

2010–11

Course design

There has been an average number of 2000 students taking introductory physics courses (for either physics or non-physics majors) per term. In 2011, the number of students admitted to Kuwait University increased about 30%; now we will be handling about 2500-3000 students! As you can see, it is a huge teaching load. Each course has a minimum of 3 contact hours per week, while some have a fourth contact hour devoted to a tutorial in which the focus is on solving problems. Students who join these courses are usually exposed to some of the materials covered during their high school studies. Most students come from Arabic-based environments, while some joined Language schools. Language is sometimes a barrier, but it is Math that we think is the major obstacle for our students, as some of them don't really possess the required prerequisites.

Assessment

MasteringPhysics quizzes are worth 10% of the overall grade, and MasteringPhysics homework is also worth 10%. The remaining 80% is divided between three exams (two mid-terms worth 20% each and a final exam worth 40%).The lab work for all courses is assessed separately as the lab is assigned one credit hour and three contact hours.

Implementation

We wanted to adopt a new book that came with an online homework system and so we agreed to use MasteringPhysics for Physics 101 and 102. In the first tutorial, I did a demonstration on how to register, how to work out grades, and how to submit assignments. Any students who still had problems could come and see me or my Teaching Assistant, but after the first few weeks they were fine. MasteringPhysics does not really require training because anyone who can use a computer can use it.

We also wanted to integrate an online homework system to facilitate grading and to have uniformity for all faculty members so that, although we had different homework content, we used the same grading system. There are many features for homework in MasteringPhysics; I gave the students a list of problems to solve at the end of each chapter of the textbook, I chose different levels of difficulty for the questions and I extended the deadlines where necessary. Based on feedback from my students they found it much better than a traditional paper-based homework system.

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There are many useful features in MasteringPhysics, such as:

1. A variety of questions.
2. The ability to put in random numbers. If you are using the same textbook over a number of years, students can get the answers from the previous years. However, with this program I was able to put in random numbers so that the answers were not transferable.
3. The option to insert your own problems.
4. The ability to use problems from other textbooks. I found this freedom to assign problems from all different kinds of textbooks invaluable.
5. You can allow Teaching Assistants to have complete supervision or support.
6. Using an internet-based system, you can assign homework and quizzes without having to spend time doing so during the class.
7. It also comes with tutorials and hints, which give students motivation to think about the problems. This also allows me to give students more chances to get homework questions right.
8. You can compare the results of my students to other students all over the world.

All of this flexibility was invaluable. We always emphasise reading the textbook but sometimes the textbook is wordy and we have problems with students that don't have an English background.

In designing my first courses, it took me a long time in the beginning getting used to the system and trying to test all the settings to see what is best. To help with this, I use two accounts: an instructor one and a student one (to see how it would look if I were a student). Also, you can use the same quizzes and course plan for all courses after you have designed it a first time.

Course results

I was expecting the grades from the student to go higher and they did. They can enjoy doing their homework in the comfort of their own homes; they don't have to do it in the library. Students have exposure to different kinds of problems, and I can give them extra credit to motivate them.

Students are now becoming more familiar with MasteringPhysics and are overcoming initial difficulties in registering and using the system. Many students expressed their satisfaction with MasteringPhysics and the way hints are provided. Students can now register for two courses at a time and they are admitting that their performance increased. They are providing us with very positive comments about how to improve the service offered (e.g. increasing practice problems, allowing for extra-credit, online quizzes).

We have separate teaching teams for the four 100-level Physics courses that we conduct at Kuwait University. From the feedback I received from each and every faculty member, I can certify the fact that the students' grades improved. I believe this is because students have more opportunity to practise, and the comments of students in the course evaluation forms testify to this fact. We are currently working on having a centralised system by which we can systematically collect all the data on the students' performance so that we can conduct rigorous statistical studies to analyse the data.

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Conclusions

Initially we only used MasteringPhysics for PHYS 101/102. Starting Fall 2011, all introductory Physics courses are supported by MasteringPhysics. I believe that this is evidence that we trust the technology as we intend to use it more in the future.