

Higher Education in the Digital Age

by *Abdullah Al-Mutawa*

The benefits of Information and Communications Technology in the Gulf

With the advances in Information Technology (IT) and the connectivity of the Internet, more tools than ever are available to higher education providers. Using IT together with communications is usually referred to as Information and Communications Technology (ICT), and it has played a major role in the education sector both worldwide and in the Gulf region specifically during the last two decades.

Online learning tools

New tools and educational apps can support almost all areas of knowledge, and they are being used by many Gulf educational institutions to supplement face-to-face (F2F) teaching. Many instructors have replaced traditional learning tools and models with online learning materials. Examples include replacing print maps with Google ones and physical models with digital images of human anatomy. These online tools are much easier to handle, do not need any inventory or custody tracking and do not wear down from repeat use.

Virtual labs are also getting attention for the educational value they provide. Personally, I've integrated a virtual lab into one of my robotic lab experiments at Kuwait University (KU). The results were very positive. Students could login at any time to conduct experiments, using real tools without being physically present at the lab. The robots were operated using a website interface that is connected to a microcontroller (Arduino) that can run the experiment. Students get to watch the output in real-time through a web camera located on the physical voltammeter.

Learning Management Systems

A Learning Management System (LMS) is a comprehensive system that gives instructors full control over online material. Instructors can upload learning materials such as videos, lec-

ture notes or presentation slides onto the LMS, and they can set access permissions according to timeframe, the completion of requirements or passing a certain grade threshold in a prerequisite test.

LMS has become a standard tool in most Gulf educational institutions today. There are many commercial (Blackboard and Desire2Learn) or open source (Moodle) services available. Although most institutions provide the option for instructors to use LMS services, they do not enforce their use as a standard teaching tool. This leaves each instructor the choice of whether to use just the bare minimum of LMS features to broadcast news and course announcements, or to more fully utilize the entire spectrum of services available. LMS plays an important role in giving instant feedback to instructors on how well students are participating. In addition, instructors can see which course materials received the most attention, and they can then fine-tune the course to better meet students' needs.

Flipped Learning

Flipped Learning (FL) is another learning strategy that is now available thanks to ICT. Instructors can pre-record lectures and make them available either via LMS or on any other web service such as YouTube. Students are then asked to watch the lecture before class, and class time is used to discuss the material, solve some examples or reinforce the knowledge gained from the web lecture. Many implementations of FL utilize the F2F lecture time to solve homework in groups under instructor supervision. This builds positive social interactions between peer students as well as course instructors.

Although FL is still new to the Gulf, I've personally implemented it in some of my courses. It has been well-received by students. Nonetheless, FL will need high-levels of instructor preparation and a more hands-on approach to make sure lectures are watched before class. If that were to occur, I predict that FL will then become very popular in the Gulf.

MOOCs and online courses

Massive Open Online Courses (MOOCs) use the Internet to allow a *massive* number of students

from any age and background to join a course (it is *open*), and take it at their own pace and time (it is *online* and available). Offering the course for free or at a low price also helps to increase enrollment. Some MOOCs only charge tuition if the student requests a certificate of completion, which some MOOC providers call a course enrollment upgrade.

Many elite Western universities have invested in building MOOCs both as a public service and to complement their current course offerings. Initially, it was widely expected that MOOCs would negatively affect lesser-known educational institutions by encouraging students to eschew traditional F2F instruction at these small institutions altogether. But these fears soon disappeared once it became clear that instructors were using MOOCs to facilitate and reinforce in-class learning. Instead of totally relying on MOOCs, a local institution can adapt these courses to their needs as they see fit. At the same time, local instructors can further elaborate on the material found in MOOCs by adding more examples and introducing in-class interaction.

Last semester (Fall 2016), I uploaded all of my lectures to a MOOC service provider (RWAQ) for a Computer Fundamentals course I was teaching. Twenty-nine students enrolled in the F2F class, compared to 7,500 students for the MOOC equivalent. These online courses are clearly in high demand among students.

MOOCs are still very young in the Gulf, and I have no knowledge of a higher education institution in the region that is officially offering MOOCs as part of their degree programs. There have been some personal or commercial MOOC providers—such as RWAQ, EDRAA and NADRUS—that have entered the market, but they have failed to partner with well-established academic institutions in the Gulf.

Education and “gamification”

The PlayStation, Xbox and Nintendo gaming consoles have succeeded in catching students’ attention for countless hours. There have been academic studies that show games can be used to facilitate instruction (called “gamification”). Games can also be used to create challenging problems that have yet to be solved. Hence, by using the

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appeal of games, instructors can better service students’ educational needs.

For example, a Swiss company has recently launched a game called CeeBot that teaches computer programming through a space robot used to solve challenging problems. I have used this game to teach a C++ course at KU, and the early results were very promising. My students kept solving problems way beyond what was assigned—as long as the game kept challenging them by offering additional difficulty levels. In comparison, when I teach traditional F2F C++ classes, students frequently complain about the number of problems to solve.

Mixing and matching digital tools

The use of ICT in education has made many different teaching methodologies available. Instructors can even mix and match different technologies to better suit their students’ needs. For example, instructors can record FL lectures via LMS or simply upload them to a MOOC service provider. At the same time, instructors will still have to handle the increasing number of students that may register in MOOC courses.

In any case, the future of higher education in the Gulf will likely entail even more use of ICT tools. Instructors will increasingly take on more of a facilitator role than a lecturer one. Handling large online courses is not an easy job, and it will require instructors to learn new skills. As for students themselves, they will no longer be constricted by their geographic location, and will be able to increasingly connect and participate with their instructors and peers through a whole host of tools available to them.

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