

The Games that people play

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There is much discussion about all aspects of higher education. The Go8, Oxbridge and Ivy Leaguers all quite rightly advertise their research achievements, and the world is better off for that work, but prior to those advances, researchers were students in a class being taught. It is, presumably, the quality of the teaching that drove them along the academic highway. I believe more attention needs to be placed on what is the core function and *raison d'être* of educational institutions and that is teaching. So the question what can we do to improve the teaching experience of our students? One new model of education that has emerged in recent years is that of 'gamification'.

Gamification

Gamification refers to the application of digital game mechanics to non-game situations to motivate users' behaviours (Deterding, Dixon, Khaled, & Nacke, 2011). Gamification in education refers to the incorporation of game design elements and "gameful experiences" in the design of learning processes. The use of games has been adopted to support learning in a wide variety of contexts, subject areas and also to encourage both collaboration and self-guided study. It has also been suggested that using games would help students complete of assignments because it made assessment more accessible and more effective (Caponetto et al. 2014). The use of game techniques in the classroom is not new, teachers have harnessed the natural competitiveness of students in many ways. The use of point's tables, leader boards, ladders and other hierarchical tools were the devices most commonly employed. Now, points can help stimulate a person's desire for reward, while a leader board or ladders can fulfil a person's desire for competition while catering to his or her need for achievement. However, they have always been regarded as a sideline, a filler, to add a bit of variety to what might be boring delivery of a topic. The sole use of points' tables or leader boards could be frustrating for some students. Nicholson (2012, cited in Dichev & Dicheva, 2017) proposed that instructors focus on play as a strategy to circumvent this problem and the recent and rapid development of technology and in particular game technology has made far more sophisticated strategic educational "games" possible. Indeed, it could well be argued that *"gamification cannot be successfully implemented into the classroom without the support of a solid technological infrastructure"* (Dichev et al, 2015, p.4). The world of computer gaming has provided this infrastructure. Technology is also providing access to phenomena that might otherwise remain opaque to many novices, particularly so-called experiential learners. Software visualizations, images, audio, and haptics bring abstractions to life. For instance, when scientific, mathematic, and engineering concepts require learners to build abstract mental models that involve invisible factors, such as intangible force fields and interactions among charged particles, visualization and haptic devices can be used to help learners feel force, pressure, and temperature.

Game-Based Learning Case Studies

The Mekong e-Sim is an online learning environment that uses simulation and role-playing to immerse students in the complexities of authentic decision making, helping them develop the communication, collaboration, and leadership skills they will need to be successful practitioners in their fields. By asking students to assume the identities of stakeholders in the Mekong River Basin of Southeast Asia and debate the merits of a proposed development project, the Mekong e-Sim offers a structured method of exposing students to the wide range of social, political, economic, and scientific conflicts that affect complex engineering projects, particularly those that may be multinational in scope. Students from different disciplinary backgrounds (including civil, environmental, telecommunications, software, and mechanical) have used this learning tool to collaborate with others on authentic problems of global importance. (See <http://www.educause.edu/ir/library/pdf/ELI5014.pdf>)

The Agora

Students in The University of British Columbia's Department of Classical, Near Eastern, and Religious Studies have created 3D virtual reconstructions of the ancient Athenian marketplace known as the Agora and were required to present a rationale for the design choices they made as they built their replicas of the agora's theatre, museum, and mint. They worked from forensic evidence, including data from aerial photos, satellite images, surface surveys, topographic maps, structure measurements, and what is known in the 'trade' as the "material culture assemblage", or the accumulation of shards (pottery, stone tools, and so on) found on the occupation layers of the site. Students, employing the *Ancient Spaces 3D* model editor, are able to learn by doing or, more precisely, learn by reconstructing key architectural and artistic environments of the ancient world. (See <http://www.educause.edu/ir/library/pdf/ELI5012.pdf>)

Drones to the Rescue

But it is also possible to move to off screen environments for educational games using technology. In teaching Organizational Management, for example, drones can be used to provide students with the opportunity to show a variety of their skills. The class is divided into groups. They are given the scenario that they have to deliver medical products to stranded families in flood ravaged Victoria along with instructions on how to use the drone, take off, medical pickup and flooded farms 'locations', which are A4 sheets set reasonable distances apart. Groups have to work out the job allocation to best complete the task. The medical supplies have to be "constructed" from Lego blocks and tested for weight with the drone. Test flights need to be done and practiced. There is also a time factor, given that some of the game's "families" have serious medical issues that could have long term health consequences. In such a "game", the teacher can observe the group dynamics, the organizational and leadership qualities of each member and watch how the interactions play out as part of the assessment. This type of assessment cannot be faked as it is happening in real time in the physical world.

The literature does note that certain underlying dynamics and concepts that are present in game design are more consistently successful when applied to learning, these are: freedom to fail, rapid feedback, progression and storytelling. This project, which in one way is the construction of a simulation game, contains those dynamics and concepts. It involves story telling as the delivery to people in need is a compelling scenario. Students have the freedom to fail throughout in that the aim is to work through various failure points, is and when the drone doesn't respond properly and this will give them immediate feedback, another of the preferred aspects of gamification. It should be noted that failure will not be 'judged' but used as a learning tool to find out why a particular aspect didn't work. Finally the students will see progression in skill level but also in getting the drone to various points in the project. There will be small successes on the way which will encourage students to continue their work.

Critique

As with all new models, controversy is never far away. Traditionalists will argue that such 'games' can never replace genuine authentic learning. No-one is suggesting that the totality of learning can be done through game based scenarios but significantly, educational researchers are coming to the conclusion that "the value of authentic activity is not constrained to learning in real-life locations and practice, but that the benefits of authentic activity can be realized through careful design of Web-based learning environments." (Rabah et.al. 2018). Today's Web-based learning environments give students access to many of the same resources that professionals use in their research. Technology is also providing access to phenomena that might otherwise remain opaque to many novices, particularly so-called experiential learners. Software visualizations, images, audio, and haptics bring abstractions to life. For instance, when scientific, mathematic, and engineering concepts require learners to build abstract mental models that involve invisible factors, such as intangible force fields and interactions among charged particles, visualization and haptic devices can be used to help learners feel force, pressure, and temperature

With Web-based access to radio astronomy data, for example, students have discovered stars overlooked by veteran researchers. History students with access to American Civil War archives are drawing their own conclusions about the history and sociology of the time. With online access to remote instruments, students are using rare or expensive equipment to run experiments and interpret data for themselves. In the process, they are dealing with incomplete and uncertain information, coming to grips with complex patterns, and realizing the messiness of real-life research where there may not be a single right answer.

So on balance, the new models offer a new universe of educational possibilities. Gamification is just one aspect of this universe which needs exploration

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