

It's all in the game

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Look in any restaurant, on any train, even, dare I say, in theatres or at dinner parties, and you'd be hard pressed not to find at least a few young people with a portable device in-hand. The fact that the current generation of digital natives moving through our schools is consumed by technology is indisputable. But the ubiquitous nature of mobile devices presents a unique challenge to educators – how do we capitalise on their popularity and ability to engage, while ensuring students are actually learning and without compromising students' development as well-rounded, responsible and social human beings?

One avenue that many schools are experimenting with to achieve this is 'gamification'. Put simply, "gamification encompasses the idea of adding game elements, game thinking, and game mechanics to learning content. The goal of gamification is to take content that is typically presented as a lecture or an e-learning course and add game-based elements (story, challenge, feedback, rewards, etc.) and create a gamified learning opportunity..." (Kapp, 2012). Although theoretically this can be done without technology (think programs like

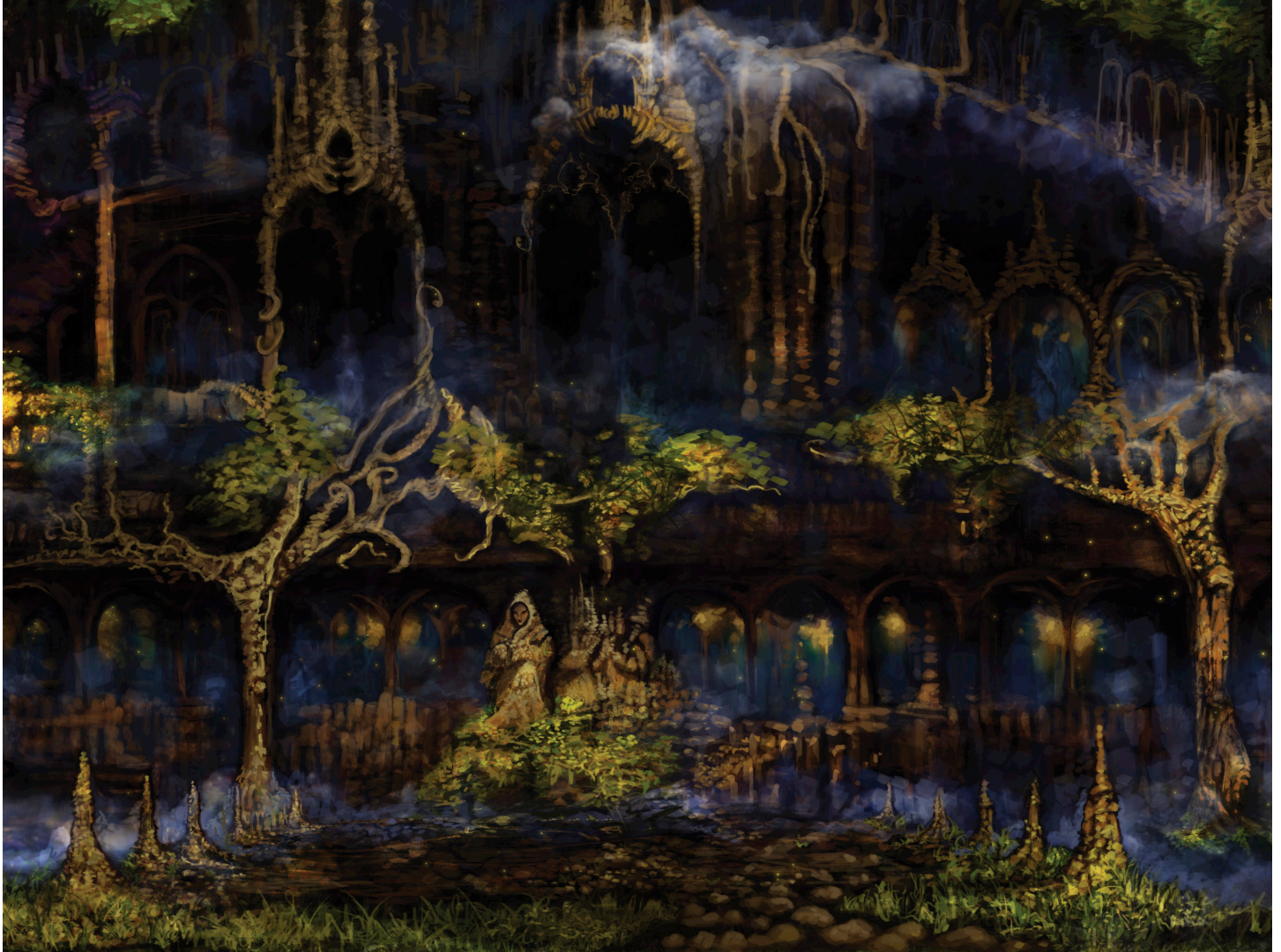
'Earn and Learn'), more and more, schools are incorporating ICT-based gamification into their learning programs.

The most obvious gamification examples are the many iPad apps which are available at no or low cost, and which open up a whole host of learning opportunities that have the potential to turn dry content, such as practising maths facts, into something that is far more palatable for students. There is a definite skill, however, in selecting the most appropriate app to achieve the learning aims that you are focusing on. In an article about technology in maths lessons, Attard and Northcote (2011) observe, "There is a danger of the technology driving pedagogy, rather than pedagogy driving the technology. In other words, technology sometimes becomes the focus of the mathematics lessons instead of the mathematics itself." It is therefore critical that teachers look for gamified learning options that meet their identified goals for students, with engagement as a happy bi-product, instead of focusing first on what students are likely to enjoy.

Kapp identifies eight different characteristics

needed for successful gamification. Perhaps the most important, and indeed the most obvious, of these is that it promotes learning. "Items such as assigning points to activities, presenting corrective feedback, and encouraging collaboration on projects have been the staples of many educational practitioners. The difference is that gamification provides another





layer of interest and a new way of weaving together those elements into an engaging game space that both motivates and educates learners” (Kapp, *ibid*).

Learning grammar

Michele Fitz-Gerald, co-founder of online grammar game ‘Grammatikus’ explains how these considerations influenced the development of the program. “My co-founder, Sarah Sharp, and I were teaching high school students and identified a need to address the significant gap in their knowledge of grammar, as the teaching of grammar had mostly been disregarded for the previous 40 years. Yet grammar is paramount as it is the cornerstone of language and therefore of effective communication. However, to be successful in our vision, and with a subject as dry as grammar, we needed a vehicle that would engage students and inspire them to learn. Gamification was the obvious answer.”

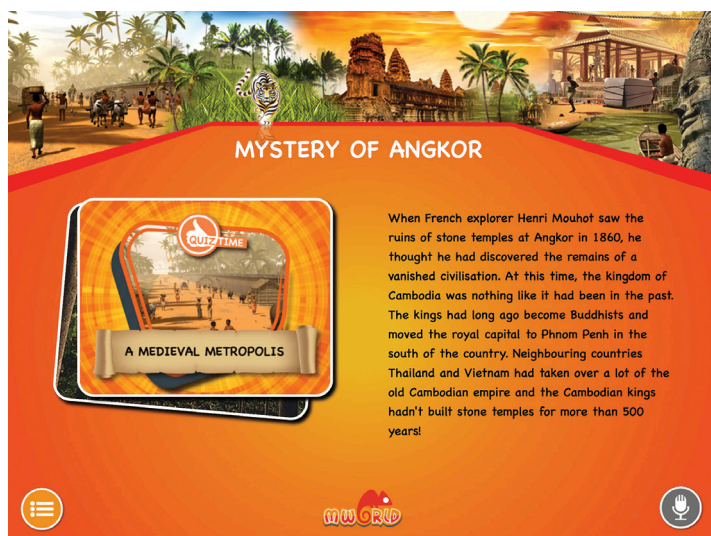
Grammatikus delivers information about grammar topics including nouns, phrases and determiners via interactive tutorials, then presents students with game-based practice. Initially the games revolved around a central story that placed students in the mythical land of ‘Gramadach’, where their mission is to defeat the evil tyrant ‘Aalius Donatus’, however

the concept is being reworked based on user feedback that the narrative distracted from the learning. Currently students complete worksheets, tests and games, earning points to spend in a virtual ‘shop’ to buy additional outfits and weapons along the way. The combination of curriculum-based content and online gameplay offers a structured yet absorbing way for students to learn about grammar, a topic that does not traditionally excite many people.

Grammatikus also meets Kapp’s ‘game thinking’ and ‘mechanics’ criteria. Game thinking is “the idea of thinking about an everyday experience like jogging or running and converting it into an activity that has competition, cooperation, exploration and storytelling” (Kapp, *ibid*). Fitz-Gerald affirms that, “While gamification works (98% of students using Grammatikus improve by 1.2 year levels within six months only!), the trick was to build an online game with role playing elements around a flexible framework.”

Exploring the world

The exploration side of game thinking is evident in Monash University’s MWorld App. Covering a range of curriculum areas including science, history and geography, MWorld is constructed to encourage students to



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investigate different elements of the available topics through videos, quizzes, images and text. MWorld is divided into two sections: ‘Explore’ and ‘Build’. In ‘Explore’ students earn points by reading and interacting with information within each topic. The points are then used to unlock equipment to complete missions in the ‘Build’ section, in which students also create their own customised virtual world. The ‘MPoints’ that students earn help them complete missions and gain power shields. “Once programmed, power shields will allow students to interact with the worlds that their friends have built (leave messages on walls, play pranks, etc.). This is just one aspect of ‘Build’ that is in development. It’s an exciting space that will continue to grow in complexity and interactivity as MWorld matures and implements feedback from children about what they would like to see,” says Eleonore Bridier, MWorld’s Engagement Marketing and Partnerships Manager.

Kapp suggests that mechanics include “levels, earning badges, point systems, scores and time constraints”.

Learn and earn

Both Grammatikus and MWorld draw on the mechanics element of gamification by providing opportunities for students to earn virtual currency, which can be used within the programs. In MWorld, points can be accumulated to help players progress through levels from ‘Rookie’ to ‘Grand Master’. Bridier explains that “Grand masters are MWorld champions – meaning they’ve explored enough content, answered enough quizzes and played enough games to earn over 500,000 MPoints.”

The coins collected in the course of activities in Grammatikus can be exchanged for a variety of equipment that supports the players with their quests, together with customisable aspects of the avatar the player is using, including heads, arms and tails. ‘Achievements’ are also awarded for a range of feats including completing the first test or worksheet, redecorating by purchasing a new background and completing a test with a 100 per cent score. All of these elements mimic many of the games that students play outside school and are aimed at maintaining students’ interest as they learn. The changes made to the program over the summer break will further refine the mechanics elements of Grammatikus. “The new version includes a whole revamp of the gamification systems in Grammatikus. These include points earned for correct answers, levels, power-ups (speed, boosts, health potions), achievement badges, and leaderboards, which encourage progress and competition. Those systems are then combined with play in our suite of games to create meaningful activities for students,” asserts Fitz-Gerald.

Aesthetics and engagement

Aesthetics are another key component of effective gamification according to Kapp. Both Grammatikus and MWorld have invested a lot of effort into constructing their virtual worlds, Grammatikus being an example of a totally created world while MWorld’s Explore area draws on real-world elements to immerse students in different environments and situations. Kapp (ibid) asserts, “How an experience is aesthetically perceived by a person greatly influences his or her willingness to accept gamification,” and in order to effectively engage students (another of Kapp’s key criteria), designers of gamified experiences need to pay proper attention to this element.

Research by Lee and Hammer (2011) into gamification in education has found a number of benefits to students. Most striking is the development of greater persistence in players. They have found that, “Gamification offers the promise of resilience in the face of failure, by reframing failure as a necessary part of learning,” an observation that makes instinctive sense when you consider the time and determination young people are willing to put into beating a particular level or challenge in an online game compared with the effort they will put in if they feel that a more traditional classroom task is beyond them.

Lee and Hammer also suggest that, “One critical game design technique is to deliver concrete challenges that are perfectly tailored to the player’s skill level, increasing difficulty as the player’s skill expands.”

The potential to personalise content to move each student from the known to the unknown at their own level presents exciting opportunities for educators as it takes a great deal of time and effort to meet the needs of every student. In Grammatikus, “Based on sequential learning, each student is presented with content that connects directly with their individual level of achievement” (Grammatikus, 2013) or as Fitz-Gerald says, “as they improve, the content will continue to adapt to be just challenging enough without being too difficult to keep the students engaged.” In MWorld “Children can navigate their own path of discovery, share and compete with their friends” (MWorld 2014). In different ways, both apps are able to tailor content based on the needs and interests of players.

It’s all in the game

Gamification is not, however, a panacea for every educational ill, nor is it the only way to engage modern learners. In an article outlining some of the potential pitfalls of educational gamification, Justin Marquis (2012) notes, “Some limitations that hinder a real integration of game-based learning in education range from the availability of games to teacher training.” The unstoppable pace at which technology is advancing means that it is difficult for schools to keep up with what is best practice in terms of using games for education. As Marquis observes, “...most teachers have not been trained in the pedagogy of gaming in their teacher education programs. Using games in the classroom requires a rethinking of the student-teacher relationship,



a new model for ownership of tasks, complex structures for support of learners, new ways of evaluating learners, and a host of technological integration issues that most teachers are not prepared to undertake.”

Without a considered approach, there is a risk that teachers will in effect lose control of the learning as interpersonal communication decreases in favour of student-to-device interactions. It is true that many programs do allow at least some degree of visibility for teachers to see where students are at and to analyse the kinds of errors they are making, however, this information needs to then be used to support or extend the student, possibly in ways that are not computer based. There are also concerns that while gaming may increase student engagement, the lack of direct teacher involvement may actually have a detrimental effect on a teacher's ability to engage with students and their learning.

Marquis also cautions that many games used in classrooms do not have clearly defined content or objectives. “Even specifically designed educational games do not always come with instructions for how they integrate with a curriculum, what the learning outcomes are, or why they are relevant. Consumer games definitely do not come with that information” (Marquis, *ibid*). While games designed for the Australian market such as Grammatikus and MWorld include explicit links to the Australian Curriculum in the supporting teacher materials, there are many other programs marketed as educational that do not have the same degree of thought put into the learning content. Teachers must then spend time making their own connections to ensure that the games are truly meeting learning objectives.

Lee and Hammer (op cit.) contend that in an app such as *Angry Birds*, “Players must experiment with the game to figure out the physical properties of different tower materials, the ballistics of the slingshot, and the structural weaknesses of each tower ...In short, players’ desire to beat each level makes them small-scale experimental physicists.” However, unless this is

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made perspicuous for students, with supporting discussions to help them identify, articulate and understand the physics used to conquer the level, it is unlikely that students will learn in a way that is easily adaptable to non-game environments.

Gamification also relies largely on extrinsic motivation – rewards, points, badges, etc. Teachers have, of course, always used their own versions of extrinsic motivation in the classroom, from star charts to bonus free time, but these rewards are more often linked to behaviour than to learning. In our ‘every child wins a prize’ culture, where participation certificates are routinely given out in preference to awards that celebrate achievement, there is a concern that coupling learning outcomes with rewards may result in stifling curiosity and a thirst for knowledge in favour of chasing high scores. As Conway (2014) observes, “...the subject is simply concerned with the consumption of signs (‘I’m now level 80!’) rather than being tied to the transformation of an individual’s comprehension, social status or political relations.” It may also have an impact on students’ self-reliance and independence if external motivators become the main reason for completing work. Most of all, too much gamification in the classroom could lead to ‘game fatigue’, reducing the effectiveness of the strategy.

The key message here is really balance. Incorporating well-chosen games with a clear purpose and teaching objectives into your teaching program certainly holds promise in terms of engaging students, personalising learning and providing data that can be used to improve teaching. However, classrooms still need to encompass rich and diverse learning

experiences that reflect the world beyond the classroom and equip students to be successful members of society. As Lee and Hammer (op cit.) put it, “Gamification of learning and assessment will require new approaches to defining tasks as teachers will need to decide how to incorporate diagnostic, formative, and summative assessment components within a more holistic educational environment. Game theory will be blended with learning theory in curriculum design and will result in the redesign of learning and assessment activities that are based on engagement (flow), user needs, and on an evidence-centered design approach.”

Further reading

- Attard, Catherine and Northcote, Maria T. (2011) “Teaching Technology: Mathematics on the Move: Using Mobile Technologies to Support Student Learning (Part 1)” *Education Papers and Journal Articles*. Paper 26. Accessed 20 December 2014. http://research.avondale.edu.au/edu_papers/26
- Conway S. (2014) Zombification?: Gamification, motivation, and the user. *Journal Of Gaming & Virtual Worlds* [serial online]. June 2014;6(2):129-141. Available from: Computers & Applied Sciences Complete, Ipswich, MA. Accessed January 5, 2015.
- Grammatikus. (2013). *Educators*. [online] Available at: <http://www.grammatikus.com/educators/> [Accessed 23 Dec. 2014].
- Kapp, Karl M. (2012) *The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education*, e-book. Accessed 20 December 2014, <<http://UNIMELB.eblib.com.au/patron/FullRecord.aspx?p=821714>>.
- Lee, J & Hammer, J (2011) “Gamification in Education: What, How, Why Bother?” *Academic Exchange Quarterly*, 15(2).
- Marquies, J (2012) *The Trouble with Gamification*. [online] Available at: <http://classroom-aid.com/2012/08/27/the-trouble-with-gamification/> [Accessed 23 Dec. 2014].
- MWorld, (2014). *MWorld kids’ educational app | Teacher*. [online] Available at: <https://www.discovermworld.com/teachers/> [Accessed 23 Dec. 2014].

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