



CASE STUDY: RESEARCH PERSPECTIVE - DR CHAD HABEL

Chad Habel, a Senior Lecturer within the Faculty of Arts at the University of Adelaide and the Director of Game Truck Australia, is a strong advocate of the Australian STEM Video Game Challenge and of game-based learning more broadly, as he explains.

What is the purpose of the Australian STEM Video Game Challenge from the gaming and game design perspective?

The Australian STEM Video Game Challenge aims to give students an early opportunity to learn skills in game design and game development, but also broader skills in science, technology, engineering and mathematics (STEM). The Challenge not only encourages skills development in game design, but also develops computational thinking, which is a way of solving problems, designing systems and understanding human behaviour. Computational thinking is a new notion in Australian education and is starting to be built into the Australian Curriculum. It incorporates learning coding and specific programming languages, as well as the soft skills that complement these activities.

Why does Australia have a problem with student interest in science, technology, engineering and maths (STEM)?

Australia tends to focus on sports and celebrities, often to the detriment of science, technology and the arts more broadly. Funding is certainly an issue as well, particularly in medical and scientific research.

There's also a belief that STEM skills are too difficult for younger children, which is untrue as platforms used to build games and the like are so accessible now.

A short-term focus on outcomes makes it hard in education to sustain the kinds of programs, to build the resources and maintain the energy needed to create long-term outcomes. It's difficult to see the immediate return on interventions such as the Challenge, as it requires long-term investment in skills that evolve over a lifetime. If you invest in someone's education they need to finish high school, complete a degree, do a PhD, and then perhaps spend a decade as a researcher before producing cutting edge work.

How does the Challenge support efforts to stimulate and maintain students' interest in STEM?

The Challenge leverages the massive interest and engagement that many students have in video games to engage them in a more constructive and explicit learning process. People in education say teaching is learning twice – you need to understand something inside out before being able to teach it to someone else – and the same goes for creating a game. Developing a game by its very nature involves STEM. The idea of the Challenge is that students take concept knowledge, something they've learnt in science class for example, and then create a game that elaborates on that concept. The Challenge also encourages freedom and creativity, and that can be a liberating experience for many students. It also offers goals and rewards which drive commitment to developing a game.

Is game design all about STEM or does it bring together students with other skills?

There is definitely a group of skills needed to create a game. Aside from STEM, one of the major aspects is creativity – students need to develop concept art, plus design environments, figures and characters. Music and sounds are also important in a game, and need to be

edited and built into the technology. Building a game also requires communication and interpersonal skills, people to test the game, and even non-commercial games require project management skills, and business and marketing acumen.

What prompted you to become involved with the Challenge?

My academic research was moving towards an interest in non-traditional game-based learning and I became interested in how students learn through creating something in particular. When you've got kids creating a video game themselves, I think the potential for an amazing learning experience is much stronger than the common approach of simply giving a student a game to play in the hope that they will learn something. I met one of the 2014 Challenge winners at an expo and saw the potential outcome for students to become engaged, and also potentially kick-start their career. My business is also about getting kids involved in gaming, so it had me interested from all angles.

What does the research indicate about the impact of game-based learning?

As game-based learning is new, we're still in the very early days of research, although the research so far suggests that game-based learning can increase engagement. There's a psychological term called 'flow', whereby people become completely absorbed in an activity and lose all sense of time, space and themselves. This is how people end up playing a video game until 4am! Some researchers have started to ask, wouldn't it be incredible if students could become that

engaged and engrossed in learning? Through initiatives such as the Australian STEM Video Game Challenge, we can make a lifelong difference to STEM and its applications.

How can the Challenge help students during their schooling and in pursuing STEM-based careers?

The Challenge will give students a portfolio. It doesn't matter what the game is or how successful it is, they'll be able to prove to potential employers that they created or helped to create a game from start to finish. The idea of realistically identifying what it takes to make a game, the amount of work and effort, time and iteration that goes into it is really a crucial skill that's developed in game design.

There is also a huge opportunity for students to develop their computational thinking. This will assist students through their education and beyond with skills such as logic and problem solving, self-efficacy, confidence and risk management. Finally, it will let students know that they are capable of understanding and using STEM, and that anything is possible.

