

Exploring the unknown: Designing a serious game for tertiary education from scratch, a case study

Gillian McGregor

Faculty of Health and Behavioural
Sciences
The University of Queensland

Emma Bartle

Faculty of Health and
Behavioural Sciences
The University of Queensland

Serious games offer educators the opportunity to enhance student motivation and engagement, setting the stage for authentic and productive learning (Coates, 2005). Anecdotal evidence suggests barriers to adoption of serious games in education include perceptions of the need for technological expertise and high costs of development. The author created a serious game to assist post graduate professional psychology students to manage the transition from theoretical knowledge to professional practice. This demanding stage of development is key to graduate competence, perceptions of self-efficacy and employability (De Stefano, D'Iuso, Blake, Fitzpatrick, Drapeau, & Chamodraka, 2007; & Skovholt & Ronnestad, 2003). During this developmental stage, serious games provide an opportunity for safe and engaging learning opportunities. This case study provides insight into the theory and principles to be considered when developing a serious game.

Keywords: Serious games in Tertiary education, Innovation and design, professional skills training, serious games development, serious games design

Background

The education of healthcare professionals is critical for the safe delivery of services to patients (Ricciardi & de Paolis, 2014). Post graduate psychology students undertaking a professional degree encounter a steep learning curve when transitioning from theoretical knowledge to professional practice. The beginning student stage of development is fraught with anxiety and high stress levels with implications for both student and client wellbeing (Skovholt & Ronnestad, 2003). Successful navigation of this phase is critical to psychology graduate competence and employability, with potentially lasting consequences for psychologists' perceptions of self-efficacy (De Stefano, et. Al., 2007; & Skovholt & Ronnestad, 2003). Serious games can provide an opportunity for safe practice opportunities in an engaging and entertaining manner. Serious games can be defined as games which have a primary purpose of educating and training players, whilst entertaining them at the same time (Stokes, 2005). Within the field of health, serious games have been identified as providing an additional means of encouraging interest in training, education and assessment of performance (Wattanasoontorn, Boada, Garcia, & Sbert, 2013). The author developed a suite of serious games, named Laurus, with the intention of providing students with increased and more convenient opportunities to practice psychological competencies. The process of conceptualising, designing, developing and implementing a serious game for education is explored and solutions for overcoming perceived barriers are highlighted.

Aim

To create a serious game for the training of professional psychological competencies in postgraduate training of psychologists.

Theoretical underpinnings

The author sought to develop a serious game with a minimal budget. An inter institutional and inter professional collaborative approach was used. The author collaborated with several final year Game Design students at SAE Institute, Brisbane. The students were provided with the opportunity of undertaking their final year project with a real world client and the game was developed out of this mutually beneficial relationship.

Development of the game was underpinned by the theoretical framework of Experiential Learning Theory (ELT) (Kolb, 1984). ELT highlights the central role of experience in the process of learning. Serious games create a vehicle for such experiences. In terms of the process and content involved in development, a combination of a programmatic and participatory framework were used in the creation of Laurus (Russ, 2010). The expert (programmatic) content of the case scenarios created were based on the psychological competencies, guidelines and policies for practice established by the Australian Psychological Accreditation Council (APAC), the Psychology Board of Australia (PsyBA) and The Australian Psychological Society (APS). The purpose of such an approach is to communicate specific knowledge in a top down manner, in order to generate a desired outcome. In this context, the desired outcome is one of competent and qualified practitioners (Russ, 2010).

A participatory approach was also used in order to ensure that the Laurus games were relevant and useful to the end users and stakeholders. This approach engages stakeholders to generate and incorporate their knowledge and ideas into the final product (Russ, 2010). A focus group was conducted with students at the beginning of the development process to seek to understand the needs of the students from their own perspective. Three user testing sessions were held over the course of development, to obtain insight into how students interacted with the games. This use of the collective intelligence of students, academic and professional staff helped to define what their needs were and what would best support the users (Clochesy, Buchner, Hickman, Pinto, & Znamenak, 2015).

A number of design elements were considered when creating Laurus (Brox, Fernandez-Luque, & Tollefsen, 2011; & Lewis, 2007). These elements are the foundation upon which the user experience is built and in which learning occurs (Caine, Caine, McClintic, & Klimek, 2009; & Skalski & Whitbred, 2010).

Table 1: Design considerations for Laurus

Element	Considerations	Laurus implementation
Experience	Problem solving strategies chosen	Role playing; choose-your-own adventure; drag and drop; and quiz features employed
Facilitate engagement and immersion	Graphics, animation and sound	Realistic 3-d images, rigged for animation; realistic clinic environment with reception and consultation rooms. Natural sounding, varied, recorded voices with closed captioning; and background environmental sounds e.g. walking down hallway and rain on window.
Feedback and reward mechanisms	Immediate feedback	Feedback provided through client's responses to choices player makes; earning points and tokens for progression; review of performance; comparison to other players.
Levels of play	Multiple levels of play	Each time a player completes a scenario, they progress to the next client. As the levels progress, the clients present with increasingly complex difficulties.
Evaluation	Game analytics	Data collected includes time spent playing and user choices.
User interface	Ease of access	Desktop / PC, and mobile devices, including smart phones and tablet. Both android and iOS versions were created.

References

- Brox, E., Fernandez-Luque, L., & Tollefsen, T. (2011). Healthy gaming – Video game design to promote health. *Applied Clinical Informatics*, 2, 128-142. <https://doi.org/10.4338/ACI-2010-10-R-0060>
- Caine, R.M., Caine, G., McClintec, C., & Klimek, K.J. (2009). *12 Brain/mind learning principles in action* (2nd ed.). Thousand Oaks CA: Corwin Press/Sage Publications.
- Coates, H. (2005). The value of student engagement for higher education quality assurance. *Quality in Higher Education*, 11(1), 25-36. <https://doi.org/10.1080/13538320500074915>
- Crocco, F., Offenholley, K. & Hernandez, C. (2016). A proof-of-concept study of game based learning in higher education. *Simulation & Gaming*, 47(4), 403-422. <https://doi.org/10.1177/1046878116632484>
- Clochesy, J.M., Buchner, M., Hickman, R.L., Pinto, M.D., & Znamenak, K. (2015). Creating a serious game for health. *Journal of Health and Human Services Administration*, 38(2), 162-173.
- De Stefano, J., D'Iuso, N., Blake, E., Fitzpatrick, M., Drapeau, M., & Chamodraka, M. (2007). Trainees' experiences of impasses in counselling and the impact of group supervision on their resolution: A pilot study. *Counselling and Psychotherapy Research*, 7 (1), 42-47. <https://doi.org/10.1080/14733140601140378>
- Kolb, D.A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall, New Jersey.
- Lewis, M.W. (2007). Analysis of the roles of "Serious Games" in helping teach health-related knowledge and skills and in changing behaviour. *Journal of Diabetes Science and Technology*, 1, 918-920.
- Ricciardi, F., & de Paolis, L.t. (2014). A comprehensive review of serious games in health professions. *International Journal of Computer Games Technology*, 2014(2014). <http://dx.doi.org/10.1155/2014/787968>

- Russ, T.L. (2010). Programmatic and participatory: Two frameworks for classifying experiential change implementation methods. *Simulation & Gaming*, 41(5), 767-786. <https://doi.org/10.1177/1046878109353570>
- Skalski, P., & Whitbred, R. (2010). Image versus sound: A comparison of formal feature effects on presence and video game enjoyment. *PsychNology Journal*, 8(1), 37-84.
- Skovholt, T.M., & Ronnestad, M.H. (2003). Struggles of the novice counsellor and therapist. *Journal of Career Development*, 30(1), 45-58. <https://doi.org/10.1177/089484530303000103>
- Wattanasoontorn, V., Boada, I., Garcia, R., & Sbert, M., (2013). Serious games for health. *Entertainment Computing*, vol4(4), 231 – 247. <https://doi.org/10.1016/j.entcom.2013.09.002>

Please cite as: McGregor, G. & Bartle, E. (2016). Exploring the unknown: Designing a serious game for tertiary education from scratch, a case study. In S. Barker, S. Dawson, A. Pardo, & C. Colvin (Eds.), *Show Me The Learning. Proceedings ASCILITE 2016 Adelaide* (pp. 406-408). <https://doi.org/10.14742/apubs.2016.891>

Note: All published papers are refereed, having undergone a double-blind peer-review process.



The author(s) assign a Creative Commons by attribution licence enabling others to distribute, remix, tweak, and build upon their work, even commercially, as long as credit is given to the author(s) for the original creation.