POSTCARDS FROM THE TORRID ZONE: USING EFFECTIVE TEAMWORK, STORY AND GAMIFICATION TO CREATE A VIBRANT SUITE OF REUSABLE LEARNING OBJECTS

ABSTRACT

Introduction

The James Cook University Library is heavily invested in online resources. In the 2012 Client Satisfaction Survey, a substantial number of respondents stated that they wanted to learn more about accessing databases, ejournals, and ebooks. There was a clear need to provide flexible delivery of training beyond the face-to-face sessions offered on campus. With three campuses across two countries and increasing numbers of off-campus students, it was important to develop outreach programmes to deliver information literacy (IL) support to students in diverse locations. Using a Student Services and Amenities Fees grant, a suite of re-usable learning objects (RLOs) was designed to provide asynchronous learning opportunities for our multimodal learners.

Methods

The first step, creating a team to carry out the project, was the most challenging. We began with a large, committee-like team, but found the workflow difficult to manage. A smaller team, given dedicated time and space for the project, proved more effective. An environmental scan included an audit of the Library's current online tools and those used by other institutions. We selected a combination of tools which would give us the most flexibility, including LibGuides and Articulate Storyline, and chose to adapt a modular format that had previously worked well. We developed a story to provide coherent themes for each module – basing our story on the adventure of a "Road Trip" (http://libguides.jcu.edu.au/roadtrip). Each module became a town in a fictional tropical region, and activities were designed to follow that theme. Using the principles of gamification, we rewarded people for completing the module by giving them games to re-enforce the key messages and presented a "certificate" for completing the module – in this case, "postcards". We created and repurposed existing RLOs. Some were "out of the box" applications of the tools, and some were coded by the team. We also outsourced some IT development and graphic design – enabling us to create a professional look for the package. Real postcards were designed to market the suite. The package was trialled by a number of small focus groups, given a soft launch mid-2013 and then refined for 2014.

Results

By mid-2014, the Info Skills Road Trip had received over 17,000 hits. This programme is completely voluntary, without any subject embedding. Given the size of JCU, this shows great potential. Feedback has been highly positive – and indicates the resource has been particularly useful for those returning to study: "I am brand new to this and have not studied for many, many years, I found this to be very informative and interesting."

Conclusion

We found three elements in particular contributed to the success of this project: the creation of a small, dedicated team, hiring professionals to assist with technology and graphic design, and the use of "Story" and gamification to create an

engaging through-line for the content. The Road Trip has been quite a journey, and has informed practice for future projects.

Relevance

Our experience with developing this project can assist other libraries in the creation of online Information Literacy packages.

BACKGROUND

The James Cook University Library, like most academic libraries, has greatly increased its expenditure on online resources to meet the needs of students and staff who cannot or do not wish to come into the physical buildings. The focus has spread from journals (93% are online) to providing more monographs online – over 25% of our books are eBooks and this percentage is growing. Increasingly, the Library has found its collection shifting away from physical to online resources. In the 2012 James Cook University Library Client Satisfaction Survey (Insync Surveys, 2012), 33% of undergraduate respondents stated that they did not know which database to search and 27% did not know where to start looking for information. Additionally, 46% of respondents stated that they wanted to learn more about accessing electronic databases, eJournals, and eBooks. It was felt that our clients needed an electronic, asynchronous platform to enable them to access training regarding our electronic resources in their own time – and in their own space.

As the university adopted more flexible modes of study, there was also a clear need to provide flexible delivery of training beyond the face-to-face sessions offered on campus. With three campuses across two countries and increasing numbers of off-campus students, it was important to develop outreach programmes to deliver information literacy support to students in diverse locations. Using a Student Services and Amenities Fees grant, a suite of re-usable learning objects (RLOs) was designed specifically for use in asynchronous learning to meet the needs of both on and off campus learners throughout Australia and Asia.

SELECT LITERATURE REVIEW

Gamification, Badging and Story Elements

Deterding, Dixon, Khaled and Nacke (2011) defined gamification as "using game design elements in non-game contexts" (p. 9) and noted that "gamefulness" was distinct from "playfulness" in that games have rules and goals. They observed a difference between serious games (in which a fully-fledged game is used to teach, rather than entertain) and pervasive games (in which elements of games are overlaid onto real-world activities and interactions). Prince (2013) noted that gamification, *per se*, only involves elements of gaming, and does not encompass all of the features of an actual game – but also notes that social tools like Facebook are blurring the boundaries between using applications and playing them. Martin and Ewing (2008) and van Meegen and Limpens (2010) remarked that the Millennials, who have grown up with video games, are predisposed to being engaged by the use of game design elements – particularly elements such as narrative, feedback and interaction. Wortley (2014) discussed the concept of serious games, which he described as "games technology for non-entertainment purposes" (p. 1). He noted that games and immersive environments were highly engaging and increased the likelihood that participants would experience a "state of flow" (p. 3) – behaviour that is less likely to occur in traditional learning environments. Pointing out the increased use of gamification and immersive technologies in a wide variety of areas, including business, education and recruitment, Wortley put forward the theory that we are likely to see more immersive, game-like environments used across the full range of human activities, particularly supporting life-long learning. However, he noted that there are many barriers to using serious games and immersive environments – a prominent one being the general resistance to the idea that anything resembling a game could or should be taken seriously. Adams, Mayer, MacNamara, Koenig and Wainess (2012) also observed that narrative elements, while being appreciated and accepted in an entertaining game, could be distracting in a learning context. Wortley (2014) also noted that the professional gaming industry can create much higher standards of games for entertainment purposes than most educational institutions can create

for educational purposes, which makes the educational version seem poorly designed in comparison.

Galli and Fraternali (2014) provided a highly detailed and useful description of different types of achievement systems within games and game-like applications. They defined an achievement as "a set of tasks … for the player to fulfil to achieve a milestone and track progress" and a badge as "an artifact associated to the completion of an achievement" (p. 26). They observed that achievements and badges can be highly motivating elements of game design, playing a factor in interest and retention, and different types of achievements can prompt different kinds of behaviour from players. The most important factor about achievements is their role as goals and incentives, which are a core element of any gaming system. Galli and Fraternali noted the most effective achievements required the completion of one or more criteria, involving "well-stated goals" (p. 43) and players must be able to equate their efforts to the outcomes of the achievement rather than stumbling upon it by chance in order for the achievement to be motivating and engaging. Abramovich, Schuun and Higashi (2013) noted that badges had a symbolic role and were meant to display the acquisition of achievements or skills. They noted that some learners found them motivating, while others were highly ambivalent towards them, depending on the type of badge and the proficiency of the learner.

Flexible Delivery and Off-Campus Training for Information Literacy

Libraries have provided off-campus services to students along with information literacy training (IL) for many years (Ruess & West, 1995). The understanding that students away from the campus need to develop skills in information literacy rather than be left to their own devices long predates the current age of ubiquitous technology and Google. The field of information literacy has grown and matured as a result of developments such as the Association of College and Research Libraries' (ACRL) Information Literacy Competency Standards for Higher Education (2000). This standard and other subject-specific standards subsequently developed are in the process of being critically examined and revised (Sproles, Detmering, & Johnson, 2013). Themes that run through the literature are collaboration and delivery of instruction through partnering with faculty or student support services. Sproles et al. (2013) noted that these collaborations are only rarely examined for long-term impacts, or reasons for success. A key point of relevance to this paper is that there is an absence of knowledge about whether learning objects are valued and well used by students – even though the importance of technology is clearly recognised by librarians and demonstrated by the amount of literature about the development and provision of self-guided tutorials, learning games and tours (Sproles et al., 2013). In recent years, the literature has shown that students are more likely to use Internet sources than the library's subscribed resources (Tang & Tseng, 2013). Librarians remain confident that library management systems provide higher quality results than those of the general Internet and its well-known search engines. It is clear that students do not possess the skills necessary to recognise higher quality resources without instruction. Students vary in their levels of self-efficacy but Tang and Tseng (2013) showed that they benefited from intervention even if they initially had more sophisticated information literacy skills.

It is essential for academic librarians to be able to assess whether information literacy efforts have an impact on student success. However librarians continue to be challenged by their position, which is generally on the outside of the academic curriculum (Sproles et al., 2013). The growing role of librarians as teachers who can truly collaborate with faculty is a way that student assessment can include information literacy components. Harnessing technology correctly can also provide accurate figures on student use of learning objects.

Online pedagogy requires a unique skillset, and techniques not commonly used in the classroom need to be used to encourage collaboration, discussion and reflection (Junk, Deringer, & Junk, 2011). In order to develop a successful online course it is not possible to simply repackage an existing face-to-face course. The field of blended learning applies these useful online techniques with the traditional classroom pedagogy to offer a variety of methods best suited to provide all students – not just those studying exclusively online – with the best use of educational design, regardless of their mode of study (Bonk, 2009). It is possible for academic and liaison librarians to advantageously use products like LibGuides to create professional, flexible modules to deliver IL training and also monitor and evaluate student use (Mann, Arnold, & Rawson, 2013).

METHODS/EXECUTION

We began with a large, cross-campus team, which initiated the project by auditing our current training and tools and determining the scope of the project. The team then canvassed other training packages, suites and RLOs offered by universities in Australia and overseas. This was partly to see if anything already existed that could be reused (with permission), and partly to gather recommendations for software that could be used to create original RLOs. After noting some innovative RLOs produced by other universities, we selected a number of tools to trial. One of which was Articulate Storyline, which we eventually purchased for use in the project. This was chosen because it enabled us to integrate games and activities into a PowerPoint-style presentation, and had a similar interface to Microsoft's PowerPoint application so the learning curve would not be too steep.

This team was then restructured into a smaller working party, which was tasked with using the technology available to create the suite of resources. It was decided to create the suite using the LibGuides platform, which we had previously used to develop successful modular training suites for subject-specific courses. In addition to LibGuides and Articulate, we also used Prezi, Camtasia Studio and Windows Movie Maker to create content for the suite. Supplemental content from YouTube and TED was also included. Approximately 70% of the content was created by the working party specifically for the project, although some of the content was adapted from the library's pre-existing guides and training modules. The working party was given dedicated time and space to develop the project. A "parallel play" mode of work was used, in which the members of the working party worked on separate parts of the project while in the same room, and the team members would frequently consult each other for assistance, ideas and problem solving. Working in this manner, the team was able to brainstorm solutions for many issues with the technology, and develop a consistent look and feel for the suite.

In an attempt to make the suite more game-like, we created a "story world" (or "narrative environment") to provide coherent themes for each module: "The Info Skills Road Trip". Each module became a town in a fictional tropical region, and activities were designed to follow that theme. In addition to providing a thematic through-line connecting each of the modules together, this also helped us brand the suite as a product. This, in turn, made the suite easier to market – and also made it easier to refer to when discussing it with stakeholders. In order to make this story layer more authentic and engaging, we hired a professional graphic designer to create a "look" for the suite based on the road trip theme. Key elements were a fictitious tropical themed tourist map based on genuine touring maps, and authentic Australian road signs integrated as wayfinders throughout the modules. We hired an IT professional to give us more flexibility with coding features of the suite, such as interactive maps and annotated texts. As part of the gamification of the project, we created rewards for completing each module by adding small games to re-enforce key skills. Each module included a collectable "certificate" on completion – in this case, "postcards", which recalled key messages from the module's content.

The suite was designed to consist of several stand-alone modules which could be completed separately or together, nonlinearly or sequentially. The infrastructure developed for the modules included clear guidelines on the time needed to complete each module (30 minutes), interactivity, instructions via podcasts and introductory sections to enable the student to progress via clearly labelled pathways through each "town". The "Getting Started", "Postcard" and "Rear View" pages were incorporated into each module to ensure a similar structure and design across all modules and to provide an opportunity for students to reinforce their learning through educational games.

The suite was trialled by a number of focus groups, then soft-launched in second semester 2013, a time when we traditionally have less face-to-face training and a smaller intake of new students. After monitoring its use for the semester and seeking feedback from various library staff, students and stakeholders, the suite was revised and marketed more pro-actively in first semester 2014. We had started regarding the postcards at the end of each module as emblematic of the road trip theme, so we capitalised on the idea when it came to marketing the product. Promotional postcards were created, which we included in welcome packs sent to off-campus students and also disseminated at on-campus orientation events.

RESULTS

As of December 2014, the Road Trip has been running for 18 months with over 25,000 hits. Similar discipline specific IL modules, which are embedded in core first year subjects, typically experience 45,000–55,000 hits per year. As there is no formal requirement for students to undertake the Road Trip, the statistics are promising. Statistics show that the "Getting Started", "Ideas Town" and "Finders Way" modules are the most popular. Examining the statistics in greater detail suggests that not all students progress through the modules in a systematic fashion, with the first few pages of each module being the main focus. When developing these modules, best practice from previous projects including iCAS (Induction in Core Academic Skills), ETC (Engaging the Tri-City Culture) and PhAST (Pharmacy Academic Support and Tuition) helped inform our design and content (Jackson, Ireland, Lim, & Hooper, 2011; Lim, Hooper, Ireland, & Jackson; Reinke, Llewelyn, & Firth, 2014). Modules were structured around clear learning outcomes and expanded on a variety of techniques and artefacts developed in these previous projects.

Of the 26 multimedia items embedded in the Road Trip, 18 are RLOs developed in-house by librarians on the project team specifically for the Info Skills Road Trip. Some of these have now been reused for IL classes as well as for use as teaching tools for specific online cohorts (i.e. first year Bachelor of Arts students). These RLOs are hosted on a range of platforms including YouTube, Google Drive, LibGuides and internal servers. Many show reasonable usage. One of the limitations has been the inability to harvest statistics from Google Drive and some internal servers. The team are looking for alternative cloud hosting services for 2015.

Students were surveyed at the completion of each module and given an opportunity to leave free-text comments and rate the modules on a scale of 1 (not at all helpful) to 5 (extremely helpful). To date 78 students have responded with the majority finding the information helpful with the average across the five modules of 4.24 out of 5. Interestingly, "Ideas Town" (which covers unpacking topics) has had the most hits and has rated highest with an average score of 4.4, while "Credibility Creek" (which covers referencing) received some of the least hits and rated only 3.8. Free text feedback has been very encouraging, including:

"I am so glad that JCU has all these resources. I keep discovering more every time I look around the website. Thank you for all the time, effort and thought that has gone
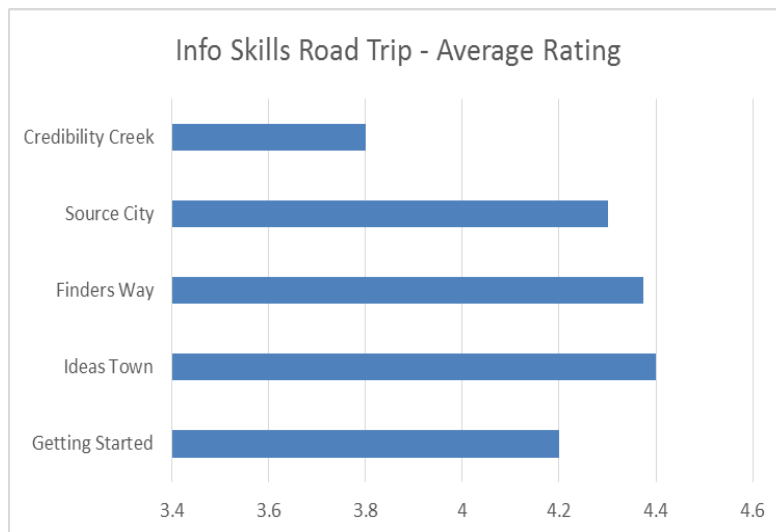
into preparing all this. I think just about every question that could be asked is answered, if you can find the right place to look. I would like to have more time to work through everything. Thanks"

"Step by step was great, did not have time to play and I plan to go through this again."

"Very useful information, I was lost, but now am enlightened"
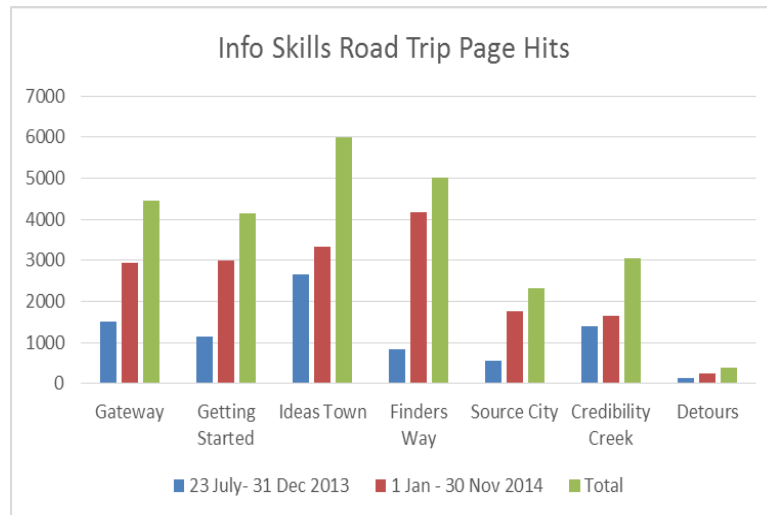
Figure 1: Page hits by year

Figure 2: Combined 2013 and 2014 ratings

DISCUSSION

The Project Team(s)

The project was originally conceived as a cross-campus activity involving several representatives of the library from both Cairns and Townsville. The original team assembled to work on the project was more of a committee than a working party. A number of liaison librarians from both campuses were involved, and the team would meet regularly to discuss the project and assign tasks. These tasks were in addition to the librarians' normal duties. After a few weeks it was found that this approach was not moving the project forward as

rapidly as was hoped. In fact, the project stalled. Reflections from members of the original team revealed there were three primary reasons for the lack of progress: the large numbers involved and the subsequent lack of an individual sense of ownership of the project as a whole, the fact that the team members did not have specific time away from their normal duties to focus on the tasks involved in the project, and the asynchronous nature of the team – with all members working individually on small tasks and only meeting occasionally, there was little sense of cohesion in the team as a whole. The environmental scans and needs analysis completed by the original team created a platform that enabled the working party to launch directly into the development and creation of the RLO suite. The restructured working party would not have been able to work as efficiently as they had without the background work completed by the original team.

The smaller working party, shepherded by the project manager, comprised three liaison librarians who worked with the faculties that had the largest numbers of off-campus students. Their cohort diversity ensured that the ensuing suite offered information and examples relevant to students from different disciplines. The "hot house" approach, which involved the team being removed from their regular duties and work environment, proved to be an exceptionally effective approach as the team members were able to complete different modules simultaneously while constantly asking each other for advice and feedback. The "hot house" concept, which was originally employed for one week, proved so effective that it was repeated on several other days and half-days in subsequent weeks leading up to the soft-launch of the project. It was such an effective technique that it has subsequently been used for other projects and has been shared with other departments in the university.

Professional and Technical Support

We felt that the project benefited greatly from the expertise of professional graphic designers and IT support staff. While we did produce a significant amount of multimedia RLOs in-house, using a graphic designer gave the suite a more professional appearance and greater sense of cohesion. Additionally, being able to call upon the expertise of an IT professional enabled us to get past limitations in our own abilities. Using professionals in this way allowed us to concentrate on the content and to produce a higher standard of product than we could on our own. We are now in the process of reviewing some of our in-house media in order to create new RLOs with the aid of a professional media producer in order to improve the quality.

Gamification and Badging

The use of gamification for the suite was experimental, and we were reluctant to completely engage with the gamification process. We had not consciously used game elements or badging in any of our previous, subject specific modular training suites and we did not know whether it would be motivating or demotivating for our students. We knew the platform would be used by mature aged students as well as school leavers, and questioned whether the use of obvious game elements would make the suite less appealing to those students who were not part of the gaming culture. Conversely, we were also concerned that it could make the suite unappealing to students who were part of the gaming culture, who might find our attempts at using game elements amateurish. Ultimately, we opted for a watered down approach to gamification, using a narrative environment (Lester et al., 2013) to link the modules together as well as incorporating two extra pages at the end of each module – one containing a game, and the other containing a disguised badge. Users could bypass these pages if they were not interested in the games or the badges and simply treat the suite as a largely text-based, linear online training suite.

The narrative environment involved the creation of a "story world", in which there was a very light plot guiding the progression of the user through the modules. The story world

was designed to be thematic, but not invasive. As the modules were made up of reusable learning objects, we could not weave the story into the training because the boxes that held the core information may be reused in other guides and would appear out of context. Therefore, the story was conveyed in other boxes that were, essentially, parenthetical. The story element for the suite could be completely removed with minimum work and a standard online training suite would remain.

While we were deliberately light-handed with using gamification for the suite, there were noticeable game elements right from the very beginning. The first module, "Getting Started", was set in a tourist information bureau. As with the first few missions of most video games, this module was partly designed to teach users how to navigate the suite and familiarise them with the expectations of the environment (van Meegen & Limpens, 2010). The game included at the end of this module reflected this, as it was the only game in the suite that was not designed to reinforce content, but rather to encourage users to interact with the technology. Subsequent games at the end of each module picked up on one of the core concepts covered in that module to encourage active engagement, as opposed to a purely passive intake of information. These games were created using Articulate Storyline. We had originally intended to use Articulate to create interactive content within the main pages of the modules, but found the technical difficulties involved with hosting the content on our own servers and embedding it into LibGuides made the technology unreliable, and we decided to limit its use to the games until we could solve these problems. This decision proved wise as the games do not work on all devices and browsers, which is unfortunate, but at least the core content is not hindered by this problem.

Badging, in terms of this suite, was very subtly done. In fact, it is not true badging, in the strictest sense of the word. A legitimate badge would be achieved as a result of completing an activity in order to demonstrate the acquisition of skills, and it would be something the user could display to other users (or to librarians or teaching staff) as evidence of achievement (Abramovich et al., 2013; Galli & Fraternali, 2014). However, this suite is not tied to any course, it is not connected to any community, and no assessment or feedback is associated with it, so true badges were not necessary even though they were not impossible. This postcard was intended to be a certificate of achievement, but the only achievement actually made was successfully navigating to the page that contained the postcard. As it stands, reaching the postcard is an indication that the learner has completed the module and is, therefore, a symbol of achievement in that sense.

Disappointingly, the interactive games on the "Rear View" pages of each module are the least visited. This could be due to the fact that students have either lost interest at this stage, found what they needed earlier or did not realise that an activity awaited them at the end of the module. We felt that "Source City" and "Credibility Creek" were the most valuable modules but statistics showed that these were the least accessed. Traditionally these are the areas that students struggle with the most. Organically, these two modules belong at this point (after defining and researching the assignment topic) but how do we motivate users to "stick with the program" and get to that point? It may be timely to review the content in some modules and review the nomenclature across the suite.

RECOMMENDATIONS & CONCLUSIONS

In hindsight, we recognise that we did not implement the concept of gamification correctly. Although we created the concept of a Road Trip through tropical Australia (with its associated imagery), inviting students into a fantasy world to learn information skills, the true game elements were offered to participants as a reward for completing the modules. A better use of gamification would involve using the game elements as an integral part of the learning process.

We have been disappointed with the breadth, depth and quality of statistics that we have been able to gather. As our method of hosting the games did not allow us to collect any data, we do not know the numbers of students who tried the games. Libguides allows statistics for guide level, page level and links (if included correctly) and YouTube also shows viewing statistics, but the Articulate games were hosted on Google Drive and we have been unable to get statistics for this. New hosting solutions must be found as the hosting features of Google Drive are going to end, soon, and the current option is not completely satisfactory.

To improve the suite a short, engaging activity needs to be included on every page in order to encourage engagement and retention. Additionally, students need pointers in earlier modules that would encourage them to understand the importance of "Credibility Creek" and "Source City". Game elements and activities regarding referencing, academic integrity and evaluating sources could be added to "Ideas Town" and "Finders Way" to encourage students to continue to later modules.

The Info Skills Road Trip has become one of our key training resources, and many RLOs from the Road Trip have been successfully reused in other guides. It has been a steep, but worthwhile learning curve, and it is hoped that other libraries will be able to benefit from the lessons we have learnt in the process.

REFERENCES

Abramovich, S., Schunn, C., & Higashi, R. M. (2013). Are badges useful in education?: It depends upon the type of badge and expertise of learner. *Educational Technology Research and Development, 61*(2), 217-232. doi: 10.1007/s11423-013-9289-2

Adams, D. M., Mayer, R. E., MacNamara, A., Koenig, A., & Wainess, R. (2012). Narrative games for learning: Testing the discovery and narrative hypotheses. *Journal of Educational Psychology, 104*(1), 235-249. doi: 10.1037/a0025595

Association of College and Research Libraries (ACRL). (2000). Information literacy competency standards for higher education. Retrieved from http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf

Bonk, C. J. (2009). *The world is open: How web technology is revolutionizing education*. San Francisco: Jossey-Bass.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). *From game design elements to gamefulness: Defining "gamification"*. Paper presented at the Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, Tampere, Finland. doi: 10.1145/2181037.2181040

Galli, L., & Fraternali, P. (2014). Achievement systems explained. In Y. Baek, R. Ko & T. Marsh (Eds.), *Trends and applications of serious gaming and social media: Gaming Media and Social Effects* (pp. 25-50): Springer Singapore. doi: 10.1007/978-981-4560-26-9_3

Insync Surveys. (2012). *James Cook University Library client survey data report: May 2012.* Retrieved from http://www-public.jcu.edu.au/public/groups/everyone/documents/review/jcu_106910.pdf

Jackson, T. F., Ireland, L. M., Lim, L. K., & Hooper, H. (2011). Making room for Gadamer: Promoting intellectual well-being in academic learning. *International Journal of Interdisciplinary Social Sciences, 6*(3), 307-317.

Junk, V., Deringer, N., & Junk, W. (2011). Techniques to engage the online learner. *Research in Higher Education Journal, 10*, 1-15. Retrieved from http://www.aabri.com/manuscripts/10597.pdf

Lester, J. C., Ha, E. Y., Lee, S. Y., Mott, B. W., Rowe, J. P., & Sabourin, J. L. (2013). Serious games get smart: Intelligent game-based learning environments. *AI Magazine, 34*(4), 31-45.

Lim, L. K., Hooper, H., Ireland, L., & Jackson, T. *Dismantling borders and boundaries: Capturing the perspectives of the 'other'*. Paper presented at the Proceedings of 2011 ATEA Conference: policy, perspectives, partnerships, , Melbourne, VIC, Australia. Retrieved from http://researchonline.jcu.edu.au/18974/

Mann, B., J., Arnold, J., L., & Rawson, J. (2013). Information literacy in a distance education environment. In A. W. Dobbs, R. Sittler & D. Cook (Eds.), Using LibGuides to enhance library services: A LITA Guide (pp. 221-234). Chicago: ALA TechSource,. Retrieved from http://site.ebrary.com/lib/jcu/detail.action?docID=10751724

Martin, J., & Ewing, R. (2008). Power up! Using digital gaming techniques to enhance library instruction. *Internet Reference Services Quarterly, 13*(2/3), 209-225. doi: 10.1080/10875300802103874

Prince, J. D. (2013). Gamification. *Journal of Electronic Resources in Medical Libraries, 10*(3), 162-169. doi: 10.1080/15424065.2013.820539

Reinke, N. B., Llewelyn, V., & Firth, N. (2014). Developing discipline-specific study skills for pharmacy students learning anatomy and physiology. *International Journal of Innovation in Science and Mathematics Education, 22*(1), 57-66. Retrieved from http://openjournals.library.usyd.edu.au/index.php/CAL/article/view/6835

Ruess, D. E., & West, S. M. (1995). Library and information literacy for distance education students. *Journal of Distance Education, 10*(2), 57-72. Retrieved from http://www.ijede.ca/index.php/jde/article/view/236/610

Sproles, C., Detmering, R., & Johnson, A. M. (2013). Trends in the literature on library instruction and information literacy, 2001-2010. *Reference Services Review, 41*(3), 395-412. doi:10.1108/RSR-03-2013-0014

Tang, Y., & Tseng, H. W. (2013). Distance learners' self-efficacy and information literacy skills. *Journal of Academic Librarianship, 39*(6), 517-521. doi: 10.1016/j.acalib.2013.08.008

van Meegen, A., & Limpens, I. (2010). How serious do we need to be? Improving information literacy skills through gaming and interactive elements. *Liber Quarterly: The Journal of European Research Libraries, 20*(2), 270-288. Retrieved from http://liber.library.uu.nl/index.php/lq/article/view/7993/8316

Wortley, D. (2014). The future of serious games and immersive technologies and their impact on society. In Y. Baek, R. Ko & T. Marsh (Eds.), *Trends and applications of serious gaming and social media: Gaming Media and Social Effects* (pp. 1-14): Springer Singapore. doi: 10.1007/978-981-4560-26-9_1