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Evolving customer engagement: Using mobile technology and gamification to improve awareness of and access to library services

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In this paper we present an approach to the use of game based techniques in library orientation and customer engagement at Bond University using freely available mobile and online applications. Turning library orientation into a game is not a new strategy, indeed the library treasure hunt is a tried and tested alternative to traditional guided tours of the library. In addition, virtual library tours and orientation videos have been widely adopted in academic libraries. More recently libraries have begun following the lead of North Carolina State University in exploiting the potential of free mobile apps to deliver library orientation. Since 2012 librarians at Bond University have been exploring the use of both mobile and gamified approaches to customer engagement programs, which have most recently been delivered using a combination of Google Forms and Google Docs. We evaluate the success of these activities, their sustainability in terms of staff resources and consider future developments of our approach. The paper focuses on our experience of using these freely available technologies rather than the basics of gamification, but suggested resources on the latter are provided for those interested in employing gamification in the library context.

Introduction

Gamification is the use of game-like elements in otherwise non-game-like contexts. In education it has been suggested that gamification increases engagement and therefore learning outcomes (Nah, Zeng, Telaprolu, Ayyappa, & Eschenbrenner, 2014). One of the key activities of an academic library is to educate users about the services and resources that are available and how to use them, and libraries have been adopting gamified approaches to learning activities for many years. Alongside the increasing awareness of the advantages of gamification, technological changes are continually remaking the way libraries carry out their core activities. The rise of the smartphone and other mobile technologies in recent times is a good example, and many academic libraries have been quick to meet the demands for mobile services, and to look for opportunities to take advantage of this new mobile world (Johnson, Adams Becker, Estrada, & Freeman, 2014). Since 2012 Bond University Library has been moving to adopt both gamification techniques and mobile technologies to better provide orientation and customer engagement activities.

Evolving customer engagement at Bond

Bond University is a private, not-for-profit university on the Gold Coast in Queensland, Australia. As part of its focus on a personalised student experience, student numbers are limited and there are currently 3500 full time equivalent students enrolled. In this context of personalised experience and individual support, the Library aims to provide face to face orientations for as many students as possible, and this paper focuses on the gamification of the orientations provided for new cohorts of both medicine and law students. Another gamification initiative developed for Bond's research community is also discussed.

The Law Library leads the way

The Law Library orientation is an integrated part of the Faculty of Law's orientation of new students each semester, and also initiated Bond Library's move toward more gamified approaches. Prior to 2012 the Law Library orientation comprised a lecture style presentation and guided tours, introducing students to both the online and physical spaces of the Law Library. It was felt however that a more motivating and engaging orientation activity might be developed, and we began to explore the potential of gamified approaches. In 2012 a new orientation format was introduced which was largely self-guided and involved a mix of paper-based and online tasks. In the first part of the orientation the students completed tasks in the physical space of the Law Library using paper handouts. Then the students completed an online quiz created using SurveyMonkey, which required them to recall what they had learnt in the first part of the orientation, and also allowed them to explore the online legal resources. For the first time at Bond, prizes were offered as part of a library orientation (textbooks donated by a legal textbook publisher). The effectiveness of prizes and rewards in motivating learners has been noted by Nah et al. (2014). All students who completed the quiz went in the draw for the

prizes, which were awarded randomly. While SurveyMonkey was quite an effective way of gathering the quiz responses it also had some limitations. It was not possible to include images or links in questions, so the appearance was quite plain and not really game-like. SurveyMonkey was also not very mobile friendly, so students needed to use a computer or laptop, and quiz attempts couldn't be paused midway and resumed later.

The Research Game
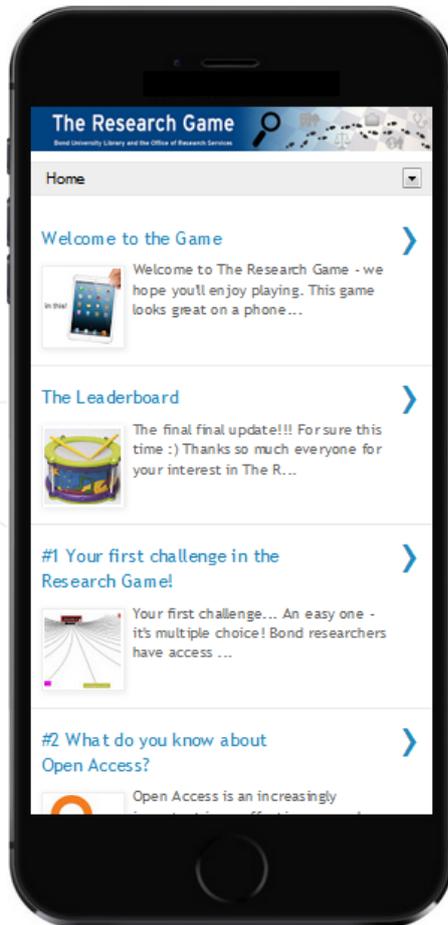
In 2013 as part of Bond University's annual Research Week, the Library coordinated a number of research and library focused events and activities, one of which was "The Research Game". The idea behind the Research Game was to produce a game which would engage Bond's research community throughout the week, and at the same time facilitate learning and awareness about the library services for researchers. The Research Game was a new project; we intended to build a game and all else was a blank slate.

We investigated a range of possible platforms using the following criteria: cost (no budget, or very limited), ease of game building (no programmers were available in the library!), desktop and mobile friendly, visual appeal, and ability to incorporate the appropriate types of tasks (quiz questions essentially). As the Game would run over the course of a week it was also important that players could stop and start their attempts, rather than having to complete everything in one go. Platforms considered included the SCVNGR mobile app, Questli, Textadventures, email, Twitter, or embedding tasks/questions in platforms such as Blackboard, Facebook or a Blogger blog. A Blogger blog was chosen as the best option in terms of our criteria, notably for visual appeal and the ability to easily configure. After consideration of a range of embeddable tools for collecting user responses including ProProfs and Quiz Revolution, Google Forms was selected. The Game was completely online, requiring no paper, and the Blogger blog looked very appealing on mobile devices.

Figure 1 The home page of the Research Game on a mobile device

The gameplay included a point system where players earned points for successfully completing tasks. Each blog post described a task to be completed ranging from using a LibGuide or ebook to find the answer to a question, to attending a nominated Research Week event where the player would receive the "code" which could be entered into the game for points. A deliberately informal writing style was used to keep the feel light-hearted, and care was taken to keep the gameplay at the right level; difficult enough to be challenging but not so difficult as to cause players to give up. As noted by Snyder Broussard (2012) the player should feel like they are choosing the game experience because it's fun, rather than being coerced into learning, so we were careful not to be too pushy with the information about library services. Leaderboards are another commonly used element of game design (Nah et al., 2014), and a leaderboard was embedded into the Game using infogr.am. This enabled a competitive aspect to the game play where players could see their progress and how they were faring in comparison to their colleagues. A grand prize of an iPad Mini was also on offer, with the winner of the Game and the prize being randomly drawn from the pool of players who reached a certain point threshold.

For the first iteration of the Game much work went into planning the game requirements, considering the available tools, and figuring out how best to put it all together to make something completely new. This work required approximately 190 staff hours. Now that the Game format is in place, producing another version of the Game requires a smaller but still significant amount of staff time. The Game was very well received in its first year and was repeated again in 2014. We developed fresh content for the 2014 iteration of the Game to keep it new and playable for any researcher who had played in 2013, and we estimate that making the 2014 Game required about 70 staff hours. This consisted of coming up with new tasks, finding new images and making any new graphics, and then putting this all into the blog, including writing up the tasks to convey the feel of the game. The time required to develop the tasks should not be underestimated as it requires consideration of the information you'd like to expose the game players to, and also the overall gameplay (keeping the tasks varied,

fun, at the right level etc.). Each day of play, one or two hours of staff time was required to collate results, update the leaderboard, and post updates on the state of play in the Game.

The medicine orientation becomes the Bond Med Student Challenge

The Library has provided resources, training and support for the medicine program at Bond since the inception of the program in 2005, and this has included the opportunity to orient each year's newly arrived medical students to the available library services. For much of this time the orientation was paper based. The students would receive printed directions to a series of tasks to undertake both in the library and online, and would fill in any answers to the tasks on the printed task sheet. By 2012 some online interaction had been incorporated using Google Forms embedded into the Bond website. The forms provided a quiz element; students could answer questions and receive the correct answer and accompanying information. While the orientations to this point indeed afforded each student the opportunity to learn about the library's services, there was no intrinsic motivation beyond the students being told to do the activities, and their own self-motivation to learn.

After the development and success of the Research Game in 2013 it was apparent that it would be quite simple to adopt the same format for the orientation of medicine students. In 2014 the medicine orientation used Google Forms embedded in a Blogger blog, and was largely online and mobile-friendly for the first time. We estimate that the adaptation required about 100 staff hours as the content was completely different to the Research Game. It is planned however to reuse the orientation largely unchanged in future years, so staff effort required will be minimal. The orientation was named the "Bond Med Student Challenge" to add to the game-like feel. Following the lead of the Law Library orientation, prizes (textbooks donated by a publisher) were included as part of the orientation. The winners of these were randomly drawn from the students who successfully completed a specified number of tasks, as had been done for the Law Library orientation and the Research Game. One of the drawbacks (discussed below) of the infogr.am leaderboard used in the Research Game was that it had to be

Figure 2 One of the more light hearted tasks in the Bond Med Student Challenge

manually updated, and due to the one hour duration of the medicine orientation it was not feasible to include this element. During the hour of the orientation only one staff member was required, to supervise and answer any questions.

And then there was the Law Library Challenge

The experience of the Bond Med Student Challenge led the Law Library to use embedded Google Forms rather than SurveyMonkey for the next semester's orientation, offering several advantages. It was now possible for students to complete the quiz on their mobile device, affording a more personal and seamless experience and reducing the need for paper handouts. Video, images and links could be directly embedded, improving the overall visual appeal.
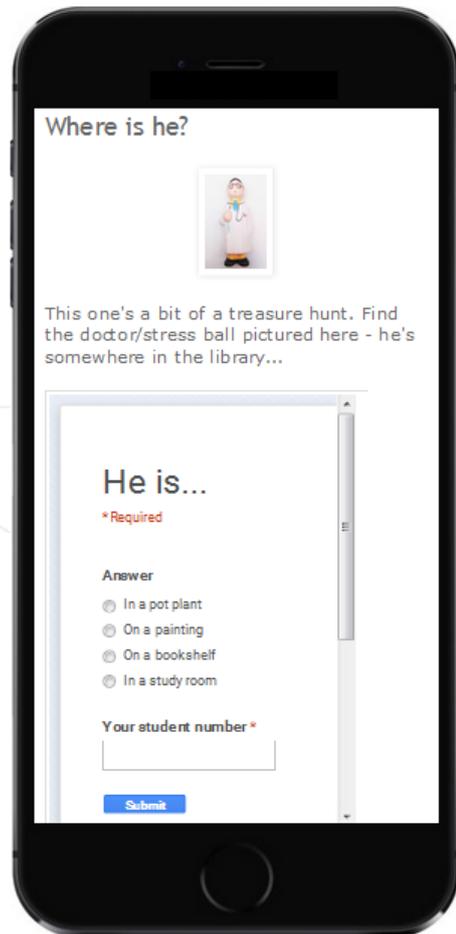
Challenge 2 - Legislation

Contemporary legislation (law made by Parliament) is all online - although that doesn't always mean it is easy to research. Older legislation can also be difficult to find, but in different ways.

Hopefully you are still on Level 3. Look for this display cabinet:

Question 2A

In the display cabinet you will see two nineteenth century colonial statutes ("Acts"). The title of each Act appears in italics just before the preamble. Fill in the missing word from the title of the following Act in the box below: AN ACT to restrain the Increase of ......

Figure 3 An example task from the Law Library Challenge

However, rather than using a separate Google Form for each task as was done in the Bond Med Student Challenge and the Research Game, the Law Library orientation used a single Google Form, divided into pages for each question. This different approach had significant benefits and limitations. An important advantage of the single form approach is the reduced staff time required to build the activity. We estimate that this took about 23 staff hours. In designing the game content, emphasis was given to making the tasks varied, fun and game-like. Tasks included using a "secret code" found in one question as the basis for completing the next, and identifying a photograph of a famous legal figure which had been placed in a group study room. The new online, mobile-friendly Law Library orientation was rebranded the "Law Library Challenge", again to add to the game-like feel. The use of textbook prizes was continued and completion of the Challenge was now tied to the opportunity to win an iPad Mini being offered as part of the wider Law Faculty orientation. As for the Bond Med Student Challenge, during the orientation only one staff member was required, to supervise and answer questions. The success of the initial Law Library Challenge has led to it being repeated with minor tweaking of the content in subsequent semesters.

What worked

One of the key concepts behind gamification is that the game-like nature of the activity increases engagement, motivation and ideally learning outcomes (de Sousa Borges, Durelli, Reis, & Isotani, 2014). One measure of engagement and motivation would be the rates of completion for the various activities - did the players who started the activity complete it? The average number of responses for all 22 tasks in the Bond Med Student Challenge was 61.7, and the average for the last 5 questions was 62, suggesting that students were still engaged right at the end. The data from the 2012 and 2013 medicine orientations show a decline in response rate toward the end, though this is not directly comparable to the gamified 2014 orientation due to other changes in format. The 2013 Research Game received an average of 18.5 responses over the 19 tasks, with the last 5 tasks receiving an average of 15.5 responses. The 2014 Research Game received an average of 20.9 responses over the 17 tasks, with the last 5 tasks receiving an average of 19.6 responses. This is consistent with our experience that a number of researchers "dipped their toes" in the Game but didn't continue, and is an area where future improvements might be made. Due to the Law Library Challenge's use of a single Google Form, data was not collected from any students who started but did not complete the entire Challenge (data was collected only if students reached the end of the Challenge and clicked submit). We plan to collect this data in the future by including a separate Google Form at the beginning of the Challenge.

In terms of learning outcomes, the objective of the three engagement activities was largely to increase customer awareness rather than to teach something. In this sense the activities can be considered a success; by completing tasks players are automatically made aware of the available services and resources, and receive the message that support from the Library is available.

Perhaps the best indicator of levels of engagement and motivation is an informal one - player behaviour and feedback. For all three engagement activities this has been very positive and suggestive of good levels of engagement and motivation. During the Bond Med Student Challenge the students appeared to be very involved with the activities, and towards the end a number of students put in considerable effort to complete a task which no-one else had managed to complete. A number of students answered questions more than once which indicates that they were concerned with getting their answer in. One student commented to staff that she had enjoyed the orientation and thought it was particularly well done. Online feedback was directly requested for the Research Game in 2014 and was positive from all respondents; for example all said that they would recommend the Game to others, and 13 of 15 respondents said that they would now use a library service that they hadn't been aware of before playing the Game. The Law Library Challenge incorporated an opportunity at the end for students to comment on their experience; the overall feedback from the many positive comments was that the challenge was both fun and useful.

A benefit of the online format employed is the limited need for paper and printing, resulting in reduced environmental impact. We also felt that the online format was preferable to paper documents for creating a more technologically modern and game-like experience. The URL of the online activity and some basic instructions are all that's needed for players to get started, and this small amount of information can be fitted on small slips of paper. The Bond Med Student Challenge and the Law Library Challenge provided each player with a small printed sheet containing this basic information, and the Research Game was conducted entirely online. For both the Bond Med Student Challenge and the Law Library Challenge, printed versions of the complete online orientation were available for students who did not have a smartphone or preferred to work on paper. However only a handful of the students chose this option. Our experience is that the great majority of players had a web-enabled phone which they preferred to use.

Meeting our customers' preference for using their own device is another benefit of the mobile format. This preference is consistent with the wider BYOD (Bring Your Own Device) movement in business and education as described in the NMC Horizon Report 2015 Higher Education edition (Johnson, Adams Becker, Estrada, & Freeman, 2015). All of the activities discussed in this paper required players to move around different physical locations to complete tasks and the mobile format also helps to make this simple and seamless. Having players use their own devices also reduces the need for the library to reserve PCs for the activities.

The limitations

Visual appeal

One area where some limitations were encountered was visual appeal. As mentioned above, a different approach to the use of Google Forms was taken for the Law Library Challenge than for the other two activities. The Law Library Challenge was constructed using a single Google Form embedded in a LibGuide, which limited the available visual design elements to those available in Google Forms. Images and videos can be embedded, but largely the layout and visual elements such as fonts and colours can't be customised, and it was felt that this resulted in less than ideal visual presentation. The Bond Med Student Challenge and the Research Game instead embedded a number of individual Google forms in separate posts in a Blogger blog. The forms themselves were quite plain and used simply to enable players to provide responses, while the Blogger platform provided the overall look and feel. Blogger provides a range of different, customisable templates for a blog's layout and appearance, and individual blog posts are customisable using both WYSIWYG and html editing. The end result for both the Bond Med Student Challenge and the Research Game was quite visually appealing, however some visual limitations regarding the Google forms were still noted. Google branding is present on each form, and the forms would display slightly differently on different browsers and devices, affecting the layout and white space. While the single form approach used for the Law Library Challenge had drawbacks in terms of visual appeal it also offered some significant practical benefits. The choice between the two approaches is essentially a trade-off between improved visual appeal and benefits in other areas.

Collating results to produce player scores

A limitation of the use of multiple Google Forms for both the Bond Med Student Challenge and the Research Game was the time required to collate the results. While this choice allowed for much greater visual customisation, it also meant that the player's responses were collected in a number of separate Google Sheets, one for each task. There were 22 separate Google Sheets for the Bond Med Student Challenge and 17 for the most recent Research Game. This made the process of checking answers and collating results for each player quite labour intensive. This was not an issue for the Law orientation; the single Google Form resulted in a single Google Sheet for all responses. Another limitation to the "multiple form approach" is that it was possible for players to enter responses in any form more than once. A decision must be made as to how to treat multiple responses, and time is required to identify them when collating responses as each attempt at a task results in a new entry in the associated Google Sheet. Because the Law Library Challenge used a single form players would have had to complete the entire orientation again to submit more than once and this did not happen. Notably the simpler, "single form approach" requires significantly less staff effort overall for collating results. More recently Google has introduced a feature to Google Forms which can prevent multiple responses, however this requires players to have and to log into a Google account which we feel could be a barrier to gameplay.

The time required to collate results also meant that the leaderboard in the Research Game could be updated only once or twice a day, and that it was not possible to include a leaderboard or other display of scores in the Bond Med Student Challenge or Law Library Challenge. This is not ideal in terms of good gamification practice. As Nah et al. (2014, p. 406) note, "the more frequent and immediate the feedback is, the greater the learning effectiveness and learner engagement". Ideally players would complete a task and get some instant feedback to help motivate them. This would require an automated system to generate and display scores, a feature not available in any of the form tools we investigated.

Identifying players

A further limitation of the multiple form approach was that for each task the players completed they also had to enter some identifying information (eg. name or student ID number). This meant that during the Med Student Challenge players were required to enter their ID number 22 times. The Law Library Challenge did not have this issue using a single Google Form. Players needed to enter their identifying information only once and this was associated with all of their responses in the single Sheet which collected all responses. A related drawback of the single form approach is that it's not possible to stop and start gameplay. If the form is closed halfway through the activity any previous responses are lost. Google Forms will warn users if they are about to do this however and this was not considered to be problem. It does mean though that this approach is only suitable for activities which happen over a continuous time period.

Where to from here?

Library endeavours such as these are often bound by certain restrictions; we rely on free or cheap tools that can be used with a minimum of technical expertise. In this case we have adapted the free form tool Google Forms to collect user input and enable us to build game-like activities on platforms such as Blogger or LibGuides, and we have been able to create successful and enjoyable engagement experiences for our customers. Using a free tool means accepting its limitations, which in the context of Google Forms and gamification we have described above. With either more funding or more in-house technical expertise available, a wider range of tools could be considered to achieve a similar approach to engagement. For anyone interested in trying our approach of making a game-like experience using embedded forms, we recommend looking for a form or user input solution with the following features:

Visual appeal

Forms should be individually embeddable to allow game builders to place them in any desired platform (e.g. a Blogger blog, LibGuide or webpage) which can then be visually customised. Ideally forms would themselves be customisable in terms of images, layout, colour, fonts etc.

Collating results to produce player scores

The responses from the multiple embeddable forms for a single game should be accessible online in a single place (e.g. a single spreadsheet). Ideally it would be possible to specify a correct answer for each form so that responses are automatically marked correct or incorrect, and scores for the players automatically maintained. Embeddable visualisations of the scores (e.g. an individual's score, graphs, leaderboards) would be available. It would be possible to either allow or prevent players from responding multiple times to tasks.

Identifying players

A simple login system would be ideal. The first time a new device tried to access the game players would be asked to create a login (first time players) or login (returning players). Once a device had logged in to the game it would be recognised and there would be no need to log in again. All responses would then be associated with a login and multiple responses either prevented or allowed.

Conclusion

Overall we have found that this gamified and mobile approach to customer engagement offers definite improvements over previous print-based methods and we will continue to use and improve these methods in the future. For anyone wishing to try something similar there is a major trade-off to be considered when choosing between our two distinct approaches. The multiple forms approach offers more visual appeal and the ability for players to stop and start the game, whereas the single form approach requires less staff effort to build and score the activity. Also consideration should be given to the limitations we encountered, and possible solutions. We feel that the reward of a more engaging and fun experience for both the library customer and library staff is well worth the investment, and encourage those interested to explore the use of mobile games in their own libraries.

Further reading

While this paper has not focused on the basics of gamification practice, Felker (2014) offers a good overview of the high level concepts in gamification, and Snyder Broussard (2012) has analysed the landscape around gamification in libraries and makes six recommendations.

References

de Sousa Borges, S., Durelli, V. H., Reis, H. M., & Isotani, S. (2014). *A systematic mapping on gamification applied to education*. Paper presented at the 29th Symposium On Applied Computing, Gyeongju, Korea. Retrieved from http://www.producao.usp.br/handle/BDPI/45451

Felker, K. (2014). Gamification in libraries: The state of the art. *Reference & User Services Quarterly, 54*(2), 19-23. doi: 10.5860/rusq.54n2.19

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 library edition*. Austin, TX: New Media Consortium.

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). *NMC Horizon Report: 2015 higher education edition*. Austin, TX: New Media Consortium.

Nah, F. F.-H., Zeng, Q., Telaprolu, V. R., Ayyappa, A. P., & Eschenbrenner, B. (2014). Gamification of education: A review of literature. In F. F.-H. Nah (Ed.), *HCI in business* (Vol. 8257, pp. 401-409). Cham, Switzerland: Springer.

Snyder Broussard, M. J. (2012). Digital games in academic libraries: A review of games and suggested best practices. *Reference Services Review, 40*(1), 75-89. doi: 10.1108/00907321211203649