

GAMIFICATION OF LIBRARIES IN UNIVERSITIES: POTENTIAL OPPORTUNITIES & CHALLENGES

¹Tan Wee Hoe & ²Siti Sumaizan Ramli

¹Associate Professor, Faculty of Art, Computing & Creative Industry,
Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia.

whtan@fskik.upsi.edu.my

²Senior Deputy Chief Librarian, Tuanku Bainun Library,
Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia.

sumaizan@upsi.edu.my

ABSTRACT

This paper reveals potential opportunities afforded by gamification to libraries built within universities, while juxtaposing challenges to be faced by the library administrators in different phases of gamification. In the context of libraries, gamification means turning the provision of information resources and library services into game-like activities. When the resource and service provision activities are fun, they could engage users and optimize the functions of a library in a university. A library in a Malaysian public university was examined in order to propose gamification strategies for conducting short-term and long-term game-like activities. To embark on gamification, the library should operationalize its objectives into measurable intended outcomes, and each of the outcomes should consist of three components: intended observable users' behaviours, conditions of attainment and degree of attainment. These components would be aligned to the goal, rules and feedback mechanism of a game or game-like activities. In particular, features of feedback like reward of glory, reward of access, reward of sustenance and reward of utilities would be introduced to reinforce positive behaviours shown by users. The library could also delineate users into four types of players: killers, achievers, explorers and socializers based on the library usage analytics, for which provision of resources and services could be differentiated according to their needs. Nonetheless, a plan can only be a good plan after successful implementation. Thus, this paper highlights key challenges to be taken into consideration to assure quality gamification.



Keywords: University libraries; Universities; Gamification; Game-like activities; Malaysia.

1. INTRODUCTION

In Malaysia, universities which offer academic programmes are required to set up a physical library or a physical information centre. Stated as a benchmarked standard for physical facilities by the Malaysian Qualification Agency (MQA), the library or information centre must have adequate and up-to-date reference materials and qualified staff that meet the needs of the programme and research amongst academic staff and students (MQA, 2016). In particular, individual universities must state the database system used in the library, and describe how resources are shared and how users can access these resources. According to MQA (2016), for every programme to be offered or intended to be offered, the institution must list down all library resources which support the programme, including specific number of books and journal titles, and number of collection acquired by the institution. Individual universities are also required to describe how feedback can be obtained from students and staff on the library policy, services and procedures (MQA, 2016).

When the vision of libraries in four different types of university in Malaysia were juxtaposed (see Table 1), all visions seem to gear towards gaining world, global or at least regional recognition. In terms of the scope of library missions, research and learning are two constant focuses in all four types of university. Public universities (UM & USIM) are still highlighting the notion of “teaching” in their mission, but the missions of private university libraries (MMU & Monash University) do not contain the notion of “teaching”. This could reveal a difference between public and private university libraries. Recognising the similarities and differences among university libraries is essential before employing any gamification measures.

Table 1. Comparison of Vision and Mission of Libraries in Four Different Types of University in Malaysia

University	Vision of Library	Mission of Library
Universiti Malaya (UM, a public research university)	To transform the University of Malaya Library into a world ranked library, consistent with UM's aspiration for world ranking.	In support of the University of Malaya's global mission, the Library provides professional expertise, diverse information resources, and knowledge-based services for the advancement of its quality research, teaching and learning.



Universiti Sains Islam Malaysia (USIM, a public non-research university)	To be the center for Islamic reference information and knowledge at the global level.	To collect, process and disseminate the latest information for the purpose of teaching, research, and learning as a base for the establishment of Islamic Digital Library.
Multimedia University (MMU, a private university)	The Library is a key academic partner in advancing MMU vision and goals to be a Top 100 university in Asia with global recognition by 2020.	To provide a knowledge hub with up to date and reliable scholarly information and services in supporting the instructional, research and development programs of the University.
Monash University Malaysia (a branch campus of a foreign university)	Underpinned by Monash University Malaysia's ambition to become the leading research and teaching university in the ASEAN region, the library is a key academic partner in advancing the mission and goals of the Malaysia campus.	<p>The Library contributes to the vision of the University as a leading institution of higher learning and research by providing access to, and delivery of, outstanding information resources and services, effective research skills development programs and innovative learning experiences.</p> <p>The Library is committed to providing every graduate with a foundation for lifelong learning and to enabling students, faculty, and staff to achieve their academic and intellectual endeavours.</p>

Gamification is a process of turning non-game activities into a game or game-like activities by using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems (Kapp, 2012). In the context of university library, gamification means turning the provision of information resources and library services into game-like activities. The purpose of gamifying university libraries would be engaging library users, motivating users to use information resources and library services, and promoting learning inside and outside the library. When the resource and service provision activities are fun, university libraries could engage users and optimize its functions in the university.



Tan (2015) proposed a five-step gamification process for education, which can be adopted for university libraries. The process was adapted from the game design process commonly practiced in the creative industry. The five-step gamification process is as follows:

- Step 1: Setting game goal and rules
- Step 2: Designing gameplay
- Step 3: Designing feedback
- Step 4: Designing game space
- Step 5: Designing game story

2. OBJECTIVE

This paper aims to reveal potential opportunities afforded by gamification to libraries built within universities, while juxtaposing challenges to be faced by the library administrators in different phases of gamification. In this paper, a library in a Malaysian public university, Tuanku Bainun Library of Universiti Pendidikan Sultan Idris (UPSI) was examined in order to propose gamification strategies for conducting short-term and long-term game-like activities.

3. POTENTIAL OPPORTUNITIES AFFORDED BY GAMIFICATION

Walker (2006) demonstrated that real-life humorous examples can be used as a teaching technique by instruction librarians. The purpose of using humour was to reduce library anxiety, promote classroom environment and help students to get more comfortable with resources in the library. Subsequently, Walker (2008) reported a case study on the usefulness of a library version of Jeopardy! TV game show in Pennsylvania State University. The game was prepared as an active learning technique for a one-shot library instruction. Walker (2008) discovered that the Library Jeopardy motivated students to *“actively participate in class and assume more responsibility for learning library instruction, while adding variety to class sessions by providing a fun environment for instructor and students alike”*.

Another instance of university library gamification was initiated by library staff in Utah Valley University (Smith & Baker, 2011). Two self-paced games were designed and developed to orient students to the library and library services. The first was called “Get a Clue” game which used clues placed throughout the library building to orient new students as they solved a mystery; while the second game was LibraryCraft, an online game where students used library resources to slay a dragon. Through post-game surveys, Smith and Baker (2011) discovered that students



found the “*games entertaining and informative, and they regarded the orientations as a good use of their time and their comfort levels with library services increased*”.

In 2012, Broussard reviewed best gamification practices of libraries which involved 17 online library games. Broussard (2012) gave six recommendations for choosing or creating games for library.

1. Keep it simple
2. Have a plan for using it in class or marketing it
3. Implement “gating” for key concepts
4. Make it fun
5. Provide lots of feedback
6. Playtest / evaluate

In a more comprehensive review conducted by Hamari, Koivisto and Sarsa (2014) with 24 gamified activities or services, 132 positive outcomes of gamification were found and divided into three categories, i.e. motivational affordances, psychological outcomes, and behavioural outcomes. These positive outcomes (Table 2) unfold the potential opportunities afforded by gamification to university libraries. Ten items were listed under motivational affordances, in which leader board, story, theme, points, badges and levels were mentioned repeatedly (count ≥ 7) in the literature (Hamari, Koivisto & Sarsa, 2014), hence these items can be considered as key game mechanics to provide motivational affordances to library users. As for psychological and behavioural outcomes, game-like activities must be able to provide enjoyment (count = 5) and engagement, while creating positive impact on the attainment of learning outcomes (count = 5).

Table 2. Potential Opportunities Afforded by Gamification to University Library

Motivational affordances	<i>f</i>	Psychological outcomes	<i>f</i>	Behavioural outcomes	<i>f</i>
Leader board	10	Enjoyment	5	Impact on learning / Learning outcomes	5
Story / narrative	8	Engagement	4	Amount of content contributed	3
Theme	7	Motivation	3	Intentions to use & recommend	2
Points	7	Attitude towards gamification / service	2	Level & quality of participation	2
Badges	7	Fun	2	Task completion speed &	2



Challenge	7	Degree of happiness / flow	2	quality Task performance	2
Levels	7	Attitude towards badges	1	Users contribution	2
Clear goals	5	Perceived added value of gamification	1	Steering behaviour	1
Rewards	4	Social motivation	1	Response patterns	1
Feedback	4	Difference in interaction	1	Likelihood of voluntary participation	1
Time pressure	2	Social comparison	1	Number & duration of interactions with virtual clients	1
Achievement	2	Clear goals	1	Type of content distributed	1
Progress bar	2	Network effects	1	Exploration while interacting with the app	1
Avatar	1	Social influence	1	Quality of collected calibration data	1
		Recognition	1	Change of behaviour due to receiving badges	1
		Reciprocal benefits	1	Change in relative energy consumption	1
		Task involvement	1	Impact on time management	1
		Satisfaction	1	Site participation	1
TOTAL 73		TOTAL 30		TOTAL 29	

4. GAMIFICATION ATTEMPT IN TUANKU BAINUN LIBRARY

The Tuanku Bainun Library is an academic library located in Universiti Pendidikan Sultan Idris (UPSI). The library was constructed with the vision to be a prestigious library in the field of education in line with globalization (Tuanku Bainun Library, 2016). The mission of the library is to provide information resources and library services to fulfil customer needs professionally, in support of the university's teaching-learning and research activities. Five objectives were set to achieve the vision and mission:



1. To identify, collect, store, manage and make available relevant, quality and up-to-date sources of information to support university's programs;
2. To develop and maintain a comprehensive collection in the field of education in line with the library's mission;
3. To provide various information and communication technology facilities in step with current advances and user needs;
4. To assist and enhance library skills among library users in searching, accessing and acquiring accurate information;
5. To generate competent human resource in every area of knowledge and related activities.

Based on the vision, mission and objectives, customers' needs analysis was done to identify all relevant customers of the Tuanku Bainun Library (Table 3). The gamification efforts can be started by operationalizing the needs into intended observable behaviour, conditions of attainment, and degree of attainment (Tan, Nurul Fazmidar & Wang, 2016). Next, the effort of gamification should be placed on making users' library experience fun and engaging. Table 4 shows how library could provide various ICT facilities in step with current advances. Lazzaro's (2004) 4Keys2Fun was adopted when proposing four types of fun activities in the library.

Table 3. Customer's Needs Analysis

Customer(s)	Needs library to
University	Support teaching and learning activities Support research activities Develop and maintain a comprehensive collection in the field of education
Lecturers	Identify, collect, store, manage and make available quality and up-to-date sources of information for running academic programmes
Students	Provide various ICT facilities in step with current advances and learners' needs Assist in searching, accessing and acquiring accurate information Enhance library skills in searching, accessing and acquiring accurate information
Staff	Generate competent human resource in various areas of knowledge



Table 4. Generating Gamification Ideas to Make Students' Library Experience Fun

Type of Fun	Gamification Ideas	Activities
Easy fun	Inspires students to play active role in exploring digital and printed treasure of information in a fantasized library.	Pustaka Fantasia
Hard fun	Provides students the opportunity to beat their personal reading records and mastery of library skills.	Personalized Leader Board
People fun	Provides the excuse to hang out with friends. Build social bonds and team work by spending more time with friends.	Info-searching Competition/ Book Searching Challenge
Serious fun	Enlivens boring assignments through purposeful play of ICT devices. Changes how students think, feel, behave or do assignments in the augmented reality (AR) world.	AR Assignment Challenge

In terms of playing an active role in exploring the library, the virtual presence of the Tuanku Bainun Library was made accessible to users, in which a mock-up Facebook page was placed at the entrance for users to take photos. If this mock-up is used during a special library programme or activity, the photo-taking session could establish a sense of ownership among users towards the library.





Figure 1. Using Facebook Mock-up Frame to Establish a Sense of Ownership Towards the Tuanku Bainun Library

As for the hard fun activities, the library constantly updates the leader board, presenting five types of users who borrowed the most books from the library—academic staff, non-academic staff, external member, postgraduate student, and undergraduate student (Figure 2). Apart from giving the winners rewards of glory, other forms of rewards could be given to users to recognise their achievement in accessing resources and services, including rewards of access, rewards of sustenance and rewards of facilities.





Figure 2. Leader Board at the Entrance of Tuanku Bainun Library



The effort of increasing visits and usage of the Tuanku Bainun Library was reinforced by the establishment of the Knowledge Café (Figure 3). The Knowledge Café consists of five zones. In the Net Comm Zone, users can read newspapers and magazines, chit-chat or access internet using their personal laptop or mobile devices; for those who do not bring their laptop or computing devices, they can use computers at the Internet Hub. In the Brainstorm Hub, up to eight users can gather and discuss; while the Teabrary allows users to eat and drink while using the library. A TV was also placed at the Media Lounge for users to watch TV programmes. All these efforts were meant for engaging younger users, particularly UPSI students. Perhaps, games related to library instruction could be installed on to desktop computers in the Internet Hub to expose users to resources and services provided by the library.





Figure 3. Setting up the Knowledge Café to Facilitate Users' Interaction in the Library



By referring to the library usage analytics, the library could also delineate users into four types of players: killers, achievers, explorers and socializers (Bartle, 1996), for which provision of resources and services could be differentiated according to their needs. Players who are categorized as killers will thrive to compete with other players, so organising competition or contests related to reading or library services would excite them. Achiever type of players are commonly objective-driven, thus organizing activities which require them to collect points, badges or trophies would motivate them to take part. As for the explorer type of players, conducting treasure hunt or reshuffling collections in the library would attract them to visit the library frequently. The socializer type of players are keen to engage with other library users. Thus, hosting seminars, talk series or workshop which are related to library education would fit them.

5. CHALLENGES

The key challenge encountered by university libraries would be in keeping abreast with the changing needs of the students, particularly the generation Z students. Gamification has been recognised as an effective tool to engage the generation Z students, but there are two questions that need to be addressed. Firstly, to what extent should the library administrators gamify their information resources and library service provision activities? Secondly, will gamification-embedded activities enhance library services and further promote user engagement? In addition, university libraries need to take into consideration the changes or changing style in reading culture and new innovations in reference services for their users.

Another issue in gamification of library services is the need for technical and pedagogical support, particularly in creating dedicated apps or games for the library. In the case of the Tuanku Bainun Library, mobile apps which feature the library services, including OffPAC, iPUSTAKA UPSI and others. This requires creative and innovative thinking skills of the library staff, in collaboration with the experts from the faculty. Innovation and sustainability are major aspects in improving the delivery system of library management and administration, with the changing trends in ICT.

6. CONCLUSION

Physical libraries are essential facilities which must be provided by universities when offering academic programmes. Public and private university libraries generally share a similar vision to gain world, global or regional recognition. Research and learning are two common scopes catered in the missions of both public and private university libraries.



Needs analysis should be conducted with the library customers or users, in which the outcomes could be operationalized to initiate gamification process. In the context of university library, gamification means turning the provision of information resources and library services into game-like activities. Leader board, story, theme, points, badges and levels are proven game mechanics which can provide motivational affordances to library users.

REFERENCES

- Bartle, R. (1996). *Hearts, clubs, diamonds, spades: Players who suit MUDs*. Retrieved Aug 25, 2016 from <http://mud.co.uk/richard/hcds.htm>
- Broussard, M.J.S. (2012). Digital games in academic libraries: a review of games and suggested best practices. *Reference Services Review*, 40(1), 75-89.
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does Gamification work? A Literature Review of Empirical Studies on Gamification. *The 47th Hawaii International Conference on System Sciences*, 6-9 Jan 2014, Hawaii, USA, pp. 3025-3034.
- Kapp, K.M. (2012). *The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education*. San Francisco: Pfeiffer.
- Lazzaro, N. (2004). *Why we play games: four keys to more emotion without story*. Oakland: XEODesign Inc. Retrieved Aug 20, 2016 from http://xeodesign.com/xeodesign_whyweplaygames.pdf
- Malaysian Qualifications Agency. (2016). *COPPA: MQA-01 Programme Information*. Petaling Jaya: Malaysian Qualifications Agency. Retrieved Aug 11, 2016 from <http://www.mqa.gov.my/portalMQA/borang/coppa/MQA-01.pdf>
- Smith, A-L., & Baker, L. (2011). Getting a clue: creating student detectives and dragon slayers in your library. *Reference Service Review*, 39(4), 628-642.
- Tan, W.H. (2015). *Gamifikasi dalam pendidikan: Pembelajaran berasaskan permainan*. Tanjong Malim: Penerbit UPSI.
- Tan, W.H., Nurul Fazmidar M.N., & Wang, Y. (2016). Inventive problem-solving puzzle game design and development. *International Journal of Computational Vision and Robotics*, 6(3), 244-252.
- Tuanku Bainun Library. (2016). *Vision, Mission, Objective*. Retrieved Aug 20, 2016 from http://pustaka3.upsi.edu.my/index/?page_id=9&lang=en_US
- Walker, B.E. (2006). Using humor in library instruction. *Reference Services Review*, 34(1), 117-128.
- Walker, B.E. (2008). This is jeopardy! An exciting approach to learning in library instruction. *Reference Services Review*, 36(4), 381-388.

