ISSN 2278-3091
Volume 8, No.1.6, 2019
International Journal of Advanced Trends in Computer Science and Engineering
Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse1481.62019.pdf
https://doi.org/10.30534/ijatcse/2019/1481.62019

User/Player Type in Gamification

Ryan Macdonell Andrias[1,2,3], Mohd Shahrizal Sunar[1,2]
[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Johor Bahru, 81310, Malaysia
[2]Media and Game innovation Centre of Exellence, Institute of Human Centred Engineering, Universiti Teknologi Malaysia, Johor Bahru, 81310, Malaysia
[3]Faculty of Computing and Informatics, Universiti Malaysia Sabah, F.T. Labuan 47000, Malaysia

ABSTRACT

Gamification is defined as the use of game design elements in non-game contexts. Even though game design elements were integrated into the gamification application, some researches show negative and mixed outcome about user engagement and performance. The purpose of users segmentation is to identify groups which share commonalities characteristic but still profoundly different from each other. There are four types of users subdivision; demographic, psychographic, geographic, and behavioural. Our goal is to explore the theoretical and conceptual aspects of the player/user type towards creating an engaging gamification application by doing a literature survey. Our finding shows that the user type profile is not inclusive to one characteristic as it may be derived from a combination of either all types. The classification can guide the gamification designer to decide which game elements to incorporate into the gamified application. It is essential to consider a suitable game mechanics with user types because some researches have shown that certain game elements will produce an adverse outcome towards a specific user type. It is also recommended to suit an individual motivational preference with suitable game elements by using an adaptive approach. Furthermore, most of the gamification user type research is still using games player types such as Bartle's Taxonomy and BrainHex, while HEXAD is a well-accepted model to describe gamification user type.

Key words : Gamification, Adaptive Gamification, User Type, Player Type

1. INTRODUCTION

The term gamification existed since 2003 when a game developer named Nick Pelling set up a UK consultancy company (Conundra Ltd) to develop a game like user interface for electronic devices [1]. However, the term only gained wide attention after Foursquare application was released in 2009. Foursquare a location-based social media application is among the earliest and popular mobile gamification application in the market which gamified user check-ins by giving points and badges. Since 2010 the term is widely accepted as researchers and practitioners are using it in written documentation.

The definition of Gamification is the use of game design elements in non-game contexts [2]. The main intention to gamify a non-gaming context is to motivate and engage the user to act. In the perspective of psychology, motivation can be divided into two types [3]: (1) Intrinsic motivation – when a person acts by his/her values. (2) Extrinsic motivation – when a person executes a task because of the external rewards such as status and money. Both types of motivation share the common goal in gamification which is to increase the level of engagement as several of the researchers acknowledged [2-5].

In the literature, some researches show negative and mixed outcome about user engagement and performance even though game design elements were integrated into the gamification application [6]. Seaborn and Fels [6] had reviewed 32 studies on the utilisation of digital gamification elements in education. Out of the 32 studies, 20 shows positive results connecting gamification to increased levels of motivation and engagement. However, the remaining 12 studies produce negative results showing no correlation between students' engagement and game elements. It seems to indicate that not only game design elements are an essential factor in gamification, but another aspect such as player/user type. Ferro [7] has indicated that an individual's personality type has the potential to influence gaming experience design.

In this article, we present a literature survey that focuses on the player/user type in gamification. Our goal is to explore the theoretical and conceptual aspects of the player/user type towards creating an engaging gamification application

2. RELATED WORKS

2.1 Player/user Type Segmentation

The objective of users segmentation is to identify groups which share homogenous characteristic but significantly different from each other. There are four types of users segmentation; geographic, demographic, psychographic and behavioural [8]. In geographic segmentation, users are grouped according to their location for instance country, region, population density, city, town size and climatic zone. In demographic segmentation, users are divided based on these features such as gender, education, age, occupation, socio-economic, marital status, family life-stage, family size, and ethnicity. In psychographic segmentation, users are grouped based on their attitudes,

interests, values, and lifestyles. Meanwhile, in behavioural segmentation, users will be divided according to user status, usage rate, loyalty status and attitude towards the application.

Most player/user types are derived from psychographic and behavioural approaches for gamification, games and game-based learning. The authors decided to select only seven among most cited player/user types. It is either based on personality [9], neurobiological [10], motivation [11-13], play style [14, 15], and emotion [16] as shown in table 1.

Table 1: Player/user types and dimension of segmentation

Player/User Types	Games	Dimension
Bartle Taxonomy[14]	MUD	Playstyle
Yee's MMORPG user motivations [11]	MMORPG	Motivation
4 Fun Keys[16]	Games in multiple genres (Fighting, Racing, Puzzle, Sports & Strategy, Other)	Emotion
DGD1[9]	Non-exclusive	Personality
DGD2 [15]	Non-exclusive	Play style
BrainHex [10]	Non-exclusive	Neurobiological
HEXAD [12, 13, 17]	Gamification	Motivation

2.2 Game Player Type

Bartle Typology

According to Richard Bartle's qualitative research among MUD players, there are four main types of players based on playing style; achievers, explorers, socialisers and killers. Achievers: Player that driven to perform and achieve goals by collecting points as well as climbing levels. The reason for playing is to master the game. Explorers: Player that interested to explore and figure out as much as they can about the games. Socializers: Player that loves to communicate and interact with others in the games. Killers: Player that uses the games as a medium to cause distress with the other player

Yee's MMORPG user motivations

Yee argued that it would be challenging to use Bartle's typology model because it has not been validated with empirical data. Therefore, by using factor analysis for 40 items questionnaire, Yee's result has revealed that there are ten user motivations for playing in three major components: achievement, social and immersion (see Table 2).

Table 2: Yee's MMORPG Player Type

Achievement	Social	Immersion
Advancement	Socializing	Discovery
Mechanics	Relationship	Role-Playing
Competition	Teamwork	Customization
		Escapism

Achievement component: Players that either feels satisfaction from the continuous progress or achieving the goal. Social component: Player that prefers to socialize, having a relationship or work together as a group. Immersion component: Player is motivated by discovery, role-playing, customisation of the game and escapism.

Four Fun Keys

The Four Fun Keys Model was derived from game research conducted by XEODesign, Inc by doing qualitative methods through observation and interview. It is mainly to evaluate the emotions that the player felt during playing games. The model comprises of easy fun, hard fun, people fun and serious fun. Easy fun: The main focus is to immerse player attention towards the game and not the winning condition. Hard fun: Player that strive to overcome challenges while playing the game. People fun: Player that felt enjoyment from playing with other people either inside or outside the game. Serious fun: Player feeling emotionally satisfies while playing the game.

Demographic Game Design model (DGD1)

DGD1 is a game player typology based on Myers-Briggs typology (MBTI). Katharine Briggs and Isabel Briggs Myers have created MBTI that comprises of 16 types of human personality. There are four types of player in DGD1: Conqueror, Manager, Wanderer and Participant. Conqueror: Player that play the game with the intention to complete all challenges and tend to finish the game. Manager: Player that play the game for mastery. Wanderer: Player that play the game for the gaming experience. Participant: Player that felt happy when they are playing with other people as it triggers emotion.

Demographic Game Design model (DGD2)

DGD2 is the extension of DGD1, instead of using MBTI, DGD2 is using Temperament Theory by Berens [18]. Both MBTI and Berens' version of Temperament Theory referring to the same theoretical foundations with the extension of specific skill sets correspond to player type. DGD2 can be divided into four types: Logistical, Tactical, Strategic and Diplomatic. Logistical: Player that drew to optimisation, planning and trading. Tactical: Player that drawn to improvisation, operation, controlling single characters and thinking on the spot. Strategic: Player that drew to solving, hypothesising, controlling multiple units and thinking ahead. Diplomatic: Player that drew to harmonising, imagining and cooperation.

BrainHex

BrainHex was formulated based on the neurobiological result with the basis of earlier demographic game design models (DGD1 and DGD2). There are seven types of players identified: Seeker, Survivor, Daredevil, Mastermind, Conqueror, Socialiser and Achiever. It was based on 60,000 players respond through an online survey. Achiever: Player is a goal oriented and motivated by long term achievements. Seeker: Player is curious about the game

and enjoys exploring the game. Survivor: Player is feeling pleasure when he/she able to overcome fear. Daredevil: Player is always seeking for excitement as a positive experience. Mastermind: Player is thinking strategically and solving puzzle trigger pleasure. Conqueror: Player is looking for challenge and competition. Socialiser: Player likes to communicate, working together and socialise with people that they trust.

2.3 Gamification User Type

HEXAD

Gamers researchers or practitioner prefer to use the term "player" however; gamification researchers prefer to use the term "user" to represent the person using the application. HEXAD is design based on two user motivational factors: intrinsic and extrinsic. HEXAD has identified six types of gamification users: Seeking social connection and relatedness motivate the Socializer. Autonomy and self-expression motivate the free spirit. Meanwhile, an achiever is a type of user that eager to accomplish the goal of mastery by completing challenges and obstacles. A sense of meaning, purpose, and altruism motivate the Philanthropist. The player is a type of user that is driven only by external rewards. The disruptor is a type of user that always create chaos within the gamified environment.

3. ANALYSIS

3.1 The mapping between games player type and HEXAD gamification user type

HEXAD gamification user type and games player type share some similarity as shown in Table 3. The most common types are; achiever, socialiser and free spirit/explorer. Meanwhile, killer/disruptor types only exist in HEXAD gamification user type and Bartle's typology. Philanthropist also shares the same characteristic with serious fun (4 fun keys). Even though achiever and disrupter/killer are categorised in a different group, yet both types share the common goal to always winning. However, the disrupter/killer has the tendency using cheat, hack and heckle to achieve the goal [14]. There is one type of user that exists only in HEXAD which is the Player. This type of user only motivated by external rewards.

A. 3.2 The mapping between game elements and gamification user type

Table 4 shows the mapping between game elements identified in the literature [19-23] and HEXAD gamification user type [12, 13, 24, 25]. There are certain game elements that that have a positive, negative or moderate impact towards the user emotion [26, 27]. For example, teamwork elements will give a negative impact to the achievers, free spirit and disruptors but positive towards Socializers [27]. It is also essential to have the continous feedback element in any gamified environment [28]. This table guideline can help any gamification designer to develop a gamified application that can suit game mechanics and game elements towards the relevant user type.

Table 3: Game player type and HEXAD mapping

	HEXAD Gamification User Types					
	Achiever	**Player**	**Socialiser**	**Disruptor**	**Free Spirit**	**Philanthropist**
Bartle Typology	Achiever		Socialiser	Killer	Explorer	
Yee's	Achievement, Immersion		Social		Immersion	
4 Fun Keys	Hard Fun		People Fun		Easy Fun	Serious Fun
DGD1	Conqueror, Manager		Participant		Wanderer	
DGD2	Strategic, Logistical		Diplomatic		Tactical	
BrainHex	Achiever, Conqueror, Mastermind		Socialiser		Seeker	

Table 4: User types, game mechanics and game elements mapping

		Free Spirits	Achievers	Philanthropists	Players	Disruptors	Socializers
Reward	Badge	X	X	X	X	X	
	Achievement	X					
Narrative	Achievement						X
	Points						X
	Story	X					X
	Badge						X
Cooperation	Team	-ve	-ve			-ve	X
Competition	Leaderboard		X			X	
	Points					X	
	Gifting					-ve	
Transaction	Gifting		-ve	X			X
Progression	Points	X	X	X			
	Level	X	X	X			
Status	Leaderboard		X		X	X	
	Points	X	X		X	X	
Resource Acquisition	Achievement		X				
Others	Clear goals		X			X	
	Challenges	X	X			X	
	Helping						X
	Immersion	X	X				
	Socialization		X (+/-)		X (+/-)		X
	Countdown					X	
	Roles	X		X			X
	Interaction						X
	Feedback		X			X	
	Share						X
	Comment						X
	Cascading information	X	X			X	X
	Quest		X			X	
	Altruism			X			X (+/-)
	Epic meaning	X	X			X	X

4. DISCUSSION

4.1 The player/User type is not inclusive

The player profile description can be derived by collecting behavioural, psychographic and demographic data [3]. All of the player and user type research shows that a person type is not inclusive to one category. In other words, a player can have characteristics from a combination of either all types [3]. The breakdown might look something like this: 40% Achiever, 80% Socializer, 60% Free Spirit, 10% Disruptor.

Therefore, it is difficult for a gamification developer to create an application that can cater to a specific user. Different user types have different types of motivation. Therefore it is essential to carefully consider a well balanced as an overall combination [25]. The player type analysis provides useful information of overall user type for a developer, and it is a useful tool for a specific group of people such as in an organisation or students with specific demographic group. For example, in a study conducted at a workplace, for energy saving to become a daily habit the gamified application should include progression, level and points game design elements [24].

4.2 Player/user type and game elements

Gamification elements impact towards each user type can be used to predict user motivation. The gamified application should be design using game elements that suitable for a user because a specific game element may not

be suitable and some might negatively affect some user types [5, 27, 29]. For example, the teamwork element will only motivate socializer type and yield adverse effect towards disruptor, achiever and free spirit. Meanwhile, gifting element also negatively affect the achiever [27]. For this reason, a gamified application should be designed to incorporate a variety of game elements so that it can attract each user type.

This classification can also help the designer to decide which gamification mechanics to incorporate into the gamified application. As an example, highly competitive medical students have a little spare time during their study, so it will be successful if the gamified application integrates the element of competition and a shorter playing period [25]. The gamification application should be able to determine the motivational needs of an individual user to foster engagement [30]. However, poorly design gamification may cause a user showing characteristics different than the pre-defined user type [27]. Ferror (2018) finding stressed that player's personality type (Australian Personality Inventory) could not be used to predict a player's preference for game elements and mechanics [7].

4.3 Adaptive gamification (user type and game elements)

The entire gamification system should be designed to bring an end to an individual player engagement [30]. It is difficult to develop a gamification application that suits the specific user. However one of the approaches that can be explored is using the adaptive technique. A highly adaptive gamified application that can match the intended game mechanics and elements is required among the diversity of learners-players [31]. The gamified application should be able to provide elements which are suitable for a user adaptively. For instance, those users that have the characteristic of socializer will be provided with a "share" button to post on a social network while that user interested in the competition should be provided with a leaderboard [31]. Adaptation of game elements can lead to an increase in participant for active users [31]. The authors also suggested the adaptation should not be based on users' choice but rather on indirect measurements either through a questionnaire or user interaction. However, the adaptation process does not guarantee to improve the users' engagement [32]-[33].

5. CONCLUSION

The user type profile is not inclusive to one characteristic as it may be derived from a combination of either all types. The user profile analysis will give some clear insight into what is prominent and less prominent characteristics of an individual user or group of people. The gamified application should be design using game elements that suitable for a user because a particular game element may not be suitable and some might negatively affect some user types. This classification can also help the gamification designer to choose which gamification mechanics to incorporate into the gamified application. It is recommended to suit an individual motivational preference with the suitable game elements by using an adaptive approach. The gamified application should be able to provide elements which are suitable for a user adaptively.

ACKNOWLEDGEMENTS

The work of Ryan Macdonell Andrias was supported by the Ministry of Education (MOE), Malaysia, during his study leave.

REFERENCES

1. K. Werbach and D. Hunter, *For the win: How game thinking can revolutionize your business*. Wharton Digital Press, 2012.
2. S. Deterding, M. Sicart, L. Nacke, K. O'Hara, and D. Dixon, "Gamification. using game-design elements in non-gaming contexts," presented at the CHI '11 Extended Abstracts on Human Factors in Computing Systems, Vancouver, BC, Canada, 2011. https://doi.org/10.1145/1979742.1979575
3. G. Zichermann and C. Cunningham, *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*. O'Reilly Media, Inc., 2011, p. 208.
4. K. M. Kapp, *The Gamification of Learning and Instruction Fieldbook: Ideas into Practice*. Pfeiffer Company, 2013, p. 480.
5. K. Robson, K. Plangger, J. H. Kietzmann, I. McCarthy, and L. Pitt, "Game on: Engaging customers and employees through gamification," *Business Horizons*, vol. 59, no. 1, pp. 29-36, 2016/01/01/ 2016. https://doi.org/10.1016/j.bushor.2015.08.002
6. K. Seaborn and D. I. Fels, "Gamification in theory and action: A survey," *International Journal of Human-Computer Studies*, vol. 74, pp. 14-31, 2015/02/01/ 2015.
7. L. S. Ferro, "An analysis of players' personality type and preferences for game elements and mechanics," *Entertainment Computing*, vol. 27, pp. 73-81, Aug 2018.
8. J. Hamari and J. Tuunanen, "Player Types: A Meta-synthesis," *Transactions of the Digital Games Research Association*, vol. 1, pp. 29-53, 2014. https://doi.org/10.26503/todigra.v1i2.13
9. C. Bateman and R. Boon, *21st Century Game Design (Game Development Series)*. Charles River Media, Inc., 2005.
10. L. E. Nacke, C. Bateman, and R. L. Mandryk, "BrainHex: Preliminary Results from a Neurobiological Gamer Typology Survey," Berlin, Heidelberg, 2011, pp. 288-293: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-24500-8_31
11. N. Yee, "The demographics, motivations, and derived experiences of users of massively multi-user online graphical environments," *Presence: Teleoper. Virtual Environ.*, vol. 15, no. 3, pp. 309-329, 2006.
12. G. F. Tondello, R. R. Wehbe, L. Diamond, M. Busch, A. Marczewski, and L. E. Nacke, "The Gamification User Types Hexad Scale," presented at the Proceedings

of the 2016 Annual Symposium on Computer-Human Interaction in Play, Austin, Texas, USA, 2016.
13. L. Diamond, G. Tondello, A. Marczewski, L. Nacke, and M. Tscheligi, *The HEXAD Gamification User Types Questionnaire: Background and Development Process*. 2015.
14. R. Bartle, "Hearts, clubs, diamonds, spades: Players who suit MUDs," *J. MUD Res.*, 1996.
15. C. Bateman, R. Lowenhaupt, and L. Nacke, *Player Typology in Theory and Practice*. 2012.
16. N. Lazzaro, *Why we Play Games: Four Keys to More Emotion without Story*. 2004.
17. A. Marczewski, *User Types HEXAD*. 2015, pp. 65-80.
18. L. V. Berens, *Understanding yourself and others: an introduction to temperament*. Telos Publications, 2000.
19. R. Alsawaier, "The effect of gamification on motivation and engagement," *International Journal of Information and Learning Technology*, vol. 35, no. 1, pp. 56-79, 2018. https://doi.org/10.1108/IJILT-02-2017-0009
20. B. Taspinar, W. Schmidt, and H. Schuhbauer, "Gamification in Education: A Board Game Approach to Knowledge Acquisition," *Procedia Computer Science*, vol. 99, pp. 101-116, 2016/01/01/ 2016.
21. A. Marczewski, *Even Ninja Monkeys Like to Play: Gamification, Game Thinking and Motivational Design*. CreateSpace Independent Publishing Platform, 2015.
22. B. Gil, I. Cantador, and A. Marczewski, "Validating Gamification Mechanics and Player Types in an E-learning Environment," Cham, 2015, pp. 568-572: Springer International Publishing.
23. N. Yee, "Motivations for Play in Online Games," *Journal of CyberPsychology and Behavior*, vol. 9, pp. 772-5, 2007.
24. D. Kotsopoulos, C. Bardaki, S. Lounis, and K. Pramatari, "Employee Profiles and Preferences towards IoT-enabled Gamification for Energy Conservation," *International Journal of Serious Games*, vol. 5, no. 2, pp. 65-85, Jun 2018.
25. B. Kim, *Designing Gamification in the Right Way*. 2015, pp. 29-35.
26. G. F. Tondello, A. Mora, and L. E. Nacke, "Elements of Gameful Design Emerging from User Preferences," presented at the Proceedings of the Annual Symposium on Computer-Human Interaction in Play, Amsterdam, The Netherlands, 2017. https://doi.org/10.1145/3116595.3116627
27. S. A. Kocadere and S. Caglar, "Gamification from Player Type Perspective: A Case Study," *Educational Technology & Society*, vol. 21, no. 3, pp. 12-22, Jul 2018.
28. F. García, O. Pedreira, M. Piattini, A. Cerdeira-Pena, and M. Penabad, "A framework for gamification in software engineering," *Journal of Systems and Software*, vol. 132, pp. 21-40, 2017/10/01/ 2017.
29. J. Hamari, J. Koivisto, and H. Sarsa, "Does gamification work?--a literature review of empirical studies on gamification," in *2014 47th Hawaii international conference on system sciences (HICSS)*, 2014, pp. 3025-3034: IEEE.
30. S. Nicholson, "A recipe for meaningful gamification," in *Gamification in education and business*: Springer, 2015, pp. 1-20. https://doi.org/10.1007/978-3-319-10208-5_1
31. B. Monterrat, É. Lavoué, and S. George, "A framework to adapt gamification in learning environments," in *European Conference on Technology Enhanced Learning*, 2014, pp. 578-579: Springer.
32. B. Monterrat, E. Lavoué, and S. George, "Adaptation of gaming features for motivating learners," *Simulation & Gaming*, vol. 48, no. 5, pp. 625-656, 2017.
33. A. D. M. Africa, F. M. M. Espiritu, C. R. V. Lontoc and R. J. M. Mendez, "International Journal of Advanced Trends in Computer Science and Engineering," *International Journal of Advanced Trends in Computer Science and Engineering*, vol. 8, no. 4, pp. 1139-1145, 2019. https://doi.org/10.30534/ijatcse/2019/22842019