

Gamification for Tourist Guide Application

Elinne Yong¹, Aslina Baharum^{1#}, Siti Hasnah Tanalol¹, Dinna @ Nina Mohd. Nizam¹, Farhana Diana Deris², Noorsidi Aizuddin Mat Noor³

¹ UXRL, Faculty of Computing and Informatics, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, MALAYSIA.

² Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, Johor, MALAYSIA.

³ UTM CRES, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, Johor, MALAYSIA.

#Corresponding author. E-Mail: aslina@ums.edu.my; Tel: +6088-320000; Fax: +6088-435324.

ABSTRACT Tourist Guide application is a mobile application that will be useful for all visitors for a holiday. This application (app) is proposed to provide visitor information about attractive places. Through the app, visitors easily find out the most attractive places by using the map as the app will recommend visitors the top destination to visit. Thus, it is important as they do not have to waste their time seeking information about the location's place and details. The less attractive of the current system affects the user engagement. Thus, the gamification elements that will be implemented in the app can provide a new way of interaction and engagement in a fun and rewarding way. The elements of gamification that will be implemented are point, reward and challenge. The challenge or mini-game, such as quizzes, will make visitors go to the location to find the answers. Not only that, but the visitors also may receive some reward based on the point they collect for each of the correct answers they give. Hence, the app was developed to provide information about the attractions to users and encourage and motivate the users who visit the places. The methodology used for developing the Tourist Guide app is prototyping. The software will be developed in a few phases, including an initial requirement, design, prototyping, customer evaluation, review and update, and final system development.

KEYWORDS: Mobile; User engagement; Attraction; Interaction; Reward

Received 17 March 2021 Revised 29 March 2021 Accepted 4 August 2021 Online 2 November 2021

© Transactions on Science and Technology

Original Article

INTRODUCTION

The term gamification appeared in 2008 (Deterding *et al.*, 2011a) and became popular in 2010 (Johnson *et al.*, 2016). Gamification refers to the use of game thinking, and game mechanics were used in gamification to engage an audience and to solve problems in a non-game context (Yu *et al.*, 2019; Deterding *et al.*, 2011a; Deterding *et al.*, 2011b) were ranged from raised brand awareness to encourage customer engagement (Xu *et al.*, 2016). A change of revolution in business has been seen because of its effect on the consumer's loyalty (Kandampully, 2015).

The researchers suggested that the reward structures, optimistic reinforcement, and feedback loops alongside mechanics such as points, challenges, levels, badges, and leaderboards must be considered to attract audiences (Kim, 2021). Others introduced simple gamification applications that can be developed quickly and easily and meet user needs, including challenges, videos, photos, quizzes, predictions, tracking actions, and social sharing (Hamed, 2017).

According to Harwood and Garry (2015), an innovative approach that the global organization's search was estimated to be 50 per cent will be used gamification by 2015. Thus, gamification uses are claimed to be successful in marketing, business, health, business, education and marketing (Wünderlich *et al.*, 2020). As described, gamification is used to engage audiences, influence their behaviour and establish a brand not in traditional gaming context but by using game mechanics in areas. Gamification can be defined as game mechanics and game design techniques in non-game contexts to design behaviours, develop skills, or engage people in innovation (Mora *et al.*, 2017).

The gaming concepts are differentiated into two different types: games via a two-dimensional chart of playing/gaming and part or whole games. Gamification using a different context in game design elements and different purposes than games can be differentiated from whole games (Deterding *et al.*,

2011b). The elements of the game (e.g., prize, challenge, badges) strengthen an individual's motivation by creating competition among the players (Aguiar-Castillo *et al.*, 2019). The aim of gamification that is applied in tourism is divided into two groups. First, to increase a behaviour change, gamification should enhance the motivation of tourists and employees. Second, gamification allows the co-creation value of tourists.

The game is used to provide good opportunities for marketing in the tourism industry. Based on co-creating personalized services, tourism that is an experienced industry (Pine & Gilmore, 2013), was increased. To develop such experiences, technological tools like gaming, smartphones and social media have been provided. One of the first to engage in new initiatives will be the travel industry (Buhalis & Law, 2008). Points for actions, badges for rewards and leader board for competition, cash prizes, discounts and other free perks are introduced and used to encourage service engagement (Baptisa & Oliveira, 2017) to give positive feedback and reinforce loyalty (Teng & Chen, 2013).

From the finding of gamification in tourism, the gamification elements applied in the tourism application are to engage users and influence user behaviour. Thus, the element gamification, such as points, rewards, levels, badges, and leaderboards, including the challenge of sharing videos, photos, quizzes, predictions, tracking actions, and social sharing, are important and should be considered in the development of the application.

RELATED WORKS

The travel and tourism sector are in the arena of communication and information technologies (ICT), and that is one of the most widespread industries (Buhalis, 2019; Buhalis & Law, 2008). Destinations around the world invested in destination management and marketing and management in the use of ICT. Gaming, the most assured information and communication technology (ICT) technology, gives advantages in many areas like tourism experiences in co-creation, entertainment, and education. Gaming can provide knowledge, experiences and increase tourist interest in the destination. To increase their interest in visiting by posing a challenge and a promising reward can be used in gamification to attract tourists (Swacha & Ittermann, 2017).

According to Xu *et al.* (2016), understanding the gameplay's motivation could be useful in designing specific games. An important contribution had been made in their study of identifying gaming tourists' motivations. Their study's findings stated that the practical information about the destination has to be collected before, during and after the visit, and socializing with other people was the main tourism gameplay motivation (Swacha & Ittermann, 2017). Their study reflected a combination of tourists' requirements and motivation based on the identified motivations (Xu *et al.*, 2016; Gaya, 2013; Nguyena *et al.*, 2020).

Gamification practices have been started by destinations and information technology (IT) companies in the last ten years (Shen *et al.*, 2020). For instance, Strayboot is an app providing a gamified guide to New York visitors where they can follow it to explore the City and share their travel experiences with others. The researcher also stated that using such an interactive map enables them to locate themselves and have fun in finding objects in gamified trips, such as Pirate Trail Geocaching Treasure Hunt and Wroclaw's Dwarfs. Also, gamified trips were used to gain attention and minimize visitors from using excessively popular sites. Play London with Mr. Bean is launched by Visit London, where players can attain vouchers and discounts for shops, restaurants and attractions.

Table 1. Review of Existing Gamification in Tourism

Industry	Company	Case description	Game mechanic/element
Airlines & Transportation	Air Canada	A gamified app that provided users with the reward (loyalty program) to every landing and take-off.	<ul style="list-style-type: none"> • Leader board • Rewards • Gifting • Progress bar • Points
Retail & Hospitality	Shopkick	Is a gamified shopping app that lets users earn points from tasks like scanning items, walking into stores and shopping. The gamification applied involves a geo-targeted method to engage locals aiming to influence buyers' behaviour via game mechanics.	<ul style="list-style-type: none"> • Points • Virtual • Currency • Rewards • Challenge
	Checkpoints	Products can be scanned by customers for exchange of checkpoints which can be used later for gift cards or virtual currency.	<ul style="list-style-type: none"> • Currency • Rewards
	Starwood SPG program	Partnership with Foursquare, where customers can claim a 250 point bonus for each check-in and chances to unlock badges.	<ul style="list-style-type: none"> • Points • Badges
	Marriott My Hotel	Design for social media game for new staff recruiting of job positions and for players familiarize with many parts of a hotel.	<ul style="list-style-type: none"> • Points • Levels • Virtual Goods
Travel	Foursquare	Mayorships can be claimed, unlock the badges, rewards such as discounts to specific retailers and special offers are provided. Users can challenge their friends via a leaderboard.	<ul style="list-style-type: none"> • Badges • Leaderboard • Real reward(discount)
	Sighter	A game of photography that will use a location-based, to win points in which players need to choose a sight then find the place and snap a photo. The description of sight can be unlocked and all the photos related to that sight can be discovered as well.	<ul style="list-style-type: none"> • Points • Sharing • Leaderboard

Table 1 shows the systematic review presented by Xu *et al.* (2016) of the concept of gamification in applying the application of gamification in tourism. It includes the analysis of the gamification motivational elements. The example of gamification elements is like points, reward, challenge, leaderboard, gifting, currency, real-reward, sharing, virtual reward and progress bar.

METHODOLOGY

There will be two phases that need to achieve the objectives of this study; Phase 1. Based on the literature review and Phase 2. Qualitative method. This method will explain the gamification element in tourism based on the systematic literature review, followed by the qualitative method. It also will explain the compiled gamification elements based on the literature that had been reviewed. All the identified elements will be used in a qualitative method used to identify the most suitable gamification elements for users that can be implemented and developed in the application. This study aims to identify elements of gamification in tourism whereby the elements will be implemented upon the

development of the Tourist Guide Application. The identification of elements of gaming is conducted through systematic literature and qualitative method. A further understanding of the value and meaning of gamification has been gained through the study to better prepare for the evaluation process. By identifying the gamification element, it would be a good guideline to develop tourist guide gamified applications.

Phase 1 - Based on the review of gamification in tour application, few findings of the gamification elements can be concluded that can be a guideline to build function (gamification element) for the application. Based on the literature review that had been reviewed, the commonly used gamification elements in tourism were obtained from different sources, which are the points, rewards, level, leaderboard, challenge, virtual reward and badges.

Phase 2 - Qualitative method can be taken through interviews, observation and other documents used in the gamified settings as qualitative data sources. The process of meaning-making through interpretation is supported by adding qualitative data sources (Rashid *et al.*, 2019).

Creating a tourist guide gamification app starts with the understanding of the target user group's information needs. The interview technique for data collection in terms of user's requirement will be carried on to identify the suitable element gamification to be built in the proposed application.

In this study, an interview session with the staff of EcoCampus Visitor Information Centre (EVIC), Universiti Malaysia Sabah (UMS) has been conducted to determine what are the users' perceptions about the mobile application and to identify which is the suitable gamification element based on finding the element of gamification in the literature that will be developed in this study later. The result from the data collection will be used to build the Tourist Guide Application.

RESULT AND DISCUSSION

Table 2 below listed the gamification element results from the literature review that had been reviewed and the qualitative method conducted with a staff of EVIC, UMS. It can be seen that the commonly used gamification elements in tourism were obtained from different sources: the points, rewards, and challenges. Therefore, all of these elements of gamification are going to be implemented in this study. The most suitable gamification elements that can be implemented in the application are the points, rewards, and challenges such as a quiz.

Table 2. List of Gamification Elements

Element	Literature
Point	(Deterding <i>et al.</i> , 2011b), (Xu <i>et al.</i> , 2016), (Baptista & Oliveira, 2017)
Rewards	(Xu <i>et al.</i> , 2016), (Sigala, 2015)
Challenges	(Xu <i>et al.</i> , 2016)

From the interview also, the gamification type of user was gained. The tourists who have come will be asked by the tour guide which type of user they do on the trip. Most of the visitors will be players type which they are motivated by extrinsic rewards. Therefore, the designed element that suits this type of user is like points and rewards. Points and rewards can be collected through completing the challenge or task. The designed challenges or tasks must not be too difficult because from the information gathered, most tourists dislike the extreme trip, which means they just one to have a

relaxing trip. Therefore, the staff had suggested the challenges will be like a simple quiz game and puzzle game. The result from the data collection will be used to build the Tourist Guide Application.

The user interface design will be based on the comparison functionalities and features of the existing tour guide that have been reviewed with the additional functionalities of gamification element that have been identified, which are the point function, reward function and the challenge/game function will have implemented in developing the user interface of the Tourist Guide Application.

The user interface design of the proposed Tourist Guide Application is shown in Figures 1 to 9. This user interface design will be going through the design of an interaction between the user and the application.

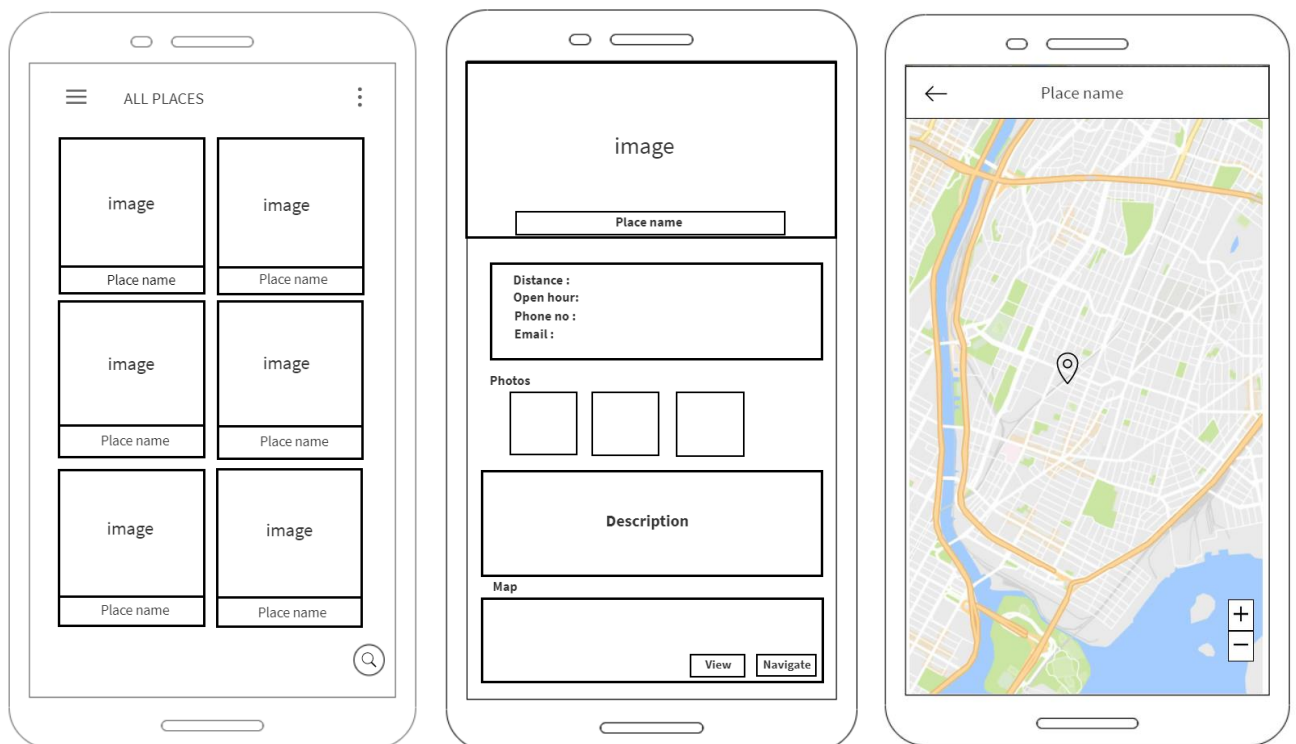


Figure 1. Homepage Interface **Figure 2. Attraction Details Page** **Figure 3. Map interface design**

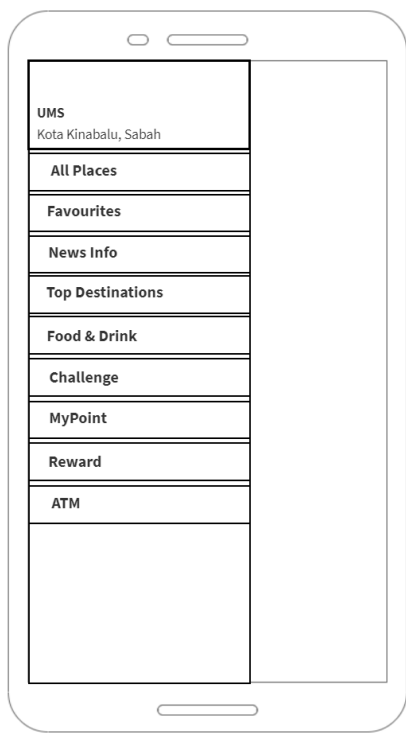


Figure 4. Navigation Drawer Interface

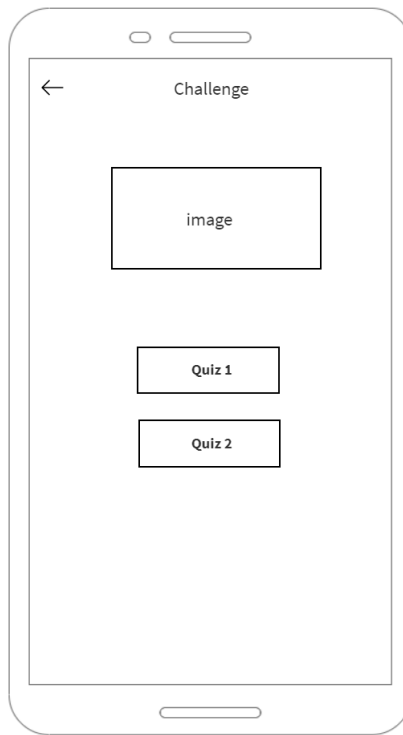


Figure 5. Challenge Interface

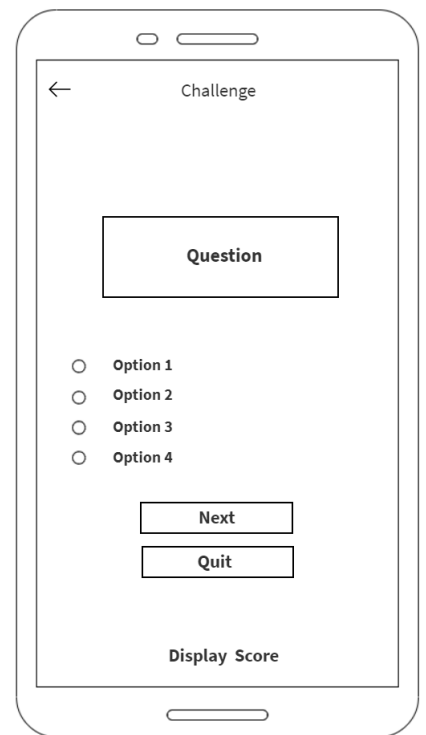


Figure 6. Quiz Details Interface

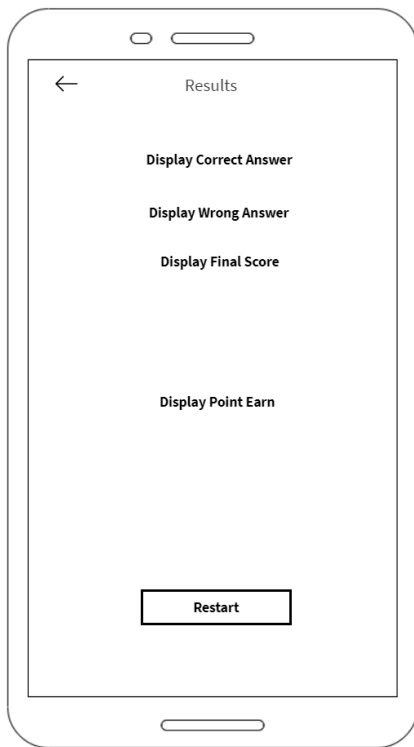


Figure 7. Quiz Results Interface

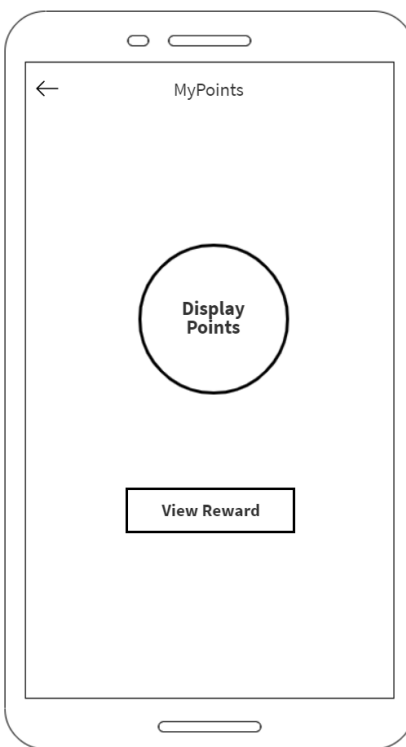


Figure 8. MyPoints Page

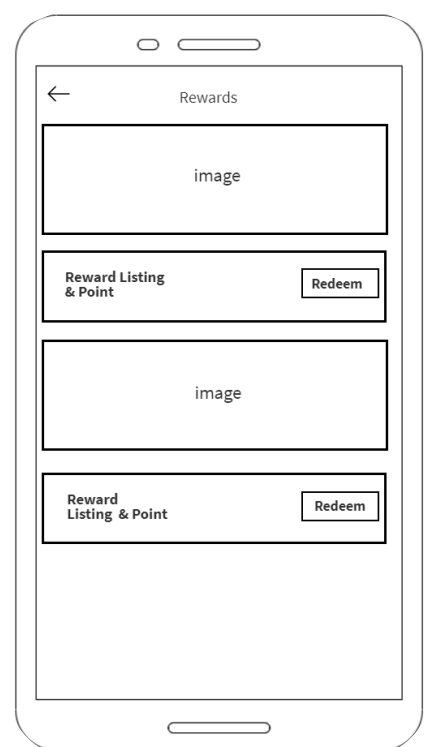


Figure 9. Reward Page

CONCLUSION

In conclusion, the objective of this study is achieved, which consists of a literature review for this study, a brief overview of the methods and strategies used for this study. Besides, a review of several existing gamification of tour guide applications had been conducted as a guideline to include the important features and functionalities with the additional gamification elements in the proposed app

for this study. Additionally, the interview section with UMS staff to gather information about the element of gamification and get the suitable gamification elements that can be implemented in this study. Therefore, the element of gamification such as point, reward and challenge have been identified. The contribution to this study is proposed gamified design elements for Tourist Guide app development that allows tourists to get to know all the interesting places. Future works will implement the gamification elements that are useful for all the visitors, attracting and engaging more visitors to the attractive place in the future. As a result of evaluating the developed app's engagement, the developed Tourist Guide app's challenges are not very engaging for the user. Therefore, future work should also improve the performance and store big data for more challenges to enhance travel and fun experience. Adding more gamification elements such as leaderboard, badges and level to make the application more competitive and can grab potential user attention to use it.

ACKNOWLEDGEMENTS

Researchers thank Universiti Malaysia Sabah (UMS) for the support of resources and facilities needed to prepare research. This study is currently funded by the SBK Grant from Universiti Malaysia Sabah (SBK0444-2018).

REFERENCES

1. Aguiar-Castillo, L., Clavijo-Rodriguez, A., Saa-Perez, D. & Perez-Jimenez, R. 2019. Gamification as an approach to promote tourist recycling behavior. *Sustainability*, 11(8), 2201.
2. Baptista, G. & Oliveira, T. 2017. Why so serious? Gamification impact in the acceptance of mobile banking services. *Internet Research*, 27(1), 118-139.
3. Buhalis, D. 2019. Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: a perspective article. *Tourism Review*, 75(1), 267-272.
4. Buhalis, D. & Law, R. 2008. Progress in information technology and tourism management: 20 years on and 10 years after the Internet - The state of eTourism research. *Tourism management*, 29(4), 609-623.
5. Deterding, S., Khaled, R., Nacke, L. E. & Dixon, D. 2011a. Gamification: Toward a definition. *Proceedings of the International Conference on Human Factors in Computing Systems (CHI 2011) Extended Abstracts Volume*. May 7-12, 2011. Vancouver, BC, Canada.
6. Deterding, S., Sicart, M., Nacke, L., O'Hara, K. & Dixon, D. 2011b. Gamification: Using game-design elements in non-gaming contexts. *Proceedings of the International Conference on Human Factors in Computing Systems (CHI 2011) Extended Abstracts Volume*. May 7-12, 2011. Vancouver, BC, Canada.
7. Gaya, E. 2013. *Understanding motivation of visitors at dark tourism sites: Case study of August 7th Memorial Park, Kenya* (<https://core.ac.uk/download/pdf/38095097.pdf>.) Last accessed on 2 January 2021.
8. Hamed, H. M. 2017. Investigating the effectiveness of applying gamification on tourism websites from the customers' perspective: An exploratory study. *European Journal of Hospitality and Tourism Research*, 5(4), 1-27.
9. Harwood, T. & Garry, T. 2015. An investigation into gamification as a customer engagement experience environment. *Journal of Services Marketing*, 29(6/7), 533-546.
10. Johnson, D., Deterding, S., Kuhn, K. A., Staneva, A., Stoyanov, S. & Hides, L. 2016. Gamification for health and wellbeing: A systematic review of the literature. *Internet Interventions*, 6, 89-106.

11. Kandampully, J., Zhang, T.(C). & Bilgihan, A. 2015. Customer loyalty: a review and future directions with a special focus on the hospitality industry. *International Journal of Contemporary Hospitality Management*, 27(3), 379-414
12. Kim, S. 2021. How a company's gamification strategy influences corporate learning: A study based on gamified MSLP (Mobile social learning platform). *Telematics and Informatics*, 57, 101505.
13. Mora, A., Riera, D., González, C. & Arnedo-Moreno, J. 2017. Gamification: a systematic review of design frameworks. *Journal of Computing in Higher Education*, 29(3), 516-548.
14. Nguyen, Q., Nguyen, H. & Le, T. 2020. Relationships among novelty seeking, satisfaction, return intention, and willingness to recommend of foreign tourists in Vietnam. *Management Science Letters*, 10(10), 2249-2258.
15. Pine, B. J. & Gilmore, J. H. 2013. The Experience Economy: Past, Present and Future. In: Sundbo, J. & Sørensen, F. (Eds). *Handbook on the Experience Economy*. Edward Elgar Publishing.
16. Rashid, Y., Rashid, A., Warraich, M. A., Sabir, S. S. & Waseem, A. 2019. Case study method: A step-by-step guide for business researchers. *International Journal of Qualitative Methods*, 18, 1609406919862424
17. Shen, Y. S., Choi, H. C., Joppe, M. & Yi, S. 2020. What motivates visitors to participate in a gamified trip? A player typology using Q methodology. *Tourism Management*, 78, 104074.
18. Sigala, M. 2015. The application and impact of gamification funware on trip planning and experiences: the case of TripAdvisor's funware. *Electronic Markets*, 25(3), 189-209.
19. Swacha, J. & Ittermann, R. 2017. Enhancing the tourist attraction visiting process with gamification: Key concepts. *Engineering Management in Production and Services*, 9(4), 59 - 66.
20. Teng, C. I. & Chen, W. W. 2014. Team participation and online gamer loyalty. *Electronic Commerce Research and Applications*, 13(1), 24-31.
21. Wunderlich, N. V., Gustafsson, A., Hamari, J., Parvinen, P. & Haff, A. 2020. The great game of business: Advancing knowledge on gamification in business contexts. *Journal of Business Research*, 106, 273-276.
22. Xu, F., Tian, F., Buhalis, D., Weber, J. & Zhang, H. 2016. Tourists as mobile gamers: Gamification for tourism marketing. *Journal of Travel & Tourism Marketing*, 33(8), 1124-1142.
23. Yu, R., Cao, J., Liu, R., Gao, W., Wang, X. & Liang, J. 2019. Participant incentive mechanism toward quality-oriented sensing: understanding and application. *ACM Transactions on Sensor Networks*, 15(2), 1-25.