Effects of Gamification in Crowdsourcing Tasks: Understanding User Expectancy, Intentions, and Engagement

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ABSTRACT

The application of gamified elements and designs in non-gaming contexts is an emerging trend in recent years. This process of integrating game mechanics and its virtual reward system in crowdsourcing tasks are commonly termed "gamification". Previous empirical studies have shown that gamification may afford increased engagement and enhanced motivation. However, despite the abundance of studies on motivation affordances and behavioral outcomes of gamification, there was a lack of studies on the underlying confounding factors such as the qualities of users.

This study explored the effects of gamification in crowdsourcing tasks of restaurant reviewing by revealing theoretically the relations between gamification and users' prior experience with their expectancies and intentions. To provide a more coherent study, we extended our research by measuring the level of user engagement as an assessment of the quality of user experience on the gamified crowdsourcing task. This paper discussed the results of an online experiment (N =60 participants) that involved restaurant reviewing tasks which were followed by an online questionnaire. Although the results suggest that a gamified app has a greater effect on user's intention to use and motivation to contribute, no significant change in user expectancies and engagement was found when compared to the non-gamified version. Major findings from this research indicate that gamification and user prior experience did indeed influence their acceptance of crowdsourcing tasks. Still, the effects are reliant on the gamified elements implemented, incentives involved, as well as the users using it. The implications of the findings are discussed in this paper.

Author Keywords

Gamification, Crowdsourcing, Prior Experience, Effort Expectancy, Performance Expectancy, Behavioral Intention, User Engagement.

INTRODUCTION

There are multiple representations of crowdsourcing initiatives across a variety of domains for instance healthcare, journalism, art, investments, and politics (de Vreede et al., 2013). Implementing gamification within crowdsourcing tasks such as restaurant reviewing as an effort in promoting long-term usage is a trend that is emerging in recent years. Generally, crowdsourcing systems attract participants via monetary incentives (Goh et al., 2017). Gamification may also translate into an unethical contract that claims effort without any compensation (Yoo et al., 2017). However, literature reviews on existing empirical studies suggest that gamification is indeed effective, but with some caveats exist. Many quantitative studies to date showed positive effects in only a portion of the premeditated relations between the gamified elements and the designated events (Hamari et al., 2014). This calls for a deeper investigation of the user's perception of gamification implementation to understand if gamification is an appealing factor that encourages contribution, which could result in better use of gamification in crowdsourcing tasks. Hamari et al. also suggested that sporadic usage may not harmonize so well with the persistent gamified affordances as the users may not have sufficient engagements with the app to build interests in them. Hence, user prior experience could have relative effects on the relevant expectancies as well.

In this research, the Technology Acceptance Model (TAM) (Davis, 1989) that is widely adopted in information systems (IS) research serves as a conceptual groundwork to perceive user's adoption of technology. TAM proposes that performance and effort expectancies establish user's notion and mindset approaching a technology that subsequently justifies their intention to use. More specifically, a user's level of acceptance towards technology is based on two constructs: perceived usefulness and perceived ease of use. This model is selected in this research where the fundamental focus is on users' perception and expectancies on the crowdsourcing technology we have chosen in this study — restaurant reviewing app.

Perceived usefulness and effectiveness are often investigated as psychological outcomes and regarded to be crucial factors for the consistent use of diverse systems. Behavioral outcomes such as measurement of the number of contributions to a system, use intentions, willingness to use, and intentions to repeating usage are among the more commonly studied aspects (Koivisto & Hamari, 2019). In this research, we will also be exploring the concept of user engagement to study the psychological perspective of users who either has prior experience in the task or not. With regard to human-computer interaction, engagement is having the capacity to engage and sustain engagement in online systems and developing pleasurable results to evoke user inquiry and participation (O'Brien H.L., 2017). To this end, the User Engagement Scale Short Form (UES-SF) by O'Brien et.al. was adapted in our experiment to measure the level of user engagement.

PROBLEM STATEMENT

Research Objectives

With the increasing adoption of gamification in crowdsourcing initiatives, it is imperative to investigate whether gamified applications have effects on the user expectancies and intentions. The concept regarding engagement is also being investigated to explore the user's perception in engaging with the gamified crowdsourcing task. The specific objectives of this research are:

How gamification and user prior experience

1. Influence user's performance and effort expectancies of crowdsourcing reviewing app.
2. Influence user's intentions to use and recommend crowdsourcing reviewing app.
3. Influence user's engagement with crowdsourcing reviewing app.
4. Influence user's numbers of contributions with crowdsourcing reviewing app.
5. Influence user's expectation with crowdsourcing reviewing app.

Research Gaps

One of the shortcomings in current empirical research is that contexts like gamified restaurant reviewing in the crowdsourcing domain which progressively calls for engagement and collective concepts have not yet captivated much concern of researchers to a significant degree. Current studies mostly focused on individual game affordances in existing mobile applications, but a comparative study on gamified and non-gamified versions of flagship applications like Google Maps is not frequently being experimented with. In regard to crowdsourcing, gamification is used to foster user engagement, increase user motivation so users would be motivated to participate and be immersed in the activity. Engagement has been identified as a major aspect in comprehending generic user behavior and the overall efficacy of intention or task-oriented behavior among digital environments (Wiebe et al., 2014). However, user engagement attributes are not commonly being discussed in previous research related to gamification.

Previous works on user's motivational affordance suggested that there are indeed differences when people interact with game-like systems (Hamari & Koivisto, 2014). Hamari et. al. emphasized there was a lack of studies on the underlying confounding factors such as the qualities of users. In this research, aspects such as user prior experience and engagement in crowdsourcing tasks are taken into account, differing and bridging the gaps of previous empirical works.

LITERATURE REVIEW

User Prior Experience

User prior experience is defined as a user's degree of knowledge on a particular domain (Sweller et al., 2011). As Sweller et al. (2011) suggest, users with prior experience, or experts, are likely influenced by "activated schemas" developed from their past engagements and would be more attached to their mental representations upon encountering familiar situations.

Likewise, Karahanna et al. (1999) discovered that with increasing experience, the user's mental outlook towards a particular task became more influential whereas their notions towards social norms became less crucial. User prior experience was included as a supplementary factor in this research as the crowdsourcing reviewing tasks involves both participant's individual experiences with crowdsourcing and gamification influences).

User Expectancy

Effort Expectancy

Effort expectancy indicates the extent of fluency when users interact with a given system (Venkatesh et al., 2012). In regard to restaurant reviewing crowdsourcing tasks, it is related to the extent of ease of writing reviews. The concept of effort expectancy is related to perceived ease of use from TAM, which suggests that when the user feels the system is effortless to utilize, they would have a higher intention to use the system (Davis, 1989).

Users find it easier and more enjoyable to perceive the system's contents, information, and data when interacting through gamified elements (Rodrigues et al., 2016). Not many researches have demonstrated the significance of gamification on effort expectancy of crowdsourcing tasks. Still, research on the adoption of gamification on e-banking system showed that game elements and mechanics developed on the system positively influence the perception of ease of use (Rodrigues et al., 2016). Also, user prior experience with the system could influence the effort expectancy, since that users who have experience using the system would feel that the system is effortless to utilize than those without an experience (Hackbarth et al., 2003). Hence, it is hypothesized that:

H1. Effort expectancy is likely <u>higher</u> for gamified applications than non-gamified ones.

H2. Effort expectancy is likely <u>higher</u> for users with prior experience than those without.

Performance Expectancy

Performance expectancy indicates to the extent where a user considers adopting a system that can aid in their task accomplishment (Venkatesh et al., 2012). With regards to restaurant reviewing, performance expectancy can indicate to a certain extent that user perceives writing restaurant reviews will bring benefits to both the individuals and community. It is related to the perceived usefulness from TAM, which suggests that the users are more inclined to adopt a system when they believe the system is useful to them (Davis, 1989).

Likewise, prior study shows that adopting gamification strengthens user's intention to use applications (Baptista & Oliveira, 2017), but the effects of the motivational system may diminish as the user become more experienced with the system (Sung et al., 2015) due to repetitive activity and lack of fresh novelty, resulting in counter-performance. Also, the study suggests that users could be experiencing novelty effects from gamification, and the perceived usefulness of the applications diminish as they continue to use them (Koivisto and Hamari, 2014). Therefore, the following hypotheses are proposed:

H3. Performance expectancy is likely <u>higher</u> for gamified applications than non-gamified ones.

H4. Performance expectancy is likely <u>lower</u> for users with prior experience than those without.

<u>User Intentions</u>

Intention to Use

Gamification elements and perceived enjoyment positively influence user intention to use the system (Rodrigues et al., 2016; van der Heijden, 2003). Games are designed to provide entertainment in particular, rather than utilities, and it offers a desirable experience to users and motivates them to be engaged in the activity with exceptional immersion and period. Hence, when a game design is applied to non-game services and applications, users can perceive the system as more engaging, motivating, and enjoyable (Deterding et al., 2011). Apart from satisfying individual active participants with the gamification features, it is also crucial for those features to provide forms of continuous engagements via scoreboards (cooperative or competition) to enlist new participants through channels like participant's advocacy (Morschheuser et al., 2019). Therefore, it is hypothesized that:

H5. Intention to use is likely <u>higher</u> for gamified applications than non-gamified ones.

H6. Intention to use is likely <u>higher</u> for users with prior experience than those without.

Intention to Recommend

In crowdsourcing systems, it is prevailing that participants would benefit from a larger pool of members as it would increase the long-term usefulness, credibility, and value of their personalized gamified elements (Geiger & Schader, 2014). This could result in an interdependent relationship in which active participants who are engaged with the gamification features to have extensive usage and recommend the system willingly (Morschheuser et al., 2019). Furthermore, with the aid of social media nowadays, initiating recommendations require simply one step more (Naranjo-Zolotov et al., 2019). Also, users who are willing to accept current technologies are more inclined to adopt a system (Leong et al., 2013), as well as recommending it to other potential users (Miltgen et al., 2013; Oliveira et al., 2016; Talukder et al., 2019).

Research also shown by adopting gamified elements on the banking system has indicated that user intention to recommend a system is more compelling when the system is more gamified due to intriguing features (Rodrigues et al., 2016; Rahi & Ghani, 2019). Hence, we expect gamification to positively influence user intention to use along with the intention to recommend crowdsourcing tasks too, leading to the following hypotheses:

H7. Intention to recommend a system is likely <u>higher</u> for gamified applications than non-gamified ones.

H8. Intention to recommend a system is likely <u>higher</u> for users with prior experience than those without.

User Engagement

An objective of gamification is to deepen user's level of engagement with gamified mechanics such as points, progress bars, and badges, by building ownership and generating goals while engaging with tasks (Pavlus, 2010). Such game design elements enable non-gaming apps to be more engaging, exciting, and enjoyable (Deterding et al., 2011). Also, quantitative data shows that gamification can captivate, inspire, invite, and retain users (Kuo & Chuang, 2016).

During the period of engagement, when users are immersing and investing themselves in the activities (O'Brien & Toms, 2008), they should be informed of what to expect next; Feedbacks are strong motivators that capture focused attentions evoke anticipation to prolong engagement while maintaining the flow of participation and could also be reinforced with user prior experience (Csikszentmihalyi, 1990).

Disengagements and reengagements are also likely to occur as activities like crowdsourcing reviewing tasks are progressive, indicating a range of levels in engaging experiences (Muntean, 2011). These levels of engagements can be affected by gamified elements like progress bars or prompts (i.e. participants may be more engaged to contribute when being informed about approaching a certain new badge or a level). These elements serve as Control, where participants formulate perceived usability and feel in charge of the interfaces (O'Brien & Toms, 2008); Novelty, where participants seek curiosity and aesthetic appeals towards fresh and new progressions (Huang, 2003); and other Reward Factors that provide motivations every so often (Aboulafia, 2004). Therefore, it is hypothesized that:

H9. User engagement is likely <u>higher</u> for gamified applications than non-gamified ones.

H10. User engagement is likely <u>higher</u> for users with prior experience than those without.

Number of Contributions

User participation level with a web service is commonly measured by the contribution metrics. With regard to crowdsourcing tasks, metrics that can be used to measure crowdsourcing contributions, such as the number of likes, shares, and reviews on web pages or applications, are used to indicate the level of user participation. Hence, when the usage is higher and more frequent, the chances of user participation are higher (Lehmann et al., 2012). Thus, it can be assumed that more contributions, in this case, restaurant review crowdsourcing tasks, and user participation is positively related.

A research with regard to gamification effects on performance showed that gamification elements like points, badges, levels, and leaderboards serve as extrinsic incentives to users and increased user's performance quantity (Mekler, 2014). Therefore, the following hypotheses are proposed:

H11. Number of contributions is likely <u>higher</u> for gamified applications than non-gamified ones.

H12. Number of contributions is likely <u>higher</u> for users with prior experience than those without.

Crowdsourcing Expectation

Multiple studies on gamified crowdsourcing show that some differences exist between different configurations of crowdsourcing, but in general, gamification has a positive effect on crowdsourcing. When gamification is implemented in crowdsourcing, it promotes user's motivation, participation, and output quality (Morschheuser et al. 2017). Thus, the user can benefit and expect more from the crowdsourcing tasks when gamification is implemented.

Regarding prior user experience in crowdsourcing, the positiveness of experience is an important factor for shaping the user's view towards crowdsourcing. A previous study shows that experiencing positive social interactions during crowdsourcing has promoted user's motivation on the task, while negative experiences, such as receiving bad feedback from peers, resulted in negative outcomes regarding user's feelings towards crowdsourcing (Faullant & Dolfus, 2017). Therefore, the following hypotheses are proposed:

H13. Crowdsourcing expectation is likely <u>higher</u> for gamified applications than non-gamified ones.

H14. Crowdsourcing expectation is likely <u>higher</u> for users with prior experience than those without.

RESEARCH FRAMEWORK AND HYPOTHESES

This study focuses on whether gamification or prior user experience in crowdsourcing tasks affects user expectancy including effort expectancy and performance expectancy, user intentions including intention to use and intention to recommend, user engagement, number of contributions, and crowdsourcing expectation. Figure 1 shows the schematic representation of the hypothesis.
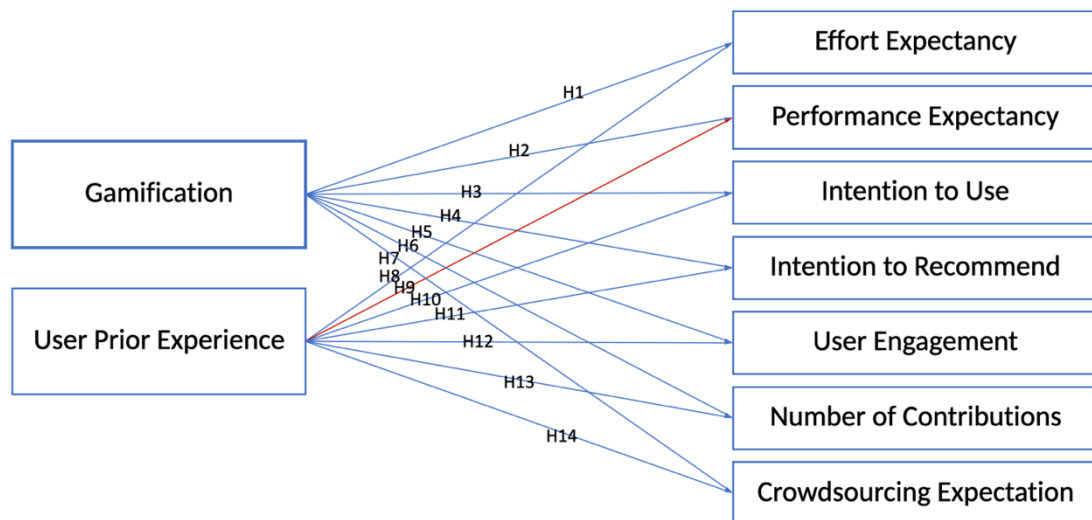

Figure 1. Research Model

METHODOLOGY

Scope of the Research

The research was conducted over the course of one semester, with two data collection methods that consisted of an online experimental design that involves restaurant reviewing tasks using the Google Maps App, followed by an online questionnaire, over a period of 2 weeks with the inclusion of buffering time.

Both data collection methods were carried out online not only to address the ongoing COVID-19 situations but also to ensure a decent number of participants and data collection in a structured and undemanding way, including the offering of a small token of appreciation. Besides, online data collection will aid in filtering participants to have the technological knowledge to experience crowdsourcing tasks via online or mobile applications, ruling out technology accessibility as an extraneous variable.

Sampling Design

A mix of convenience and random sampling were used for the choice of our study population, with participants consciously recruited among our social circle with half of them having prior experience in contributing crowdsourcing contents online and half of them without. Subsequently, they were then random assigned via an online random picker to be allocated to either a gamified or non-gamified version of the Google Maps app for the restaurant reviewing experiment.

A total of 60 participants were gathered. There was no incomplete participation, all participants have fully participated in both the online restaurant reviewing experiment and questionnaire, allowing for all the data collected to be utilized for the analysis. Table 1 below presents a summary of the participants' demographics.

Demographics	Dimension/Measure	Number (n)	Percentage (%)
Gender	Male	31	51.67
	Female	29	48.33
Age Group	21 - 25	7	11.67
	26 - 30	35	58.33
	31 - 35	13	21.67
	36 & Above	5	8.33
Education	Primary School and Below	0	0.00
	Secondary School	0	0.00
	Junior College or Diploma	6	10.00
	Bachelor's Degree	40	66.67
	Master's Degree and Above	14	23.33
Employment Sector	Advertising, Design and Media	5	8.33
	Building and Construction	3	5.00
	Business and Finance	4	6.67
	Computer Science and Engineering	33	55.00
	Education	4	6.67
	Others	11	18.33

Table 1: Demographics of Participants

Research Design

As mentioned, the research consisted of an online restaurant reviewing experiment followed up questionnaire serving as a second triangulation evaluation to collect the necessary data. Both the quantitative data collection methods are to be distributed and evaluated entirely online to the participants.

Prior to the actual deployment of both data collection methods, a pilot study was performed with 8 participants to validate the entire process of our research design. These participants were particularly recruited with and without prior experience in crowdsourcing tasks and allocated with both gamified and non-gamified accounts to ensure more uniform chances of identifying any jargons related to crowdsourcing, and any vagueness that might lead to any unambiguity and clarity of the instruction of the experimental design and question items.

The restaurant reviewing experiment was carried out using the Google Maps app (Appendix A). It was chosen for this experiment as it offers both gamified and non-gamified versions of the app, which was ideal and appropriate for this two-group experimental design to ensure that Gamification was the only difference between the two versions of the app. The gamified version was enabled with a 'Local Guide' feature where reviewers are given points and levels for their contributions, while the non-gamified version did not have this feature enabled. Participants were given anonymous Google Maps accounts for the experiment to enable us to get the right mix of participants with gamified accounts (Experimental group) versus non-gamified accounts (Control group). It was known that anonymous accounts and remunerations might have effects on the quality of reviews, however, all of the participants would have an equal chance of being affected, thus canceling the issues out.

With the sampling design mentioned above, random assignment was performed via an online random picker to ensure equal chances of allocating to either the gamified or non-gamified accounts, and according to their prior experience in crowdsourcing tasks. As result, out of the total 60 participants, 30 were assigned to gamified and non-gamified accounts each, and within that, 15 were with prior experience while 15 were without, respectively.

Two different sets of instructions (Appendix B & C) were designed specifically for both participants with either gamified or non-gamified accounts, with the differences of additional gamified elements guidelines and explanations in the instructions for the participants assigned to the gamified version of the app. Participants were instructed to perform restaurant reviewing tasks, over an equal period of 1 week. In order to prevent and address the ethical issues of defamation to restaurant businesses due to the influx of reviews of this experiment, participants were notably informed and have consented that their reviews given should be honest and truthful with regards to their personal experiences that the restaurants have provided.

The experimental design was only concerned with the output quantity such as the Number of Contributions and output quality such as the number of characters, ratings, photos, and photo tags in each review. It did not concern with which restaurant being reviewed nor whether a positive or negative review is given. This was to ensure that the individual preferences or biases do not distort or skew the data collected in any way.

The followed up online questionnaire (Appendix D) was formulated to measure variables justified from previous literature, and therefore would ensure content validity of the items and to serve as a clarification to the prior experimental design. The hyperlink of the online questionnaire was indicated to the participants together with the instruction given. Beside demographic, User Prior Experience, and Crowdsourcing Expectation questions, the other question items in the questionnaire were designed to specifically gather data relating to the following:

- Participant's Effort and Performance Expectancy in crowdsourcing tasks
- Participant's Intention to Use and to Recommend crowdsourcing tasks
- Participant's Level of Engagement in crowdsourcing tasks

A $5 Grab voucher was given to every participant at the end of the research as a token of appreciation

Design of Measurements and Questionnaire

The questionnaire comprised of three main sections and they are presented below.

1. <u>Demographic Questions.</u> This section surveyed the general characteristics related to each individual participant, namely their age, gender, education, and employment sector.

2. <u>User Prior Experience and Crowdsourcing Expectation Questions.</u> For this section, participants with prior experience in crowdsourcing tasks were questioned further to specify the frequency and types of tasks, including the applications or websites they used. Subsequently, all participants were also asked about the social media platforms they are using and their expectations towards crowdsourcing platforms. All the questions presented in this section were to have a sense of their levels of involvement and perceptions with crowdsourcing activities. This section also ensures that the random assignment of participants with or without prior experience corresponds with the number of gamified and non-gamified accounts equally as mentioned in the research design above.

3. <u>Questions determining the Dependent Variables that might be influenced by the Independent Variables of Gamification and User Prior Experience.</u> The variables of this section are summarized in Table 2 below. Cronbach's Alpha was computed to ensure Equivalence Reliability for the indicators. Each scale has exceeded a coefficient value of more than 0.7, affirming good reliability in the indicators.

Construct/ Variable	Operationalization			Cronbach's Alpha
	Dimension/ Measure	Question Item/ Indicator	Sources	
Effort Expectancy	N/A	Google Maps makes it easier for me to review restaurants.	Adapted and Revised from (Koivisto & Hamari, 2014)	0.856
		Google Maps enables me to accomplish more in terms of reviewing restaurants.		
		I feel Google Maps is effective with regards to restaurant reviewing.	Adapted and Revised from (Koivisto & Hamari, 2014; Morschheuser et al., 2019)	
		I find Google Maps to be useful for restaurant reviewing.		
Performance Expectancy	N/A	Using Google Maps does not require a lot of mental effort.	Adapted and Revised from (Koivisto & Hamari, 2014; Hamari & Koivisto, 2015)	0.789
		The interaction with Google Maps is clear and understandable.		
		I find Google Maps easy to use.		
		I find that the interface of Google Maps is intuitive to do what I want it to do.		
Intention to Use	N/A	I intend to continue using Google Maps for restaurant reviewing in the future.	Adapted and Revised from (Naranjo-Zolotov et al., 2019)	0.829
		I predict I would use Google Maps for restaurant reviewing in the future.	Adapted and Revised from (Nikou & Economides, 2017)	
		I will use Google Maps more often during the next few months.	Adapted and Revised from (Hamari & Koivisto, 2013)	
Intention to Recommend	N/A	I will recommend Google Maps to others who seek for my advice.	Adapted and Revised from (Kim & Son, 2009; Morschheuser et al., 2019)	0.828
		I will refer to people I know to use Google Maps, if asked.		
		I will recommend Google Maps as a way to review restaurants.	Adapted and Revised from (Oliveira et al., 2016; Talukder et al., 2019)	

Table 2: Question Items with Cronbach's Alpha

Construct/ Variable	Operationalization			Cronbach's Alpha
	Dimension/ Measure	Question Item/ Indicator	Sources	
User Engagement	Attention	I felt engrossed in the experience of using Google Maps.	Adapted and Revised from (O'Brien et. al., 2018)	0.762
		Time flew by while using Google Maps.		
		I was immersed in the experience of using Google Maps.		
	Usability	I felt frustrated while using Google Maps. (Reversed)		0.872
		I found Google Maps confusing to use. (Reversed)		
		Google Maps was stressful to use. (Reversed)		
	Aesthetics	Google Maps was attractive.		0.863
		Google Maps was aesthetically appealing.		
		Google Maps appealed to my senses.		
	Rewarding	Using Google Maps was worthwhile.		0.786
		My experience with Google Maps was rewarding.		
		I felt interested in using Google Maps.		

Table 2: Question Items with Cronbach's Alpha (cont'd)

All constructs in Table 2 were measured using a five-point Likert Scale varying from 1 to 5 points, where 1 signifies 'Strong Disagree', 3 signifies 'Neutral' and 5 signifies 'Strongly Agree'.

Reliability and Validity

In view of the rigor of our research, despite time and space constraints, specified efforts are allocated strategically to ensure credible standards and trustworthiness for the quality of measurements of this research.

The overall measurement reliability is examined with unambiguous conceptual definition and pilot study to attain some degree of Stability Reliability, while multiple indicators are used to measure variables in order to obtain the most precise level of measurement possible for a strong Equivalence Reliability. Additionally, Cronbach's Alpha was used as the statistical measure, to test the internal consistency of these indicators.

Followed by the overall measurement validity, which is being observed with empirical literature and constructs for Face Validity and Content Validity, while multiple indicators are used to test the fit in the case of User Engagement to achieve some extent for Convergent Validity too.

Likewise, there are no significant threats present to the Internal Validity of this research design due to the nature of the research and the aforementioned pilot study to review our research design for any errors. Having an online questionnaire allows participants to be in their uncontrolled environment where the researchers are not directly involved in the data collection, it can reduce participant's reactivity and social desirability bias. Participants are likely to be more receptive to take part in the online experiment and questionnaire rather than to attend face-to-face interviews in the views of introverted participants, traveling time, and the current stringent pandemic regulations being enforced outdoors. As for External Validity, regarding Naturalistic Generalization, users are in their most natural real-life environment when participating in the experiment and questionnaire as though they are doing their actual crowdsourcing tasks, anywhere and anytime, voluntarily and willingly.

Lastly, this research also aims to seek a balance between both the reliability and validity of the overall measurements for assuring a rigorous measure that is not far from the ideal situations, with minuscule trade-offs between both measurements.

Independent Variables: Gamification and User Prior Experience

The independent variables that were of interest for this research were the Gamification and User Prior Experience. The development of the hypotheses necessitated a divide between gamified/non-gamified accounts and users with/without prior experience in crowdsourcing tasks. The descriptive statistics of central tendency (Mean) and dispersion (Standard Deviation and Error of the Mean) are summarized in Table 3 below.

With the instructions assigned to all 60 participants to review at least 12 restaurants, both gamified accounts and users with prior experience in crowdsourcing tasks have a significant increase in the number of contributions as in comparison with non-gamified accounts and users without prior experience in crowdsourcing tasks respectively. Although the Standard Deviation is probable to have a high range, it is justified by the plausible Standard Error of the Mean and the frequency distribution in intervals of 1, per review.

Demographics	Mean	Standard Deviation	Standard Error of the Mean
Gamified Accounts	17.23	8.533	1.558
Non-Gamified Accounts	13.13	1.814	0.331
Users with Prior Experience in Crowdsourcing Tasks	16.20	8.164	1.491
Users without Prior Experience in Crowdsourcing Tasks	14.17	4.001	0.730

Table 3: Number of Contributions by Participants

ANALYSIS

Testing the Hypotheses

Each hypothesis was tested through independent samples t-test. The test results for hypotheses with gamification as independent variables are shown in Table 4 and user prior experience as independent variables are shown in Table 5. During the study, User Engagement was divided into four categories (Attention, Usability, Aesthetics, Rewarding) for fine-grained analysis.

	Hypotheses			Mean	SD	t	Sig.
H1	Gamification →	Effort Expectancy	Gamified	16.8	3.305	1.635	0.108
			Non-Gamified	15.5	2.838		
H2	Gamification →	Performance Expectancy	Gamified	17.67	2.426	1.408	0.165
			Non-Gamified	16.83	2.151		
H3	Gamification →	Intention to Use	Gamified	11.67	2.657	2.669	0.01*
			Non-Gamified	9.73	2.947		
H4	Gamification →	Intention to Recommend	Gamified	12.23	2.763	1.448	0.153
			Non-Gamified	11.3	2.2		
H5	Gamification →	User Engagement (Attention)	Gamified	8.83	2.451	-0.802	0.426
			Non-Gamified	9.3	2.037		
	Gamification →	User Engagement (Usability)	Gamified	13.5	2.03	1.916	0.06
			Non-Gamified	12.5	2.013		
	Gamification →	User Engagement (Aesthetics)	Gamified	9.97	2.414	0.123	0.902
			Non-Gamified	9.9	1.709		
	Gamification →	User Engagement (Rewarding)	Gamified	11.3	2.231	0.063	0.95
			Non-Gamified	11.27	1.856		
H6	Gamification →	Number of Contributions	Gamified	17.23	8.533	2.574	0.015*
			Non-Gamified	13.13	1.814		
H7	Gamification →	Crowdsourcing Expectation	Gamified	38.37	8.861	-1.201	0.234
			Non-Gamified	41.03	8.323		

*Result is significant at the 0.05 level (2-sided)

**Table 4. Independent t-test results for hypotheses with gamification as the independent variable**

	Hypotheses			Mean	SD	t	Sig.
H8	User Prior Experience →	Effort Expectancy	Experience	15.47	3.071	-1.723	0.09
			No Experience	16.83	3.075		
H9	User Prior Experience →	Performance Expectancy	Experience	17.07	2.303	-0.611	0.544
			No Experience	17.43	2.344		
H10	User Prior Experience →	Intention to Use	Experience	10.27	3.084	-1.142	0.258
			No Experience	11.13	2.788		
H11	User Prior Experience →	Intention to Recommend	Experience	11.63	2.58	-0.407	0.686
			No Experience	11.9	2.496		
H12	User Prior Experience →	User Engagement (Attention)	Experience	8.77	2.674	-1.035	0.305
			No Experience	9.37	1.712		
	User Prior Experience →	User Engagement (Usability)	Experience	12.27	2.303	-2.918	0.005*
			No Experience	13.73	1.507		
	User Prior Experience →	User Engagement (Aesthetics)	Experience	9.67	2.264	-0.996	0.324
			No Experience	10.2	1.864		
	User Prior Experience →	User Engagement (Rewarding)	Experience	11.27	2.196	-0.063	0.95
			No Experience	11.3	1.896		
H13	User Prior Experience →	Number of Contributions	Experience	16.2	8.164	1.225	0.227
			No Experience	14.17	4.001		
H14	User Prior Experience →	Crowdsourcing Expectation	Experience	39.53	8.593	-0.148	0.883
			No Experience	39.87	8.807		

*Result is significant at the 0.05 level (2-sided)

Table 5. Independent t-test results for hypotheses with user prior experience as the independent variable
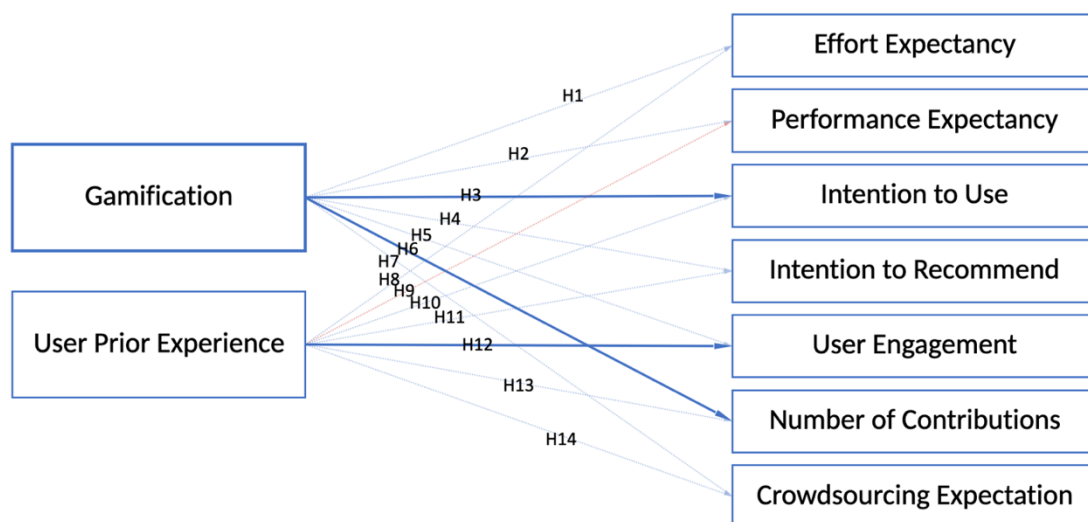
Figure 2. Research model test results

Table 4 presents the result of conducting t-test to find out the effect of gamification, and the results were significant for H3 and H6. The results support the hypotheses that users' intention to use the crowdsourcing task is likely to be higher when the task is gamified, and users are more likely to write more reviews when the task is gamified. However, the result shows that gamification of crowdsourcing tasks does not affect effort expectancy, performance expectancy, user's intention to recommend, user engagement, and crowdsourcing expectation. Therefore, hypotheses H1, H2, H4, H5, and H6 are not supported.

Table 5 presents the result of conducting t-test to find out the effect of users' prior experience with crowdsourcing tasks, and the result was significant for H12. The result showed that the users without prior experience had a higher rating for usability, more likely to be engaged in crowdsourcing tasks. Results except for the usability rating showed insignificance between users' prior experience and dependent variables. Therefore, while hypothesis H12 is supported, H8, H9, H10, H11, H13, and H14 are rejected.

DISCUSSION

This research advances the study on the effects of Gamification with regard to crowdsourcing tasks with User Prior Experience in reviewing tasks as an additional aspect we explored as an independent variable. The result suggests that gamified applications increase the user's intention to use and contribute, in terms of restaurant reviewing tasks, leaving a higher number of contributions. Against our expectations, the gamified component did not differ user's performance and effort expectancies and level of engagement by much, nor did participant's prior experience influence the effects of gamification on their expectancies, intentions, and level of engagement. Although the results deviated to an extent from what was usually perceived in the literature regarding the acceptance of Gamification system, previous studies have established that the characteristics of individuals or systems could also have effects on how the benefits of gamification are being perceived (Koivisto & Hamari, 2014).

In this study, Performance Expectancy indicates the extent that user perceives writing restaurant reviews will bring benefits to both the individuals and the community. Effort Expectancy can be specified as the degree of ease in relation to the usage and the effort and resources required to use the application. Furthermore, Ease of Use is also being regarded as an aspect that reduces negative emotive experiences like dissatisfaction, resulted from complicated user interfaces (van der Heijden,H., 2004). The non-significant results of performance and effort expectancies between the gamified and non-gamified versions of Google Maps can be explained by the similar operations and cognitive tasks involved in both versions, hence there is a lack of negatively affective experiences or huge differences in the effort required that would influence users' perceived usefulness and ease of use of the application.

One notable finding is that users with no prior experience perceived the application to have higher usability. The perceived usability can be split into the task's cognitive requirement and users' constructive feedback to the application (O'brien and Toms, 2010). We evaluated whether users felt that they could execute their desired tasks via the application cognitively and perceived control over the application. Results indicated that novel users that have not involved in reviewing tasks before finding the application relatively useful and not challenging to use. These users were able to achieve a state of flow with organized content and consistent navigation cues in the Google Maps app. Studies showed that novelty has the capacity to prolong users' attention (Pace, 2004) and focused attention to anticipate their perceived usability (O'brien and Toms, 2010), implying that when users were having fun throughout the engagement and being captivated by the application, thus perceived usability of the users would be determined by the level of involvement enacted.

Significance of Independent Variables

Understandably, a gamified app shown a positive effect on the user's behavioral intention to use the application with regard to the significance of gamification associated with use intentions. The enhanced intentions to use encouraged users to participate in the task and contribute significantly to the higher number of reviews. The research calls for attention with regard to competitive interfaces that offer users compelling challenges and capabilities for appraising their own performance, thus affording possibilities for contentment needs like proficiency, familiarity, and accomplishment (Morschheuser et al. 2019). Google Maps app's points, badges, and levels components contribute to these motivational aspects, which indirectly potentially promote user behavior. The difference in the number of contributions between gamified and non-gamified app is supported by previous research that confirmed that gamified elements like points, badges, levels, and leaderboards significantly escalate with the tag counts produced in image annotation tasks, in comparison the non-gamified settings (Mekler et al., 2015).

CONCLUSION

The purpose of this study is to inspect whether Gamification and User Prior Experience have effects on crowdsourcing tasks. The results showed that the main distinction occurs with an individual's number of contributions, implying that Gamification and User Prior Experience did indeed influence their acceptance of crowdsourcing tasks depending on the type of gamified elements and incentives. Be it the sense of accomplishment from interactive achievements or monetized rewards, users are more willing to participate and benefit from crowdsourcing tasks in gamified applications with experiences accumulated throughout the course of investments of their attention and engagement.

Implications of Research

This study shows that Gamification could be an attractive feature of crowdsourcing applications that appeals to potential Internet and mobile users as they will likely have a high intention to use gamified applications, with the perceptions of benefiting from it either via self-satisfaction or incentives obtained in return for their generous contributions. Crowdsourcing organizations and developers might be able to use the preliminary findings presented here as a critical inquiry to relevant application products or improve current crowdsourcing functionalities using Gamification to adequately target the needs of high participation from individuals.

Regarding the other variables, the significant difference in user's Intention to Use being observed for gamified accounts implies that users are indeed more drawn towards gamified applications and will be more likely to use them compare to their non-gamified counterparts. This infers that gamified attraction might be a deciding factor to entice users with the intention to use a particular crowdsourcing application or simply just giving it a try, leading users to the exploration and other discoveries of the application.

In the case of User Prior Experience, the significant difference in User Engagement's dimension of Usability being observed for users with prior experience with crowdsourcing tasks implies that experience does make a difference when it boils down to usability. General crowdsourcing applications should consist of similar interface features like rewards accumulation and contribution progress bar, and elements like text fields for comments, ratings, and even the uploads of photos as testimonies. All these provided tools can enable rich contributions and interactions between users, to evoking familiarity and improve usability across the different platforms.

An implication for researchers tackling similar types and areas of this study is to consider the types of crowdsourcing tasks for their experimental design. A possible drawback of this study is where participants were tasked to review at least a certain number of restaurants within a period of 1 week, which might be an unusual or taxing task for certain participants who do not patronize restaurants as often.

LIMITATIONS AND FUTURE RESEARCH

This study was limited by the interfaces of the application used to capture the participant's crowdsourcing decisions, in this case, the crowdsourcing task of restaurant reviewing experiment was carried out based on interfaces of the Google Maps App. Since the choices made by the participants throughout the entire reviewing process were limited and based on the particular flows, interactions, and gamified or non-gamified elements of Google Maps, hence, it might have some effect on the way they responded to the experiment. Participant's contributions in Google Maps might not reflect the same way on other crowdsourcing applications or platforms and vice versa.

The use of convenience sampling in this study was also another limiting factor. Through convenience sampling, the samples collected were within the range of our social circle and the population was largely restricted to university students and within an Asian context, hence, the findings have some leeway as a representation for Population Generalization with interest in crowdsourcing tasks. Future research can also expand to a greater and more diverse population, which may provide additional insights into whether individuals' cultural backgrounds may influence the perceptions of crowdsourcing tasks.

Lastly, the output quality of each review given by our participants was not analyzed due to time and space constraints. The output quality includes the number of characters, ratings, photos, and photo tags for each review. This may provide additional insights and correlations to the output quantity of this study. Hence, future works may also consider further examine each of our participant's reviews and its contents and make comparisons using a more qualitative method for existing statistics and secondary analysis.

ACKNOWLEDGEMENTS

REFERENCES

Aboulafia, A. L. T. (2004). Understanding Affect in Design: An Outline Conceptual Framework. Theoretical Issues in Ergonomics Science, 5(1), 4–15. https://doi.org/10.1080/1463922031000086708

Baptista, G., & Oliveira, T. (2017). Why so serious? Gamification impact in the acceptance of mobile banking services. Internet Research, 27(1), 118–139. https://doi.org/10.1108/IntR-10-2015-0295

Csikszentmihalyi, M. (1990). Flow: The psychology of optimal experience. New York: Harper & Row Publishers Inc. https://doi.org/10.1080/00222216.1992.11969876

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Q, 13(3), 319–39. https://doi.org/10.2307/249008

de Vreede, T., Nguyen, C., de Vreede, G-J,. Boughzala, I., Oh, O., & Reiter-Palmon, R. (2013). A Theoretical Model of User Engagement in Crowdsourcing. 94–109. https://doi.org/10.1007/978-3-642-41347-6_8

Deterding, S., Khaled, R., Nacke, L., & Dixon, D. (2011). Gamification: Toward a definition. Proceedings of CHI 2011 Workshop Gamification: Using Game Design Elements in Non-Game Contexts, 12–15.

Faullant, R., & Dolfus, G. (2017). Everything community? Destructive processes in communities of crowdsourcing competitions. Business Process Management Journal, 23(6), 1108–1128. https://doi.org/10.1108/BPMJ-10-2016-0206

Geiger, D., & Schader, M., 2014. Personalized task recommendation in crowdsourcing information systems – current state of the art. Decis. Support Syst. 65, 3–16. https://doi.org/10.1016/j.dss.2014.05.007

Goh, D. H., Pe-Than, E. P. P., & Lee. C. S. (2017). Perceptions of virtual reward systems in crowdsourcing games. Computers in Human Behavior, 70, 365–374. https://doi.org/10.1016/j.chb.2017.01.006

Hackbarth, G., Grover, V., & Yi, M. Y. (2003). Computer playfulness and anxiety: positive and negative mediators of the system experience effect on perceived ease of use. Information & Management, 40(3), 221–232. https://doi.org/10.1016/S0378-7206(02)00006-X

Hamari, J., & Koivisto, J. (2013). Social motivations to use gamification: An empirical study of gamifying exercise. ECIS 2013 - Proceedings of the 21st European Conference on Information Systems.

Hamari, J., & Koivisto, J. (2015). Why do people use gamification services? International Journal of Information Management, 35(4), 419–431. https://doi.org/10.1016/j.ijinfomgt.2015.04.006

Huang, M. (2003). Designing Web site attributes to induce experiential encounters. Computers in Human Behavior, 19(4), 425–442. https://doi.org/10.1016/S0747-5632(02)00080-8

Karahanna, E., Straub, D. W., and Chervany, N. L. "Information Technology Adoption Across Time: A Cross-Sectional Comparison of Fre- Adoption and Post-Adoption Beliefs," MIS Quarterly {23:2), 1999, 183–213. https://doi.org/10.2307/249751

Kim, S.S., Son, J.-Y., 2009. Out of dedication or constraint? A dual model of post-adoption phenomena and its empirical test in the context of online services. MIS Q 33, 49–70. https://doi.org/10.2307/20650278

Koivisto, J., & Hamari, J. (2014). Demographic differences in perceived benefits from gamification. Computers in Human Behavior, 35, 179–188. https://doi.org/10.1016/j.chb.2014.03.007

Koivisto, J. & Hamari, J. (2019) The rise of motivational information systems: a review of gamification research. Int J Info Manage, 45, 191–210. https://doi.org/10.1016/j.ijinfomgt.2018.10.013

Kuo, M.-S., & Chuang, T.-Y. (2016). How gamification motivates visits and engagement for online academic dissemination – An empirical study. Computers in Human Behavior, 55, 16–27. https://doi.org/10.1016/j.chb.2015.08.025

Lehmann, J., Lalmas, M., Yom-Tov, E., Dupret, G., Masthoff, J., Mobasher, B., Desmarais, M., & Nkambou, R. (2012). Models of User Engagement. In User Modeling, Adaptation, and Personalization: 20th International Conference, UMAP 2012, Montreal, Canada, July 16-20, 2012. Proceedings (Vol. 7379, pp. 164–175). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-31454-4

Leong, L.-Y., Hew, T.-S., Tan, G. W.-H., & Ooi, K.-B. (2013). Predicting the determinants of the NFC- enabled mobile credit card acceptance: A neural networks approach. Expert Systems with Applications, 40(14), 5604–5620. https://doi.org/10.1016/j.eswa.2013.04.018

Mekler, E. D., Brühlmann, F., Tuch, A. N., & Opwis, K. (2017). Towards understanding the effects of individual gamification elements on intrinsic motivation and performance. Computers in Human Behavior, 71, 525–534. https://doi.org/10.1016/j.chb.2015.08.048

Miltgen, C. L., Popovič, A., & Oliveira, T. (2013). Determinants of end-user acceptance of biometrics: Integrating the "Big 3" of technology acceptance with privacy context. Decision Support Systems, 56, 103–114. https://doi.org/10.1016/j.dss.2013.05.010

Morschheuser, B., Hamari, J., Koivisto, J., & Maedche, A. (2017). Gamified crowdsourcing: Conceptualization, literature review, and future agenda. International Journal of Human-Computer Studies, 106, 26–43. https://doi.org/10.1016/j.ijhcs.2017.04.005

Morschheuser, B., Hamari, J., & Maedche, A. (2019). Cooperation or competition – When do people contribute more? A field experiment on gamification of crowdsourcing. International Journal of Human- Computer Studies, 127, 7–24. https://doi.org/10.1016/j.ijhcs.2018.10.001

Muntean, C. (2011). Raising engagement in e-learning through gamification. Proc. 6th International Conference on Virtual Learning ICVL, 2011 323–329.

Naranjo-Zolotov, M., Oliveira, T., & Casteleyn, S. (2019). Citizens' intention to use and recommend e-participation: Drawing upon UTAUT and citizen empowerment. Information Technology and People, 32(2), 364–386. https://doi.org/10.1108/ITP-08-2017-0257

Nikou, S. A., & Economides, A. A. (2017). Mobile-Based Assessment: Integrating acceptance and motivational factors into a combined model of Self-Determination Theory and Technology Acceptance. Computers in Human Behavior, 68, 83–95. https://doi.org/10.1016/j.chb.2016.11.020

O'Brien, H. L., & Toms, E. G. (2008). What is User Engagement? A Conceptual Framework for Defining User Engagement with Technology. JASIST. 59. 938–955. https://doi.org/10.1002/asi.20801

O'Brien, H. L., Cairns, P., & Hall, M. (2018). A practical approach to measuring user engagement with the refined user engagement scale (UES) and new UES short form. The International Journal of Human-Computer Studies, 112, 28–39. https://doi.org/10.1016/j.ijhcs.2018.01.004

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. Computers in Human Behavior, 61, 404–414. https://doi.org/10.1016/j.chb.2016.03.030

Pace, S. (2004). A grounded theory of the flow experiences of Web users. International journal of human-computer studies, 60(3), 327–363. https://doi.org/10.1016/j.ijhcs.2003.08.005

Pavlus, J. (2010) The Game of Life. Scientific American, 303, 43–44.

Rahi, S., & Ghani, M. A. (2019). Does gamified elements influence on user's intention to adopt and intention to recommend internet banking? International Journal of Information and Learning Technology, 36(1), 2–20. https://doi.org/10.1108/IJILT-05-2018-0045

Rodrigues, L. F., Oliveira, A., & Costa, C. J. (2016). Does ease-of-use contributes to the perception of enjoyment? A case of gamification in e-banking. Computers in Human Behavior, 61, 114–126. https://doi.org/10.1016/j.chb.2016.03.015

Sung, H.-N., Jeong, D.-Y., Jeong, Y.-S., & Shin, J.-I. (2015). The Relationship among Self-Efficacy, Social Influence,Performance Expectancy, Effort Expectancy, and Behavioral Intention in Mobile Learning Service. International Journal of U- and e- Service, Science and Technology, 8(9), 197–206. https://doi.org/10.14257/ijunesst.2015.8.9.21

Sweller, J., Ayres, P,. Kalyuga, S., & Chandler, P. (2011). The Expertise Reversal Effect. Faculty of Education - Papers. 38. https://doi.org/10.1007/978-1-4419-8126-4_12

Talukder, M. S., Chiong, R., Bao, Y., & Hayat M. B. (2019). Acceptance and use predictors of fitness wearable technology and intention to recommend. Industrial Management & Data Systems, 119(1), 170–188. https://doi.org/10.1108/IMDS-01-2018-0009

van der Heijden, H. (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands. Information & Management, 40(6), 541–549. https://doi.org/10.1016/S0378-7206(02)00079-4

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. MIS Quarterly, 36(1), 157. https://doi.org/10.2307/41410412

Wiebe, E. N., Lamb, A., Hardy, M., & Sharek, D. (2014). Measuring engagement in video game-based environments: Investigation of the User Engagement Scale. Computers in Human Behavior, 32, 123–132. http://doi.org/10.1016/j.chb.2013.12.001

Yoo, C., Kwon, S., Na, H., & Chang, B. (2017). Factors Affecting the Adoption of Gamified Smart Tourism Applications: An Integrative Approach. Sustainability, 9, 2162. https://doi.org/10.3390/su9122162

Chosen Application

Google Maps

Google Maps (Gamified)

Points are awarded and accumulated to gain *Levels* in accordance with the numbers, quality, and types of reviews contributed, additionally, specific *Badges* are also being earned respectively.

Google Maps (Non-Gamified)

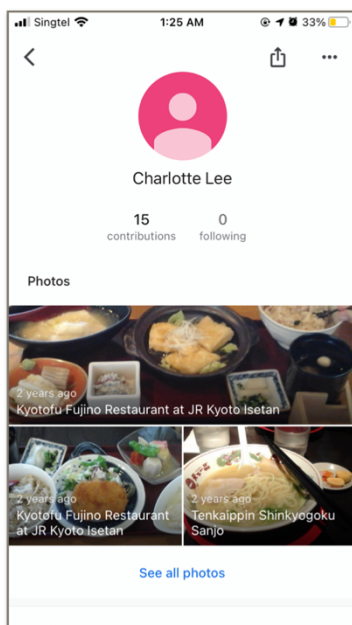Only show the number of reviews (contributions) in app and no other gamified elements.

Design

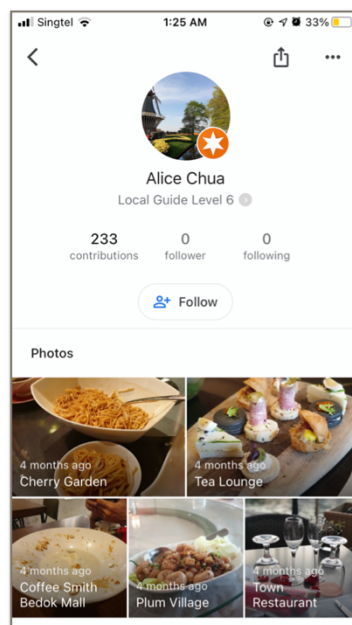A map orientated design for users to search their desired restaurants to review.

Types of Reviewing Contributions

Only rating is mandatory. Texts and photos can be added.

*Types of contributions will gain a different number of points for gamified version

User Profile

(Non-Gamified Version)

User Profile

(Gamified Version)

Points Allocation

Levels and Badges

Instructions

1) Download and install **Google Maps** from Apple App Store or Google Play Store, if you don't already have the App.

2) Sign in with your assigned Google Account at the top right corner. The account information is below:

   Assigned email: _____
   Assigned password: _____

   * Please do not share your assigned email and password to anyone.

3) Upon signing in, proceed on to the assigned tasks below.

- -

Assigned Tasks (Reviewing and Questionnaire)

Task 1 - You are to **review at least 12 restaurants** with your assigned Google Account. If you are unsure how to do this, please see instructions in the next section.

- For every review submitted, you will be awarded with points.
- Accumulated points and reviews will earn you levels and badges that can be seen by everyone.
- For more information, please see guides in the last section.

Review guidelines:
- Have a mindset whereby this account belongs to you.
- Your assigned period for reviewing is from _____ to _____ .
- Take your time to search for the ideal restaurants that you would like to review.
- You may also want to write your experiences and/or add photos to support your reviews.
- Your reviews should be informative and helpful to other readers, and thus provide sufficient levels of detail.

Task 2 - Upon done, proceed on to questionnaire at _____ .

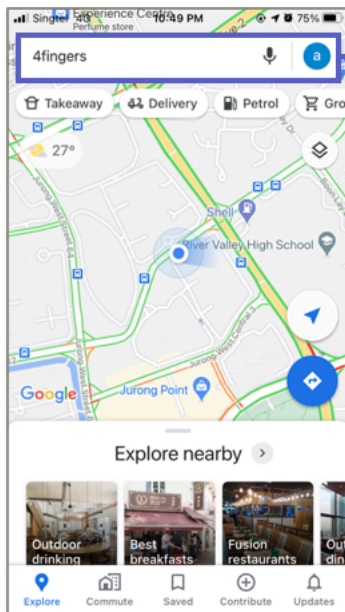Feel free to contact us you have any questions at any point in time at:
- James Sua (jsua003@ntu.edu.sg)
- Teoh Ming Miin (mteoh004@ntu.edu.sg)
- Cho Yejin (choy0070@ntu.edu.sg)

Thank you for your reviews. We appreciate your involvement and participation for this research.
*You will be notified of your remuneration via your email in the questionnaire at the end of the research.
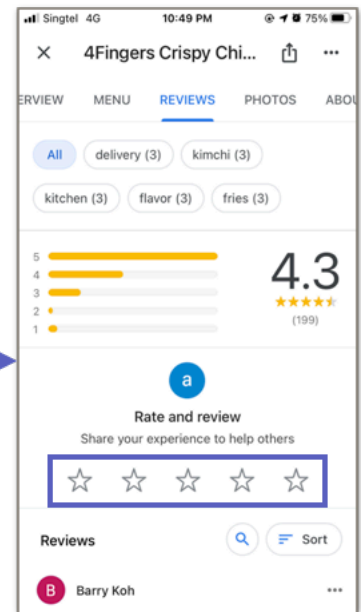
How to write a review

Method 1
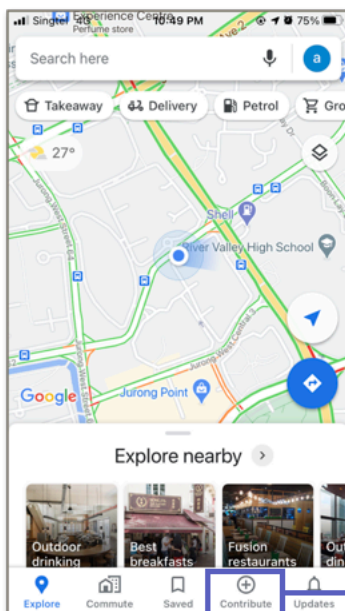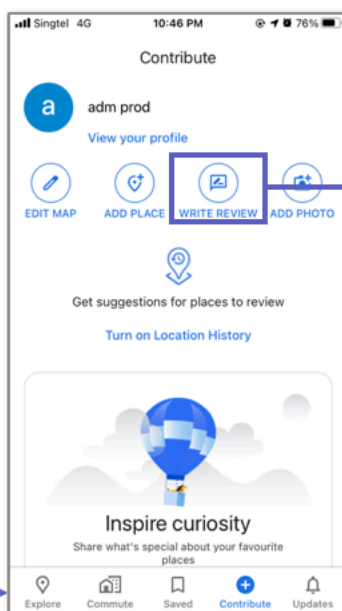

Search for the ideal
restaurant
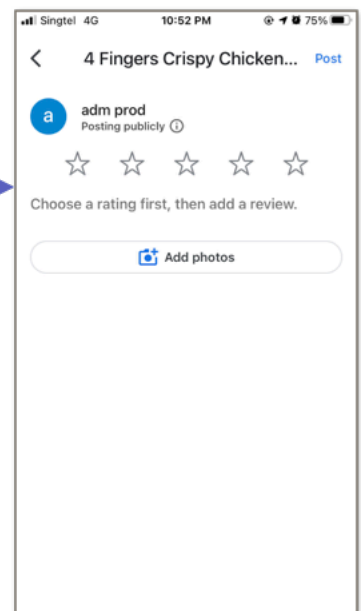

Go to "Reviews" tab

Leave a rating to add
a review

- -
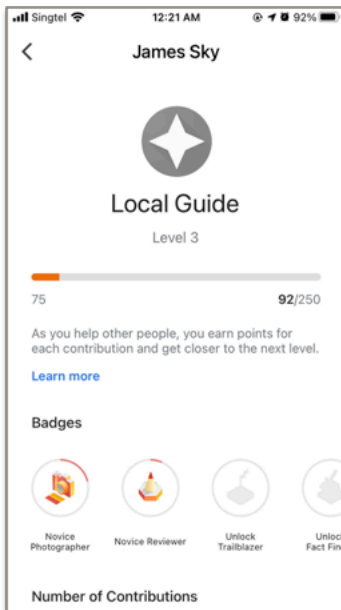
Method 2

Go to "Contribute" tab

Follow by "Write Review"

Search and review the
ideal restaurant

How to earn points, badges and level up (For Local Guide Accounts)

Progress Bar (In profile)

Levels Guide

Level	Points	Badge
Level 1	0 points	No badge
Level 2	15 points	No badge
Level 3	75 points	No badge
Level 4	250 points	✦
Level 5	500 points	★
Level 6	1,500 points	✸
Level 7	5,000 points	✳
Level 8	15,000 points	✳
Level 9	50,000 points	✴
Level 10	100,000 points	✴

Badges Requirement

Badge Type	Badge Name	Requirement
	Novice Reviewer	• Review 3 places
	Expert Reviewer	• Review 25 places • Review 5 places that are each over 200 characters • Write reviews that are liked 5 times
	Master Reviewer	• Review 100 places • Review 50 places that are each over 200 characters • Write reviews that are liked 50 times
	Novice Photographer	• Add photos of 3 places
	Expert Photographer	• Add photos of 25 places • Add 100 photos • Get over 100,000 views
	Master Photographer	• Add photos of 100 places • Add 1,000 photos • Get over 1,000,000 views
	Novice Director	• Add videos of 3 places
	Expert Director	• Add videos of 25 places • Add 100 videos • Get over 100,000 views
	Master Director	• Add videos of 100 places • Add 1,000 videos • Get over 1,000,000 views
	Novice Trailblazer	• Add the first photo of 1 place • Write the first review of 1 place • Add 1 approved place
	Expert Trailblazer	• Add the first photo of 10 places • Write the first review of 10 places • Add 10 approved places
	Master Trailblazer	• Add the first photo of 50 places • Write the first review of 50 places • Add 50 approved places
	Novice Fact Finder	• Suggest 3 approved edits • Verify 3 edits • Answer 25 questions
	Expert Fact Finder	• Suggest 25 approved edits • Verify 25 edits • Answer 250 questions
	Master Fact Finder	• Suggest 100 approved edits • Verify 100 edits • Answer 1,000 questions

Points Guide

Maps contribution	Points earned
Review	10 points per review
Review with more than 200 characters	10 bonus points per review
Rating	1 point per rating
Photo	5 points per photo
Photo tags	3 points per tag
Video	7 points per video
Answer	1 point per answer
Respond to Q&As	3 points per response
Edit	5 points per edit
Place added	15 points per place added
Road added	15 points per road added
Fact checked	1 point per fact checked
Eligible list published	10 points per published list
Description (in list)	5 points per description added

Instructions

1) Download and install **Google Maps** from Apple App Store or Google Play Store, if you don't already have the App.

2) Sign in with your assigned Google Account at the top right corner. The account information is below:

   Assigned email: _____
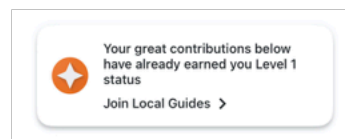
   Assigned password: _____

   * Please do not share your assigned email and password to anyone.

3) Upon signing in, proceed on to the assigned tasks below.

Assigned Tasks (Reviewing and Questionnaire)

Task 1 - You are to **review at least 12 restaurants** with your assigned Google Account. If you are unsure how to do this, please see instructions in the next section.

** Please do not activate the Local Guides feature if you happen to see it.

> Your great contributions below have already earned you Level 1 status
> Join Local Guides >

Review guidelines:
- Have a mindset whereby this account belongs to you.
- Your assigned period for reviewing is from _____ to _____ .
- Take your time to search for the ideal restaurants that you would like to review.
- You may also want to write your experiences and/or add photos to support your reviews.
- Your reviews should be informative and helpful to other readers, and thus provide sufficient levels of detail.

Task 2 - Upon done, proceed on to questionnaire at _____ .

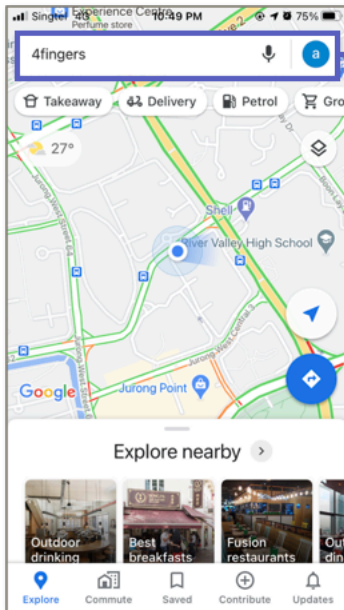Feel free to contact us you have any questions at any point in time at:
- James Sua (jsua003@ntu.edu.sg)
- Teoh Ming Miin (mteoh004@ntu.edu.sg)
- Cho Yejin (choy0070@ntu.edu.sg)

Thank you for your reviews. We appreciate your involvement and participation for this research.
*You will be notified of your remuneration via your email in the questionnaire at the end of the research.
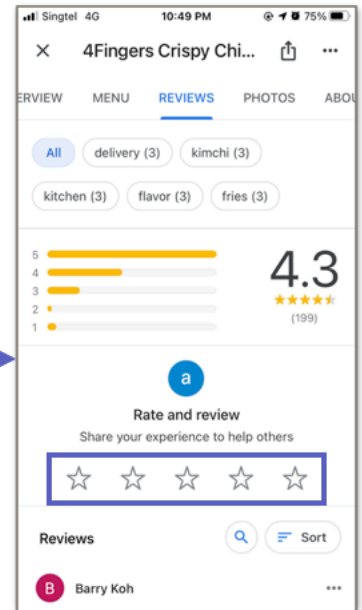
How to write a review

Method 1

Search for the ideal restaurant

Go to "Reviews" tab

Leave a rating to add a review

- -
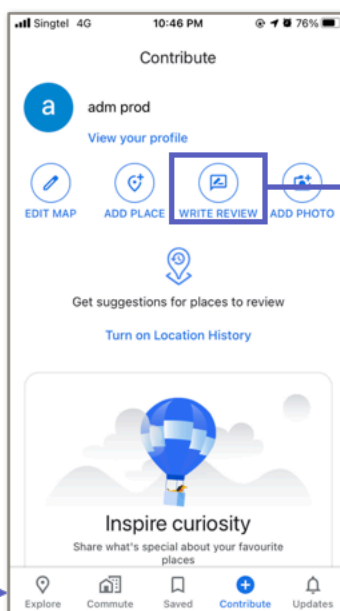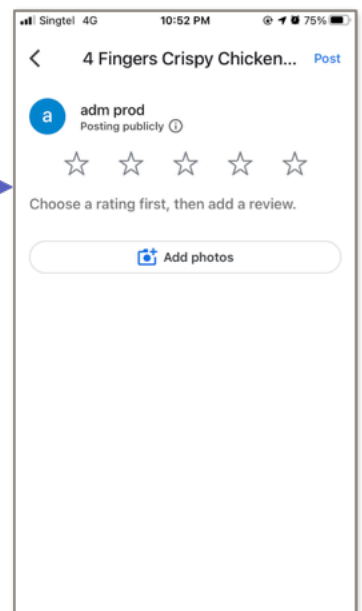
Method 2

Go to "Contribute" tab

Follow by "Write Review"

Search and review the ideal restaurant

**This questionnaire only applicable participants who have done the
Google Maps Restaurant Reviewing Task. It will take approximately 10 mins.**

I. User Demographic

1. Please specify your age.

　　Answer: _____

2. Please indicate your gender.

○ Male

○ Female

3. Please indicate your highest education qualification.

○ Primary School and below

○ Secondary School

○ Junior College or Diploma

○ Bachelor's Degree

○ Master's Degree and Above

○ Others (Please specify): _____

4. Please indicate your current employment sector.

○ Advertising, Design and Media

○ Building and Construction

○ Business and Finance

○ Computer Science and Engineering

○ Education

○ Healthcare

○ Hospitality and Tourism

○ Military and Civil Forces

○ Manufacture and Production

○ Retail and Sales

○ Transport and Logistics

○ Others (Please specify): _____

II. User Prior Experience – Part I

5. Please indicate if you have participate in crowdsourcing applications.

○ Yes

○ No (Please skip to question 8.)

6. Please indicate how often do you participate in crowdsourcing applications.

○ Daily

○ Weekly

○ Monthly

○ Yearly

7. Please indicate the crowdsourcing applications and tasks that you have participated in the past 3 months.

Crowdsourcing Application	Task

+Add Row

8. Please indicate which of the following social media application have you used.

○ Facebook

○ Instagram

○ LINE

○ Linkedin

○ Snapchat

○ TikTok

○ Twitter

○ WeChat

○ YouTube

○ Others (Please specify): _____

III. User Prior Experience – Part II

9. Please indicate a tick on your level of agreement for each statement on a scale of 1-5 that is most true for you.

1 = Strongly disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

Statements	1	2	3	4	5
To make money.					
To feel a part of an online community sharing the same interest as me.					
To use my expertise to help solve a problem.					
To help others.					
To make our society a better place.					
To make friends.					
To gain status or reputation.					
To entertain myself.					
To make increase my self-esteem.					
To learn new things.					
To advance my career.					
To join existing friends who are participating.					
To make myself feel better.					

IV. Perceptions of Google Maps for Reviewing Restaurants - Part I

10. Please indicate a tick on your level of agreement for each statement on a scale of 1-5 that is most true for you.

1 = Strongly disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

Statements	1	2	3	4	5
Google Maps makes it easier for me to review restaurants.					
Google Maps enables me to accomplish more in terms of reviewing restaurants.					
I feel Google Maps is effective with regards to restaurant reviewing.					
I find Google Maps to be useful for restaurant reviewing.					
Using Google Maps does not require a lot of mental effort.					
The interaction with Google Maps is clear and understandable.					
I find Google Maps easy to use.					
I find that the interface of Google Maps is intuitive to do what I want it to do.					
I intend to continue using Google Maps for restaurant reviewing in the future.					
I predict I would use Google Maps for restaurant reviewing in the future.					
I will use Google Maps more often during the next few months.					
I will recommend Google Maps to others who seek for my advice.					
I will refer to people I know to use Google Maps, if asked.					
I will recommend Google Maps as a way to review restaurants.					

V. Perceptions of Google Maps for Reviewing Restaurants - Part II

11. Please indicate a tick on your level of agreement for each statement on a scale of 1-5 that is most true for you.

1 = Strongly disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

Statements	1	2	3	4	5
I felt engrossed in the experience of using Google Maps.					
Time flew by while using Google Maps.					
I was immersed in the experience of using Google Maps.					
I felt frustrated while using Google Maps.					
I found Google Maps confusing to use.					
Google Maps was stressful to use.					
Google Maps was attractive.					
Google Maps was aesthetically appealing.					
Google Maps appealed to my senses.					
Using Google Maps was worthwhile.					
My experience with Google Maps was rewarding.					
I felt interested in using Google Maps.					

APPENDIX E (IRB Application Approval)

NANYANG TECHNOLOGICAL UNIVERSITY

Wee Kim Wee School of Communication and Information

Reg. No. 200604393R

16 September 2020

WKWSCI IRB Code: **CI202021S1-002**

SUPERVISOR, Assoc Prof Goh Hoe Lian, Dion

Sua Kah Yong, James

Teoh Ming Miin

Cho Yejin

WKWSCI Institutional Review Board Approval
Project Title: Effects of Gamification in Crowdsourcing Tasks: Understanding User Expectancy, Intentions and Engagement

I refer to your application for ethics approval with respect to the above project submitted on **10 Sep 2020.**

The school board has deliberated on your application and noted from your application that your research involves **Human Subjects**.

You have also confirmed that informed consents will be obtained from the participants and you have guaranteed the confidentiality of your participants' biodata obtained from them.

The documents reviewed were:
  a) IRB Application Form
  b) Epigeum Certificate of Completion
  c) Participation Information Sheet and Consent Form
  d) Compensation details

The board is therefore satisfied with the ethical considerations for the project and approves the ethics application under Exempted Review. The approval period is from **16 Sep 2020 to 15 Sep 2021**. Please use the WKWSCI IRB Code **CI202021S1-002** for all future correspondence.

The following protocol and compliances are to be observed upon WKWSCI IRB approval:

1. All research involving procedures greater than minimal risk on minors (individuals who are less than the legal age of 21 years old) requires IRB approved written Parental Consent and assent from the participant to be obtained before any research protocols can be administered. Minimal risk refers to an anticipated level of harm and discomfort that is no greater than that ordinarily encountered in daily life, or during the performance of routine educational, physical, or psychological examination.

2. Only the approved Participants Information Sheet and Consent Form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject should be given a copy of the signed consent form.

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3. No deviation from, or changes of, the protocol should be initiated without prior written WKWSCI IRB approval of an appropriate amendment.

4. The Principal Investigator should report promptly to WKWSCI IRB regarding:

   a. Deviation from, or changes to the protocol.
   b. Changes increasing the risk to the subjects and/or affecting significantly the conduct of the trial.
   c. All serious adverse events (SAEs) which are both serious and unexpected.
   d. New information that may affect adversely the safety of the subjects of the conduct of the trial.
   e. Completion of the study.

WKWSCI Institutional Review Board
On behalf of the Associate Chair-Communication and Information (Research)

(This is an auto-generated letter. No signature is required.)