

Gamified-Assessment For Learning Indonesian as A Foreign Language: Heuristic Evaluation Approach

Darmawansah¹

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Abstrak: Penilaian dalam bentuk gamifikasi belum terkeksplorasi dengan baik saat ini. Meskipun fenomena penerapan gamifikasi telah banyak diteliti dalam dunia pendidikan dan pembelajaran bahasa asing tertentu, penilaian yang berbasis game untuk menguji pembelajaran bahasa Indonesia sebagai bahasa asing telah membuat penelitian ini menjadi unik. Atas dasar itu, penelitian ini didukung oleh enam guru bahasa Indonesia yang saat ini mengajar bahasa Indonesia di berbagai negara atau wilayah. Hasil penelitian ini berupa tigabelas heuristik yang berisi serangkaian daftar item yang terkait dengan kerangka teori permainan edukatif yang disebut HEDEERS. Setiap item kemudian dievaluasi oleh responden untuk memahami bagaimana sistem dapat diterima sepenuhnya oleh pengguna. Evaluasi heuristik dan diskusi dapat mengidentifikasi aspek-aspek penting dari penilaian desain di kedua perspektif yaitu pendidikan dan permainan yang pada akhirnya akan berdampak pada pengalaman pengguna untuk belajar bahasa Indonesia dalam pendekatan pembelajaran yang lebih baik. **Kata kunci:** penilaian gamifikasi, bahasa Indonesia untuk penutur asing, evaluasi heuristik

Abstract: While the current assessment mostly repletes with paper-based or switching to online-based to see the assessment efficiency, gamified-assessment is underexplored yet. Even though the widespread of gamification phenomenon has been observed in the particular foreign language, the scarcity of game-based for assessment in learning Indonesian as foreign language forces this study to heuristically evaluate 'travelling-like' game. It aims to assess non-native students in higher education for learning Indonesian as a foreign language (BIPA). To this end, the study was supported by six Indonesian teachers who are currently teaching the Indonesian language in various countries or regions. The outcome of the study is thirteen heuristics which contains a set of checklist items related to an educational game framework called HEDEERS. Both the heuristics and the discussions can identify essential aspects of assessment design in both educational and game perspectives that will impact users experiences for learning the Indonesian language in a better approach.

Keywords: gamified-assessment, Indonesian language as foreign language, heuristic evaluation

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INTRODUCTION

The massive invention in the educational technology field has shown the development of learning tools such as gamification, game-based learning, and serious game, in particular, has revised user perception in the performance assessment and grown fastly due to students' vast influence in the learning process (Georgiou, Gouras, & Nikolaou, 2019; Orhan Göksün & Gürsoy, 2019). Previous studies argue how gamification approach could lead the terms of facilitating, motivating, engaging, stimulating, and improving learners' knowledge assets (Lopez & Tucker, 2019; Orhan Göksün & Gürsoy, 2019). Furthermore, M.Jurgelaitis et al. (2019) stated that gamification could be a powerful tool if teachers are correctly implementing within the learning process in any level of educational institutions, including higher education.

Adukaite et al. (2017) stated how higher education was found lacking both students' motivation and their learning engagements. It is related to the long-term application of traditional strategies which not answering either the issue of students motivation or upbringing of learning engagement (Bouwmeester et al., 2019; Zainuddin, Shujahat, Haruna, & Chu, 2020). Thus, gamification is introduced to improve students' motivation and engagement.

Moreover, several gamification advantages include fun and cooperative learning through narrative stories, challenges, and rewards (Hamari et al., 2016). These advantages are common viewpoint through students' eyes, other benefits profound students' critical thinking, and multi-tasking skills so teachers can track students' data to ensure the learning effectiveness through gamification (Ding, Er, & Orey, 2018). Unfortunately, the limited studies which only focused on the use of gamification for students' assessment (Bicen & Kocakoyun, 2017; Ismail et al., 2019) that used on-built apps such as Kahoot and Quizizz. The development of customized-game for learning assessment has not been studied yet. Hence, a gap exists in the previous literature for developing a gamified-assessment tool for students' performance and any other learning variables. To cope with the aforementioned issue, this study aims to determine users' perception heuristically of using *Ayok Liburan ke Indonesia* game in assessing Taiwanese higher education students who enrolled in Indonesian as a foreign language course.

Heuristic evaluation's goal is to set users' experience of a particular phenomenon (Sultan, 2018) which is the use of gamified-assessment in particular. Moustakas (2011) states the importance of primary instrument to collect data then intimately to involve every emerging dataset throughout the study.

Based on the arguments as mentioned earlier above, the study's objective was to develop a gamified-assessment which is preferred usability method to international students who are willing to learn the Indonesian language. Therefore, some well-experienced Indonesian as a foreign language teachers were employed to contribute to this study. These experts were expected to adopt their practical skills along with both theoretical knowledge and teaching experience while evaluating the gamified-assessment. Such practical skills demanded include the form of conformance in the particular design (Yeratziotis & Zaphiris, 2018), the prompt and easy evaluation of user interface, and the lively state-condition within the play.

Moreover, heuristic evaluation has inherent value and the needs of improvement which still exist (Law & Hvannberg, 2004) even though a study found its drawbacks (Frøkjær & Hornbæk, 2008). Nevertheless, the value of heuristic evaluation cannot be underestimated since the identification of the errors can be in various contexts which designers did not consider.

The *Ayok Liburan ke Indonesia* game is developed as an adventure-like game assessment. Articulate Storyline was used to design and to develop its game. The game provides several game elements such as; time user, animated-character, and else. Students are required to sign their names up while

starting the play. The scoring results are based on the achievement of each number of questions. At the end of the game, students are shown their overall result and given opportunities to review the assessment and to see players' leaderboard.

Table 1. *Ayok Liburan ke Indonesia* Game Elements

Categories	Game Elements	Descriptions
General	Instruction	Game instructions for the user at the beginning
	Progress / Feedback	Progress interface in any visited-city
	Theme	Tourism sites and traditional music
	Narrative Story	A traveller named Putri who tends to visit several cities
	Time pressure	Reducing the amount of user's time
Player	Signposting	Typing the user's name
	Points	Points are given based on a user's achievement
	Leaderboard	Showing all users' rank



Figure 1. Introduction Interface



Figure 2. Users' Challenge



Figure 3. Progress Board



Figure 4. Questions' Interface

A set of 13 heuristics was used to evaluate user' interaction and engagement through the game. It was modified based on Giang, Piatti, and Mondada' HEDEERS (2019) which is the epicentre of its heuristic evaluation for educational robotic systems. It was stated that twelve schools teachers had validated it through experiments (Giang et al., 2019). The authors initially designed fourteen principles based on literature and practical learning and teaching experiences of educators by combining the sense of playing game and learning. Therefore, HEDEERS were used in this study in which evaluators are currents Indonesian language as foreign language teachers (known as BIPA teachers).

Table 2. Modified Heuristic Scope in Hedeers

No	Heuristic	Game	Edu
1	Cognitive workload	√	√
2	Challenge	√	√
3	Adaptability	√	√
4	Interaction	√	
5	Automation	√	
6	Competitiveness	√	√
7	Feedback	√	√
8	Enjoyment	√	
9	Transparency		√
10	Active Learning		√
11	Relevance		√
12	Support reflection		√
13	Cultural literacy		√

(Adapted from Giang et al., 2019)

Furthermore, two additional short heuristic evaluation (The advantages and

disadvantage system) were given, which was furtherly discussed at the end of this study.

RESEARCH METHODS

A group of six BIPA teachers from around the world (with a range of age, age, and country/region location) was involved and participated in this study. They were asked to play the game through Articulate Online platform; then they directly went to the questionnaire to evaluate the game they played.

Table 3. Participants' Profile

Sex	Age	Teaching duration	Region / Country
T	>30	1 - 3	Uzbekistan
F	20 – 30	>3	Davao
F	20 – 30	>3	Yogyakarta
F	>30	>3	Cambodia
F	>30	>3	Germany
F	>30	>3	Taiwan

The gamified-assessment was launched in the online platform. The link was shared to a group of participants who are willing to evaluate the game. At first, HEDEERS was introduced to all participants in order to ensure their comprehension of each heuristic.

They clicked the survey button at the end of the game to open survey form. It followed by giving further instruction to emphasize and to identify usability issues related to the possible use in online learning situational classroom. It was including some students' difficulties which may encounter during the use of gamified-assessment. At the end of 5 Likert-scale questionnaires, all participants were asked to their favours and not favours towards the game they had played. The response was taken to analyze teachers' feedbacks of the device heuristically. Features and components were identified through their response. This information may not be listed during the development and its determination as described in the bar ranking of system characteristics.

Moreover, to further analysis of the use of gamified-assessment for Indonesian language learning effectively, all participants provided several perceptions both negatively and positively (Alabbasi, 2018). These perceptions were exercised using *Atlas.ti*.

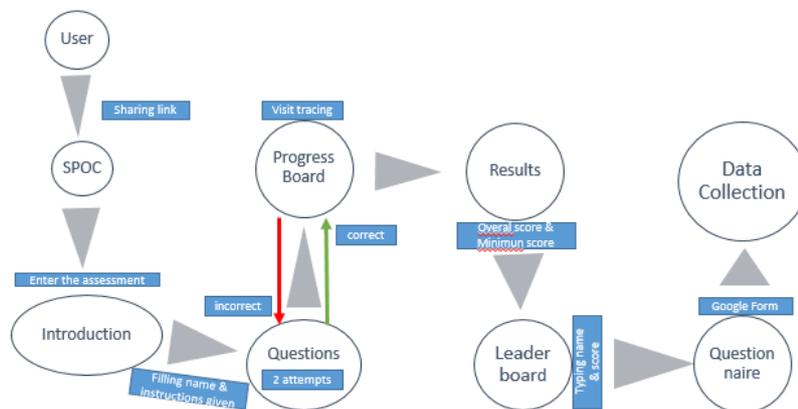


Figure 5. Flow Structure

All transcripts were scanned in the network manager to identify each perception' items and their relations. Besides, the study prepared a list of initial codes based on gamified-assessment characteristics (e.g., function, interface, content, and uniqueness). The initial lists of coding allowed us to present a scheme of content analysis comprehensively. The codes were primarily established in any deductive phases of research. In the previous study which conducted a coding analysis in learners' discussion forum (Hernández-Lara & Serradell-López, 2018), the result did provide the data not only quantitatively but also highlighted strong evidence for generic dan specific feedbacks towards the game. Thus, the same approach was made in this study.

RESULTS & DISCUSSION

Heuristic Acceptance

The first query to examine the study was participants' responses in each part of the heuristic evaluation. A group of Indonesian language teachers who are currently teaching the language in several countries and regions had provided a general acceptance of the gamified assessments heuristically. The results indicate the validity of HEDEERS by fully agree to the enjoyment item of heuristic evaluation. All participants believe that enjoyment is a significant point what learner would get while doing this assessment. The result supported previous research on how

learners full measured enjoyment in playing Edu-game (Fang, Chan, Brzezinski, & Nair, 2010). Enjoyment becomes central to play any type of games, whether the platform is online or offline. The feeling of joy was furtherly related to the perceived of the motion-based system on the gamified-assessment. The motion-based interface can increase spatial presence that learners' enjoyment is a meaningful predictor (Shafer, Carbonara, & Popova, 2011).

Following enjoyment are competitiveness, relevance, support reflection. These acceptance items are widely embraced by participants to measure the game supporting items in the assessment. The competitiveness item is one of the favours. The implementation of the educational game brings a strong argument towards the favour of competitiveness (Castro et al., 2019). However, the response time and numbers of correct answers are considered to stand students' motivations in actively participating in their learning process.

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Furthermore, some educational items are relatively supported by participants with weight agreement (i.e., cultural literacy, active learning, cognitive workload, and transparency), so are game setting items such as automation and interaction. It is related to the previous study, which argued how language literacy is likewise political language used in society (Toscano, 2011). It is due to the tighten social-historical moments in which people interact in their daily lives.

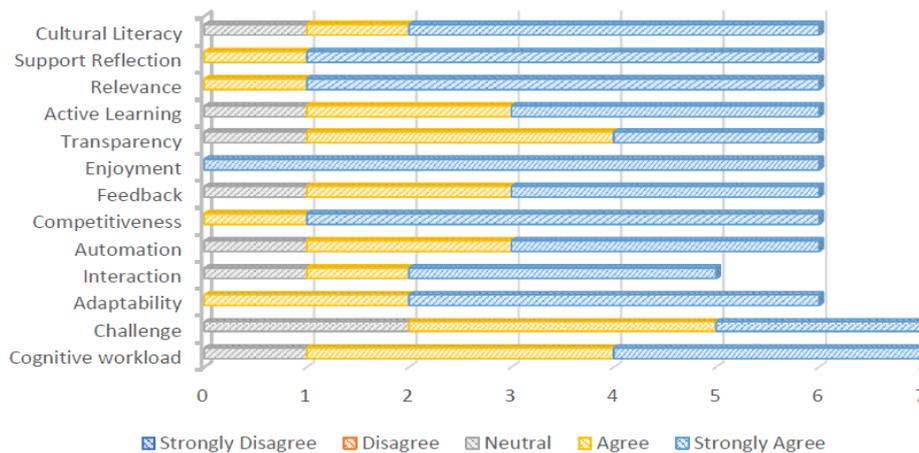


Figure 6. Participants' Acceptance

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It results in the rise of cultural messages in any popular games and education per se. In another heuristic, the cognitive workload is highly supported among participants. It is due to the challenge level, which grows in each game steps. The empirical study has been proven by Zhang et al. (2018), who found the unbeaten association between the game's challenge in each level and the variation of cognitive load. Thus, it is a rationale for

participants to opt for cognitive workload as their acceptance.

Nevertheless, the only heuristic which found the least acceptance by showing some neutral scale is a challenge. It is based on the game and educational-related literature, which both perspectives include challenge is a vital point of the game assessment. However, the gamified-assessment does not give extra challenging to the users since the aiming is travelling around the archipelago. Thus, future research would be in the proposal to investigate whether each game-related and education-related items in this heuristic evaluation apply well-equally to gamified-assessment or vice versa even though participants answered all heuristic questions. All heuristic items may need to precisely describe how the lack of clarity could be neglected among students when doing this assessment.

Perception Based on Gamified-Assessment Characteristic

Prior to the coding analysis using Atlas.ti, teachers' perceptions were analysed its network and coded for each one of them. Figure 6 beside indicates how the interface of the gamified-assessment being valued by participants.

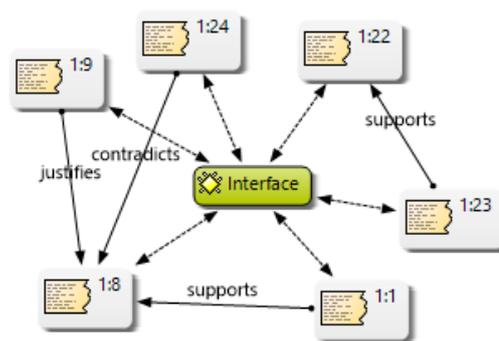


Figure 7. Perceptions in the interface

Six statements were coded to furtherly investigate teachers' respond. For example; 1:1 stated how exciting the game assessment to be used for learning Indonesian. This statement is supported by 1:8, which explain the assessment's graphic bring extra value to the user. Additionally, 1:9 justified the previous statement by mentioning the smooth accessibility when doing the test in this gamified-assessment. These generic features were more clearly observed on the participants' point of views. The analysis continuously appreciated the relationship of these features related to the learning outcomes would happen when the gamified-assessment launched. It is justified by the previous study, which showed the level of assessment competency was merely high in using the game as an intervention compared to the face-to-face situation (Fitó-Bertran, Hernández-Lara, & Serradell-López, 2014). However, 1:24 argued a contradiction statement of the lack of instruction visibilities. It might happen due to the different devices that used for playing the gamified-assessment. For brief

information, the game could be played either in PC (personal computer) or mobile device. However, we do highly recommend users to assess themselves through the PC to minimize particular errors.

In figure 7 below, eleven perceptions were coded and linked each other in order to form teachers' feedbacks toward the function in gamified-assessment.

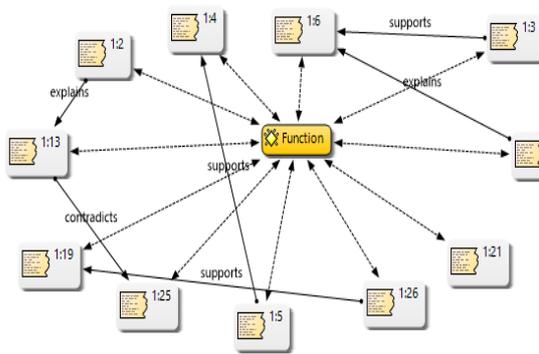


Figure 8. Perceptions in Function

The participants were involved fairly frequently by giving more than one evaluations, whether the assessment needs to be revised or not. Challenging was mentioned by 1:3 and 1:6 in sequence. This statement was furtherly explained by 1:11 how the uphold of fun that users can get while doing the game assessment. These statements are related to dealing with a very first concern of every game designers to impose the arousing competitive interest among users. The necessity to play scenario should contribute to the main viewpoint of each user.

The educational purpose was also the primary evaluation among respondents. This item is the most advocating in the gamified-

assessment. All designers should fully pay attention to the development stage. Some adjectives that game design is shown requested include; colourful, entertaining, instructional, and specific for content (Sancar-Tokmak, 2015). On the other hand, Users' anxiety while facing assessment could be reduced through this gamified-assessment. Yang and Quadir (2018) have strongly supported the statement of digital game-based learning in which extended student's anxiety to be a higher degree in experiencing the online game. Despite the fact that long duration should be taken between one answer to another, users were entertained by Indonesian traditional music in every slide of question. The previous study reflects how musical treatment conditions such as listening to music could improve the ability of perception and the daringly expression syncretic students' intelligence (Bačlija Sušić, 2019). Thus, the use of music in the gamified-assessment is believed to bring positive value towards user's cognitive load of thinking.

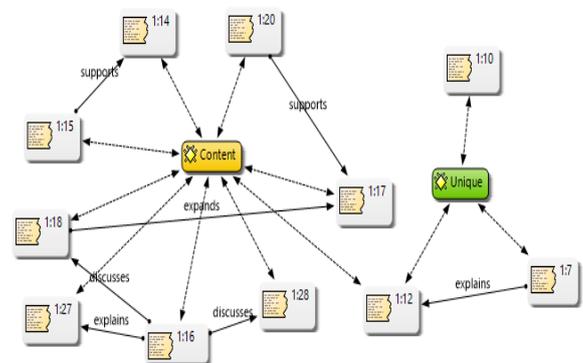


Figure 9. Perceptions of Content and Personalized Learning

Besides, figure 8 compiled two-game characters to be coded (content and personalized learning). Uniqueness represented three comments include 1:7 and 1:12, which explains each other about the use of Indonesian culture through gamified assessment. Furthermore, 1:12 was also related to the content which the assessment provided cultural literacy. Again, the goal of language learning is not only learning the language but also cultural understanding is a part of learning outcomes. It aims to recommend gamified-assessment designers to always administer music in interface interaction in terms of enhancing both learners' engagement and learning outcomes.

Some respondents argue the exciting content in the game assessment (1:14, and 1:15) even though some parts of content were incomplete and unjust which may mislead the users (1:17, 1:18, and 1:20). It is furtherly stated by 1:27 that the questions were not focused on particular language proficiency skill. Overcoming problems which related to the perceptions mentioned above was executed by giving explicit instruction, and the content should be involved two or more individuals dyad in terms of clarifying resources and learning content, so some errors and issue could be taken into account.

CONCLUSION

While the users' voices were valued, the main issues to the assessment tool were detected. When participants' acceptance and perceptions were taking firstly, some obstacles and advantages were simultaneously on the surface. We can highly propose the use of gamified-assessment in Taiwanese higher education. These recommendations which affect the design further imposed to the better improvement which aimed to offer a solution of relevant problem solving to detect user learning process in doing an assessment.

Regarding dealing with a technical issue, the designer should offer challenges as additional wanted features to the assessment. This supports could be taken into the form of decision-making mechanism or any other game mechanism which provide situational learning in gamified-assessment.

Nevertheless, this study has the limitation of future research in the same line of interest. The most limitation is the scope of data taken. Our number of participants was limited due to the global distance each participant we had. It was obviously noted that other Indonesian FL teachers would have different acquisition. The second most limitation is the lack of assessment types. It might plat an influence on every learner with different learning style. Thus, different learning style could contribute to the learning outcome in vary.

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