

Teacher's Perception of Mobile Game-Based Assessment in ELT Context

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Abstract. Mobile-based assessment is one of the ways that can be applied to English teachers to produce a good teaching-learning process in the English Language Teaching (ELT) context. In this era, the use of technology has created new possibilities. In this digital era, the students need to have significant exposure to digital media in the teaching-learning process. The perception of the teacher about mobile game-based assessment in ELT context may influence and affect the mobile game-based assessment implication in ELT context. The goal of this study is to investigate the teacher's perception of mobile-based assessment in the ELT context. The design of this study is qualitative research. This research involved ten English teachers from ten different senior high schools in Riau province and the data collected through semi-structured individual interviews, which was designed to obtain teacher perception of mobile game-based assessment in ELT context. After the data analysis, it found that the ten English teachers have positive perceptions toward mobile-based assessment but still need improvement. The research also showed that all of the ten teachers were aware that their role when using new technologies in education has changed, but because of the lack of necessary training, they were not clear on how to adopt these changes. The findings also revealed that they still do not know more about the mobile-based assessment and not too familiar with it.

Keywords: Mobile game-based assessment, English Language Teaching (ELT)

1 Introduction

Nowadays, the mobile phone is not a strange thing anymore. Everyone must have it because we depend on the mobile phone. The ownership of mobile phones in Indonesia is growing a lot. Since the mobile nature of hand telephony and the ease of communicating have made it almost a necessity. The mobile sector grew from over 2 million subscribers in 1998 to 15 million, a penetration of 60%, by early 2005 [1]. Indonesia is one of the South-East Asian countries that have high mobile penetration and the highest mobile internet use. Besides, In this era, the students need to familiar with the technology culture to support themselves involved in the digital age. It is crucial because today, there are many of the existences of learning models in which it uses technology in the teaching and learning process and provides in the mobile phone application. There are lots of supporting English learning applications that help the students to learn English. It cannot avoid that this phenomenon happens since it is the effect of the development of technology. This digital world requires the students to be able to use various media and able to construct knowledge by using it. These changing learning needs make all of the English teaching processes should be changed. They must be upgraded to make the students

have the proper skill as we can say that in this digital age, technology plays an essential role in supporting the English learning context for students.

Because of the phenomena, integrating technology and English material for the students was essential. Using mobile application was one of the good solution to make the students interest in English lesson. Integrating technology with the English assessment was indeed for education, entertainment and games.

However, the use of mobile games based assessment was still rare. The assessment that the teacher uses in the English classroom still becomes an issue. Based on the researcher's interview with the teachers and students in one of the senior high schools. The writer found that some of the teachers and students use game-based assessments to involve the English teaching-learning but still feel uncomfortable to use it. The teacher often used technology in the teaching-learning process and provided the assessment by using technology; however, they never use any mobile application like e-learning application or game-based learning application to display the assessment. The use of high-tech media like mobile game application based assessment still rare. In this digital era, the students need to have significant exposure to digital media.

On the other hand, nowadays, the teacher expects to be a step ahead in using technology. The teacher should provide the learning experiences that allow students to engage in practices that promote English with integrated it with the modern way. The teaching and learning activity should not use monotone and limited activities and assessments in the classroom. Still, it should incorporate computers and the internet as a source and media for learning. In short, the materials and media used must facilitate the learning activity to happen wherever and whenever. Game-based assessment with local content is one of the good ways to provide the cultural context but also can rich the English learning outcome in ELT context

Over the years, issues related to mobile technologies and mobile games have been studied by several researchers. [2] find out that if applied to educational settings, mGame has the potential to enrich the learning experiences of learners. The mobile technologies also can be useful tools in increasing the student's skill and catering for students in this era, and mobile games fostered the student's motivation in learning English in the classroom [3],[4],[5]. Also, the other advantages of using mGames at the school were to help the students to learn English quickly [6]. The other research showed that the learning that uses mGames was known as mobile game-based learning (mGBL) as stated by [3]. The mGBL used mobile games as the media to in classroom to teach the students and use the wireless transmission [6],[7]. and it can be applied to all of the learner's generations, at children, young adults or even older age. [8] explained that mGames was developed by popular games such as shooting games with guns, and violent games. Most of the games adding the violence part in their storyline game. Since, it is influenced by the teenager's growth process [8] and GBL is a crucial alternative to traditional teaching [9], mGame-based learning should be further explored.

Based on the researches above, the focus topic is only about mobile game-based learning. There was no study talked about the mobile game-based assessment. Based on this condition and needs, this study aimed to know how were teacher's perception of mobile games based assessment in ELT. It was considerably needed because it may influence the implementation of game-based mobile assessment in the ELT context.

This study's aim was to find out about the teacher's perception of game-based assessment in the English Language Teaching (ELT) context. It was essential to know first about the teacher's perception of this case because it might influence the implementation of mobile-based assessments in the ELT context. Teacher's personal perspective about this case will influence teacher's decisions regarding mobile game based assessment use.

Based on the overview above, this research focuses on mobile-based assessment that attempts to investigate the teacher perception of mobile game based assessment in ELT context.

2 Literature Review

2.1 Mobile content (mContent)

Mobile game (mGame) is the games that can be played in mobile phones [10]. It is aligned with what IBM stated that mGame is the game that developed or adapted for phones or other mobile devices. According to [11], mGames are classified into three categories. The first one is embedded games, that is, games that are inserted or make for the specific devices only and make it into the mobile device's system: the example is Snake, only available in all Nokia phones. Then, the second is the SMS games, often in the form of live contests and polls. The last is browser games; it is played using the mobile phone's built-in microbrowser and can be accessed either online or offline mode. Meanwhile, mGame genres also can be divided as follows the arcade or action, the sports, the skills, strategy and logic, the card and board, and the role-playing game.

All of the categories above are the games that can be choose for players to play. In previous years, mGames may be performed using the technologies that supported in each mobile phone, such as by messages, multimedia messages, or GPS location identification. However, now the common one is the games are downloaded to the mobile phone and played using a set of games technologies on the devices. This situation makes the developing of mGame is beneficial in this era, especially in the education area. The mGame growth is spectacular because some factors, including games, is easy to use and entertaining, using hybrid devices and can be used in increasing the student's skill or knowledge, then enhanced the infrastructure capabilities. This issue has become more crucial because more than one billion mobile phones are in use today [10].

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2.3 History of mobile game (mGame)

Mobile game invented first in the 1980s when the Nintendo Company introduces the portable LCD series 'Games and Watch.' The game character in the portable LCD was Mario [12]. After the portable LCD from Nintendo hit big success, it introduced the new kind of game console called Gameboy-console. On the other side, Nokia Company developed a new game that can be played on a mobile phone. The first game of Nokia is Snake. Even though it was so simple, yet it was famous and successful. Since then, Nokia kept developing mobile games for their phones, which installed permanently and only on Nokia mobile phones.

In the late 1990s, new types of mobile gaming appeared, which allow the games can be play with multiplayer gamers. These games were WAP-games and SMS-based games. Next, in 2001, when mobile phones had and equipped with color screens, the Java games appeared and were introduced to the market. Then, when more advanced phones (such as smartphones) were appeared and produced, and technology became more sophisticated, the N-Gage platform and wireless online gaming become the jackpot in mGame. The 3D-graphics and natural sounds were supported in it [12]. Nowadays, mobile gamers have the opportunity to sample much more innovative choices of mGames because technology also rapidly changes and becomes more advance, such as location-based games [13].

2.4 Game in Education

In this digital age, it is essential to give interactive activities in the classroom. One of the interactive activities that we can apply at the school is game-based learning. The term game is a fun activity, engages the students, and provides a challenging experience when the students play it [14]. It is due to these qualities that the use of games for teaching has been highly acclaimed for educational purposes. Game-based learning is one of the crucial assets that change, of course, in teaching. [12] mentioned games are so intertwining with the educational features. This phenomenon is also called gamification.

Using games in the classroom gives the students more active in doing the activities in the classroom, and they will be interested in doing something related to the material subject. Also, games promote the student's motivation to learn and encouraging them to make a more significant effort to involve in learning activities in the classroom. Meanwhile, games may also be one of the beneficial ways to teach English for students who are not from English speaking country or English Foreign Language (EFL) students. It supported by [16] that said the games-based learning has a fun element and at the same time it is perfect for EFL students because when the teacher wants to teach a new language, it is essential; to consider the pedagogical value and the game have the pedagogical value and provide the opportunities for real communication, along with the motivation they offer and the low levels of stress involved.

In conclusion, the use of games in education will provide a motivating, fun, and effective manner and activity to learn a foreign language, especially learning the English language for Indonesia students. In addition, it increases a positive learning environment and provides the other style to teach English in the classroom.

2.5 Game-based Assessment (GBA)

Game-based assessment (GBA) is the application of principles of game design to measure human performance when people are striving to perform at their best. In school, seeing the student's performance during the class and at the end of the course are often used the traditional assessment or formal standardized test to measure the student's learning and see how to understand they are with the material. However, these assessments are pathetic and problematic. They are usually used to provide the final judgments rather than to support the students during their learning [17]. These kinds of assessments are hard to assess a higher level of thinking skill or foster the students to do something complex in a fun way. These kinds of traditional assessments often fail to provide useful and practical feedback to the students during the teaching-learning process [18]. Therefore, to make the students become active and empower students, it is essential to designing and developing other alternative assessments for English language teaching process.

GBA has many advantages. First, GBA is able to use to evaluate many things that cannot be test correctly in paper-based assessment methods [19]. When the students learn with digital games, the students will require many tasks to complete a whole task and achieve the learning outcomes. Because technology has improved significantly, digital game-based learning will provide the students with interactive and simulation-based learning experiences, and it is worth it for students [20].

Next, the second advantage is GBA can provide a pleasant and positive testing experience for the students [19]. It contrasts with any traditional assessment methods that give the negative effect or influence to the students during the learning process, for example, the anxiety that the teacher feels it in the classroom [18],[21]. Because of it, it may have an adverse impact on their performance or their understanding of the material, and as a result, the assessment cannot be used to see the valid result of the student's performance. Moreover, without external interruption, students will perform authentically, and the result of the assessment will show an accurate result [22].

Then, GBA used in the classroom will make the game-based environment. It may help the teacher to record the whole process about student's learning performance and increase the validity of the result itself. GBL environments can use for the teachers to see the step of students' development and help capture how the students make decisions about something [23],[24]. Also, in GBL environments, the students can produce the task more than those in traditional assessment, and learning settings can do [18]. The results of assessment also can help the teachers to understand more about how the students get the information, how well they are producing the data, how they can achieve the learning goals, and how they behave and see the learning objectives. It can be concluded that the teacher can see the personal improvement of each student.

3 Research Methodology

3.1 Research Design

This study was qualitative by employing a case study research design. This research design was chosen because it helps the researcher to go deeper into the participant's life and obtain more precious and valuable data. It was supposed to lead the researcher to a possible solution regarding the condition or problem. A qualitative design was chosen since the study did not intend to the generalizations to the broader context and is not interested in revealing statistical data form comparison. It aims to show a detailed picture from a small number of participants that would provide a detailed answer. The case in this study was about the gap between the teacher's perspectives about mobile game based assessment the ELT context.

3.2 Participants

The participant was selected by using purposive sampling. There were ten Senior high school teachers from five senior high schools in Riau. The selection considered by the necessary data, which intended to be collected. There were some reasons why the writer wants to choose these schools as the site of research. First, the phenomena of this research found in these schools. Then, it is a suitable place to answer the research question about the teacher's perspective of a mobile game-based assessment in ELT context.

3.3 Data collection

In this study, a semi-structured interview used to obtain further and in-depth information about the student's perspective about the mobile game based assessment in ELT context. There was an interview guide developed to answer the research questions. Then, this kind of interview was intended to have a casual interview like conversation and dialogues rather than formal or simply ask questions. The interview was recorded by using a digital recorder for then transcribed in written format. The interview guide was intended to find out the teacher's perspective about mobile-based game assessment in ELT and also the condition of the teaching and learning English process in terms of assessing class.

3.4 Data Analysis

Data was collected from an interview. The data analysis consisted of procedures for preparing, organizing, examining, tabulating, categorizing, and interpreting the data to address the research questions. The procedure and processes of data analysis were adopted from the related theory and related to previous research. The analysis of the qualitative data started with transcribing the interviewing. The analysis data began with the transcription of the audio-recorded interview and phone interview data. Then it was followed by the familiarization of the data transcribed through reading the transcription several times. The data were then given meaningful codes, and those codes were later developed into categories to collect the most relevant data under general labels. These categories and the data that suit them best are presented in the following section.

4 Findings and Discussions

4.1 Teacher's perception of a mobile game-based assessment in ELT context

The interview was carried out by ten teachers from the five senior high schools in Riau. All of the teachers are English teacher in Senior high school. The interview data were grouped into modes of personal experience of gaming, teacher's assessment philosophy, teacher's assessment method, teaching with digital or mobile games, teaching with mobile-based assessment, advantages of mGame based assessment, and barriers to implementing the mobile-based assessment.

Based on the interview, the researcher found that teacher's personal experience with gaming differs in each teacher. Teacher 1, 8, and 9 told the researcher that playing games from an early age. She asked that there was some games application on her phone. Meanwhile, teachers 2 and 3 had little experience with gaming. They liked playing games, but they did not always play it continuously.

Meanwhile, Teacher 4, teacher 5, and teacher 10 said that they had no experience at all in gaming, but love played games with the students in the teaching-learning process. Besides, teacher 6 and 7 stated that they loved games. They played games because they loved it. There were many games application on their smartphone. They thought that games were only for the children, and they acknowledge they were not interested in games, especially game applications. They said that the reason why they played digital games because when they were bored, some of them played games. In another hand, two of them played games because they had interest in playing games.

Also, about teacher assessment philosophy and their assessment method in English classroom were according to what teacher 1 said in the interview, the teacher 1 enjoyed when the students assessed through oral activities, listening activities, writing activities and worksheets. The reason behind these assessment criteria was that because asses English for the senior high school students would be good if the teacher used many activities related to the oral and writing activities.

Next, teacher 2 claimed to prefer written tests when assessing students' performance. The reason was that she believed written tests are more objective than oral evaluations. Moreover, written tests were more comfortable to design, administer, and assess. According to her, written tests indeed demonstrated students' knowledge, and through the results of written tests, she could have evidence of which students had learned and studied and the ones who had not. Nevertheless, when asked for the method, she thought students felt more comfortable with, teacher 2 stated that students felt more comfortable when being assessed through group work. However, teacher 2 usually tried to avoid teamwork because, in her opinion, the amount of work was never divided equally among the members of the group. There would always be students who did not work and students who did the entire job themselves. Also, she used many varied learning methods in her English classroom, yet the written test was a must in every meeting. It was similar to what teacher 8 said. She believed that the group was so risky, and it was hard to see student's understanding. She tended to assess the students individually.

Meanwhile, teacher 3 and 7 assessed students, mainly through written tests, notebook revisions, and group projects. The reason behind these assessment criteria, according to the teacher, is that students were accustomed to being evaluated through those methods. Since they worked mostly with the student's book, the teacher tried to implement test items similar to the ones seen in the book. Students were informed of the contents that would be asked in the test, but as previously mentioned, they did not always take note. The teacher always asked questions with the same level of difficulty as the ones seen in classes.

Next, the teacher 4, 9, and 10 stated that when assessing students at school, the evaluation tends to written tests. Concerning the question about which assessment method students felt more comfortable with, the teacher believed that they felt more comfortable with written tests. Although students were familiar with written evaluations, they tended to experience negative feelings when being assessed. So sometimes, they do the oral task activities, played the game, or did the listening activities. The last, teacher 5 and 6 stated that she assessed students mostly with oral and written test. She felt comfortable when she assessed her students with that kind of assessment. It was because oral and written were the test that can assess all of the student's English skills.

As seen in the result of interview, game-based assessment still rare to use it from most school. It also found that there is a lack of variety of teaching-learning assessment method. Game-based assessment was one of the assessment that can enhance communication between the teacher and the students. Game-based assessment was the perfect option to implement in English classroom given that everyone likes to play [25], it is a natural way to learn [26], and that it leads to the use of English in the classroom in a communicative environment [27].

In all five schools, mobile games or digital games were rarely used for teaching in their school. The fun and motivation as the main advantages of mGames because they agree mGame in English classroom make their students learning without realizing. However, when the researcher asked about mGame based assessment, five out of ten teachers from different schools said that they never know the term of mGame based assessment. Some of them have the experience of using mGame in English class. Teacher 1, teacher 4, teacher 6 and teacher 7 have experience using mGame-based assessment like Kahoot but rarely used it. Meanwhile, teacher 2, teacher 3, teacher 4, had experience using Kahoot in English class. They often used Kahoot in their teaching. While teacher 8, teacher 9, and teacher 10 did not know about mGame based assessment, and they used regular game activities rather than using game applications when they assessed their students. When discussing the barriers or challenges of mGame based assessment, the teachers from all of the different schools talked about they have a lack of knowledge about mGame based assessment.

Teacher 8, teacher 9, and teacher 10 explained that they did not even know about mGame based learning, especially mGame based assessment. The teachers also stated there were no many training talked about that, and it was challenging to implement in the classroom because the teacher needs to learn again about how to manage their classroom in terms of implementing mGame based assessment. However, teacher 1, teacher 6 and teacher 7 admitted it was hard using mGame based assessment because the time allocation in the English classroom not extended. If they used mGame based assessment in her class, the students would feel overjoyed, and the English material was not wholly given to students. Then, teacher 2, teacher 3 and teacher 4 admitted they believe it had positive impacts on students but doubted use mGame based assessment because afraid of being lost in manage their class.

Based on the answer of the teacher, some of the teachers still afraid about the class management when they used mobile-based assessment in their classroom, some of the teachers thought that they will lose their attention to learn and the class will be ruin because of the mobile game based-assessment. This phenomenon showed how teachers did not fully confident and did not trust their students. In addition, they tend to control their classroom instead try the new thing that can lead students to be active in class [28]. Then some teachers believe MBGA had positive impact for the students English performance in class. This findings further support by theory that said doing assessment by using game prove that the students felt more ease and when they use learning by doing approach to gamification encourages how they think about the knowledge itself [29].

Then, the teachers agreed that mGame based assessment had many positive impacts and negative impacts on students and teachers. Seven teachers believed mGame based assessment in ELT context would increase student's attention in doing the assessment, and the students would not feel reluctant anymore because the game will make them relax. It improved the student's thinking skills, creativity, collaborative skill, and visual-spatial skills. However, some teacher shared their challenges if applying mGame-based assessment in ELT context. Three teachers shared that they will lose focus because too happy to play games, and it will be hard to manage the allocation of time during the English teaching process happened. They believed the mGame based assessment made the students are lazier to complete an assessment if the assessment was not designed digitally or using games. The mGames based assessment also only develop the shallow skills for the students rather than in-depth ones. The last one is it will be hard for the English teacher from the older generation that was not too familiar with the technology product. They also shared the same worried about lack of knowledge of using it and needed more time to adapt to new environments and situations because they need to be more pro than their students to use it.

Teacher 1 stated that she I think it is time for English teachers to be more active in using something digital in their teaching-learning process. However, think she think it still difficult to use it because of the facilitation. Even the students allowed bringing mobile phones to school; the English teacher seems unready to give them more time using mobile phones during ELT process. In the interview, teacher 1 agreed on how mGame based assessment would make the students more active involvement in the English classroom. However, at the same time, she also admitted about how it was still hard to use and applied it in ELT context, especially in her school. At the same time, teacher 3 and teacher 4 also shared the same feeling that it would be hard to give the students a big chance to use mobile phones longer in the classroom. They said that students always easily distract, and teachers seemed unready to face this condition. Teacher 5 also stated that because she was from the older generation, she admitted she could not use technology appropriately, so it would take time for her to get used to the application.

However, it was in contrast with what teacher 2, teacher 6, teacher 7, teacher and teacher 8's opinion. They thought that it was fun and a great chance to make English had a fun subject. Some of her students did not like English because it was a foreign language. Even she tried to use varied ways in English teaching language, some of them have low self-confidence in English class. mGame based assessment was a way that made the students develop their eager to learn English. It is parallel with what [30] points out that when students are a pleasure to do something, happiness cannot be separated from deep learning and working hard.

On the other hand, teacher three was quoted as:

"I think it will be good if we are not replacing the way we teach because it can become a lazy way of teaching if you already have familiarity with the digital one. It needs to be targeted carefully. I am worried it may take over the traditional method of learning and display the assessment, using books, and the others. Sometimes, this not so many games as much, but sometimes they read something on the internet, they readjust snip of it and have the whole answer because of the internet. You know, the internet makes everything is easier. They also do the copy one."

Based on teacher 3 statement, the interesting part was she tried to make a connection between how learning manifests in the classroom and how digital games are taught. Also, teacher 9 and 10 agreed about how mGame was essential to help the teacher's job to assess student's understanding, especially in ELT. But they also agreed that allowing the students to use their mobile phones while teaching-learning process happened was not a wise decision. Based on their experience, they have made game based assessment with Kahoot application, but the students use it on their laptops, not their mobile phone.

Based on the results of the present study showed that mobile based assessment helped the teacher to gain the student's curiosity, increased the learning motivation and make them more lively because game is the best tool for the students to learn English and learning performance increased because of it. It was lined with [31] stated that games was the fusible tools for teacher to make the students more active in classroom. However, besides many advantages, [32] explained that games have negatives sides when teacher used it as a tool in teaching learning process. it was also supported the answer of the teacher's perspective of using mobile game-based assessment in ELT context.

On the other side, they stated their awareness of the relationship between pedagogy and practice was high. Teacher 4 had viewed that "You know, it is hard to see the impact of mGames based assessment or mGame based-learning in the learning outcome. It is effortless for the students to get lost and carried away with digital games in the classroom. The students can be fastly absorbed because it is quite fun and not taking learning objectives from it. If it was structured in a coherent way and appropriate strategies use, then it can be beneficial." In this interview, teacher 4 stated mGame based assessment would benefit and improve the student's English skill if mGame well designed and concern with the pedagogy component. It could not have permanent results if mGame just focus on the visual factors because students only felt entertained, and they would get lost and missed the purpose of using mGame. In contrast, well-designed games can engage the students in reflecting thinking [33].

Also, many teachers mentioned the students would learn without realizing it. The thought that this had a very positive impact of mGame based assessment as it made assessment look like a less formal place. They quoted,

"..... they will think they do not seem like they are learning, like in school, or it is not like writing this down. They enjoy it, and it is entertaining." - Teacher 1

"They will forget that actually, they do the classroom assessment. And it keeps them interested and thinks we have been nice..." – Teacher 2

"It will make them pay attention. To be honest, some students are afraid with the English language assessment. Using mGame based assessment will make them pay attention, they learn from it but they do not even realize they are learning." – Teacher 3

"I can see this application will make the student motivation to learn English. The thing that makes me worry is when they have English class in the afternoon. It is hard to make them pay attention to us. Using digital application-based learning will help English teacher to managing their students in classroom." – Teacher 4

".... I believe it is a jackpot for the English teacher. – Teacher 5

"I am pretty sure that using game as the tool to make the students comfortable when we assess them was not a joke. It was impressive." – Teacher 10

In addition, teacher 6, teacher 7, teacher 8, and teacher 9 had the same perception with the other teacher that mGame was sufficient to make students were not afraid when the teacher assess them in ELT process. From this interview, it can be said how mGame based assessment could be one of the alternative ways for English teachers to make the students felt enjoyed while being assessed. It is aligned with three research from Anderson, Gee, and Squire that claimed games are known for their exciting and engaging features and have the potential to promote meaningful learning [34],[30],[35].

One interesting finding was about the mGames based assessment, terms such as an exciting, good idea, and effective were widely used. They agreed that mGame had many advantages for them but still need more familiar with it. However, along with the interview, the teachers only talked about the Kahoot application. They did not know the other mGame based assessment application that can use to help them to assess the students.

From the interview, the data indicates that the teachers are interested in teaching with mGame based assessment. All of the teachers believe that it is perfect for drawing student's attention and making them enjoy while being assessed. All of them saw mGame as a useful education tool. However, they seem not to have a clear framework about mGame based assessment to guide them in the English classroom because they are not too familiar with that and only learn from their teacher's friend. It can be said that teachers need to be trained and get more exposure with the mGame based assessment because they agreed that mGame in teaching could be as a reward or a tool to achieve English teaching-learning objective in ELT context. In contrast, the teachers did not know how to applied or design mGame space to accomplish this. Again, they are still not familiar with it.

5 Conclusion

In this research, the aim was to find out about the teacher's perception of mobile game-based assessment in the English Language Teaching (ELT) context. Based on the data and analysis, it can be said that the teachers have positive perception of mGame based assessment but still unfamiliar with it. It will be good if the government gives the training or seminar about mGame or digital games for the teacher because they are still confused and doubted to apply it in their English classroom because of some reason. Finally, further and more in-depth analysis will give better insight into mGame based assessment. These findings can support new research about the implication of mGame based assessment.

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