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Development and Validation of Survey Questionnaire in Determining College Students' Engagement in Mobile Legends

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Abstract

Mobile Legends: Bang Bang is a popular game among Southeast Asian college students, gaining popularity and being included as an extracurricular activity in schools like Cebu, Philippines. This study aims to develop and validate an instrument to determine college students' engagement in playing Mobile Legends. A systematic literature review was conducted to craft the 20-item questionnaire. The instrument was administered to 30 participating students from different degree programs in a state university in Cebu, Philippines.

Three experts validated the instrument, and the internal consistency was obtained, resulting in 0.849. An exploratory factor analysis was used to categorize the observed variables into three factors: Social Stability, Self-Productivity, and Stress Appraisal. It is concluded that the instrument is shown to be valid and reliable. It is recommended that the survey questionnaire be further validated using a bigger sample size in future studies and conduct confirmatory factor analysis of the said instrument.

Keywords: Mobile Legends, College Students, Development, Validation, Survey Questionnaire

1. Introduction

Mobile Legends: Bang Bang, commonly referred to as ML or MLBB, is an international mobile multiplayer online battle arena (MOBA) that has become a trend, particularly among college students. It inspired some schools, including Cebu, Philippines, to include it as an extracurricular, which became a controversial subject. As a result, it could hinder them from fulfilling their academic responsibilities. However, it could also motivate them extrinsically or intrinsically. Through this study, we can determine how influential Mobile Legends is on college students, either as a motivation or a distraction.

This challenge transcends internationally and has become rampant. As such, numerous diverse people started playing Mobile Legends, most notably in Southeast Asia. Furthermore, most schools in Cebu, Philippines, include electronic or e-games as part of the extracurricular activities, even as an organization, which many students are willing to join. In addition, playing mobile games helps develop our ability to think critically and analytically, study opponents' tactics and cooperate within a group. Moreover, a boost in artistic output is another benefit of playing mobile games. They tend to use resources in-game in inventive and creative ways (Panuyas, 2022) ^[28]. In this sense, an intervention using mobile games such as Mobile Legends can develop students' practical skills beneficial in facing the real world.

Significant international research has accumulated concrete basis that exposure to mobile games is integral. As such, the emergence of mobile games inspired the *Theory of Gamified Learning* by Richard N. Landers, Ph.D. In this theory, Landers (2015) asserts that a gamified environment contributes to helping students acquire specific learning behavior that makes them active in the learning process. With this, integrating games from mobile phones can make learning more exciting. Furthermore, it is an opportunity for social engagement, considering that mobile games, like Mobile Legends, center on strategic thinking. However, the Philippines has not fully considered integrating mobile games as a teaching strategy, which calls for extensive research to substantiate the idea.

In most universities, college students who have good grades and have done their best in school build their whole academic identity (Balijon & Abulon, 2022) ^[3]. Each of them must experience numerous circumstances and reach high expectations for academic performance. However, procrastination always finds a way to intervene. Procrastination is when students decide to do more enjoyable leisure, such as playing online games, instead of doing academic tasks. As such, it is mostly done intentionally and can cause internal issues of oneself. Burka and Yuen (2017) describe how procrastination might cause

psychological problems such as depression, which may result in much worse mental disorders.

According to Amanda (2016), people are prone to becoming entirely confused and even disintegrating into situations where they cannot choose, contrary to previous circumstances. As an example of today's children's play patterns, we can see the increasingly deserted field and the disappearance of traditional game competitions, which are now replaced with modern games online. In the field of *Hedonic Technology*, addiction studies have been excluded, with social networking sites and online games such as Mobile Legends being the most common research topics (Lee *et al.*, 2021). According to one study, internet game addiction is prevalent. González (2018) demonstrates that internet gaming disorder could have a massive influence on young people (Brand *et al.*, 2017).

The findings of this study may supply a substantial basis for understanding college students' behavioral patterns. Correspondingly, various habits have been shaped by the conditions of their surroundings (Kassarnig *et al.*, 2018) [16]. Since we are in the *Digital Age*, we have become reliant on the advancement of technology. Furthermore, the invention of mobile phones has influenced our standard of living, remarkably of youth. With that in mind, the continuous emergence of mobile games, such as Mobile Legends, proves the significance of the study. Several studies only focus on the impact of *Gamification*, mistaking it as primarily integrating games, including online mobile games, in class. As such, none has been specific in assessing Mobile Legends to both categories under motivation or distraction. Hence, this study aims to examine the adequacy of Mobile Legends by looking at the college students' perspectives. Moreover, the study emphasizes the distinctive factors that made the mobile game a common recurring pastime. To describe how Mobile Legends contribute to their upbringing, specifically toward their academic performance.

Review of Related Literature

The present study investigates if playing Mobile Legends will be an academic performance distraction or motivation for college students. Three factors constitute the enticement of the renowned online mobile gaming application. The first factor is Social Stability. The second factor is Self-Productivity. The third factor is Stress Appraisal.

Social Stability

Social Stability, which refers to how one socially adapts, depends on the condition of the environment they are in. Knowing how to adapt socially is crucial in maintaining balanced relationships with students to their surroundings, as it will improve their motivation to succeed and optimize their energy effectively (AlZboon, 2013) [2]. Integrating digital games into the learning environment can motivate students as they become more engaging (Wichadee, 2018) [38]. Such an environment can raise the standards of their goals and ambitions, and they are more motivated to learn. An adaptive individual who finds a place where his behaviors and actions fit can establish balanced and positive social interactions, influencing how they approach life (AlZboon, 2013) [2]. In other words, they will gain a positive outlook and become motivated to chase success, especially in academics. Hence, engaging in digital and online mobile games can assist students in every aspect of their lives, including their academic performance, as they will become socially adaptable and stable.

Self-Productivity

Personal productivity is how frequently and efficiently a person completes work or achieves goals (Holliday, 2023). However, it has been a challenge for many to be consistently productive. One of the factors hindering us is due to excessive applications on digital phones (Elgan, 2017) [12]. Digital phones, specifically with advanced features, have become the trend nowadays, often for entertainment. Mobile gaming is one of the most popular sources of entertainment, as it comes in unlimited forms and is accessible to anyone (Edney, 2022) [11]. Even so, the effects of engaging in online gaming are financial troubles, challenges at work and school, including lack of productivity, distorted self-perception, and agitation are all possible. Various results came from the interaction of vulnerable players with diverse game elements (Petrovskaya & Zendle, 2022) [29]. For students, this dynamic causes them to be late in finishing tasks and causing students to work overnight on many assignments. Procrastination occurs frequently in the academic field. High intensity of playing online games can impact one's manner of thinking, such that they may always look for entertainment rather than carrying their individual responsibilities. (Mubarak & Hanifa, n.d.).

Stress Appraisal

Stress is unavoidable and happens to everyone. A common misconception about stress includes its association with anything that damages our mental health. However, that is only sometimes the case. Hans Selye asserts that stress is the body's reaction to a situation (Rochette *et al.*, 2023) [31]. Our experiences, good or bad, can cause stress. It is how we respond is what makes it positive or negative. Stress significantly impacts one's whole being (Yaribeygi *et al.*, 2017) [40]. Hence, awareness of the type of stress must be a priority. The ability to evaluate and respond to stress sensibly is a must, especially for young individuals. For one, they are the ones who are susceptible to it (Varma *et al.*, 2021) [36]. According to Scott (2020), several researchers have affirmed the relevance of gaming in coping with stress, as long as it is the one that they enjoy playing and builds their skills socially, mentally, and emotionally. In addition, mobile games can enhance self-regulated learning, a positive factor that boosts students' academic performance (Nurdin & Rejekiningsih, 2022) [26]. As such, students who made excellent remarks at school displayed a high regard for self-regulation (Llagoso, 2017) [22].

2. Methodology

2.1 Research Design

A *Cross-Sectional Quantitative Survey Design* is a research design where data is gathered simultaneously from many distinct subjects. When doing cross-sectional research, variables are observed without influencing them. Furthermore, quantitative research aims to discover how many people think, act, or feel in a specific way. It favors closed-ended questions, providing the respondents with a set list of answers.

For instance, a study by Zegarra-Lopez *et al.* (2022) [42] uses a cross-sectional study on the Prevalence of Depressive Symptoms and its Associated Sociodemographic Factors in Peru during the COVID-19 Pandemic.

2.2 Sampling Design, Respondents, and Environment

This study was conducted in Cebu City, Philippines. Through Purposive sampling, a non-probability sampling

technique, 30 college students from different degree programs who play Mobile Legends were chosen as participants. *Purposive sampling* contributes to better matching the research goals with the sample, boosting the rigor of the study and the reliability of the data and findings (Campbell *et al.*, 2020) ^[6]. In such a case, the researchers selected college students actively playing Mobile Legends on several occasions. Purposive sampling intends to enhance the validity and reliability of research findings by targeting participants with a certain degree of relevance to research objectives.

2.3 Research Instrument

A *Questionnaire* was made using *Google Forms* in the form of a *Likert-Scale* method. According to Susan Jamieson (2023) ^[20], the likert-scale is a rating system intended to quantify respondents' attitudes and opinions. The questionnaire consists of statements with multiple-choice answers, ten questions about motivation, and ten about distraction.

These items were produced based on the researcher's observations and game mechanics. Although the questionnaire is not related to a specific reference, it is significant since it was designed to assist college students with insights, knowledge, and feedback about their engagements with Mobile Legends. Furthermore, the items will be on five-point Likert-scales, which include *Strongly Disagree* (1), *Disagree* (2), *Neutral* (3), *Agree* (4), and *Strongly Agree* (5).

2.4 Data Gathering Procedure

The research team filed a request to the institutional *Ethics Review Board* of the school institution for ethics approval to ensure that the study follows ethical standards and protects the participants' dignity. Afterward, send the requested file to the Organizational Adviser and Mayor of the *eSports League Organization* for approval. In addition, extensive instructions and guidelines are in the survey, including the goal of conducting the study. Furthermore, the research team used a *Likert-Scale* method to achieve reliable findings from the participants' opinions to ensure the efficiency of the study. Before analyzing the gathered responses, it must be in quorum to avoid biases and have a fair share of opinion. If not, the researchers must send the same questionnaires to the college students. This time, they do not necessarily have to be a part of the eSports League Organization.

2.5 Data Analysis

The gathered data were tallied using *Microsoft Excel* software and treated using the mean and standard deviation technique to determine the middlemost value of the data. The overall results from the questionnaire must be answered: "*Based on the 30 participants, have we arrived at the quorum to conclude that Mobile Legends is a distraction or motivation for their academic performance?*"

2.6 Validity and Reliability

This study employed a self-administered 20-item questionnaire based on observation and related literature on Mobile Legends and online gaming. It was classified into three factors: Social stability, self-productivity, and stress appraisal, with ten questions under each category. In quantitative research, questionnaires must undergo face and content validity for validation. *Face validity* defines the accuracy to which, given at face value, a test appears to measure what it promises to assess (Zach, 2021) ^[41]. Then, *Content validity* is seen as a subjective measurement since it depends on personal views to determine the alignment between a concept and a factor that falls under that concept (Elias, 2023) ^[13]. In this case, the research team evaluated the statements, ensuring each is under each factor. Through these, the research team can verify the appropriateness and relevance of the question items. After the validation of the instrument, the 20-item questionnaire underwent an *Internal Consistency* reliability test, which is suitable for research instruments composed of practical statements with multiple answers (Hassan, 2023) ^[18]. The research team used Jamovi, a statistical software that allows us to conduct Cronbach's Alpha Reliability, a commonly employed statistical metric to assess the internal consistency of a tool utilized in research (Brown, 2022). As such, Cronbach's Alpha Reliability applies to research that employs survey questionnaires using rating scales in which this study executes.

2.7 Ethical Considerations

Ethical considerations are fundamental in justifying the relevance of conducting the study. As such, it serves as a guide for the researchers to maintain professionalism. Following this, significant Ethical considerations aim to protect the participants' right to privacy, ensuring confidentiality and sensibility when acquiring personal information. Furthermore, they will have full authority to withdraw or continue participating. As such, their decisions are well-respected by the researchers unanimously. In addition, the research team ensures that they follow the standard ethical procedures in conducting the study, will not violate the school institution's policies where the research takes place, and translate the information gathered responsibly. Afterward, the participants will be given a token of ten (10) pesos through *Gcash* or cash for their participation in the study.

3. Results and Discussion

The development of research instruments underwent validity and reliability testing. This is necessary to guarantee that the accuracy and consistency of the data gathered are valid and reliable. The validated instrument does not have rejected items, and all exceeded the Cronbach's Alpha reliability test with a scale of 0.849. Three experts examined the face and content validity. The internal consistency of the instrument is shown in Table 1.

Table 1: Item Reliability Statistics

Item	Cronbach's α
I play Mobile Legends for at least 6 hours straight.	0.841
I play Mobile Legends before answering my assignments or tasks.	0.838
I play Mobile Legends to make myself mentally active and ready to do tasks.	0.838
I will abruptly play again to regain my lost star regardless of the pending activities when I lose in a ranked mode.	0.844
I will do the pending activities with an ease of mind and a positive mood when I win in a ranked mode.	0.839
I am focused while playing Mobile Legends, enhancing my attention span.	0.838
I am on edge and get easily irritated when defeated.	0.861
It gradually decreases my social awkwardness when I play Mobile Legends with random players.	0.830
I got myself into playing Mobile Legends to blend with my peers.	0.854
I am able to adapt easily and see strategies to solve situations when I play Mobile Legends.	0.833
I challenge my squad in Mobile Legends as it is an advantage for me to know one's strategy and skill.	0.833
I party with my squad as it leads to our relationship to betterment, which is a contributing factor in achieving individual or group performance tasks.	0.838
I play Mobile Legends as it is my outlet to digitally vent out my personal and school-related problems through demolishing enemies' towers and assassinating enemies' lives.	0.838
I am able to establish a sense of discipline, making me more decisive, when I play Mobile Legends.	0.832
I play Mobile Legends as it slowly affects my mind negatively, wherein I lose sight of what is important.	0.851
I tend to forget to attend an online class, it seems like my mind has been foggy since I started playing Mobile Legends.	0.850
I start my day by playing Mobile Legends instead of getting ready for school.	0.850
I play Mobile Legends as it helps me scrape my mind to think of a witty trash-talk to my teammates or enemies.	0.850
I play Mobile Legends as it improves my hand-eye coordination, an easy move to ace Physical Health activities and/or extracurricular activities.	0.832
I play Mobile Legends as my second source of income for my finances, such as allowance and compulsory books.	0.842

Cronbach's Alpha was used to check the internal consistency of the questionnaire items to guarantee that each statement was relevant to the study. As shown in Table 1, the overall instrument measures beyond 0.70, indicating high reliability in Cronbach's Alpha in the four cut-off

points (Hinton *et al.*, 2004). Following the consistency of the degree, ranging beyond 0.80, each statement is in correlation with the study. After checking the validity and reliability of the instrument, exploratory factor analysis was conducted, as shown in Table 2.

Table 2: Exploratory Factor Analysis

	Factor			Uniqueness
	1	2	3	
I play Mobile Legends for at least 6 hours straight.		0.537		0.6243
I play Mobile Legends before answering my assignments or tasks.		0.534		0.6089
I play Mobile Legends to make myself mentally active and ready to do tasks.	0.306			0.6905
I will abruptly play again to regain my lost star regardless of the pending activities when I lose in a ranked mode.		0.592		0.6068
I will do the pending activities with an ease of mind and a positive mood when I win in a ranked mode.		0.533		0.6067
I am focused while playing Mobile Legends, enhancing my attention span.	0.309			0.5349
I am on edge and get easily irritated when defeated.			0.458	0.9028
It gradually decreases my social awkwardness when I play Mobile Legends with random players.	0.523		0.398	0.3407
I got myself into playing Mobile Legends to blend with my peers.			0.326	0.8232
I am able to adapt easily and see strategies to solve situations when I play Mobile Legends.	0.761			0.2035
I challenge my squad in Mobile Legends as it is an advantage for me to know one's strategy and skill.		0.402		0.6297
I party with my squad as it leads to our relationship to betterment, which is a contributing factor in achieving individual or group performance tasks.			0.957	0.0637
I play Mobile Legends as it is my outlet to digitally vent out my personal and school-related problems through demolishing enemies' towers and assassinating enemies' lives.			0.588	0.5195
I am able to establish a sense of discipline, making me more decisive, when I play Mobile Legends.	0.771	0.309		0.1936
I play Mobile Legends as it slowly affects my mind negatively, wherein I lose sight of what is important.		0.455	0.379	0.7007
I tend to forget to attend an online class, it seems like my mind has been foggy since I started playing Mobile Legends.		0.444		0.8102
I start my day by playing Mobile Legends instead of getting ready for school.		0.309		0.8624
I play Mobile Legends as it helps me scrape my mind to think of a witty trash-talk to my teammates or enemies.	0.790			0.4598
I play Mobile Legends as it improves my hand-eye coordination, an easy move to ace Physical Health activities and/or extracurricular activities.	0.435		0.311	0.4969
I play Mobile Legends as my second source of income for my finances, such as allowance and compulsory books.		0.429		0.6828

The study used Exploratory Factor Analysis to categorize the statements of the questionnaire based on the higher value placed on each to ensure a coherent interpretation of data. As shown in Table 2, three factors were named Social Stability, Self-Productivity, and Stress Appraisal, confirming the alignment of specific statements, which is an

acceptable amount to consider as valid factors, following the value of the correlation of each statement under separate factors, which reaches +.30 (Watkins, 2018) [37]. Table 3 represents the results, which are the categorized factors' mean, standard deviation, description, and scale.

Table 3: Results (Mean, Standard Deviation, Description, Scale)

Descriptives (Social Stability)	Mean	SD	Confidence Interval	Scale
I play Mobile Legends to make myself mentally active and ready to do tasks.	3.60	0.894	[2, 5]	Agree
It gradually decreases my social awkwardness when I play Mobile Legends with random players.	3.57	1.07	[1, 5]	Agree
I am able to adapt easily and see strategies to solve situations when I play Mobile Legends.	3.90	0.960	[2, 5]	Agree
I am able to establish a sense of discipline, making me more decisive, when I play Mobile Legends.	3.77	0.817	[2, 5]	Agree
I play Mobile Legends as it helps me scrape my mind to think of a witty trash-talk to my teammates or enemies.	2.27	1.05	[1, 4]	Disagree
I play Mobile Legends as it improves my hand-eye coordination, an easy move to ace Physical Health activities and/or extracurricular activities.	3.17	1.23	[1, 5]	Neutral
Mean of Descriptives	3.38			
Descriptives (Self-Productivity)	Mean	SD	Confidence Interval	Scale
I play Mobile Legends for at least 6 hours straight.	2.17	0.913	[1, 5]	Disagree
I play Mobile Legends before answering my assignments or tasks.	3.23	0.935	[2, 5]	Neutral
I will abruptly play again to regain my lost star regardless of the pending activities when I lose in a ranked mode.	2.63	1.22	[1, 5]	Neutral
I will do the pending activities with an ease of mind and a positive mood when I win in a ranked mode.	3.77	0.935	[1, 5]	Agree
I challenge my squad in Mobile Legends as it is an advantage for me to know one's strategy and skill.	3.40	1.10	[1, 5]	Neutral
I play Mobile Legends as it slowly affects my mind negatively, wherein I lose sight of what is important.	2.37	1.03	[1, 5]	Disagree
I tend to forget to attend an online class, it seems like my mind has been foggy since I started playing Mobile Legends.	1.47	0.571	[1, 3]	Strongly Disagree
I start my day by playing Mobile Legends instead of getting ready for school.	1.50	0.572	[1, 3]	Strongly Disagree
I play Mobile Legends as my second source of income for my finances, such as allowance and compulsory books.	2.03	1.10	[1, 5]	Disagree
Mean of Descriptives	2.50			
Descriptives (Stress Appraisal)	Mean	SD	Confidence Interval	Scale
I am focused while playing Mobile Legends, enhancing my attention span.	3.93	0.907	[2, 5]	Agree
I am on edge and get easily irritated when defeated.	3.37	1.03	[1, 5]	Neutral
I got myself into playing Mobile Legends to blend with my peers.	3.33	1.12	[1, 5]	Neutral
I party with my squad as it leads to our relationship to betterment, which is a contributing factor in achieving individual or group performance tasks.	3.97	0.850	[2, 5]	Agree
I play Mobile Legends as it is my outlet to digitally vent out my personal and school-related problems through demolishing enemies' towers and assassinating enemies' lives.	3.93	0.944	[2, 5]	Agree
Mean of Descriptives	3.70			

Range of Values

- 1.00 - 1.80
- 1.81 - 2.60
- 2.61 - 3.40
- 3.41 - 4.20
- 4.21 - 5.00

Scale

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Table 3 revealed three factors that categorize each question for more straightforward interpretation. The first factor is about the Social Stability of College Students. It describes the students' adaptability in coping with the challenges they encounter and gaining strategies through playing Mobile Legends. The second factor is all about the students' Self-Productivity in handling academics and leisure activities such as online games. Lastly, the third factor is labeled as Stress Appraisal, where the questionnaires describe the students' adaptability in setting their focus right through venting it out on the Mobile Legends. Furthermore, all factors consistently agree that playing Mobile Legends

motivates them in their academic performance instead of being a distraction.

Construct 1: Social Stability

Results showed that all the participants agreed that playing Mobile Legends was their source of optimizing their motivation in handling tasks and adapting to any situation. Knowing how to adapt socially is crucial in maintaining balanced relationships with students to their surroundings, friends, and school, as it will improve their motivation to succeed and optimize their energy effectively (AlZboon, 2013) [2]. A study by Wichadee (2018) [38] supports the participants' disposition, as integrating digital games in the classroom motivates learners to participate and stimulates their senses, engaging them in interactive activities requiring their involvement. Furthermore, the need for individuals to be in a favorable environment, which boosts one's mental, emotional, and physical well-being, must be a priority, for it increases their social stability (German & Latkin, 2012) [14].

Therefore, integrating online mobile games as a tool for gamified learning can improve college students' mental capacity, contributing to developing social stability.

Construct 2: Self-Productivity

As shown in the results, playing Mobile Legends does not hinder participants from not keeping track of their academic and personal responsibilities. Instead, it becomes a means for them, as it refreshes their minds from their responsibilities to perform well. Function play has been acknowledged in evolutionary and developmental psychology, as it is held accountable for an individual's development (Granic *et al.*). A study by Coneus and Pfeiffer *et al.* (2007)^[9] concurs that self-productivity plays a salient role in the process of skill formation. This means that the skills and health formation are obtained early in the life cycle and heightened skills and health formation at later stages. Moreover, students must be engaged in various activities, including mobile gaming, to improve themselves holistically (Olipas & Leona, 2020)^[27]. A study by Li *et al.* (2023)^[21] asserts that online gaming can also satisfy students' personal growth needs. Thus, Mobile Legends is not a threat to teachers but rather a tool to help college students navigate to betterment.

Construct 3: Stress Appraisal

The results indicated that participants' ability to cope with their stress improves when they play Mobile Legends. The ability to evaluate and respond to stress sensibly is a must, especially for young individuals, as they are the ones who are susceptible to it (Varma *et al.*, 2021)^[36]. A study by Cervantes *et al.* (2020)^[7] confirms that playing mobile games is beneficial in reducing stress levels, with Mobile Legends being the most effective. It improves cognitive functioning and boosts self-confidence. According to Chiang and Hsu (2018)^[8], the competitive nature of mobile games generates tension and anxiety among players. Nevertheless, players use stress appraisal to cope with these negative emotions and employ different coping techniques based on their appraisals. Hence, playing Mobile Legends can develop a healthy mentality and provide a chance for growth and development, which results in motivation and enthusiasm.

4. Conclusion and Recommendation

The study's objectives were successfully met through a survey questionnaire of college students' engagement in Mobile Legends. The developed instrument underwent an internal consistency reliability test using Cronbach's Alpha, which surpassed the standards for having more than 0.8. Then, the instrument is validated through face and content validity by categorizing the statements of the questionnaire based on the three factors, social stability, self-productivity, and stress appraisal, to ensure the overall appearance of the instrument is credible. Furthermore, Mobile Legends brings positivity to college students' academic performances as the results revealed that the majority agreed and, thus, find it a motivation in their academic performance. Hence, it is recommended to incorporate Mobile Legends as a tool for Gamification in the learning environment, as it can help acquire interest and specific learning behaviors, such as promoting social engagement, self-productivity, and critical thinking skills, which are crucial in the real-world setting. It is recommended that further studies be conducted on bigger

sample sizes to examine the effect of playing Mobile Legends on students' academic performance. Moreover, it is all set to be used for future research concerning the pertinence of other mobile games.

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