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The Influence of Rewards on Games Flow, Challenge, and Its Effects Towards the Engagement of Malaysian Digital Traditional Games

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Abstract:

Games engagement has become one of the main concerns in game industry. Early study revealed that Malaysian digital traditional games are suffering with the same issue due to several factors. One of it is the lack of the game itself. Although many Malaysian traditional games have been digitized, none of them has incorporated rewards despite its importance in games engagement. Realizing the importance of rewards in games engagement, one of Malaysian traditional *Congkak* has been chosen to be enhanced by incorporating rewards. Experiments have been conducted among 50 gamers among the Millennials. Prior interview, game demo and human test are conducted. Experiments focused on the influence of rewards on games flow, games challenge, and its effects which covers both positive and negative effects through four hypotheses. Findings show that three hypotheses are supported by the experiments thus suggested that rewards have significant influence on the measured constructs. The findings can be useful to new psychologists to obtain more understanding pertaining to games engagement through some experiments of rewards in traditional games. Ideas of incorporating rewards in digital traditional games can useful and beneficial to game developers in attracting gamer and make them hooked to the games.

Key words: Digital traditional games, Games engagement, Game rewards, Malaysian games

Introduction:

Games engagement has become one of the main concerns in games industry. Engagement can turn into habitual play or even addiction if played for the wrong reasons. Although digital games have been introduced over 40 years ago and clearly provide highly engaging activities, the nature of games engagement is not well understood (1).

Scholars have studied and defined games engagement in many ways. Engagement has been defined as a process or a state that attracts and holds users' attention Chapman (2). In game context, engagement refers to a dimension of usability that is influenced by the user's first impression of the application and enjoyment from using it according to (3). Malone (4) in his early study has identified four aspects that lead to engagement which are challenge, fantasy, curiosity and control. Other scholars emphasized on other measures in defining engagement;involvement (5),immersion (6), arousal (7), interest (8), identification (9), enjoyment (10), involvement (11), effort (8), and flow (12).

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In order to make gamers engaged, games must be designed and developed with certain characteristics. Twelve characteristics that can make computer games engaging have been listed by one of the prominent scholars, (13); games should be fun (gives enjoyment and pleasure), games should be a form of play (gives players intense and passionate involvement), games should have rules (gives player structure in playing), games should have goals (gives players motivation), games should be in interactive form, games should be adaptive (gives players flow while playing), games should have outcomes and feedback (gives player learning), games should have win states (gives players ego gratification), games should have conflict/ competition/ challenge/ opposition (gives player adrenaline challenge), games should have problem solving (will spark players' creativity), games should have interaction (allow social groups among players), and games should have representation and story (gives players emotion while playing).

Despite the importance of rewards, emphasis is not given on how rewards can support games

characteristics towards engagement, particularly Malaysian digital traditional games. Hence, efforts are needed to enhance digital traditional games with rewards and investigating its effect on games engagement. Therefore, this article discusses how rewards influenced players towards the engagement of digital traditional games particularly in the context of games flow, challenge and its effects. Taking *Congkak*, one of the popular Malaysian Traditional games, reward has been incorporated in the game. Experiments have been conducted to measure its influences. This article is organized by discussing about Malaysian Traditional Games and the lack of the games. Further discussion touched on the importance of rewards and examples of current scenarios of rewards in digital games. Methods of incorporating rewards in digital *Congkak* are presented and thoroughly discussed Methodology section. Finally, concluding remarks are covered the last part of the article.

Rewards and Games Engagement:

In line with many other pleasurable activities, current review has regarded engagement in games in a positive light but has also highlighted the need for researchers to investigate in more detail the delicate balance between positive and negative experiences, emotions and motives in engaging players in games (1).

Rewards are defined as the outcome of an action. It is given in recognition of one's effort or achievement. In games context, rewards are given when gamers achieved certain level or managed to solve hurdle or obstacles of the game. It serves as an incentive to player to keep them playing and giving them assistance to solve tougher levels. Rewards and incentives are considered as a crucial piece in games engagements. With proper and thoughtful design, incentive and reward programs can be very effective in providing optimal levels. motivations for driving engagement. Players are assisted to deal with the twelve games characteristics especially when dealing with their ego gratification in winning. Rewards are important in motivating, assisting and act as a pulling factor to keep players playing, thus make them engaged.

In games, rewarding gamers is one of the methods that can get them engaged. Reward system will provide gamers with positive experience while engaging with various games (14). Eight form of rewards in digital games have been listed; score systems, players control developable avatars by using experience point rewards system, item grating system rewards, resources that affect gameplay, achievement system, feedback message, plot animations and pictures, and unlocking mechanisms. Reward system in digital games can also be as motivators for the gamers when compromises for easing disappointment. Rewards can also encourge gamers to keep engage with the games. In digital games design, understanding and incorprorating effective rewards are common approaches in games that can be driven by theories, motivation and incentives (15).

Scholars have listed and defined reward systems in various ways. (16) listed four categories in rewards duration system; timed rewards, transient rewards, permanent rewards and consumable rewards. Those durational characteristics rewards system is relevant to all types of reward. Study conducted by (17) listed rewards into three classes; enabling rewards, exchangeable rewards and subjective rewards. First class of rewards enables player to have privileges and added new skills in their games in order to making progress in the game. While the second class is to exchange goods from other player and get advantages from it.

(a) (b) (c)

Figure 1. Types of rewards in Candy Crush Saga.

(a) (b) (c)

Figure 2. Example of rewards provided in Candy Crush Saga.

Malaysian Digital Traditional Games

Some Malaysian Traditional Games have been digitized as one of the preservation efforts after realizing this genre of games are nearly forgotten and going extinct. Digital versions of traditional games are developed on various platforms which allow people to play using digital devices at their convenience. Most of the games can be downloaded for free. Lipandes Studios is among Mobile Gaming Developers who actively developed mobile games especially for Android™ platform. Since publishing their first Android game, they have got more than one million installs on Google Play™ store. Three most popular Malaysian Digital Games (based on the download frequency) are *Dam Haji*, *Congkak*, and *Gasing* (top spinning) as shown in Figure 1(a), 1(b), and 1(c) respectively.

(a) (b) (c)

Figure 3. Popular Malaysian Digital Traditional games.

Although the games are highly downloaded, preliminary study has revealed that younger generations are more attached and engaged to contemporary digital games. Statistics show that majority of the respondents opted for contemporary games over the traditional versions (19,20). It is now become a main concern on how to get gamers among young generations to get engaged to the traditional versions.

Although many versions of Malaysian Traditional Games were developed, none of them has incorporated rewards, despite its importance.

Rewards can motivate and encourage player to interact with digital games (14). It has been successfully implemented in contemporary digital games such as Pokemon Go and Candy Crush as shown in Figure 2(a), 1(b), and 1(c) respectively. This study will use the enhanced version of *Congkak* which incorporated rewards for the purpose of analyzing its influences on games engagement. The Figure 3(a), 1(b), and 1(c) respectively illustrate the Popular Malaysian Digital Traditional games.

Methodology:

Five main phases have been carried out in conducting this study involving two experiments among the millennials group. Phases involved are illustrated in Figure 4.

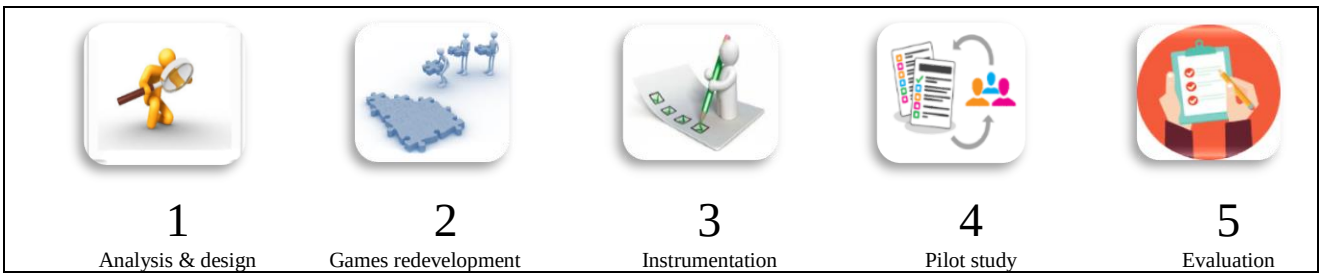

Figure 4. Research methodology.

Analysis and design

The main aim for this plase is to study the drawbacks of the existing Malaysian Digital Traditional Games particularly on the incorporation of rewards in its gameplay. To achieve this, several versions of Malaysian Digital Traditional games have been thoroughly analyzed and studied. With the cooperation of its founder, *Congkak* which is developed by (21) is chosen to be enhanced with rewards. Although there are many versions of Congkak available on the Internet, Shamsul's version of Congkak is the most popular Congkak on Google Play and has been downloaded and installed for more than 500 000 times.

For enhancement purpose, the selected *Congkak* has been thoroughly analyzed. The focus are to identify the drawbacks of the game and to redesign it by incorporating rewards to the game to suit the objective of the study. The main drawbacks that have been identified are its gameplay (pebbles moving anti-clockwise), fixed board size (only seven holes allowed), and no rewards included.

Hence, this face has focused on redesigning an enhanced version of Congkak by suggesting a major change on its gameplay (pebbles moving clockwise as the traditional version). Another suggestion is to give flexibility to gamers in choosing the board size (options to gamers to choose the size of either six, seven, or eight holes). To incorporate rewards, points in credit value was suggested which will be collected when gamers win every round of the game.

Games redevelopment

Main activity of this phase is redeveloping the chosen *Congkak* by including the suggested features as designed in the earlier phase. With the cooperation of the founder, an improved Android based *Congkak* has been redeveloped. Rewards are included in credit form (with the default value of 10). The look of the improved *Congkak* with rewards are illustrated in Figure 5.

Figure 5. The enhanced *Congkak* with rewards.

As a start, ten credits are given. More rewards can be collected when the gamer wins each round of the game. Rewards are shown on the left top of the screen and can be used to buy hits during the game or to redeem burnt holes in the next round. Buying hints will help gamers in deciding the best hole to start which lead to a long run of the game (long run will collect more pebbles in securing holes for the next round and avoiding burnt holes). Deduction of credits when rewards are used in shown in Figure 6.

Figure 6. The use of rewards in the enhanced *Congkak*.

In Figure 6, the gamer failed to secure enough pebbles to fill in all holes for the next round (all seven holes need to be filled with seven pebbles each). By having the initial rewards, the burnt holes can be freed. Three creedits are needed to free each burnt hole. Since the total available credit is ten, only two burnt holes can be freed (6 credits will be utilized; three credit to free each hole). Second round of the game will start with four credits left and two burnt holes (burnt and not active in round two). This gamer needs to collect more pebbles in round two and win the game in order to survive the game.

Instrumentation

To measure games engagement, concepts are adapted from Game Experience Questionnaire (22) which consists of seven constructs; competence, sensory and imaginative immersion, flow, challenge, negative effects, positive effects, and tension/annoyance. However, tension/annoyance is not included in this study. Figure 7 illustrates constructs and its independence variables used.

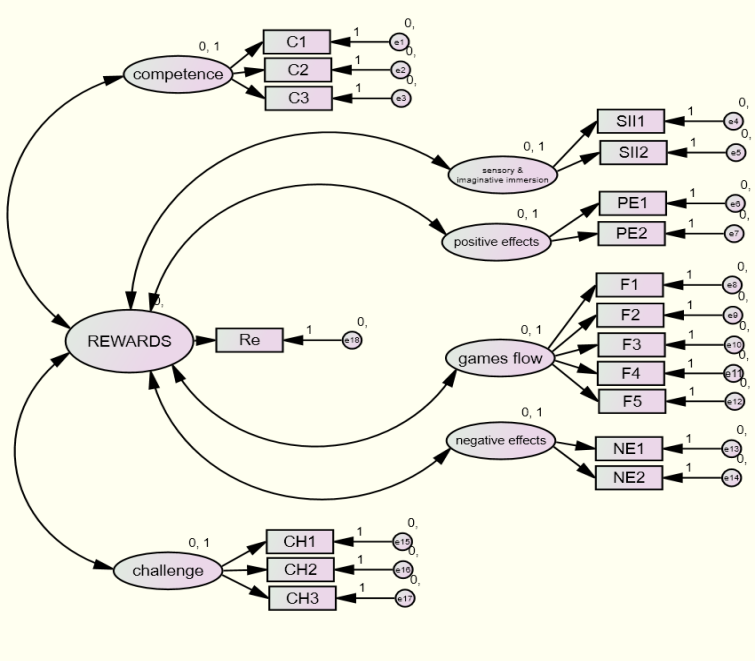

Figure 7. Constructs used to measure the influence of rewards on games engagement.

There are three questions used to measure the influence of rewards on games challenge, five questions to measure the influence of rewards on games flow and two questions to measure the effects of rewards (two for each positive and negative effects). From Figure 7, six hypotheses (H_n) have been derived:

1	There is a significant positive relationship between rewards and competence
2	There is a significant positive relationship between rewards and sensory & imaginative immersion
3	There is a significant positive relationship between rewards and games flow
4	There is a significant positive relationship between rewards and challenge
5	There is a significant positive relationship between rewards and negative effects
6	There is a significant positive relationship between rewards and positive effects

This article is focusing on analyzing the influence of rewards on games flow, games challenge, and its effects which covers both positive and negative effects (H_3, H_4, H_5, and H_6). Influences on sensory and imaginative immersion have been discussed in (23).

Pilot study

First experiment has been conducted during pilot study stage involving 40 respondents among the millennials. Majority of the respondents are between 21-29 year old (82.5%), while 12.5% are between 14-20 year old, and 5% among those above 30 year old. 75% of the respondents spent 1-4 hours playing games, while 17.5% spent more than 4 hours per day playing games.

Experiment involved game demo, gameplay experience, and systematic interview which focusing on perceptions of rewards and the influence of rewards on games engagement. Findings of the experiment are discussed and reported in Bakar et al. (24). Based on data collected from pilot study, the instrument has been improved; four Likert scales are used, and more constructs were added.

Evaluation

Evaluation involved both verification (technical test) and validation (user test). Both tests are important in ensuring the enhanced *Congkak* works correctly as specified and accepted by the gamers. Technical test has been done with the developer in checking the calculation of the rewards. Series of tests have been conducted before the enhanced *Congkak* is ready to be tested by gamers.

Following the success of the first experiment during pilot study, second part of testing involved combination of game demo, gameplay experience and systematic interview. User tests have been carried out involving 50 gamers which are among the millenials (age ranging between 14 – 34 yeards old, born between 1982 and 2003 and best known as Generation Y). (25) defined this group of respondent as the new "Great Generation" as they display ambition, confidence, optimism, and a capacity for high-level cooperative work. Table 1 shows demographic of the respondents.

Table 1. Demographic of respondents

n = 50	Frequency	Percentage (%)
Age (year old)		
20 - 25 year old	20	40
26 - 29 year old	25	50
> 30 year old	5	10
Gender		
Female	29	58
Male	21	42
Frequency playing game		
Average 2.54 hours per day		

User test began with game demos, emphasizing on rewards element as a new feature that has been incorporated. Gamers then were giving chances to play, explore, experience and test the new feature. The last part was the survey which involved structured interviews with the gamers based on their game experience.

Findings:

Feedbacks from second experiment have been analyzed quantitatively and qualitatively. Quantitative data have been analyzed using Amos and descriptive analysis. For the impacts on game flow, (22) suggested five constructs to be used; F1 representing occupancy with the game, F2 indicates that players forgot everything in the surrounding, F3 represents how gamers lost track of time while playing game, F4 represents how gamers are deeply concentrated with the game, while F5 represents how gamers lost connection with outside world while playing game. Mean for all five constructs are shown in Figure 8.

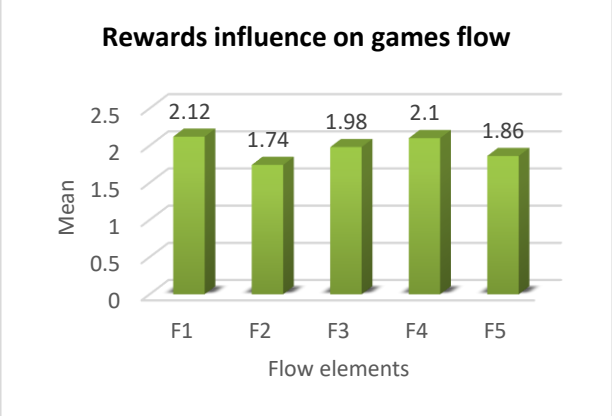

Figure 8. The influence of rewards on games flow

From the experiments, mean score for F1 and F4 are above average which are 2.12 and 2.1 respectively. Gamers agreed that playing a reward-based *Congkak* made them feel occupied and deeply concentrated with the game. However, they did not agree that playing a reward-based *Congkak* has

made them disconnected with the world, which can be seen in the mean score of F, F3, and F5. Critical ration (CR) for this relation is 1.98 which explains that it is significant, hence supported H_3 (there is a significant positive relationship between rewards and games flow).

To measure the influence of rewards on games challenge, there constructs have been used; C1 represents the difficulty of the game when rewards has been incorporated, C2 presents that games felt pressured playing a reward-based *Congkak*, while C3 is used to measure whether gamers have to put extra effort to play game with rewards. These constructs are used to analyze the significant of Hypothesis 4, H_4. Mean score for the three constructs are shown in Figure 9.

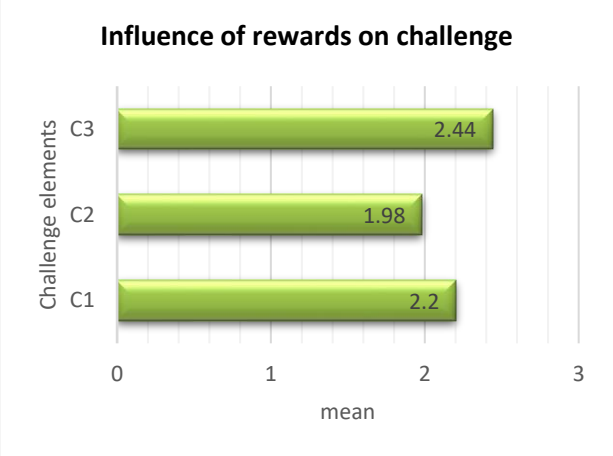

Figure 9. The influence of rewards on challenge.

Mean score for both C1 and C4 are above 2.0 which show that gamers agreed that rewards give positive influence on games challenge. Gamers need to put extra effort to secure rewards which can be used to face challenges of the game. However, mean score for C2 is low (1.98) which indicates that gamers do not agree rewards made them pressured while playing. Value for critical factor (CR) for this relation is 1.99 which indicates that it supported H_4 (there is a significant positive relationship between rewards and challenge).

To measure the effects of rewards on games engagement, four constructs have been used (two constructs for positive and negative effects respectively). PE1 represents the first construct to measure positive effects (game is fun with rewards), while PE2 represents the second construct to measure positive effects (gamers feel happy playing a reward-based *Congkak*). To measure negative effects of rewards, NE1 is used to represent that gamers felt bad playing game with rewards, while NE2 used to represent how gamers felt bored playing game with rewards. Figure 10 shows the response.

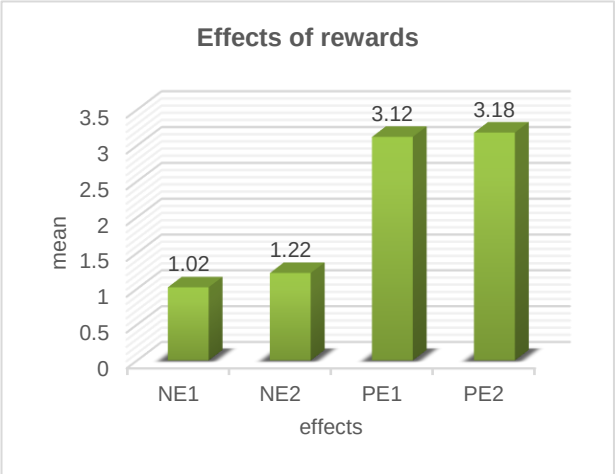

Figure 10. The effects of rewards on games engagement.

Mean score for positive effects of rewards on game engagement are high; 3.12 and 3.18 for PE1 and PE2 respectively. It indicates that gamers agreed that playing games with rewards is more fun and make them happy, hence give significant relation towards engagement. Low mean values for NE1 and NE2 show that gamers do not agree that rewards make game bored and make them feel bad playing it. In other words, gamers do not agree that rewards will give negative effects on game engagement. It is supported by the value of critical factor (CR) of 1.97 and 1.83 which indicates that it supported H_5 but not H_6 (there is a significant positive relationship between rewards and both positive but there is insignificant relationship between rewards and negative effects).

Conclusion:

The influence of rewards that have been successfully incorporated in *Congkak* have been thoroughly analyzed through experiments. Findings show that Hypothesis 3 (H_3), Hypothesis 4 (H_4), and Hypothesis 5 (H_5) are supported by the findings (values for critical factors (CR) are more than 1.96). However, Hypothesis 6 (H_6) is not supported by the findings, which is a positive finding to the conclusion of the study.

It can be concluded that rewards give positive influence on games flow, game challenge, and positive effects. However, rewards do not give negative effects to games engagement. The findings can be useful to new psychologists to obtain more understanding pertaining to games engagement through some experiments of rewards in traditional games. This study is useful and beneficial to game

developers to include rewards in enhancing digital traditional games. Ideas of incorporating rewards in digital traditional games can be considered to be implemented in other digital traditional games.

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Conflicts of Interest: None.

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تأثير المكافآت على مسار الألعاب والتحدي وآثارها نحو إشراك الألعاب التقليدية الرقمية الماليزية

نورزيه شي با **نور عزة ابو بكر** **فضيلة هبة الله** **أزهم حسين**

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الخلاصة:

أصبحت مشاركة الألعاب واحدة من الاهتمامات الرئيسية في صناعة الألعاب. كشفت دراسة مبكرة أن الألعاب التقليدية الرقمية الماليزية تعاني من نفس المشكلة بسبب عدة عوامل. واحد منها هو عدم وجود اللعبة نفسها. على الرغم من أن العديد من الألعاب التقليدية الماليزية قد تمت ترقيمها ، إلا أن أيا منها لم يتضمن المكافآت على الرغم من أهميتها في مشاركة الألعاب. إدراكًا لأهمية المكافآت في مشاركة الألعاب ، تم اختيار واحدة من ألعاب Congkak التقليدية الماليزية لتعزيزها من خلال دمج المكافآت. وقد أجريت تجارب بين 50 لاعبا بين جيل الألفية. اجريت لعبة تحريبية واختبار بشري قبل المقابلات. ركزت التجارب على تأثير المكافآت على مسار الألعاب وتحدي الألعاب وتأثيراتها التي تغطي كل من الآثار الإيجابية والسلبية من خلال أربع فرضيات. أظهرت النتائج أن ثلاث فرضيات مدعومة بالتجارب ، مما يدل على أن المكافآت لها تأثير كبير على التركيبات المقاسة. يمكن أن تكون النتائج مفيدة لعلماء النفس الجدد للحصول على مزيد من الفهم فيما يتعلق بمشاركة الألعاب من خلال بعض تجارب المكافآت في الألعاب التقليدية. يمكن أن تكون أفكار دمج المكافآت في الألعاب التقليدية الرقمية مفيدة ومفيدة لمطوري الألعاب في جذب الألعاب وجعلها متصلة بالألعاب.

الكلمات المفتاحية: المكافآت في الالعاب، مشاركة الألعاب، الألعاب التقليدية الرقمية، الألعاب الماليزية.