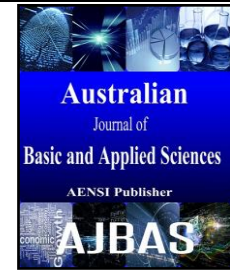




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Gamification for Workplace: Mobile Application to Motivate Lecturers towards a Satisfied Job Performance

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ABSTRACT

Background: Gamification is the use of game concept into non-game area. It has been recognised in a variety of implementations such as in marketing, sports, education and workplace. In any of an organisation, employees needed to get motivated to achieve their performance goals. However, the motivation could decrease along the journey to achieve the goals. So, this study is to assist an organisation to achieve a better performance in completion of job tasks. **Objective:** This study applies the game mechanics into the academic workplace through mobile application, in order to create a motivating work environment to assist in workplace performance management. A framework of gamification is designed to relate gamification and performance management. A real case study in a comprehensive university in Malaysia is used to verify the framework. **Results:** In the case study, participants will go through a two phases interview, a pretest and post-test interview. In the pretest interview, participants realise that the current situation of the workplace require a change in order to achieve goals in work task. Eventually, post-test interview shows that with the assist of gamification mechanics, 75% of the participants perceived that with the implementation of gamification in workplace, a motivated environment among employees could be generated. The results received from the participants are supportive with the idea of implementing gamification as an assisting tool for better performance in workplace. **Conclusion:** This study shows that a gamification practice in workplace is seen promising as one of the way to stimulate motivation among employees.

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INTRODUCTION

Gamification has seen as a context of game in non-game context. There are a number of gamification applications in the market, as it is often function to engage and motivate in learning process, business and work task. Gamification has the similar marketing fundamental that relates to its strategies, such as points cards and customer rewards, towards scholastic levels, such as, grades, and degrees, and workplace productivity (Nelson, 2012).

In workplace, organisations that apply the game-like experience is not new, regardless to academician workplace, it is an area that has the same potential to apply gamification as other departments of workplace.

The emergence of social media, mobile and web-based technologies has changed how individuals and organisations participate in, share, co-create, discuss, and modify any type of experience (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). It is believed, with the information technology,

the technology creates an opportunity to assist the effectiveness on gamification implementation.

There are number of applications existing in the market that has successfully used the gamification concept in its domain area. These applications were used as a way to engage users into increasing performance. The applications are (Nike+ running app (context of sports), Duolingo (education), Wii fit (health) and Dueprops (workplace)).

II. Research Questions:

Two main research questions for investigation, in the context of a workplace performance management, are:

1. How gamification concept could support lecturer's performance?
2. What are the factors that could trigger performance through gamification?

These two research questions will become the basis towards the development of the framework in this research.

III. Review of Literature:

From the game perspective, it is often seen that gamers spend hours of time playing video games. In a study of Massive Multiplayer Online Role Playing Games (MMORPG) by (Jung *et al.*, 2014), most gamers spent time on playing games for about one to two hours daily. An online game often took more time to spend on, compare to offline. The motivation of time spending in online game, especially (MMORPG) are nonother than visual and hearing rewards, peer group attention/approval, keeping the score, the requirement of total concentration, and incremental rewards from winning (Antonius J. van Rooij *et al.*, 2010). Gamers often find enjoyment, achievement, friendship and sense of community while playing games (Dindar and 2014). So, the gamification makes use of these aspects and applying into many different usages, including performance management.

Gamification has been reviewed as a game thinking and a term that is used to describe badges, leaderboards, levels and points as a process of taking motivational mechanics from games and applying into non-game context. (Sebastian Deterding, 2011, Richards *et al.*, 2014). Gamification is taking game concept as discussed and its motivation of gaming into non-game context, such as sports, education and workplace. It does not necessarily involve game creation, (Richards *et al.*, 2014). In education, learning can enhance children's interest and engagement in learning, and educational games can significantly increase the intrinsic motivation than traditional learning method (Nienke Vos and 2011).

A. Motivation:

Based on (Deci & Ryan, 1985), motivation can be distinguished from intrinsic and extrinsic motivation, based on different goals and reasons.

Both motivations are important to stimulate someone in doing a job task, and because both motivation has a very different reasons on driving performance, therefore, in this research, both intrinsic and extrinsic motivation are investigated further on the gamification context.

i. Intrinsic motivation

Researchers nowadays have always study with intrinsic motivation, which is to engage enjoyment, challenge, pleasure or interest (e.g., Berlyne, 1960; Hunt, 1965; White, 1959).

Ryan and Deci define intrinsic motivation (IM) as an activity that characterise for its satisfactions rather than other outcomes. It doesn't cause by other external stimulations, pressure or rewards to get intrinsically motivated, and get challenge and feel engaging. Besides, what intrinsic motivation do is not only motivation, but also volitional activity.

Besides, Gamification design describes the design of Gamification serve the goals of increasing

lecturer attendance, class participation, content understanding, problem solving skills and general engagement and it's found that Gamification is effective in a university settings. (Siobhan O'Donovan, 2013).

This proves intrinsic motivation that enable Gamification to engage the participants in this research to enjoy the pleasure and satisfaction that they will achieve.

Most of the people are not engaging themselves into particular activity is an act of not enjoying it and what boost up their inner motivation to keep them to go on isthrough intrinsic motivation. Without the external rewards, participants feel enjoyable and keep themselves engage to the activity. (Goldhaber, 2012) summarized some theories of intrinsic motivation for potential framework design modification, it has related to Funology and Gamification, with few of the researchers' supports. They stated a design needs to be fun to draw attention and as long as it is a fun interfaces.

II. Extrinsic motivation:

Extrinsic motivation (EM), refer as the motivation to earn external reward (Jonathan Sicsic, 2012). It is seems as a tangible reward given to motivate someone to work better and extrinsically motivated by a goal (Deci, 1980).

Besides, it is often been relates to monetary rewards when extrinsic motivation connects with employee performance, employees are able to perform and satisfy their needs through monetary rewards (Minbaeva, 2008).

The term of Gamification has arguably to establish itself as the umbrella term of different corresponding terms, like "productivity games" (McDonald, 2008), "surveillance entertainment" (Grace, 2008) and also "applied gaming" stated in natronbaxter.com

Extrinsic motivation also seen as peer recognition and individual reputation can be improved and reputation also related to social status, which will improve performances (Hung *et al.*, 2011). Moreover, reciprocity, also seen as an extrinsic motivation (Hung *et al.*, 2011), a mutual benefit on two parties, reciprocity is the nature of exchange pleasure (GOULDNER, 1960). Therefore, it is believe that the expectation of receive benefit from others will be high, and extrinsically motivated by the expectation.

B. Performance Management:

Organizations consist of group of members. To ensure the organization achieved their goals, all the staff members needed to complies with certain achievable performance that has been set.

Performance management is a process that an organization manage its performance uses various system, these systems includes different kinds of management, for instance, strategy development

review, non-financial performance measures, personnel appraisal and review and related administration processes and strategies (Umit S Bititci, 1997). The fact is in performance management, it is usually define as an action to measure performance in different aspect with a set of goal to achieve.

It is a drive for the participants to engage through family environment. Performance management in Gamification in this context is in this “game”, system, “players”, the participants involve together to run a organization and receive a certain

amount of “rewards” prize when successfully finished a “challenge”, goal, and what drive the performance by the rewards and push participants towards the goal.

C. Preliminary framework:

With the reviewed of literature of the gamification and its application, a preliminary framework is designed. This framework shows the relationship between gamification and performance management.

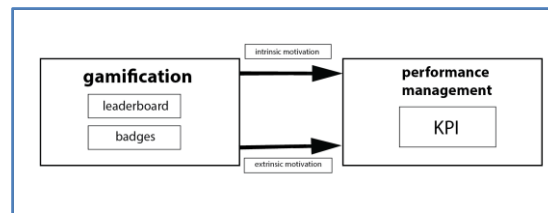


Fig. 1: Preliminary framework of gamification for this research.

As shown in the preliminary framework in figure 1, there are three (3) main factors to be investigated in this research, which are Gamification, motivation, and performance management.

In gamification, leaderboard and badges are the main elements to be investigated as well as motivation that has been distinguished between intrinsic and extrinsic motivation.

Both gamification and motivations are interrelated and it's the key factors to engage KPI. KPI is directly affected by motivation, and gamification is indirectly driving KPI. Therefore KPI is driven directly by intrinsic and extrinsic motivation. Motivation are supported by leaderboard and badges or conversely.

By the end of the analysis, the preliminary framework will be reviewed and verified based on the result in later chapter.

IV. Research Methodology:

The investigation of the research involves the exploration of gamification and performance management context in workplace. The results of the research will be measure through the understanding of participants behaviour and culture in the workplace.

As the research is to investigate the culture and behaviour of the participant workplace, the understanding of situation of each individual before and after the research is taken into consideration. Qualitative is chosen as the method of data collection as it is more on the individual basis, additionally, it analyses the social phenomena, which does not involve numbers and statistics (McLeod, 2008). Besides, it is also a method on discovering and understands the experiences, perspectives and thoughts of participants. (Hiatt, 1986).

Case study is taken as the type of the qualitative approach, as (Yin, 2003) defines case study as an empirical inquiry that explore individuals or organisations in a situation. This approach is appropriate to investigate the contemporary phenomenon within the gamification and performance management contexts. Implementation of qualitative methodology will get to know the experience of the participants and what are their thoughts and understand of the situation.

A. Data collection technique:

In this research, the focus of the university is comprehensive universities, as the target of this research is based in a comprehensive university.

A comprehensive university provides different fields of studies from pre-undergraduate, undergraduate and postgraduate degrees.

The table below shows the similarities in overall performance measurement in different areas, for 3 local comprehensive universities. Comprehensive universities have a distributed field of evaluation and it's suitable with this research, which require a balanced percentage of overall performance evaluation, compare to other universities, that bias to research or specific field.

I. Participants:

In this study, the academic staffs at Faculty of Computing and Informatics (FCI) and Faculty of International Finance (FIF), were involved in the study. The participants consist of junior lecturer, senior lecturer and lecturer with administration position. Both faculties are chosen because of their expertise in different field in information technology (FCI) and business (FIF). It is believed, both

faculties have different administration, while under the same KPI of University Malaysia Sabah.

Table 1: Comparison between three comprehensive universities.

	Publishing & Research (%)	Teaching & supervision (%)	academics contribution (%)	community services & training (%)	Consultation (%)
Universiti Malaysia Sabah	30-40	40	10-20	20-30	5
Universiti Malaysia Sarawak	30-40	30-40	10-20	5-15	5-15
Universiti Teknologi Mara	20 -25	30-40	10 -20	5 -15	5 - 15

To understand the culture and behaviour of the workplace, interview is taken as the method of data collection. It focuses on the interaction of participants with interviewer through questions and answering session. A better understanding of the behaviour of each participant towards work can be perceived.

II Interview:

Interview in qualitative research, is believe to obtain a better understanding of a social culture than quantitative methods, like, questionnaires (Silverman, 2013). Interview is viewed as a method to explore a new insight of the individual experience, views and current situation, in an organization.

Result And Analysis:

A Data analysis method:

The analysis of the data collected was assisted by Nvivo. The data was organised into theme based on the research questions and the framework. With the theme collected, noting patterns, themes, was used as the analysis method to find pattern of the response from the interview.

As (Huberman, Miles, 1994) mentioned, similarities and difference in categories can be expected from the elements of patterns, and the pattern processes involve connections in time and space within a context. As in the academician workplace, a time is specify to conduct the interview and it involve the mobile app testing to experience the gamification implementation.

The interview will separated into two phases, pre-test and post-test with an application testing phase in between.

I. Pretest:

Question	Pre-test Questions
1	What do you understand about the KPI in the school? What is your planning to achieve the KPI? If No, please explain.
2	What can you understand from gamification? From the explanation I given, which elements of gamification can be use to get better job performance done?
3	Do you think it is feasible to apply gamification in the tool to motivate the lecturers? What is the reason if you agree and what is the reason if not?

In the pre-test interview, some of the interviewee stated that Gamification is a concept, which can improve working and make it in a more game-like experience that can gain recognition. Besides, there are some think that gamification is a tool, a game design or a video game.

Both pre-test and post-test interview will depict the pattern and themes into:

- 1) Gamification,
- 2) Extrinsic & Intrinsic motivation
- 3) Competition
- 4) Rewards and
- 5) Performance management

II Application testing:

With the understanding of the situation of the workplace and the academician behaviour in the pre-test interview, a mobile tool has been developed, implemented into the academician workplace and

followed by carrying out the post-test interview which involved testing and comprehend the situation of the academician workplace, and what will the academician anticipate from the implementation of gamification mobile tool.

In order to measure lecturer performance, one of the main KPI, which is the publication of research paper will be measure through a leaderboard, lecturer needs to publish it (Figure 1) for the authority of the faculty (the dean) will authorize it (figure 2) before it get publish in the leaderboard for public view (Figure 3).

In this application testing phase, the Android application will investigate on two main elements, which are the competition (leaderboard) and also reward (badges) and recognition from authority to match the theme of competition and performance management.



Fig. 2: Publish for approval.

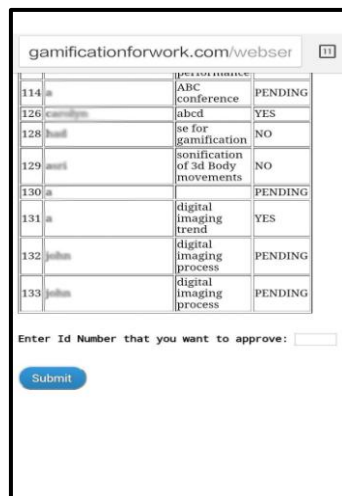


Fig. 3: approval status for authority and participants.

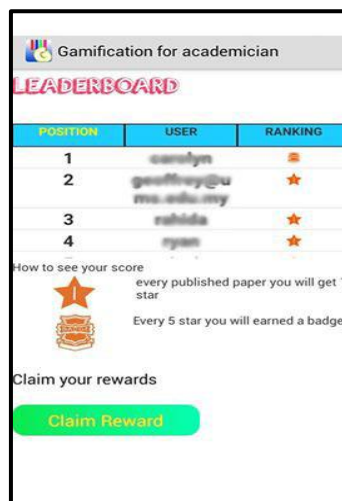


Fig. 4: Leaderboard for ranking and rewards.

III Post-test:

Question	Post-test Questions
1	In general, How gamification help lecturers to achieve targeted KPI?
2	Are you satisfy with the existance of gamification in your workplace?
3	With the help of this software/apps, will it able to help the lecturers to perform better and motivated?

75% the participants think that without gamification, workplace would be lacking of fun, if worse, it can demotivate users. Moreover, the application of gamification can create a game-like experience, a leaderboard that could be seen by others.

- Similarly to pretest, interview are theme into
- 1) Gamification,
 - 2) Extrinsic & Intrinsic motivation
 - 3) Competition
 - 4) Rewards and
 - 5) Performance management

Comparison between the result of pretest and post-test:

Both pretest and post-test interview are compared in a similar pattern of theme.

Discussion And Conclusion:

This research found that gamification and performance management are recognised by the participants as a drive to work better in daily job task, especially in KPI.

As in preliminary framework, gamification drive performance management by intrinsic and extrinsic motivation, it is verified by the result that participants agree intrinsic (competition) and extrinsic (reward) motivation could achieve participants desire performance management.

The research questions developed and result from the interview have refined and verified that intrinsic and extrinsic motivation as the catalyst to drive performance management by applying gamification mechanics from the preliminary framework.

This research explains the journey of how to apply gamification to increase academician interest to publish paper, not only to fulfill job task as a researcher but also to expand knowledge to the society. With the advancement of technology, gamification and mobile application are believed to have its potential to underpin the performance management in workplace.

condition interpretation		Before	After
Understanding of gamification		<ul style="list-style-type: none"> • There are some participants think that gamification is playing video games. • While others think that it is a tool to relate games to make something more interesting 	<ul style="list-style-type: none"> • Participants think that with the gamification applied in workplace, environment will be fun. • It could make users more responsible and more motivated.
How they think gamification would improved performance and KPI		<ul style="list-style-type: none"> • There are some academicians that doesn't do well in their work task. • Can't achieve goal individually, major concern is publications in KPI. 	<ul style="list-style-type: none"> • Participant thinks they can achieve better performance and bring motivation. • However, there is participant states it's showing bad image to some academicians who did not publish.
Extrinsic motivation	Competition	<ul style="list-style-type: none"> • Competition is like a measurement for performance. • No colleague to remind each others, participants do works on their own. • Participants need competition, a healthy one to get motivated. 	<ul style="list-style-type: none"> • Creating competition among academicians, good for authority to monitor. • By looking what others are doing, participants feel motivated if they are fall behind. • Participant doesn't mind to compete with other of the colleagues.
Intrinsic motivation	Reward	<ul style="list-style-type: none"> • Human likes to get rewarded, that is a great motivation. • At least a recognition from authority will be great, if it's not in physical reward. 	<ul style="list-style-type: none"> • Most Participants think rewards are important. • Badges show academicians achievement been recognized and will work hard in the future.

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