

# Towards Digital Game-Based Learning (DGBL) in Higher Education (HE): The Educators' Perception

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## Abstract

There are widespread of Digital Game-based Learning (DGBL) applications or computer games (CG) utilization in various areas including education sector. Although researchers echoed that CG has potential to be leveraged as a learning tool and suggest educators to shift from conventional approach to Digital Game-based Learning (DGBL) to suit the new learning styles introduced by the Digital Natives, yet the view of educators in relation to the uptake of CG in education is still lacking. Hence this research work aims to explore the experiences, perceptions, habits and expectations of educators towards implementing CG in Higher Education(HE) focusing on Malaysian context.

**Keywords:** Game-based Learning (DGBL), Computer games, Higher Education (HE)

## 1. Introduction

“It makes learning fun”, “It takes my mind off my problems” and “I am able to interact with my friends when playing game” are some of feedbacks from Gen Y towards computer game (CG). Gen Y (aged 17-29) are technology savvy (Prensky, 2001 & Rideout et al, 2005). They are called Digital Natives because they are born and raised surrounded by new technologies and gadgets (Prensky 2001, Sotomayor & Proctor 2008). Learners from this generation expect more participation and enjoy being an active learner during the learning process (Kapp, 2005). Prensky (2001) believes that the problem with today's' education is that educators are trying to educate the new generation with the old ways. He suggests to the educators to shift from conventional way of learning to more creative and suits to the new learning style. While researchers suggest the educators to be ready to shift their approach, the perception of the educators themselves towards CG is still scant. This paper aims to address the following questions (1) What are educators experience with CG, (2) what are educators habits on CG and (3) What are educator's perception towards DGBL?

This paper is structured as follows: section I covers the introduction, Section II discusses the background study, Section III discusses the literature review, and Section IV discusses about gaming in HE and finally in Section V is the conclusion.

## 2. Gaming in Malaysian context

An online survey was conducted by the author, from a sample 176 respondents. Figure 1 shows that 97.2% (n=171) of Malaysians play at least 1 CG. As shown in Figure 2, 88.8% gamers age from 17-30 (Gen Y) while another 11.2% gamers from 31-51 years old (Gen X).

The result reveals that CG is widely accepted by Gen Y and it also shows that there is an increase acceptance of CG in Gen X in Malaysia. The results add weight to the argument that CG can potentially make a significant contribution to learning in Higher Education (HE) in Malaysia.

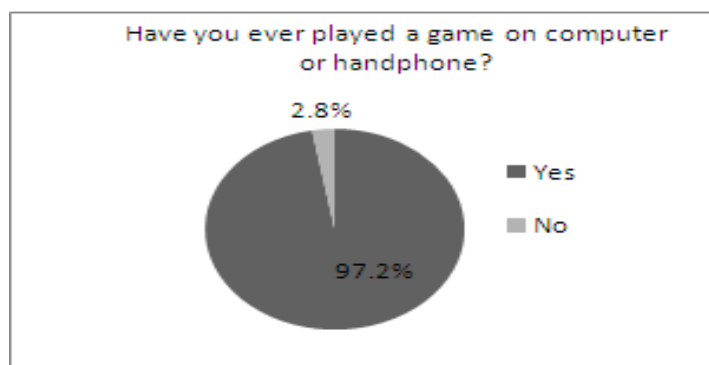


Figure 1. Respondents experience on CG

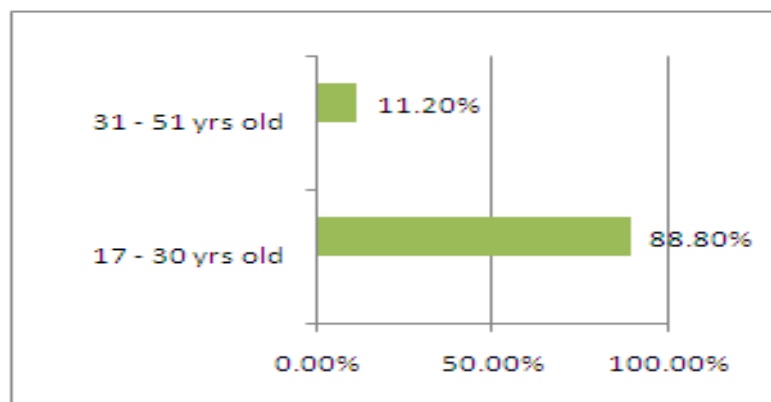


Figure 2. Gamers age profile

### 2.1 Digital Game-based Learning (DGBL)

As according to Tang, Hanneghan and El-Rhalibi (2009) DGBL refers to “the innovative learning approach derived from use of CG that posses educational value, or different kind of software applications that use games for learning and education purposes such as learning support, teaching enhancement, assessment and evaluation of learners”. O’Neil, Wainess and Baker (2005) highlighted multiple benefits of CG for instructional purpose such as (a) complex & diverse approaches to learning processes and outcomes (b)interactivity (c) motivation for learning and (d) ability to address cognitive as well as affective learning issues. DGBL is widely being utilized in various sectors such as military, business, health, education and aviation.

Although DGBL is widely being utilized, the educator’s experiences, perceptions and expectations are still scant (Griffiths 1999; Anderson & Bushman, 2001, Beggs, O’Neill et al, 2009; Hainey, 2010). Most researchers focus on the learner’s as compared to instructor’s perception. Hainey (2010) claimed that instructor’s perception is of the key aspects to consider before a researcher can evaluate any DGBL application. De Freitas (2006) did a research work to study the perceptions and beliefs of the tutors, adult learners and experts in the field about the use of games and simulations in educational context. Hence, this research paper aims to explore the educator’s experiences, perceptions, habits and expectations towards educational game in HE focusing on Malaysian context.

### 2.2 Gaming In Higher Education(HE)

An online survey was distributed to all educators in Universiti Teknologi Petronas (UTP) for a period of one week. This questionnaire has been adapted from the original research by Beggs, O’Neill et al (2009) by the Malaysian team. A total of 40 educators (12% from 330 staff) responded to the survey. Figure 3 shows the age profile of respondents. 50%(n=20) of respondents aged between 30-39, 27.5% (n=11) aged between 40-49, 10% (n=4) aged between 50-59 ,7.5% (n=3) aged between 21-29 and another 5%(n=2) aged more than 60 years old. Figure 4 shows the respondents’ seniority where 57.5%( n=23) are lecturers, 22.5% (n=9) are senior lecturers, 15% (n=6) are associate professors and the remaining 5% (n=2) are professors. Figure 5 shows the departments of the respondents

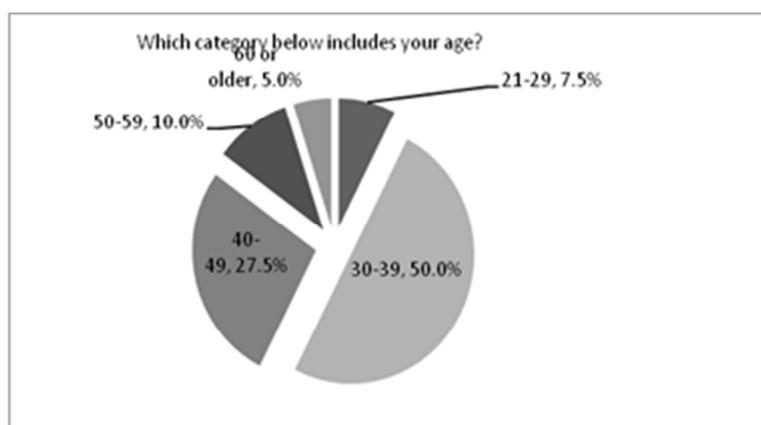


Figure 3. respondents age profile

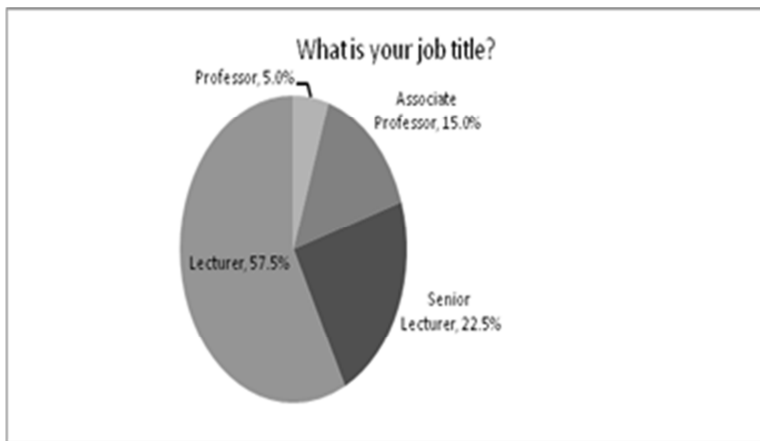


Figure 4. respondents seniority

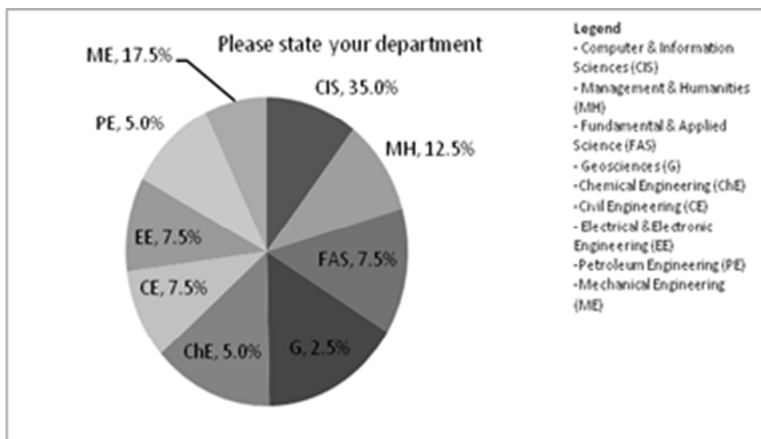


Figure 5. respondents dept profile

2.3 Habits

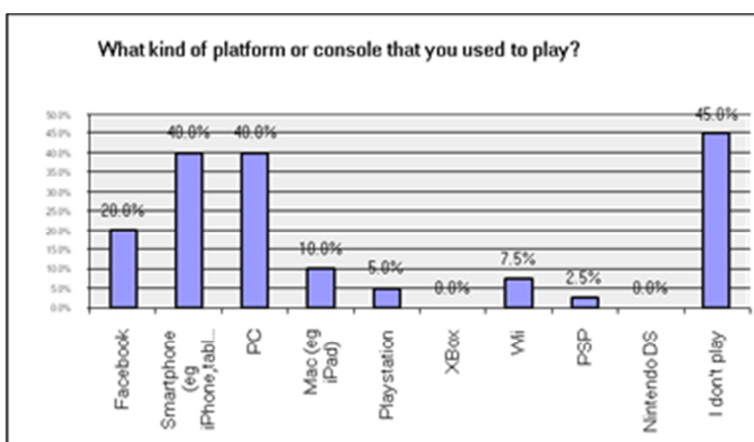


Figure 6. game console preference

As shown in Figure 6, 55% (n=22) of educators play at least one CG through various kind of platforms or consoles. Playing through Smartphone (40% n=16) and PC (40% n=16) are the most common platforms that educators used to play. Figure 7 below shows the profile of gamers as according to the department. 45% (n=10) of gamers came from Computer and Information Sciences Dept (CIS). It shows that knowledge in ICT could be an important factor for educators to play CG. It is also reveals that gamers are also coming from different education background and areas of expertise (refer to Figure 7). A total of 45% (n=18) of educators do not play any CG

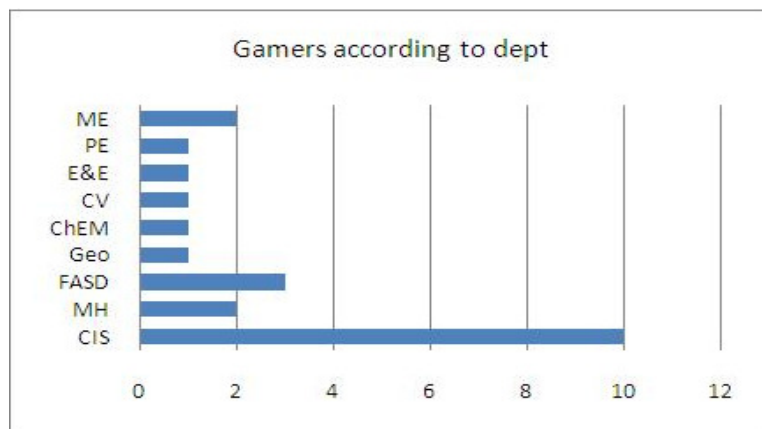


Figure 7. gamers profile according to dept

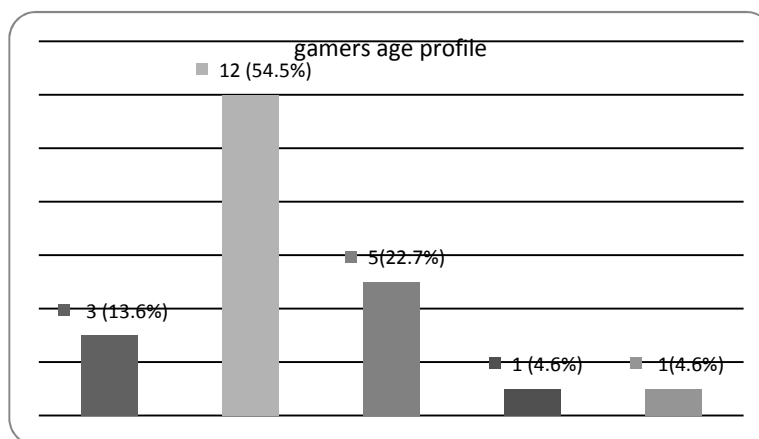


Figure 8. gamers age profile

Based on Figure 8, it reveals that majority (54.5% n=12) of gamers aged from 30-39, 22.7% (n=5) aged between 40-49, 13.6% (n=3) came from 21-29 age range, 4.6% (n=1) age range 50-59 and another 4.6% (n=1) aged above 60. This result reveals that CG is not only played by younger generation but it is also being accepted by other generation as well

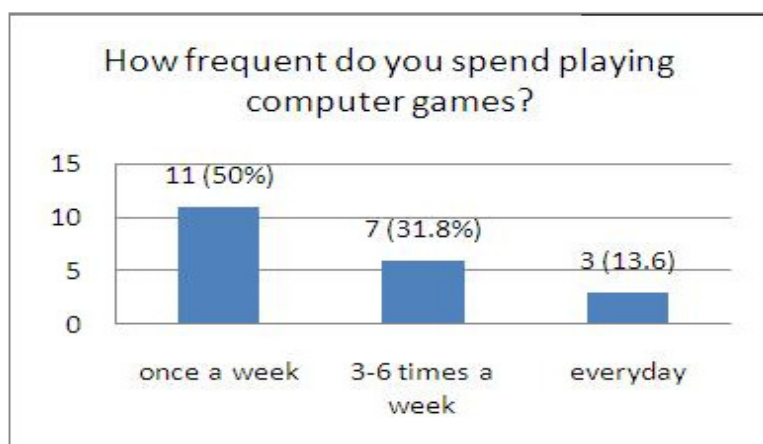


Figure 9. game activity frequency

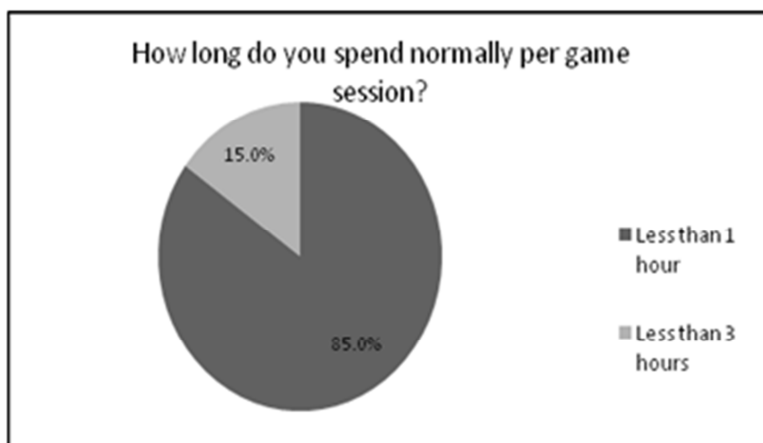


Figure 10. game activity duration

Figure 9 and Figure 10 shows the educator’s experiences and exposures to CG. From the survey, researcher finds out that 13.6% (n=3) educators play CG everyday, 31.8% (n=7) play 3-6 times per week and another 50% (n=11) play only once a week (refer to Figure 9). Figure 10 shows that majority (85% n=19) educators spent less than 1 hour for each game session. While the remaining 15% (n=3) spent less than 3 hours for each session.

2. 4 Educator’s view on CG

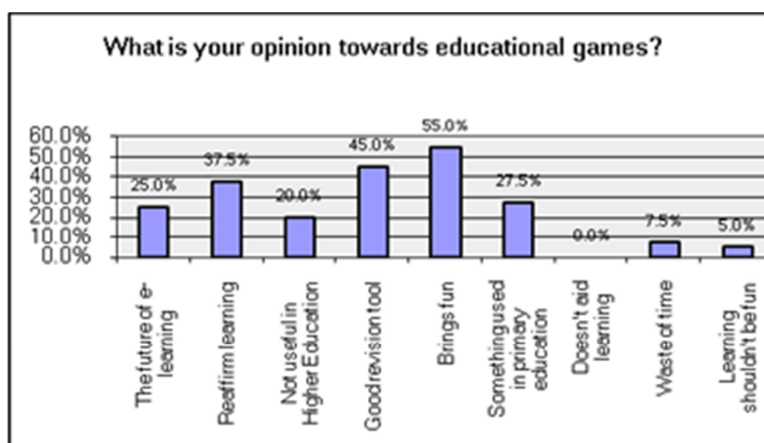


Figure 11. educators view on CG

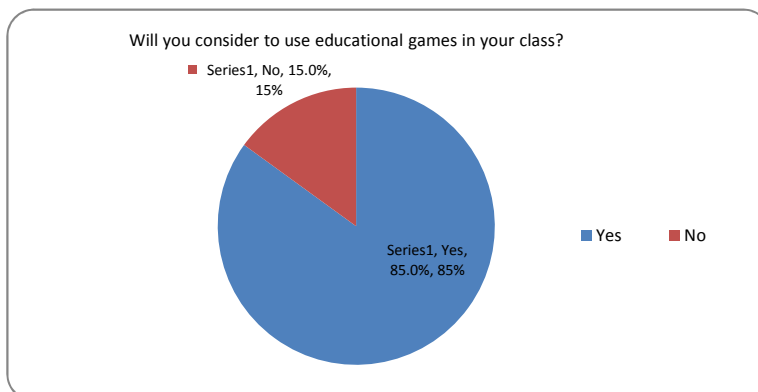


Figure 12. educators view

As shown in Figure 11, majority of educators (55% n =22) agreed that CG could brings fun to the students while

another 45% (n=18) agreed that CG is a good revision tool. Another 37.5% (n=15) agreed that CG can help to reaffirm learning. The result reveals that educators perceived that CG may help to support or facilitate learning process in the class. A respondent commented that playing CG may enforce indirect learning in the class.

As a result, 85% (n=34) react positively to use CG in their class. It shows that educators perceived that CG has potential to be leveraged as a scaffold or tool to support teaching and class activities in class (refer to Figure 12). On the other hand, 27.5% (n=11) responded that CG is only suitable for primary education. Another 20% also disagreed that CG is useful in HE. Another 5% stated that CG is just wasting time while 5% stated that learning process should not be fun. One respondent commented that CG is “only suitable to be used for foundation level and below”. Another interesting comment is that “CG is not suitable in class but ok for self-study”.

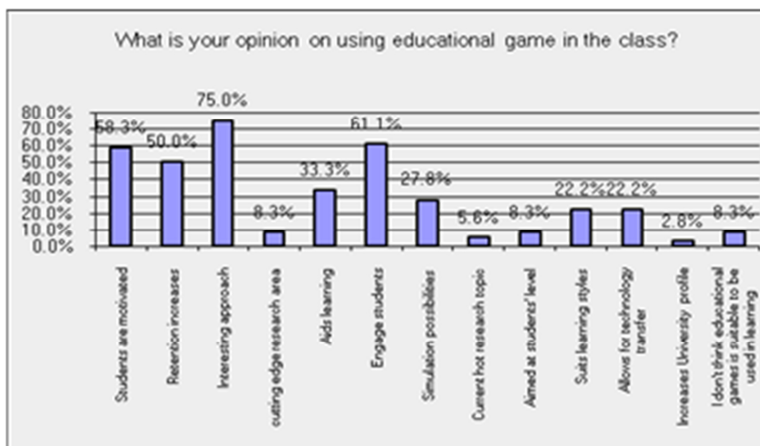


Figure 13. educators view on using CG in class

91.7% (n=37) of educators perceived positively on the impact of using CG in class. 75% (n=40) agreed that using CG is an interesting approach and 61.1% (n=25) agreed that CG can help to engage students to the learning. 58.3% (n=23) thought that using CG in class can help to boost up the students motivation. Another 50% (n=20) also thought that the retention level of students will be increased. 33.3% (n=13) of educators thought that CG can act as the learning aid in class. Only 8.3% (n=3) thought that CG is not suitable to be used in learning (refer to Figure 13).

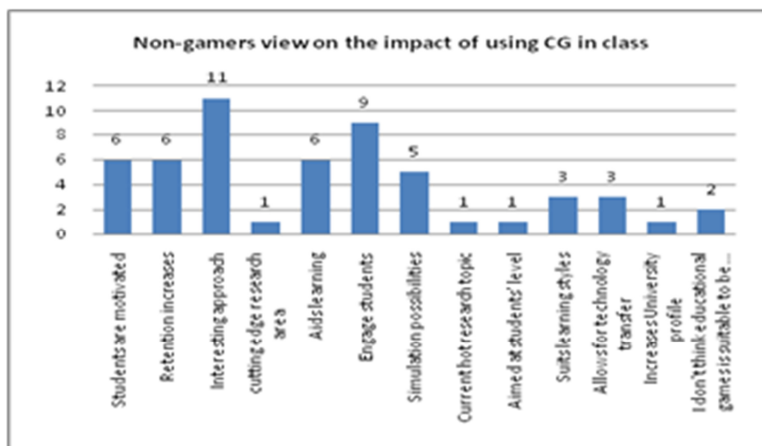


Figure 14. non-gamers view on the impact of

Although 45% (n=18) of educators were non-gamers, surprisingly 61% of them agreed that using CG in class is an interesting approach. Non-gamers also agreed that CG may have impact to the students attitude – 33% (n=6) thought that students are motivated, 50% (n=9) thought that CG may helps to engage students with learning and the remaining 16% (n=3) agreed that using CG in class suits the learning styles of the students. Non-gamers also associate using CG with students performance - 33% (n=6) thought that CG may helps to increase student’s retention level, another 33% (n=6) also agreed that CG may aid the learning process (refer to Figure 14).

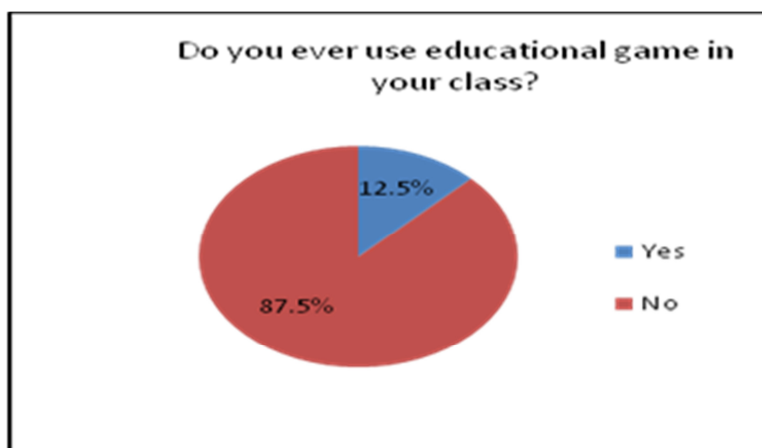


Figure 15. CG usage in class

Only 12.5% (n=5) of educators used at least one CG in class and astounding 87.5% (n=35) never use CG in their class. Interestingly, recreational game play did not automatically correlate with game usage in the class. 77% (n=17) of educators who are gamers do not use CG in the class. Only 23% (n=5) of educators who are gamers did use CG in the class. Although only 12.5% lecturers ever used CG in class, however, this efforts received good feedback from student (in a separate survey) who commented “but there is one time..i cant remember what course, the lecturer ask us to play the game that related to the subject..and it was really fun n cool..” . Based from this feedback, there is an opportunity to use CG as an alternative learning tool in class (refer to Figure 15).

Interestingly, 72% (n=13) educators who do not play any CG (non-gamers) agreed to consider to use CG in their class. An astounding 87.5% (n=35) never use any CG in class perhaps due to some barriers that hinder them from use CG in class as shown in the Figure 17. Surprisingly, non-gamers react positively on the impact of CG to the students (Figure 16). 62% (n=23) agreed that CG gives positive impact to the students

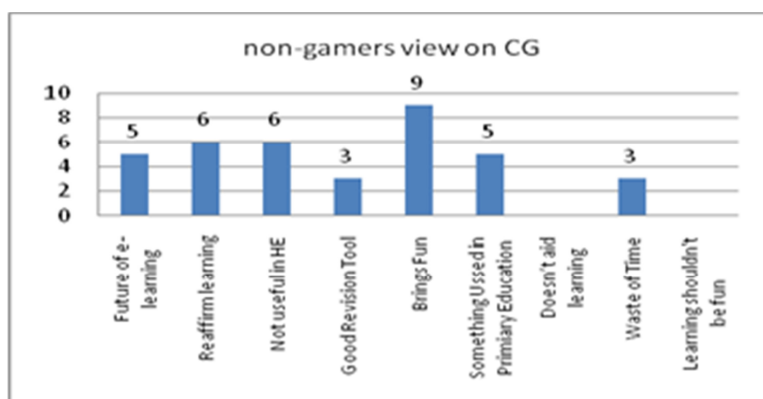


Figure 16. non-gamers view on CG

From this result it shows that there is no correlation between non-gamers with their views on the impact of CG to the students.

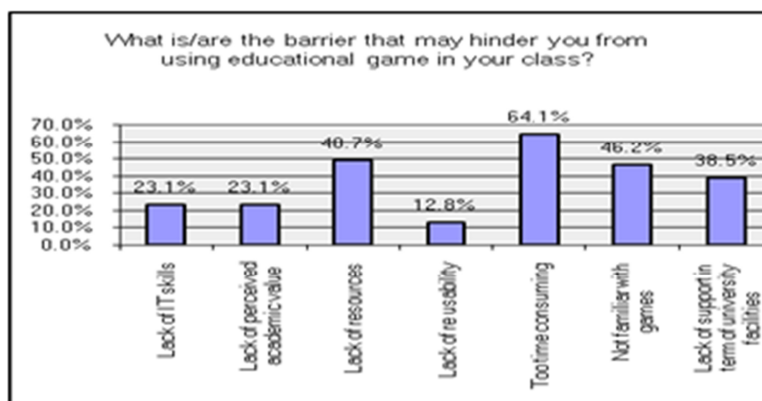


Figure 17. barriers to CG usage in class

Majority thought that lack of technical capabilities – such as lack of IT skills (23.1% n=10), lack of access to resources (48.7% n=20), not familiar with CG (46.2% n=19) and lack of support in terms of university’s support (38.5% n= 16) played significant role that deterred educators from using CG in class. Time consuming also one of critical factors that hinder the usage of CG in class (64.1% n=26). Another 23.1% (n=10) also agreed that many educators do not use CG in class because there are still lack of perceived academic value and there is one interesting comment stating that “need to see the proof that it works” (Refer to Figure 17).

2.5 Educator’s expectation

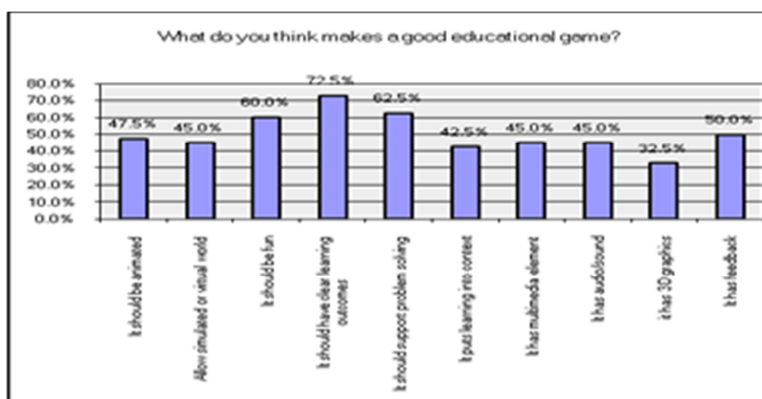


Figure 18. CG elements

A total of 72.5% (n=29) agreed that clear learning outcome is very important in a good educational game, 62.5% (n=25) agreed that it should be able to support problem solving, another 60% (n=24) agreed that educational game should embed elements of fun in it while another 50% agreed that good educational game should provides feedbacks to the players. Interestingly, educators do not think that multimedia components are very important in educational game where only 47.5% (n=19) thought animation is important, 45% thought simulated or virtual world would help, 45% thought it should has audio and another 32.5% thought that it has 3D graphics.

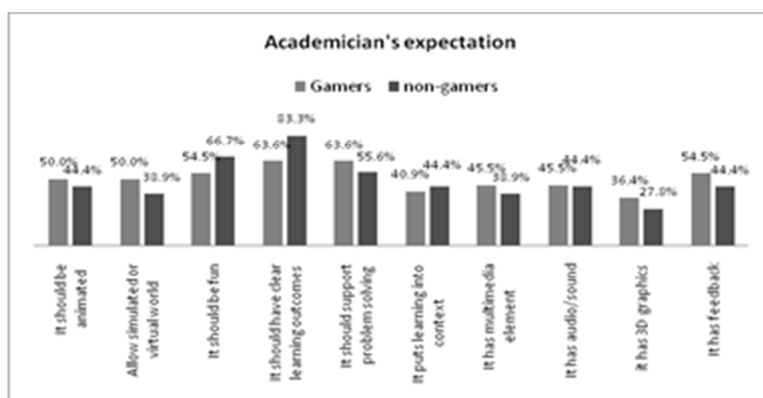


Figure 19. comparison between gamer and non-gamers on CG expectation



Both gamers and non-gamers have quite different views on the important criteria on the educational game.

Both gamers (63.6% n=14) and non-gamers (83.3% n= 15) agreed that educational game must have clear learning outcome in order to be used in class. Gamers thought that problem solving is the second most important criteria (63.6 n=14) in educational game however, non-gamers thought that element of fun is the second most important (66.7% n=12). Gamers ranked element of fun and ability to provide feedbacks as the third important criteria while non-gamers ranked ability to provide problem solving as the third important criteria. Generally, both groups thought that multimedia components are significantly important criteria in educational game.

### 3. Conclusion

As a conclusion, generally DGBL is perceived positively by the educators in UTP. The knowledge in ICT and age factor play a significant role to the DGBL acceptance. Gamers and non-gamers perceptions on the impact of DGBL to the students do not correlate with the experiences and exposure to DGBL. Surprisingly non-gamers perceived that DGBL has potential to be exploited as an alternative learning tool to the conventional approach. However, there are some clear implementation impediments that need to be addressed before DGBL can be implemented in UTP

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