Integration of Casual Video Games During Online Learning to Relief Stress in Students

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Mental stress
Online learning

ABSTRACT
COVID-19 pandemic has impacted all facets of society, including students, as daily learning activities were severely affected while the face-to-face classes were forced to be held online. As a result, students underwent tremendous stress and were exposed to severe mental health conditions. Thus, this study investigates how the integration of casual video games into online learning can relieve stress among science students. An online survey was designed and disseminated to students via social media. The respondents were pre-assessed for stress and emotional conditions during their online learning. Then, the respondents were instructed to watch a tutorial video from YouTube and play a quiz-like casual video game that we had developed. The respondents were then reassessed for stress and emotional level (post-assessment) to understand how casual video games can relieve their anxiety in online learning. All questionnaires in this survey were tested for the Likert scale, with one being strongly disagreed and five strongly agreed. Similar pre-and post-survey questionnaires were designed and tested against academicians for their perceived efficiency of casual video games in online learning. The outcome from this study has shown significant improvements in students’ stress and mental emotional levels when casual video game is introduced as part of their online lesson. On the other hand, the academicians perceived that online teaching alone is as effective as casual video games during online learning. However, the academicians also perceived that casual video games could significantly reduce students’ stress and emotional during online classes. We propose that casual video games are considered an integral tool for online teaching and learning as they can significantly reduce students' stress in online learning during the Covid-19 lockdown.

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1. INTRODUCTION
Since the outbreak of coronavirus disease 2019 (COVID-19) was labelled a worldwide pandemic, governments all around the globe have implemented stringent public health measures to minimize the morbidity and mortality due to the disease. Most countries have been placed under strict lockdown, with all public and private sectors halting operations and higher education institutions being obliged to end face-to-face teaching [1]. As a consequence, more than one billion students throughout the globe have been forced to enrol into virtual classrooms and remote learning [2], [3]. This has resulted in the academicians getting acquainted with modern teaching techniques using Zoom, Moodle, Blackboard, and Skype to convey the curriculum to the students. Such hasty digital transition had caused academics to get confused and ironically exposed students to stressful learning experiences [4]. Studies have shown that COVID-19 and lockdowns had a considerable negative impact on the psychological well-being and increased anxiety levels among students [4], [5].

In Malaysia, the COVID-19 cases were first detected in January 2020. However, the massive outbreak was reported in March 2020, and consequently, the “Movement control order” or better known as MCO, was imposed to control the spread of disease [6]. New norms such as “social distancing” and “work from home” have been introduced to curb the COVID-19 spread. Schools, colleges, and universities, on the other hand,
were closed, and face-to-face learning was replaced with online learning. With two years marking from the first detected COVID-19 case in Malaysia, the nation is, however, not fully recovered even though mass vaccination program was introduced and 78.9% of the population have completed at least two vaccination doses at the time this article was written [7]. Even though the economic sectors have been allowed to operate at full capacity (with the stringent standard operating procedure), educational sectors are kept in limbo. With the reported COVID-19 cases outbreak occurring in schools and colleges, the opening of the education sector at full capacity is uncertain [8], [9]. On the other hand, the UNICEF has made recommendations to continue with online learning and blended mode of teaching in schools and colleges till the COVID-19 situation is kept under control [10].

Conversely, millions of teenagers and adolescence throughout the globe play video games for several reasons, including stress relief and relaxation. The complexity of video games ranges from intricate multiplayer games to basic casual video games. The casual video games such as “candy crush” and “angry birds” are best described as engaging, easy to access and simple to learn games that take short periods to play and no previous video game experience or abilities are required [11]. The games are usually designed to assess the players’ motor skills (casual action), logic (casual puzzle), observation (idle games), and casual strategy games, which it become popular with broad groups of individuals. A study conducted by Desai et al. (2021) found that undergraduate students who played casual video games were comparatively joyful as individuals who took part in a mindfulness-meditation session for 20 minutes [12]. Thus, the current study aimed to examine the effectiveness and the perceived efficacy of integrating casual video games into online learning in reducing anxiety among science majoring students. The findings from this study will significantly assist in developing a holistic approach to reduce stress and improve mental health among students in online classes during the COVID-19 lockdown and in future blended classes.

2. METHODOLOGY

2.1 Experimental Design

Two Google survey forms were designed (Figure 1). The first form was to understand how casual video games can help science majoring students cope with stress in online classes during the COVID-19 lockdown. The second form was to understand academicians’ perception on students’ anxiety in online classes during the COVID-19 lockdown. The questionnaires used in this survey are shown in Tables 1 and 2 respectively, and all questions were tested for Likert scale; with the respondents were females (n = 81), and the rest were males (n = 22). A total of 14 respondents were at the Form 6 level, Form 6, and foundation in science majoring students. These respondents were majoring in Live Science courses (n = 38), medicine/ dentistry (n = 9) and the rest were science majoring (n = 56) in general. The average time

lockdown. Section two includes a casual video game that was developed in this study; the academics were instructed to play the game at the link provided in the questionnaire. The last section post-assesses the academicians’ opinion on students’ anxiety during online classes in COVID-19 lockdown with an option to integrate casual video games into their lessons. Watching the Khan’s Academy YouTube video on “Organelle in Eukaryotic Cells” was catered only in students’ surveys to mimic the actual online lesson.

2.2 Game Development

A casual video game for this study was developed using the website [https://wordwall.net](https://wordwall.net). This website enables academicians to create interactive casual video games for their students with no prior coding knowledge is required. A quiz-like ‘Maze Chase’ online game was developed based on the Khan Academy’s YouTube lecture on “Organelle in Eukaryotic Cells” (Figure 2). The duration and the game’s difficulties were adjusted, and once the game was built, the URL was shared in the Google survey form.

2.3 Statistical Analysis

The results were reported in mean ± standard deviation. A student paired T-test in Excel was performed to compare the impact of casual video games in reducing stress and mental emotional among student during online learning. The P-value < 0.05 was assumed to be significant.
spent by these respondents in online classes were 3 – 4 h (n = 24), 5 – 6 h (n = 50) and more than 6 h (n = 29). The demography data for this study is presented in Figure 3.

**Table 1. Pre- and post-assessment questionnaires in students’ survey**

<table>
<thead>
<tr>
<th>No.</th>
<th>Pre-assessment questions</th>
<th>Stress Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I am often bored during online classes.</td>
<td>Boredom (Interest)</td>
</tr>
<tr>
<td>2.</td>
<td>I feel stressed during online classes.</td>
<td>Stress</td>
</tr>
<tr>
<td></td>
<td>I feel lack of confidence learning via online classes.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I feel more irritable/exasperated during online classes.</td>
<td>Mental &amp; emotional</td>
</tr>
<tr>
<td></td>
<td>I am upset that I learn via an online platform.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Overall, how do you rate your online learning?</td>
<td>Overall rating</td>
</tr>
</tbody>
</table>

**Table 2. Pre- and post-assessment questionnaires in academicians’ survey**

<table>
<thead>
<tr>
<th>No.</th>
<th>Post-assessment questions</th>
<th>Stress Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I am bored with online classes when online games are used during the lessons.</td>
<td>Boredom (Interest)</td>
</tr>
<tr>
<td>2.</td>
<td>I am stressed with online classes when online games are used during the lessons.</td>
<td>Stress</td>
</tr>
<tr>
<td></td>
<td>I feel lack of confidence with online classes when online games are used during the</td>
<td></td>
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<td></td>
<td>lessons.</td>
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<tr>
<td>4.</td>
<td>Overall, how do you rate online games used during the online learning?</td>
<td>Overall rating</td>
</tr>
</tbody>
</table>

Note: The questionnaires were designed with 5-point Likert scale; [1] strongly disagree to [5] strongly agree.

The survey’s outcome shows that the integration of casual video games significantly relieved the stress among students in online learning during the COVID-19 lockdown (Figure 4). In the pre-assessment, on average, students felt bored (3.53 ± 1.13), stressed (3.39 ± 1.22) and mentally emotional (3.39 ± 1.21) with the online classes. However, when casual video games were incorporated as part of their online lesson, the post-assessment shows significant reduction in boredom, stress (2.56 ± 1.20) and mental emotional levels (2.52 ± 1.16) among the students. On top of that, the overall rating for casual video games in online learning is also shown significantly higher (Figure 5), indicating students prefer casual video games incorporated into their lesson plan. Casual video games and gamifying have been proven to enhance lesson delivery during the COVID-19 pandemic. In a study conducted by Gopinathan et al. (2021), it was shown that gamifying have a positive and significant impact on innovative

![Fig 2. Maze chase game was developed as casual video game from the website](https://wordwall.net)
Conversely, academics’ perspective towards casual video games in online learning is shown in Figure 6. A total of 20 respondents answered the survey, including teachers (teaching PT3, Form 4, SPM and STPM, n = 10) and lecturers (teaching foundations in science, degree, master, and PhD., n = 10). It was observed that academicians perceived that student show high interest in online classes as if casual video games are integrated (Figure 6). Contrarily, students lacking interest in online learning (Figure 7) and this shows that academicians mostly fail to realize this aspect. The Free Malaysia Today (an online news portal) reported that there has been waning motivation and lack of interest in online learning among Malaysian students, which resulted in declining day-to-day online class attendance. Students were said to develop a ‘home-based learning fatigue’ due to longer duration of online classes [19]. This can be notably seen from the data collected in the current study, where 77% of students spend ≥ 5 h for online learning every day. Prolonged exposure to online learning also may contribute to declining health and eyesight among students [19].

Besides that, as much as online learning is an utterly new phenomenon for students, it is also new for academicians and educators [20]. As such, many academicians were found lacking sensitivity and empathy towards students, which have subsequently contributed to lacking motivation among students [13]. Besides the aforementioned challenges faced by students during the COVID-19 lockdown and online learning, many students also face conflict with their family members, poor internet connectivity, procrastination, insufficient feedback, and excessive schoolwork [21]. Lack of emotional support and inadequate teacher-student communication may lead to a further mental breakdown. Thus, academicians must connect with students more humanistic and keep track of students’ well-being. A study conducted by Fawaz et al. (2010) showed that empathy in e-learning system encouraged students to study and make them more engaged in the subject, calming their learning emotions, and improving their academic achievement [2]. The online classes can be made as conducive as face-to-face classes, whereby academicians can provide synchronous and asynchronous learning besides adding flexibility such as integrating casual video games in their lesson plans. One way that this can be incorporated is by training the academicians with design thinking workshops that enhance their innovative delivery in online classes [13].

Academicians in general, perceived that incorporating casual video games in online learning could significantly reduce students’ stress and mental emotional level. This outcome is found to be similar to what was perceived by the students’ group. On top of that, the academicians also perceived that incorporating casual video games in their online teaching may improve their teaching output and they are willing to use casual video games in their online teaching modules/ subjects (Figure 8). Academicians’ openness to integrating casual video games in day-to-day online classes will quickly transform towards effective teaching and learning amid the COVID-19 pandemic.

4. CONCLUSION

It can be concluded that the integration of casual video games in online teaching significantly improves students’ interest in online learning. Besides, it also reduces stress and mental-emotional. Nevertheless, the academicians perceive that
The is no significant differences in their perceived thought and mental stress and online teaching alone is sufficient to trigger the interest in students, and it is as good as integrating casual video games in online teaching. Students are contrarily lacking interest in online teaching alone. Academicians are however, perceived that casual video games could significantly reduce stress and mental-emotional, an outcome similar to what was observed in the students’ group. Lack of empathy and creativity among academicians in managing online classes can contribute to stress and mental health among students. Thus, workshops such as designed thinking can enhance academicians’ innovative delivery in online learning.

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CONFLICT OF INTEREST

The authors declare no conflict of interest while preparing this manuscript.

REFERENCES


