

Stay Awareness with Fun: “Hit the Viruses” Game App

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DOI: <https://doi.org/10.30880/mari.2022.03.04.010>

Received 06 August 2022; Accepted 01 October 2022; Available online 20 December 2022

Abstract: Along with increased self-awareness and preventive knowledge, each individual's health should be optimised to mitigate the dangers posed by COVID-19. As a result, the project is intended to develop a digital game called "Hit the Viruses" to raise awareness and value of COVID-19 prevention measures with a hygiene and sanitation approach through exploration and intervention game-based learning. "Hit the Viruses" is an application game aimed at promoting knowledge and information development, particularly among children, by emphasising pandemic awareness in an engaging and innovative manner. Through the "learn while playing" method, the game aims to assist children in digesting complex scientific information about the virus while also increasing their knowledge of COVID-19 protective measures such as how to wear masks and sanitation requirements. The game is platform-based and includes 12 game levels; the visual style is simple 2D, and children take on the role of the game's main character by navigating the game environment safely and accomplishing tasks such as collecting masks, soap, and sanitation. The Standard Operating Procedure (SOP) information incorporated into the design of this game is supposed to aid players in recalling it, hence establishing a favourable attitude toward COVID-19 transmission prevention awareness. Not only can learning about gaming scenarios assist improve awareness, but it's also a terrific way to spend time indoors with family. The game is intended to educate the public about the precautions that must be followed during the COVID-19 outbreak. This game has implications for strategy, practise, and research, with the primary goal of educating people about viral transmission avoidance.

Keywords: Digital games, Health education, E-learning, COVID-19, Awareness

1. Introduction

The number of reported cases rose sharply during most of the year 2020 despite widespread ignorance and a generally complacent attitude among the general public, the government has made efforts to stop the disease from spreading both directly and indirectly [1], [2], [3]. In addition to achieving a higher level of self-awareness and learning more preventative knowledge, the condition of

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each individual should be improved in order to lessen the damage produced by COVID-19. As a consequence of this, as a new creative intervention, it is planned that this research will create a digital game known as "Hit the Viruses." The purpose of this game will be to raise awareness and the value of "COVID-19" preventive measures with hygiene and sanitation approaches through online game-based learning exploration and intervention. The implications of this game for tactics, practise, and research, with the ultimate goal of contributing to educational efforts aimed at preventing the spread of viruses. The purpose of this study is to: i) use games to enhance COVID-19 awareness, ii) promote passive attitude through digital games and iii) increase crucial knowledge on pandemics through gamification. The "Hit the Viruses" is a 2D educational game, designed to run on Smartphone, tablet or other mobile devices. The game app (as shown in **Figure 1**) is an interactive game that created for children to enhance their pandemic-related knowledge. These games are designed to be both attractive and fun to the children's, and to meet specific health education goals.



Figure 1: The design of "Hit the Viruses" game app

2. Materials and Methods

This application's design methodology employs an iterative model strategy [4], [5] to analyse the "Hit the Viruses" game's capabilities. Consequently, "Hit the Viruses" was developed in four major stages (see **Figure 2**). The initial step is design, which focuses on the design of characters, game assets, visual objects, and the game's setting. As a result, visual elements appropriate for local youngsters, as well as simple, basic, and colourful visual styles, are used to preserve the player's immersion in the game. In this game, all items were digitally drawn in 2D graphic programmes (Adobe Photoshop and Adobe Illustrator) and saved as JPEG and PNG files.

Next, all the drawn elements will be moved to the level of implementation. At this stage, all the elements will be combined and gamification functions will be placed on the game screen. The mechanism of the game hinges on considering the operation and response of each object. This game's primary functions were designed in accordance with cognitive theory, game theory, sensory and narrative principles. To facilitate engagement with the gaming environment, the navigational structure has been simplified. Responsiveness is the result of communication between the game and the learner, enabling students to track their progress and connect their actions to the game's outcomes. To facilitate engagement with the gaming environment, the navigational structure has been simplified. Instruction responsiveness (hints, assistance, and instructions) is emphasised, with a focus on the significance of modality sensation, which will display either a number or a symbol on-screen, with visual coordination taking precedence. At the third stage, playtest is performed to test the "Hit the Viruses" programme by ensuring that the targeted students do not encounter any bugs or errors while playing. Before recommending the "Hit the Viruses" prototype to users, the fourth stage consists of a thorough evaluation.

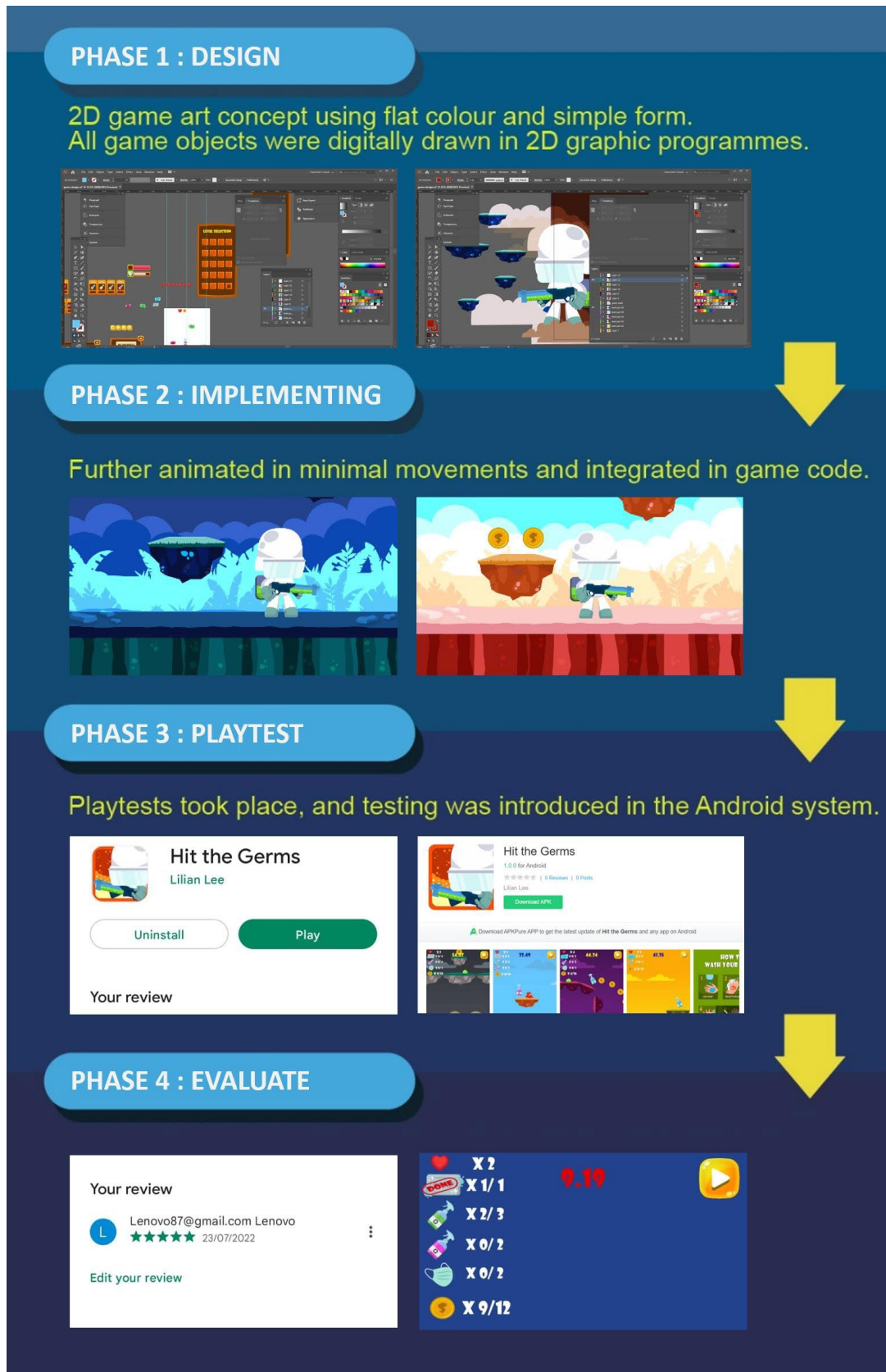


Figure 2 : Iterative Phases of “Hit the Viruses” Game App

The game's levels are linear, requiring players to complete all stages before the game ends. The player controls the protagonist, who must overcome each consecutive barrier before reaching the finish line. Each of these obstacles will be included in the levels of the game. As the player's cognitive capacity and skill grows, the challenges will get increasingly difficult. All vector-shaped objects will be arranged on a single platform (content collection) and paired with a set of technological and programming characteristics to determine the tasks given to each object in the game. This implementation ensures that each item functions properly and the game strategy is well communicated. The tests showed a number of technological issues that needed to be addressed before proceeding. **Figure 3** depicts the gaming graphical interface on the user's smartphone.



Figure 3: Game Interface in screen appearances

3. Feedback Results

Using semi-structured interviews, data will be collected to evaluate the game's output based on the players' experiences. Additionally, this data analysis will serve as a formative evaluation of the game input context adaptation in terms of mechanisms, visualisations, and game elements, and more specifically in understanding and implementing a higher level game development process that may be able. Ten youngsters were questioned on the design and development component as well as the educational content in the game (see **Table 1**).

The educational game "Hit the Viruses" features a variety of game levels as a direct result of this process of game design. These game levels are intended to familiarise the target audience with the guidelines and recommended preventative and hygiene measures against viruses. There is a need for more alterations to be made to the game in order to preserve its playability and player engagement by presenting an encouraging method to educating players of all ages through an interactive medium.

Table 1 : Results towards the game app

Contexts	Results
Experiences	
Enjoyed	High
Motivation	High
Engagement	Moderate
Usability	
Assessable	Moderate
Feedbacks	High
User-friendly	High
Learning	
Enhance my awareness	Highly Agree
Understanding the information	Highly Agree
Increase my knowledge	Agree
Stimulates my learning	Agree

3.1 Importance of the ‘Hit the Viruses’ game app

Based on the progression and danger of COVID-19, one of the primary roles today is to educate the public about the infectious disease. To raise awareness about COVID-19, various forms of online awareness campaigns, online information, media advertising, and infographics have been implemented [6], [7]. This awareness effort, however, is critical, particularly in increasing individual awareness and how to deliver preventive measures to children under the age of 12.

Considering this, "Hit the Viruses" prevention and education is a good method. Furthermore, the trends, attitudes, interests, and experiences of children who play digital games make information delivery through games easier to accept and attract children's attention. Additionally, learning about game scenarios not only helps to raise awareness, and it is also a fun way to spend time at home with the family. This game is intended to raise awareness of the precautions that need be taken during the COVID-19 pandemic.

3.2 Benefits and Contributions

The main contribution of ‘Hit the Viruses’ is as a tool that can be embedded as a powerful learning tool to attract childrens’ attention by offering knowledge in the teaching of hygienic and guidelines, through the use of game elements. The game could motivate users with the aim to educate and prevent tragedies that have occurred during the spread of COVID-19.

Students are able to comprehend the significance of sanitizing, acknowledge the significance of standard operating procedures, and realise the significance of self-hygiene by using this gaming app. Students will be encouraged to participate actively and will look forward to learning about the SOP topic through the use of the game app. Students will be encouraged to learn about the hygiene issue in an efficient manner and gain an understanding of how it relates to the present circumstances through the use of game-based learning in this interactive learning environment. Students have the ability to learn on their own without the need for an instructor and to study at any time and in any location.

4. Conclusion

COVID-19 has been a topic of global significance. The virus presents a threat to the society, population, and economy of the impacted nation. The health awareness campaign is conducted via social media, the internet, television, and radio. Digital games are an alternate method of educating the public through interactive ways, particularly for youngsters under the age of 12. The results of the study indicate that awareness can be promoted by using games with local children. As a result of this method, children are more interested in and inclined to comprehend awareness. It is envisaged that the mapping and implementation of "Hit the Viruses" will benefit children and stakeholders.

The aspects outlined in the game development module are seen as efforts and guidelines that could be recommended for more engaging game design and multimodal information delivery. Future research could focus on further improvements in the quality and complexity of game applications, particularly in terms of player demographics, experience relationships between game genres, classroom educational objectives, topic application, game character characterization, and learning effectiveness with groups of players, with the aim of developing high-quality and reliable games to enhance public awareness and health cares. As a result, "Hit the Viruses" was designed as a learning instrument to give a fundamental concept of self-protection to children from varied demographic, educational, and socioeconomic backgrounds. Today, it is crucial to engage and motivate the public with relevant information and requirements. It is also vital to effectively engage these age groups in prevention through game-based learning methods

Acknowledgement

Thank you to everyone who took the time to participate and provide thoughtful responses. In addition, a special thank you goes out to each organisation for the excellent support they provided, as well as to the reviewer for their insightful comments.

Appendix A (Optional)

Any extra data, equations or information that is beneficial to the discussion of the paper should be included here. More appendices can be added as deemed necessary.

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