

HabitFun videogame as a tool to support the generation of good hygiene habits in elementary school children

VideoJuego HabitFun como herramienta de apoyo a la generación de buenos hábitos de higiene en niños de primaria

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Abstract

This research addresses the development of a video game in Unity compiled for execution on devices with Android Operating System, said video game as a support tool for elementary school children to acquire good personal hygiene habits. Sometimes, children can be careless when it comes to their personal hygiene, and pediatricians recommend from a very young age the hygiene habits that they should follow daily, thus reducing the risk of contracting any disease. On the other hand, it is sought that the child is more organized, careful and self-demanding with himself. The Unity engine and the agile Scrum methodology were used for the development of the video game. Personal hygiene can be more interesting if it is taught through play, helping to demonstrate its importance, whether in the classroom or at home, children can learn about hygiene and find the right way to stay clean, neat and healthy. Therefore, the video game presents in text and audio, hygiene tips and each level is an area of the home that represents a hygiene challenge that the child must meet in order to move to the next level.

Resumen

La presente investigación aborda el desarrollo de un videojuego en Unity compilado para su ejecución en dispositivos con Sistema Operativo Android, dicho videojuego como herramienta de apoyo para que niños de primaria adquieran buenos hábitos de higiene personal. En ocasiones, los niños pueden ser descuidados en lo que respecta a su higiene personal, y pediatras recomiendan desde muy pequeños los hábitos de higiene que deban seguir a diario, y con ello se reduzca el riesgo de contraer alguna enfermedad. Por otra parte, se busca que el pequeño sea más organizado, cuidadoso y autoexigente consigo mismo. Para el desarrollo del videojuego se utilizó el motor Unity y la metodología ágil Scrum. La higiene personal puede ser más interesante si se enseña a través del juego, ayudando a demostrar su importancia, ya sea en el salón de clases o en el hogar, los niños pueden aprender acerca de higiene y encontrar la manera indicada de mantenerse limpios, aseados y saludables. Por ello, el videojuego presenta en texto y audio, consejos de higiene y cada nivel es un área del hogar que representa un reto de higiene que el niño debe cumplir para poder pasar al siguiente nivel.

Hygiene, Videogame, Children

Higiene, Videojuego, Niños

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Introduction

For Unicef, important hygiene behaviors are difficult to practice without adequate knowledge and skills, community support and the conviction that personal behavior can really make a difference (Unicef, 2017).

Children can sometimes be careless when it comes to personal hygiene, especially during cold and flu seasons when failure to wash hands and cover coughs can lead to transmission of this disease. (Unicef, 2000).

Hygiene habits allow us to be away from diseases and avoid bad odors, infections, poor presentation, risks of the appearance of diseases and health complications. Having personal hygiene depends on oneself (Lombeida, 2020).

Personal hygiene can be more interesting if it is taught through play, helping to demonstrate its importance. The game favors sociability, develops the creative, critical and communicative capacity of the individual, stimulates action, reflection and expression (Pinto Yépez, 2015).

Technology plays a stellar role in society today, video games are great learning motivators, through them, children can develop good hygiene habits with a less routine and, above all, less authoritarian environment.

Taking into account the above, a video game was developed that presents a series of personal hygiene guidelines that guide the child towards basic hygiene standards, making the child understand the comfort of being clean.

The video game aims to reinforce the development of hygiene habits in children from 6 to 8 years of age, facilitating their learning with different mini-games that will help strengthen their memory, attention, and perception in terms of hygiene.

This document explains the analysis, design and development of the HabitFun video game as a support tool for the generation of good hygiene habits in elementary school children.

Analysis

The final product is a video game that serves as a tool to reinforce the development of hygiene habits in children from 6 to 8 years of age.

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The game has 5 levels and 8 mini-games, which address different topics regarding hygiene; these levels will be unlocked once the minimum score established by the minigames in the current level has been reached.

In this first stage, the survey of functional requirements for the subsequent development of the video game was carried out. Table 1 presents these functional requirements, while Table 2 presents the non-functional requirements.

CLUE	NAME	DESCRIPTION
ReqF01	Create Account	A new user will be able to register a new account to be able to play the video game.
ReqF02	Login	A registered user will be able to login.
ReqF03	Services	The video game will use backend services that will be developed independently.
ReqF04	levels	The video game will be composed of 5 3D levels in its initial phase.
ReqF05	Minigames	The video game will have a total of 8 2D minigames.
ReqF06	Main character	The video game will have a main character who can move in any direction of the scenarios.

Table 1 Functional Requirements

Source: Own elaboration

CLUE	NAME	DESCRIPTION
ReqNF01	Responsive	The video game must adjust to different screen sizes.
ReqNF02	Intuitive	The video game will have intuitive user interfaces that are easy to use for children.

Table 2 Non-functional Requirements

Source: Own elaboration

Design

At this stage, a video game design document was drafted, where all its characteristics were defined, from how it is going to be played to how it will look, the tools to be used, etc.

Concept: A child character with the ability to move in all directions of the different scenarios of a house, where each room or area of the house represents a level of the video game and in each area or level there will be minigames, which the character must beat to unlock the next levels. Text and audio tips will be provided to support the generation of hygiene habits.

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Style: The main setting will be a 3D house, and the minigames in each level will be 2D.

Story: The main character is a boy between 6 and 8 years old, who is at home, starting in his room and who will receive recommendations on hygiene habits to keep his room and himself clean, highlighting at all times the importance of personal hygiene and the place where you are. The main character will move to other rooms in his home, as long as he has done the necessary hygiene tasks in the previous room or level.

Characteristics: the main character must be a child to achieve empathy with end users, the language to be used must be simple and easy to understand. The interfaces must be attractive and striking for children, the use of the video game must be intuitive for the public for which it is directed. Aspects of personal hygiene should be considered, but also for hygiene of the place where it is located.

Game mechanics: the main objective is to highlight hygiene habits and for this, recommendations will be used in all rooms of the main character's home, as well as challenges or mini-games to playfully highlight the importance of personal cleanliness and our home. The main character will be able to move in all directions from his home and in his path, he will find different obstacles to overcome.

Levels: 5 levels are considered in this first stage:

- Level 1 The room, the importance of keeping our room clean is highlighted to avoid the accumulation of dust, germs, bad odors and thus prevent diseases. Tips such as making your bed, ventilating the room, etc. are included. A mini memory game with images of hygiene habits is included.
- Level 2 The bathroom, the relevance of being careful with hygiene in the bathroom is highlighted, since activities such as showering, brushing teeth and other physiological needs are carried out there. It is also the area of the house where the greatest number of water points are concentrated, making it the place most prone to humidity. In this level, tips about removing waste, cleaning and disinfecting

the toilet are added and two mini-games are added, one of washing hands and another of cleaning teeth.

- Level 3 The kitchen, care is emphasized when preserving and preparing food to maintain its nutritional quality and avoid possible health risks. Advice on washing food properly, washing hands before cooking, and a minigame on washing dishes are included.
- Level 4 The backyard, the importance of washing the clothes we wear is enhanced, as it is like our second skin. Sufficient time should be spent on washing, drying and storing it. After the shower or bath, you have to dress in clean clothes. Two mini-games are attached, one about washing clothes and another about separating the garbage.
- Level 5 The school, hygiene in the school stands out, since it is important for the health of all, since it is a place of great circulation of people and, due to this, germs and bacteria abound. As efficient as cleaning services are, it is necessary to take certain precautions to prevent diseases. The importance of washing hands regularly, of keeping our chair or workplace clean, is highlighted, and a memory mini-game is included with school tools that we must keep clean.

Development

Once the scheme of the different levels was made, we proceeded to the design of the interfaces and the necessary coding to make each level work.

Figure 1 shows the stage layout for Level 1 The room. Figure 2 shows the stage design for Level 2 El Baño. Figure 3 represents the layout of Level 3 The Kitchen, while Figure 4 represents the layout of Level 4 The Backyard, and finally Figure 5 presents the layout of Level 5 The School.



Figure 1 Design Level 1 The room
Source: Own elaboration

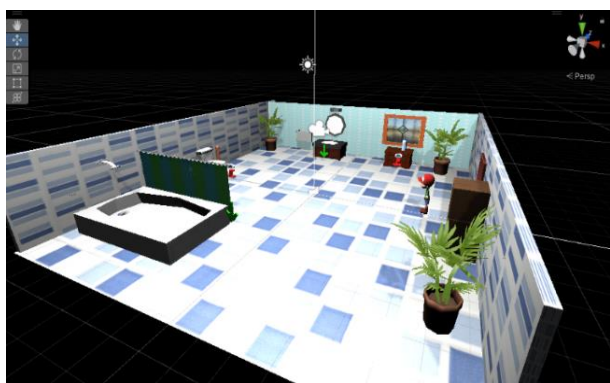


Figure 2 Design Level 2 The bathroom
Source: Own elaboration



Figure 3 Design Level 3 The kitchen
Source: Own elaboration



Figure 4 Design Level 4 The backyard
Source: Own elaboration

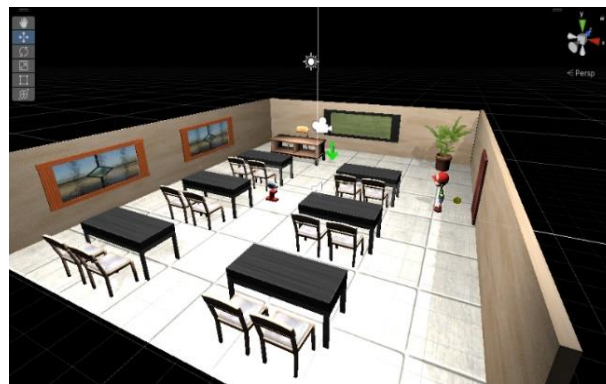


Figure 5 Design Level 5 The school
Source: Own elaboration

Results

After the first 5 levels of the HabitFun video game, part of its interfaces is presented. Figure 6 shows the HabitFun home interface, which has 4 main options, the option to log in with an already registered user, or register a new user, log in as a guest, and log out.



Figure 6 Main interface
Source: Own elaboration

When a new user (recently registered or invited) enters the video game, it only presents level 1 enabled (figure 7).



Figure 7 Levels enabled
Source: Own elaboration

Each time a new level is started, an initial tip or recommendation is presented, which can be in text or audio, as shown in figure 8.

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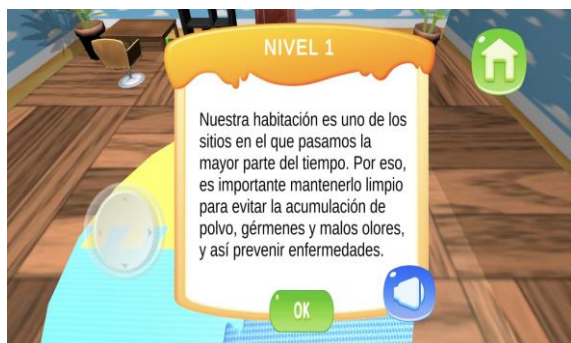


Figure 8 Hygiene recommendation
Source: Own elaboration

In each of the levels, you can find additional hygiene recommendations to the minigames, and they are identified with an *i*, as shown in figure 9.



Figure 9 Additional hygiene recommendations
Source: Own elaboration

If it is required to go to another room (level), but the mini-games corresponding to the current level have not yet been cleared, the next level will be blocked, this is shown in figure 10.



Figure 10 Level locked
Source: Own elaboration

When starting a minigame, hygiene tips are also presented, like the one shown in figure 11.



Figure 11 Hygiene advice in minigame
Source: Own elaboration

At the end of each minigame, the score obtained and more tips on hygiene are shown, that is, during the game, the child is insisted on the importance of maintaining his personal hygiene and that of the place that surrounds him.

In this phase of the project, only 5 levels of the game were considered, but more levels may be developed in a next phase and improve the existing ones.

Gratitude

Express gratitude to the academic body of Intelligent Computing (ITESHUAU-CA-3) of the Instituto Tecnológico Superior de Huachinango for the facilities provided for the development of this project.

Conclusions

It was possible to develop a video game that promotes the development of hygiene habits in children between 6 and 8 years old, with an intuitive, minimalist and appropriate user interface for children of that age. The information presented is clear, concise and in simple language so that children can understand it.

The video game developed by HabitFun is visually pleasing and fun to play, and in this way the player can enjoy it without complications and learn while having fun, since hygiene issues are not addressed in a rigid environment, full of stress and scolding.

With HabitFun, children can learn in a less routine and, above all, less authoritarian environment, which allows their psychosocial development, and articulates the cognitive, affective and emotional aspects to achieve their integral development.

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