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"Invasive Plants" – a Serious Game for Environmental Awareness

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The "Invasive Plants" Game

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Keywords: Serious games, environmental awareness, invasive species.

Objectives: to inform and raise awareness to the general public, about invasive plant species in Portugal and to show proper ways of remove these plants. The game was designed for Android mobile devices, using the Unity 3D engine and Adobe Illustrator.

The main focus of the game is to remove the invasive plants which consume oxygen from the lake's water, and due to their fast reproductive rate, can prevent sunlight from reaching the underwater flora.

To kill these plants, the player must choose the appropriate tool. If this is not done, the plants begin to reproduce, and the lake's oxygen level starts to decrease, causing fishes to die. Once the oxygen level reaches zero, the game is lost.

Only by removing invasive plants can the lake return to its healthy state. If the player successfully removes all invasive plants, victory is accomplished. To use a tool, the player can simply drag it from the bottom inventory onto the main playing area.



Figure 1. Main menu.

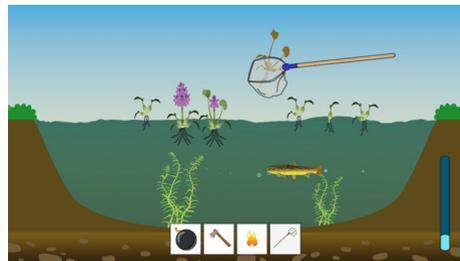


Figure 2. Interface: a lake ecosystem with some floating invasive plants (water hyacinths), underwater life, an inventory with tools and the oxygen level.

	+		→		Bomb's explosion: increases reproduction rate and difficulty.		
	+		+		→		Fire and an axe: no effect on aquatic plant.
	+		→		Net: removes water hyacinths to dry them to death!		



Figure 3. Losing the game.



Figure 4. Winning the game.

User testing

July, 2018, during an event targeted at game developers. This sample was chosen in order to gather more informed feedback and suggestions for future improvements. Sample: 30 volunteers, ages between 22 to 45 years old. Three android mobile devices were used. Each participant was lent one of them so that they could play and explore the game. After playing, participants were asked to fill a short questionnaire about their experience.

Results

- 50% believe the game needs a tutorial and/or an instruction book.
- 60% reported that the game's goal was clear enough.
- 80% believe that the game possesses an effective educative component.
- 80% thought the game was fun.
- 83% reported that they understood the message behind the game.
- 83% liked the visual component.
- 97% wanted to play more levels.