

The first tests were carried out by the members of the project, to analyze if all features are correctly implemented.

The tests with students of the 4th year of elementary school of a public school at our city. About 40 students participated (three different classes), and their average age was 9 years-old. The class teacher ever time is presented to students. The children played for approximately 20 minutes and answered the questionnaire at the end of the tests.

About the pos-game questionnaires, the Figures 7 and 8, with the Likert of 1 to 5, where: 1 = Really enjoyed and 5 = Not Like, most answered that they like computer games a lot and that they liked the water game.

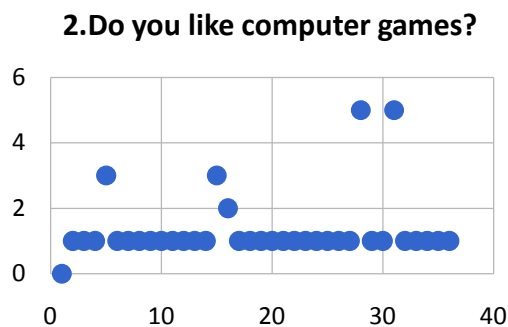


Figure 7 – Answers from questionnaire for question 2

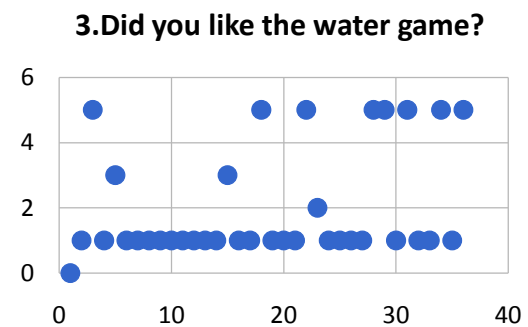


Figure 8 – Answers from questionnaire for question 3

When asked if they changed anything in the game (question 6), some students gave the following suggestions:

"I want kill someone";

"I did not like jumping in the clouds";

"The clothes";

"Turtles and little critters";

"I wanted to have a game for two people".

About the question 9, if the students understand about the main goal of the game, they gave the following answers:

"The game teaches me how to take care of the environment";

"Help the plants";

"Do not waste water".

We can conclude that they have understood the main idea of the game and help us to improve the game.

4.3 Data Mining Results

During the tests, 2,057 instances were acquired (1,767 from phase 1 and 290 from phase 2). In our first data mining, we have used the J48 algorithm J48 for Decision Trees technique in the software WEKA (WITTEN, FRANK, 2005), with its standard metrics and the chosen classifier attribute was the player's action (good or bad action during the game – the attribute "action" in table Moves of REM – Figure 5).

The correct classification of the technique was 100%, as shows that the database has solid data and the confusion matrix was obtained, according to Tables 1 and 2, indicating that there are not false-true values.

Table 1- Matix of confusion for phase of the tests performed

Classification	A	B	C	D	E	F
A = start the game	39	0	0	0	0	0
B = collect an object	0	174	0	0	0	0
C = close an objetct	0	0	279	0	0	0
D = open an object	0	0	0	43	0	0
E = start the rain	0	0	0	0	33	0
F = finished the game	0	0	0	0	0	33

Table 2 - Matrix of confusion for phase of the tests performed

Classification	A	B	C	D	E
A = start the game	11	0	0	0	0
B = collect an object	0	25	0	0	0
C = close an objetct	0	0	48	0	0
D = open an object	0	0	0	9	0
E = finished the game	0	0	0	0	6

5. Conclusions and Further Works

It is important to emphasize that this is a project still in progress and based on the results obtained it is possible to visualize that its progress presents coherent steps and with very promising results, either in the educational scope (serious game) or in the computational scope (data mining analysis).

We believe that with our tests, the game will help teachers in the classroom to put more emphasis on the subject addressed, which is of extreme relevance. The game was able to show, indirectly, children how to use freshwater in their daily lives and encouraging them to disseminate this idea to family and relatives.

As future work, we will perform more tests together with elementary school classes, as well as, with more instances in the database, to be able to perform the most complete and conscious data mining.

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