# Design and evaluation of a 3D Collaborative Game to Support Game Based Learning

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- Game-Based Learning (GBL) and OpenSim
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# Goal

Present a detailed and comprehensive design and evaluation of a **3D collaborative game** using the **OpenSim** virtual world platform

Addresses the following research questions:

- Did the virtual game activity improve the effectiveness of the knowledge acquisition?

- Do the students recommend the systematically existence of such activities in education?

# Serious Games

**Game-based learning:**

- "Serious Games"
- "Digital Game Learning"
- "Digital Game Based Learning"
- "Educational Games"
- "Immersive Learning Simulations"

We adopt the term Game Based Learning as the educational process, which uses game experiences as a tool to learn

# Why OpenSim?

- It supports online multi-user 3D environments
- Low cost (free import and creation object)
- Similar virtual environments to Second Life
- It supports the same scripting language LSL as in Second Life
- It is totally removable and dynamic
- Allows us to migrate our world to Second Life any time

# Scenario of the game

- It's a *treasure hunt* game with *hidden questions*.
- Students are divided into teams and they collaborate in order to *find* and *answer* as many questions as they can.
- Their purpose is to gain *points* and win *awards*.

The scenario of the game described below involves two types of users:
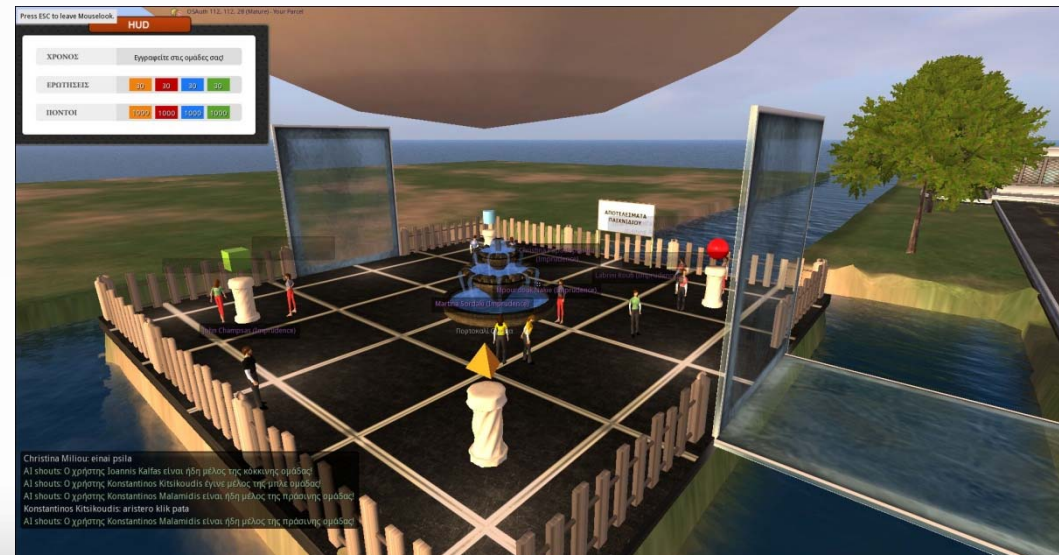
1. Teachers
2. Students

## 1. Selecting Team and Outfit

- Participants begin the game on a platform
- HUD (Head Up Display) is displayed on the upper left corner with useful information
- Their outfit has been preselected according to the team they belong to
- Players are enrolled into teams
- The game starts

## 2. Searching for the hidden questions

- Players develop their strategy

- They interact with objects inside the world in order to find the hidden questions

- If so, a pop-up window appears with the question

- They communicate through IM (Instant Message)

- After a question is answered  the question remains available for the rest of the players of the other teams

# Functionality to support the Student's role [3/3]

**3. Collaborating and answering the questions**

Options for each student:

1. Answer the question between three (3) options
2. Choose the 'HELP' option
3. Avoid answering the question

# Point System

| | Points |
|---|---|
| Starting | 1000 |
| Opening a question | -20 |
| 'HELP' option | -30 |
| Correct answer | 150 |
| Wrong answer | 0 |

# End of the game

The game ends…

- when all teams answer all the questions
- when the time ends

# Awards

- **"Wise-Man" award:** is given to the group with the most points earned.

- **Speed award:** is given to the team that answered all the questions first.

# Functionality to support the Teacher's role [1/2]

1. **Making groups:**
   - How many students will participate?
   - In what way will they be divided into groups?

2. **Configuration of parameters:**
   - Total time
   - Remaining time after a team answers all the questions
   - Number of the groups
   - Number of the members of each group
   - Point system

**3.Game instructions:**

Instructions with the rules and the goals of the game are provided

**4.Running the game:**

Control of the game through the centered item of 'Saturn'.

# Virtual world – Scene

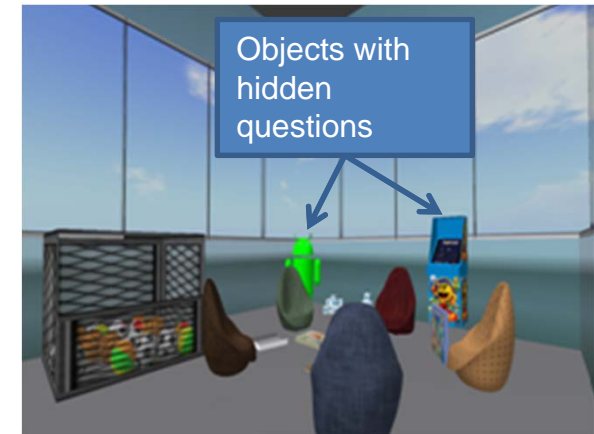1. **Initial place (platform)**
2. **E-MALL**
3. **HTML & PHP Offices**
4. **Labyrinth**

# Virtual world – Scene

## Virtual objects

- *Question objects*



Objects with hidden questions

Objects with hidden questions

- *Interactive non question objects*



**Teleferik**
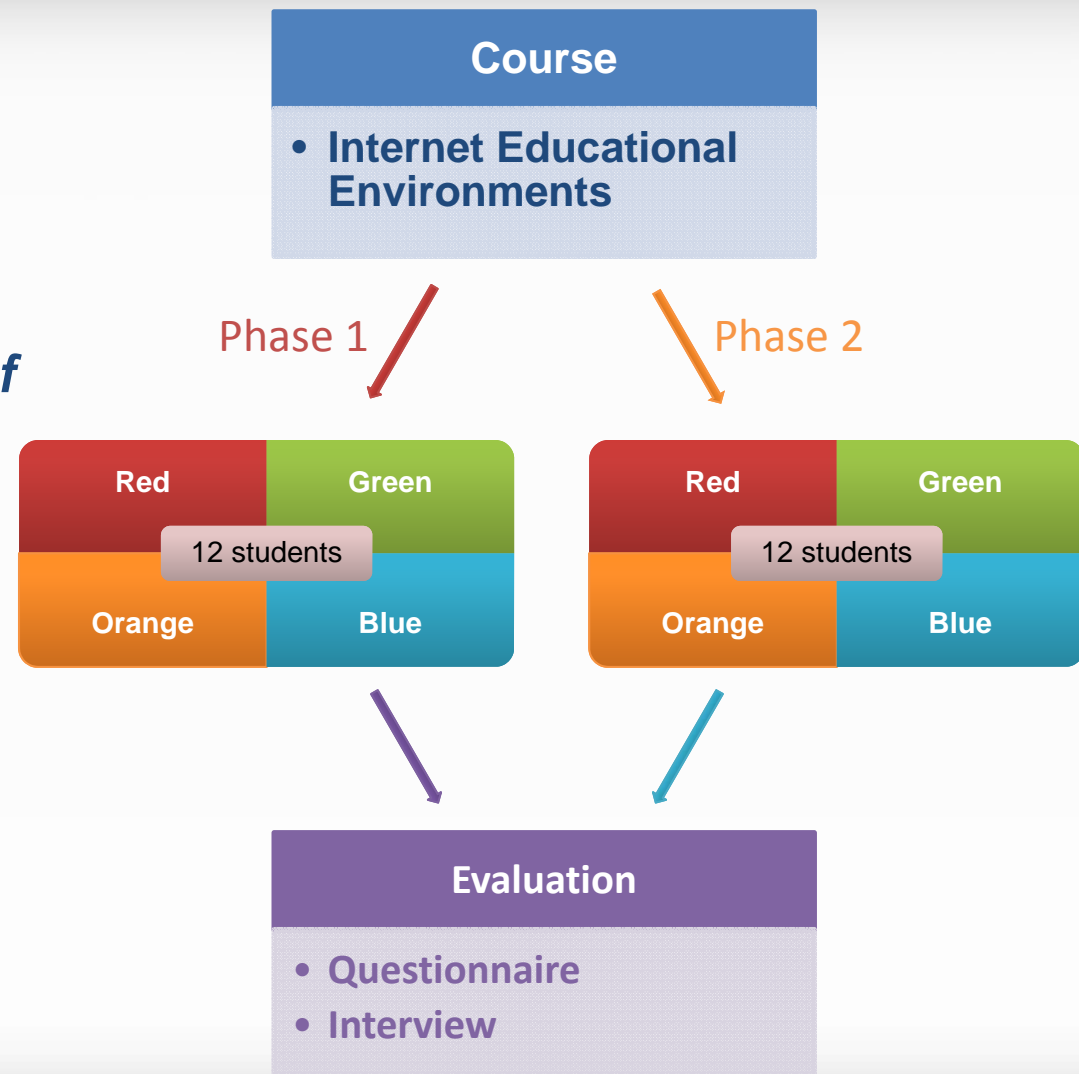
**Teleporter**

- *Irrelevant objects*

# Activity

*Twenty four (24)* undergraduate students attending the "*Internet Educational Environments*" course, of the Informatics Department in our University, were divided into *2 groups of 12*

▪**Phase 1**

•Faced certain technical problems

•"Crash" issues

•No impact to the proper execution of the game
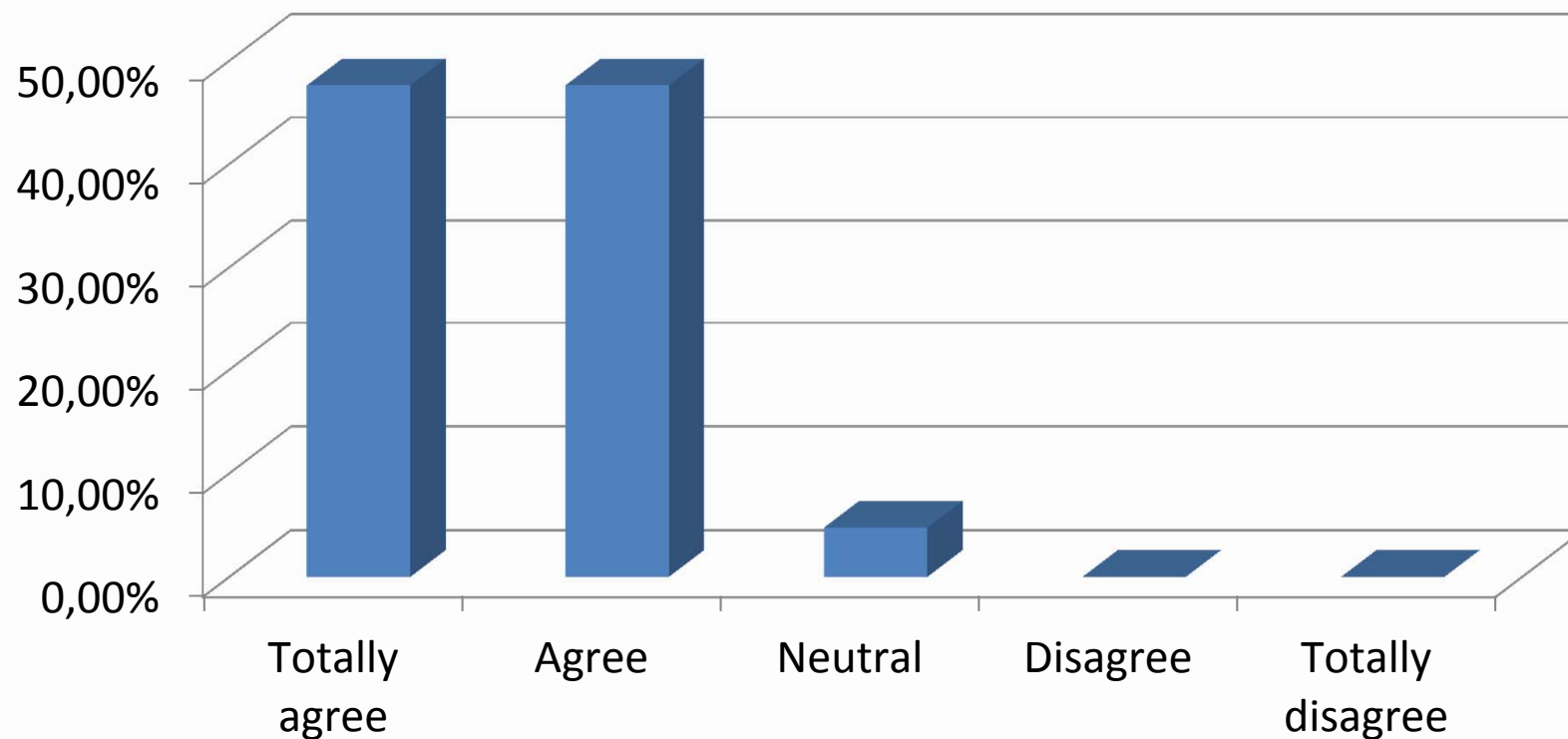
▪**Phase 2**

Success!

**Course**

• **Internet Educational Environments**

Phase 1     Phase 2

| Red | Green |
|---|---|
| 12 students | |
| Orange | Blue |

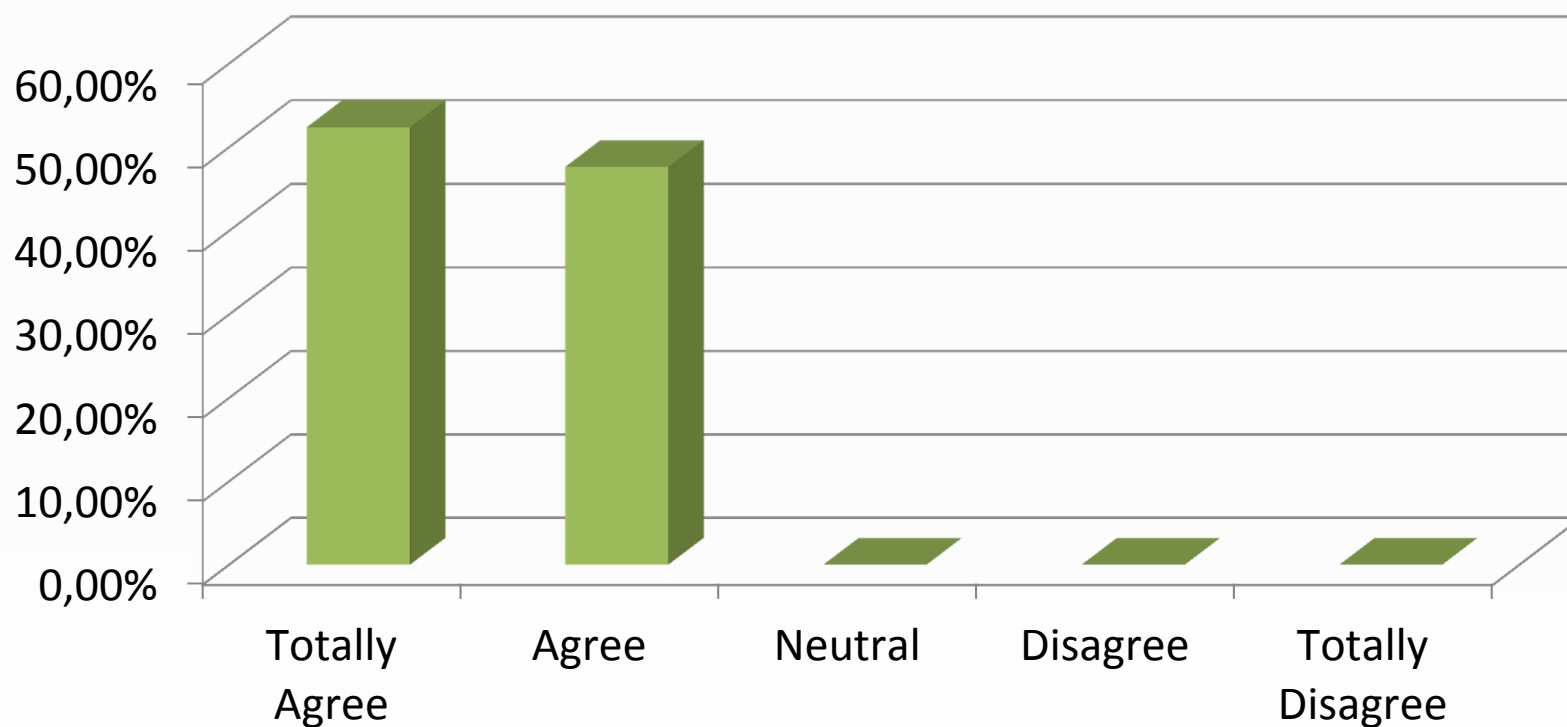| Red | Green |
|---|---|
| 12 students | |
| Orange | Blue |

**Evaluation**

• **Questionnaire**
• **Interview**

**Did the virtual game activity improve the effectiveness of the knowledge acquisition?**

**Do the students recommend the systematically existence of such activities in education?**

# Evaluation: Interview

**Comments:**

Innovative, pleasant, competitive, fun

Handy and friendly environment

*"I was thrilled by the game!"*

**Problems and Suggestions:**

Would prefer immediate feedback

Faced technical problems

# Conclusions

- Serious games can help students to improve knowledge acquisition.

- Students want such games to be part of the educational process.

- It can be a strong tool for teachers to overcome educational difficulties.

# Future Work

- Exceed difficulties related to game design
- Fix usability problems of advanced feature s
- Second cycle of evaluation
- New ways of evaluation(control and treatment group)
- Insert a human agent

# Thank you! Any questions?

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