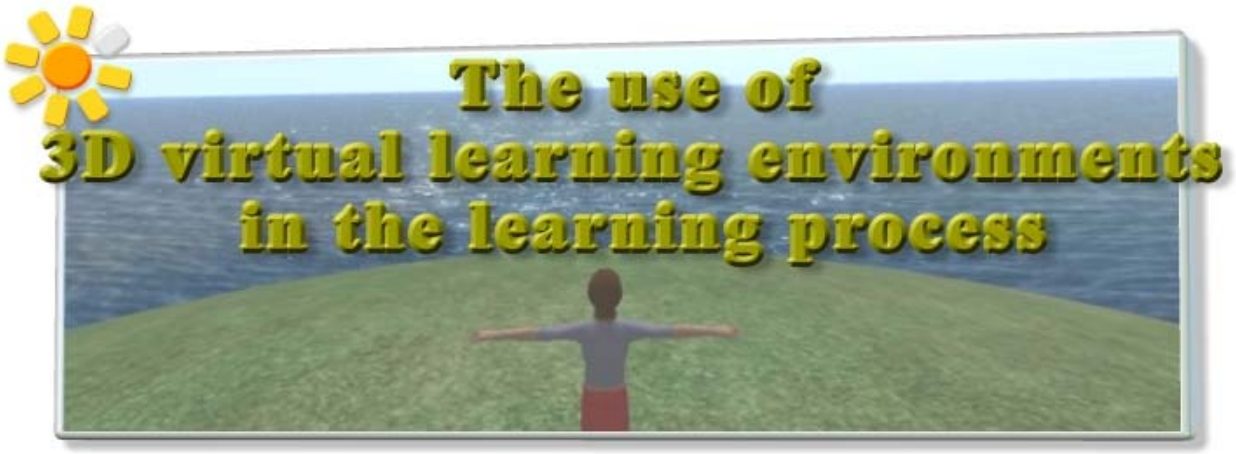

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ICODL 2009

This presentation consists of

- Introduction in virtual worlds
- Overview of common 3D platforms
- Current study
  - OpenSim on the School Network
  - Course design: In-class session, Online session
- Evaluation and conclusion


3D Virtual Environments (3DVE's)

- Increasing use due to:
  - Wide use of broadband Internet
  - Improvements in 3D graphics acceleration
- Innovative applications in education since they:
  - are used as a synchronous communication tool
  - Promote a common sense of presence
  - Allow active participation in collaborative activities
  - Change the tutor's role
  - Supplement or enhance learning rather than replace the classroom experience


The evolution of Virtual Worlds

Online Games
e.g. Quake, Half-Life,…

MMORPGs (Massively multiplayer online role-playing games)
e.g. Everquest, Project Entropia, World of Worcraft,…

Virtual Worlds (Massively multiplayer, BUT NOT ONLY role-playing games)
e.g. Big World, Second Life, There,…
• The content is created by users.
• This is not a game, there is no specific aim.
• A place for meetings, creation, exploration, cooperation, marketing and of course education.

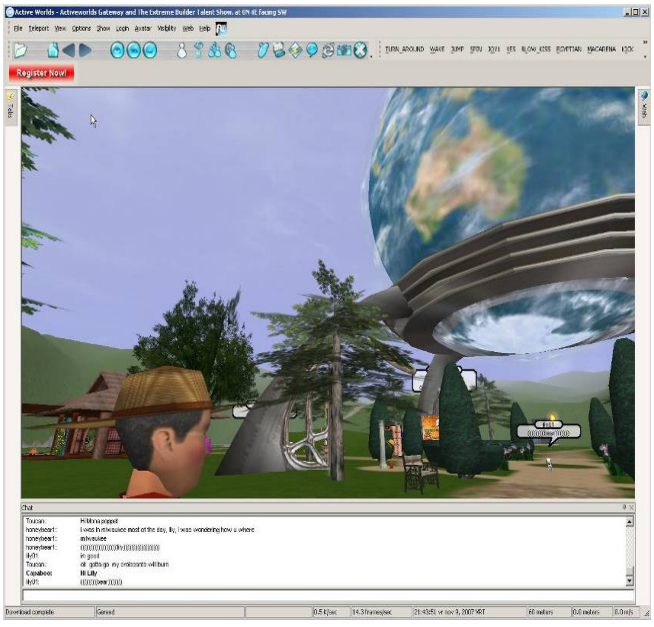
Choosing the appropriate 3DVE

- The 3DVE platform must be free and open source so that it can be adapted to the community needs
- Content creation should be easy for non-experts
- The ability to import content from external libraries is desirable
- The platform should allow web browsing, text and voice communication and file sharing capabilities
- Can operate in a distributed environment

Active Worlds

(www.activeworlds.com)

- specialized educational community (AWEDU)
- object creation and composition
- file exchange
- synchronous and asynchronous text and voice based communication
- registration fee



Project Wonderland

https://lg3d-wonderland.dev.java.net

- Sun's open source software
- The main technology for the production of 3D graphics is Java3D
- Cooperates with well known programs for building 3D graphic objects such as Blender and Maya
- Demanding when creating content
- Difficult configuration and customization (server & client)

Croquet

http://www.croquetconsortium.org

- Open source written in Squeak (Smalltalk) language.
- Is used for the creation of collaborative, interconnected, multiple-user environments
- Small data transfer without using a central server
- Runs on its own virtual machine thus it can be easily transferred to any common operating system
- Croquet is still rarely used despite its usefulness for Virtual Reality in education.

Second Life (www.secondlife.com)

- Extensively used by universities (e.g. MIT, Harvard, Edinburgh University etc.)
- Easily design & implement online courses
- Synchronous & asynchronous audio or text communication
- Restrictive policy for non-adult members
- TeenSecondLife solution for students requires a costly and complex registration process

Harvard Law School in SecondLife

OpenSim

- Open source software (server & client), written in C#
- Easy installation on a lab computer that worked as the server without special characteristics (AMD x2 2,3 Ghz processor, 2 GB RAM
- 500 GB Hard disc space, onboard graphics card and was running Windows XP SP3)
- Identical with SecondLife environment
- In world building tools (WYSIWYG)
- Ability to import objects from Second Life
- Standalone mode through a VPN or LAN and grid mode through the internet
- It can be customized and fully operating in a school computer lab (standalone mode) or through the school network (grid mode)
- It is already used formally by educational organisations and companies such as IBM, Microsoft, Nokia and Intel

OpenSim

http://opensimulator.org

A team meeting in one of IBM's Sametime 3D virtual meeting rooms

COURSE DESIGN

- The course was an introduction to computer architecture, using:
  - a) classroom teaching supported by a multimedia presentation (*in class session*)
  - b) educational activities and informational content inside the 3DVE (*online session*)

In class session

- We used a rich media presentation in order to attract students' attention. We used photos of computer parts and animations in order to achieve a vivid result
- We provided students with details and asked several questions in order to get their feedback
- However, in the absence of real computer parts we didn't perform any group tasks

Online session (first virtual meeting)

- The students were enabled to watch the same slide presentation, with the in class students, in the 3D environment
- Objects from previous courses in SecondLife have been imported and re-used
- Additional 3D objects were created
- The students had the ability to interact with the 3D objects and read information about their role and function by clicking with their mouse on each object

Displaying the presentation in OpenSim

On line session (second virtual meeting)

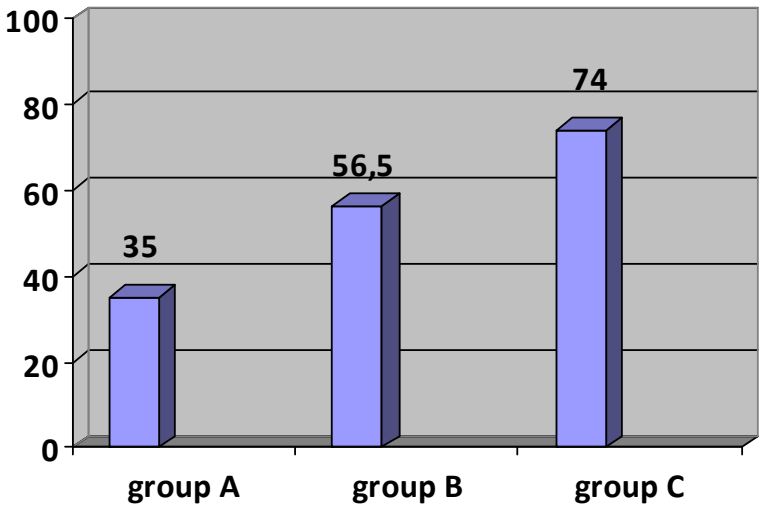
- Students learned the function of computer parts by constructing a working computer with the help of their classmates
- The teacher provided clear instructions on how to complete the activities and supported students to solve any technical difficulties
- The online lesson was more learner-centred, active and collaborative than the real-class lesson

Students completing their tasks in OpenSim

Students Assesment

- A performance assessment answer sheet with 23 questions was distributed to 3 students groups
  - The ***baseline*** group (A - 16 students), was not taught any of the learning material
  - The ***in-class*** group (B - 22 students), was taught the specific thematic unit with the typical teaching methods
  - The ***online*** group (C - 18 students), participated in the online lesson

The results of the test

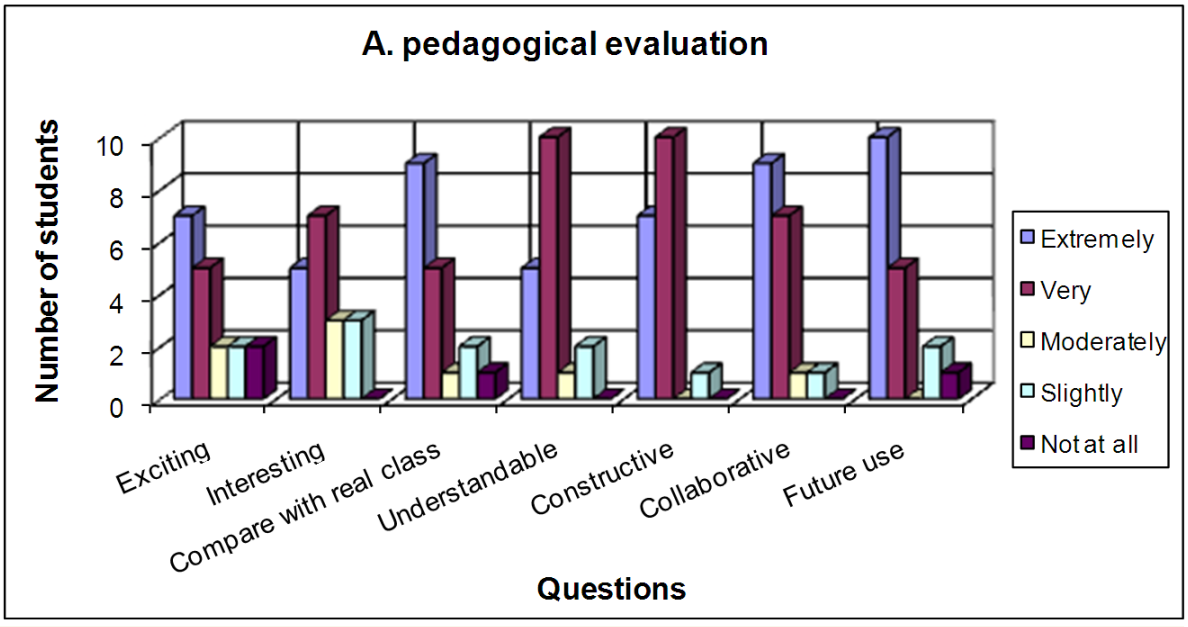


Evaluation of OpenSim 3DVE

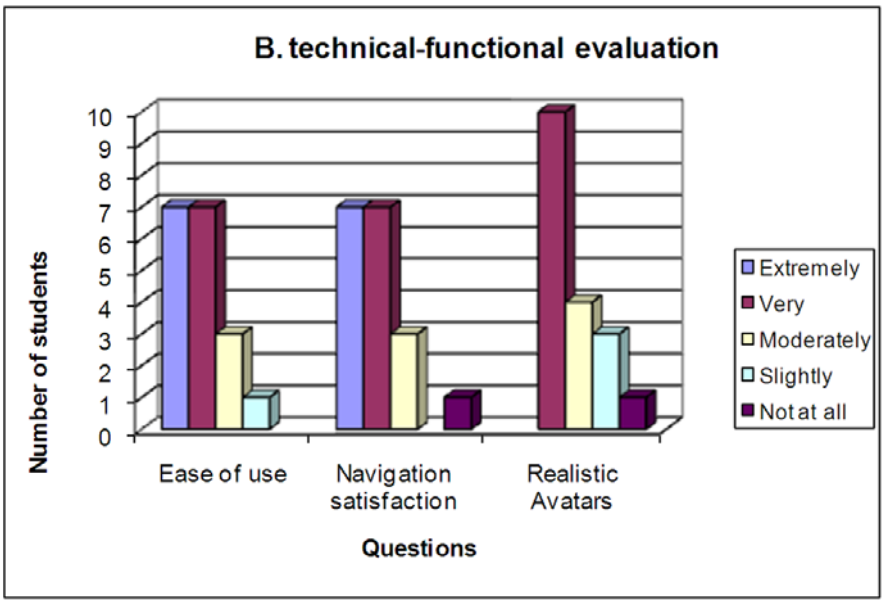
The evaluation questions aimed to:

- Depict the interest of students for the online course
  - They found the course interesting, understandable, collaborative and constructive
- Collect their complaints
  - They needed time to familiarize with the interface, they feel unconfident inside the virtual environment
- Uncover their difficulties in using the platform
  - Lack of expertise in using computers, no previous experience in 3DVE

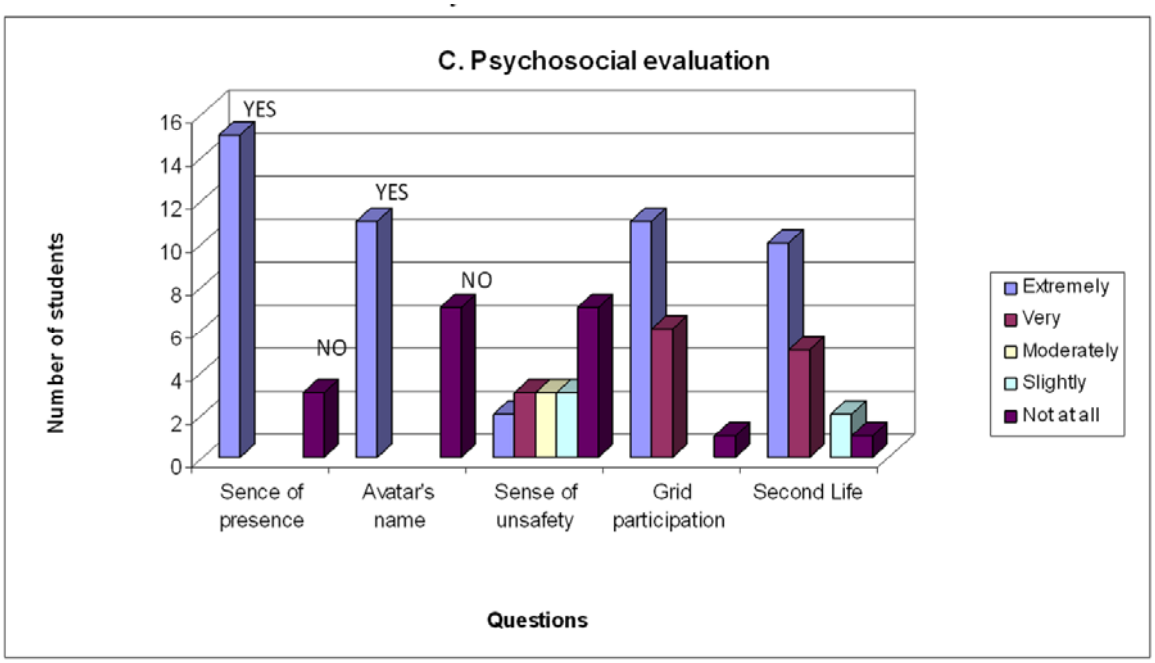
A. Pedagogical evaluation



B. Technical-functional evaluation



C. Psychosocial evaluation



Conclusions

Our evaluation verifies our intuition that

3DVEs may increase students' interest and support interactivity and cooperation

OpenSim 3DVE:

- has a user friendly interface which enables the low cost, effective, easy design and application of learning activities that can have a positive impact on students' performance
- improves the ability of students to construct objects, to learn and share their knowledge
- allows collaborative tasks to be assigned to student groups and educators to co-ordinate and support students' activities
- enables virtual worlds to interconnect creating a wider educational grid on the Greek school network

Future work

- Develop a database of educational activities that can support one or more courses
- Run virtual courses, without the physical presence of the teacher and evaluate results
- Deploy the same course across more than one schools

Thank you!

Any questions ?

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