



3D Virtual Worlds Technology in Education

Projects VR4STEM, WOP

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Workshop 12

eTwinning Thematic Conference

September 29, 2017

Divani Caravel Hotel, Athens, Greece

Workshop Program

1. Introduction (3D Virtual Worlds Technology in Education: Projects VR4STEM, WOP)

Assoc. Prof. Ioannis Hatzilygeroudis, Univ. of Patras, Greece

2. VR4STEM: Project Work Flow and Multiplication of project outcomes

Dr. Sorin Ionitescu, Universitatea Politehnica Din Bucuresti, Romania

3. STEM Entrepreneurship Training in Europe and VR4STEM Curriculum

Assoc. Prof. Zuzana Palkova, New Edu, Slovakia

4. Designing Scenarios in 3D Worlds-Examples from VR4STEM

Assoc. Prof. Ioannis Hatzilygeroudis, Univ. of Patras, Greece

Dr. Isidoros Perikos, CTI, Greece

5. Using OpenSim to Construct a 3D World

Mr. Kostantinos Kovas, MSc, PhDc, Univ. of Patras, Greece

6. VR4STEM: Example courses in the 3D World

Mr. Kostantinos Kovas, MSc, PhDc, Univ. of Patras, Greece

What is a Virtual World?

- Wikipedia
 - ✓ computer-based **simulated** environment
 - ✓ may be **populated** by many users
 - ✓ each user can create its own **avatar**
 - ✓ users can simultaneously and independently **explore** the virtual world
 - ✓ users **participate** in its activities and **communicate** with each other

An **avatar** is a graphical (humanoid) representation of a user.

How can we construct a Virtual World?

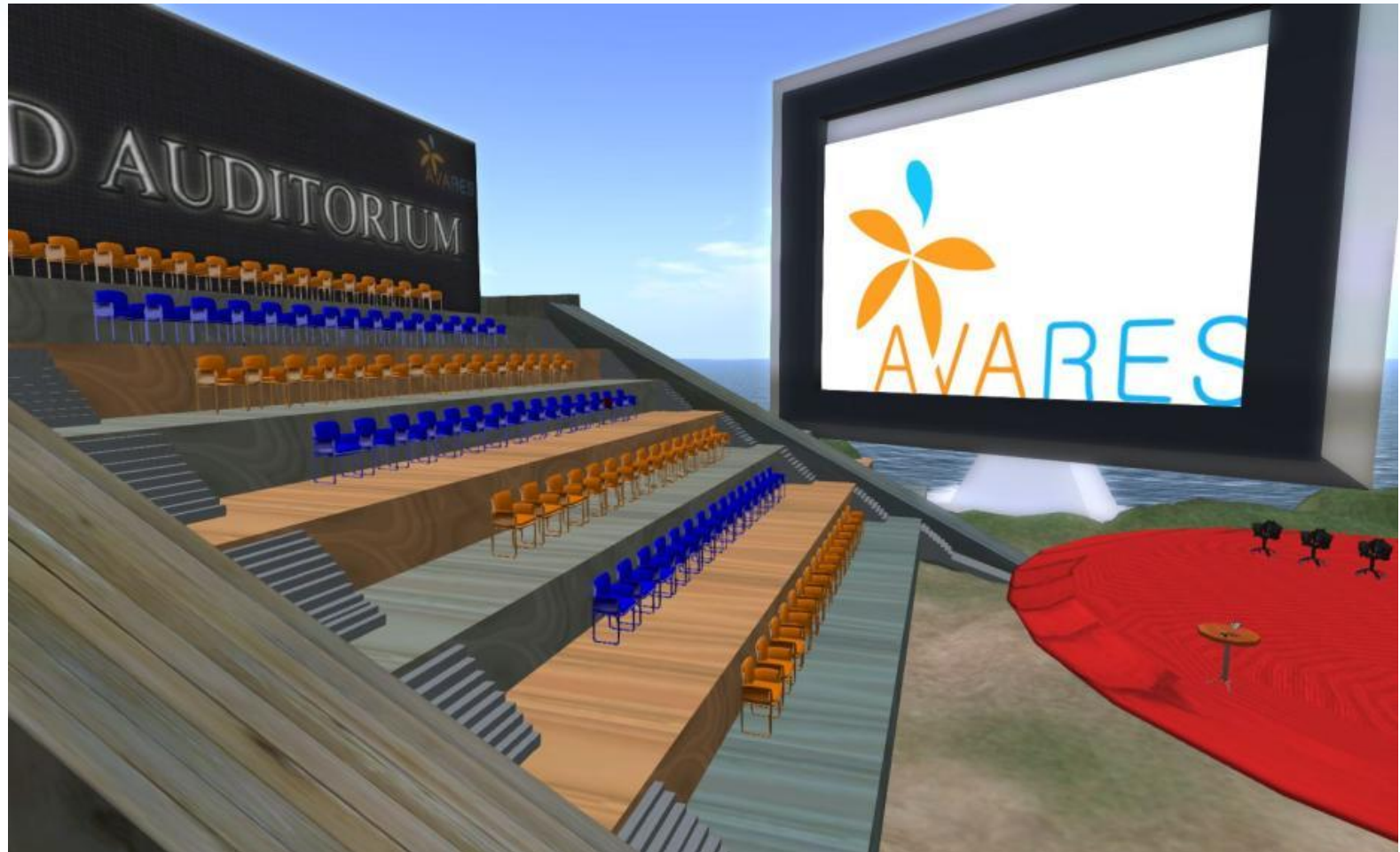
- You should
 - ✓ choose a software tool for creating a VW environment (e.g. OpenSim)
 - ✓ make a structure of your world (specify the number and the location of “islands” or “regions”)
 - ✓ format the external view of islands
 - ✓ create appropriate “objects” in the VW

What objects does an educational Virtual World contain?

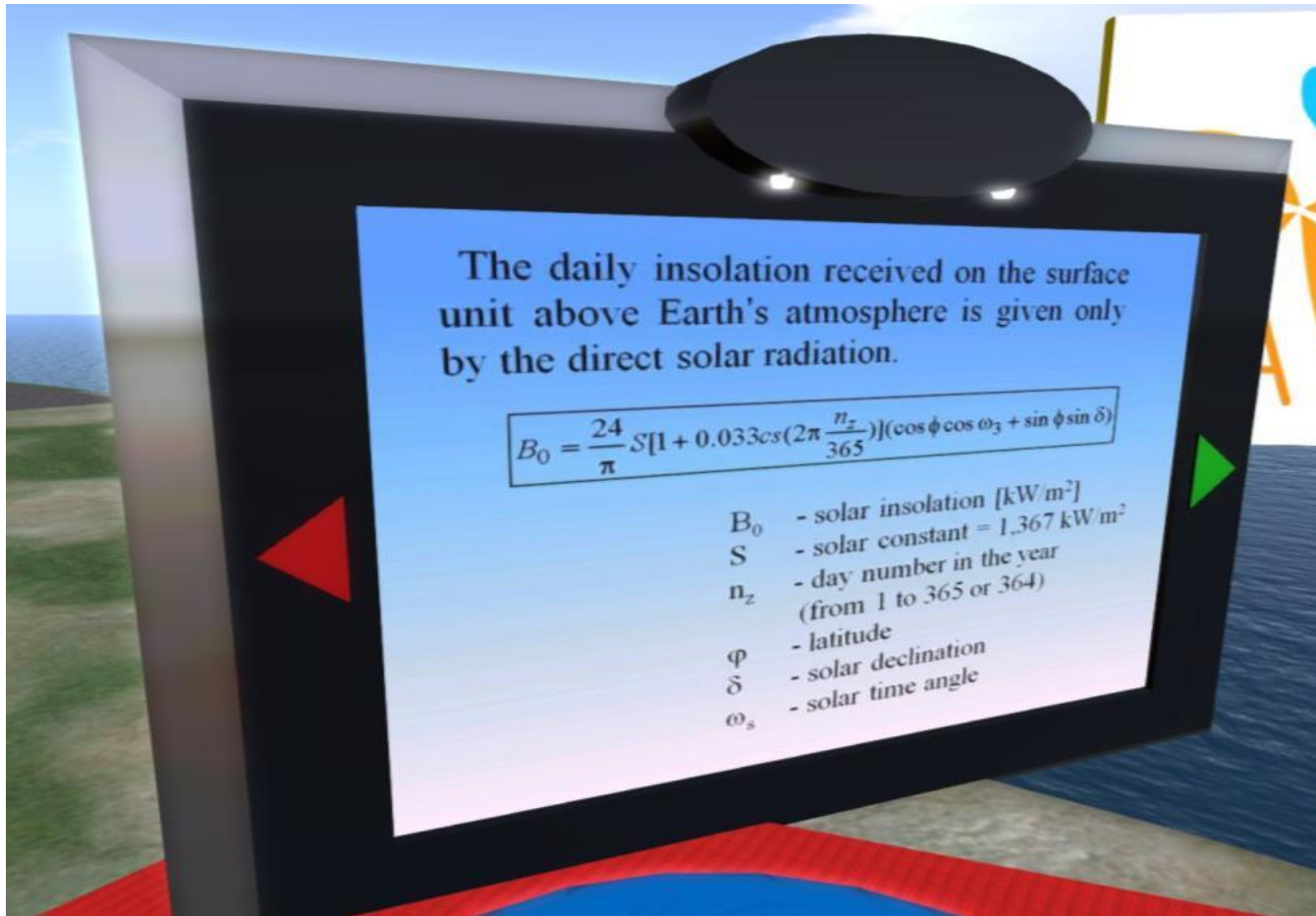
- Educational VW objects
 - ✓ Auditoriums
 - ✓ Meeting rooms
 - ✓ Libraries
 - ✓ Media rooms
 - ✓ Displays
 - ✓ Laboratories
 - ✓ 3D objects related to the educational topics
 - ✓ 3D simulations of processes or machine functions

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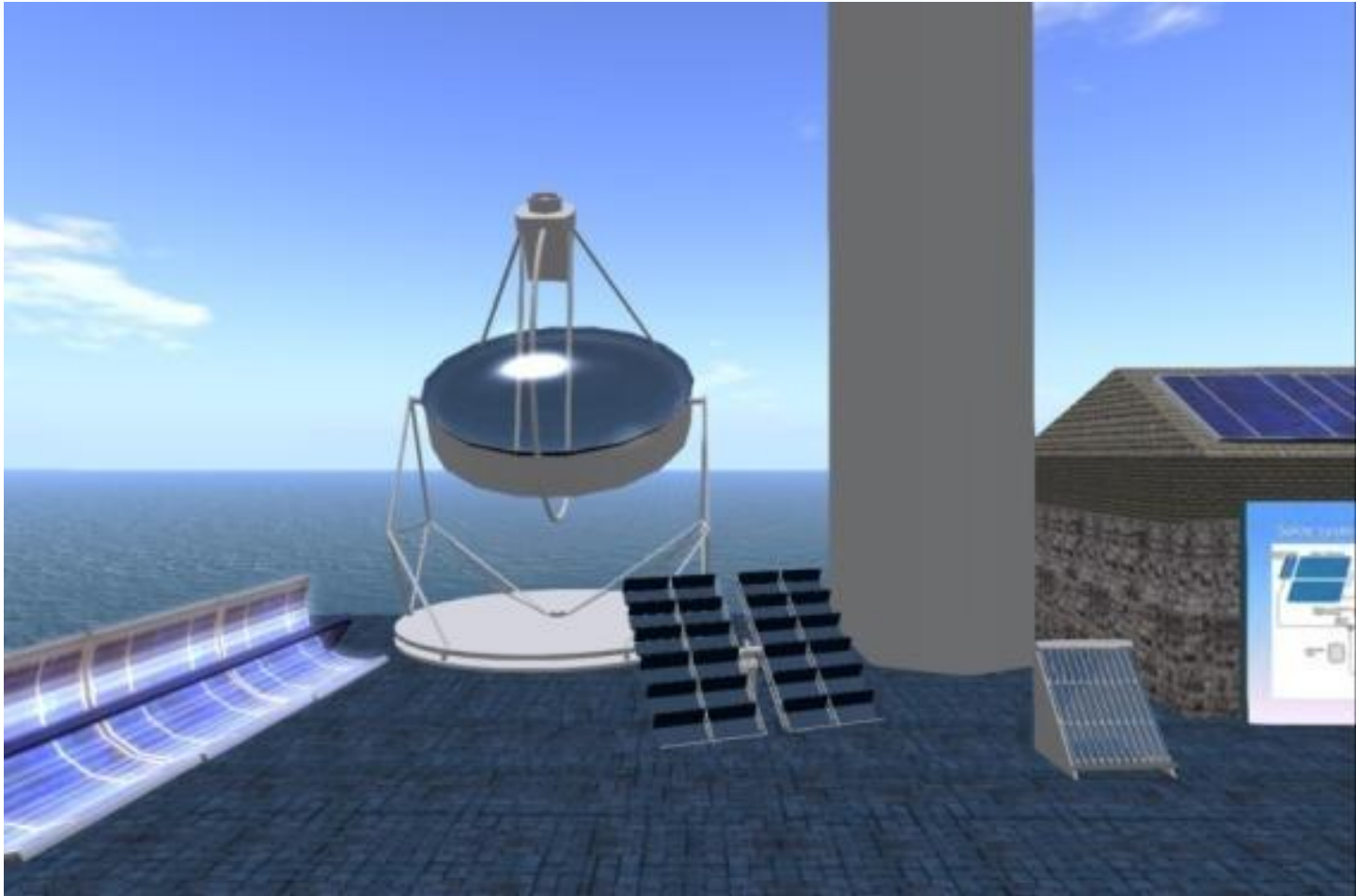
3D Virtual World (Auditorium)



3D Virtual World (Displays)



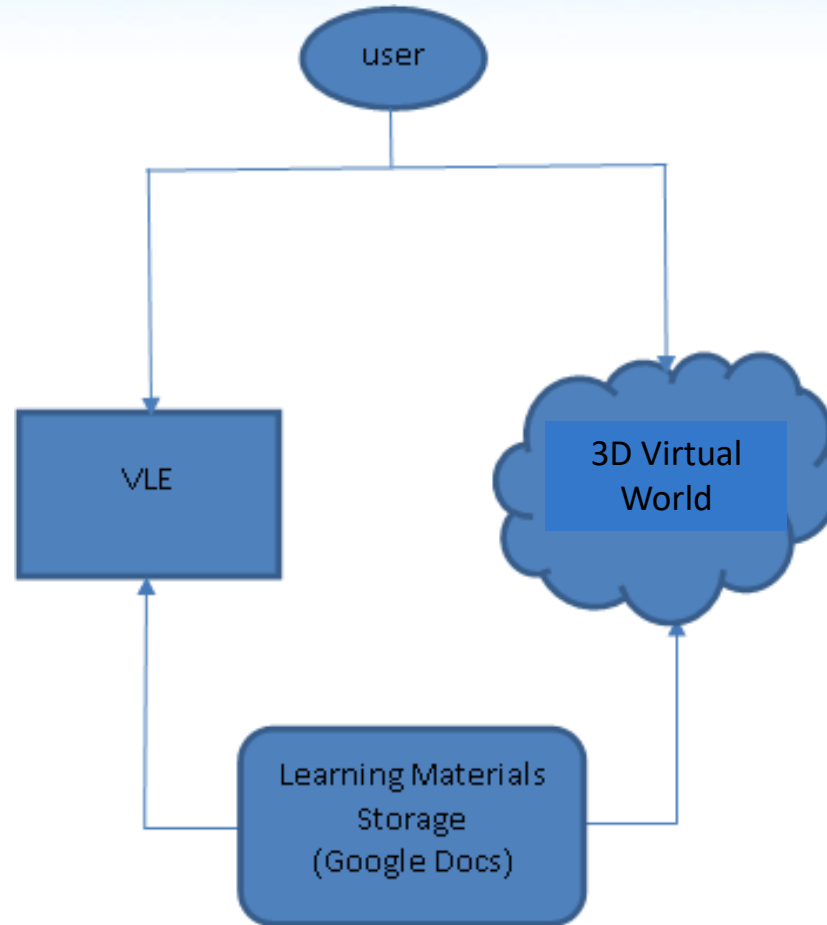
3D Virtual World (3D Objects)



What other learning materials could be used?

- Learning materials
 - ✓ Text-based graphical presentations
 - ✓ Advanced 2D simulations
 - ✓ Online tests

How can they be used in a VW?



What learning strategies can we implement?

- **Self-learning:** no teacher, no guidance (informal learning?).
- **Class-based synchronous learning:** virtual class, distance learning, teacher-avatar directs learning process in real time.
- **Class-based asynchronous learning:** virtual class, distance learning, instruction-based learning.

What learning strategies can we implement?

- **Blended learning:** real class, activities in the 3D VW are used during teaching.

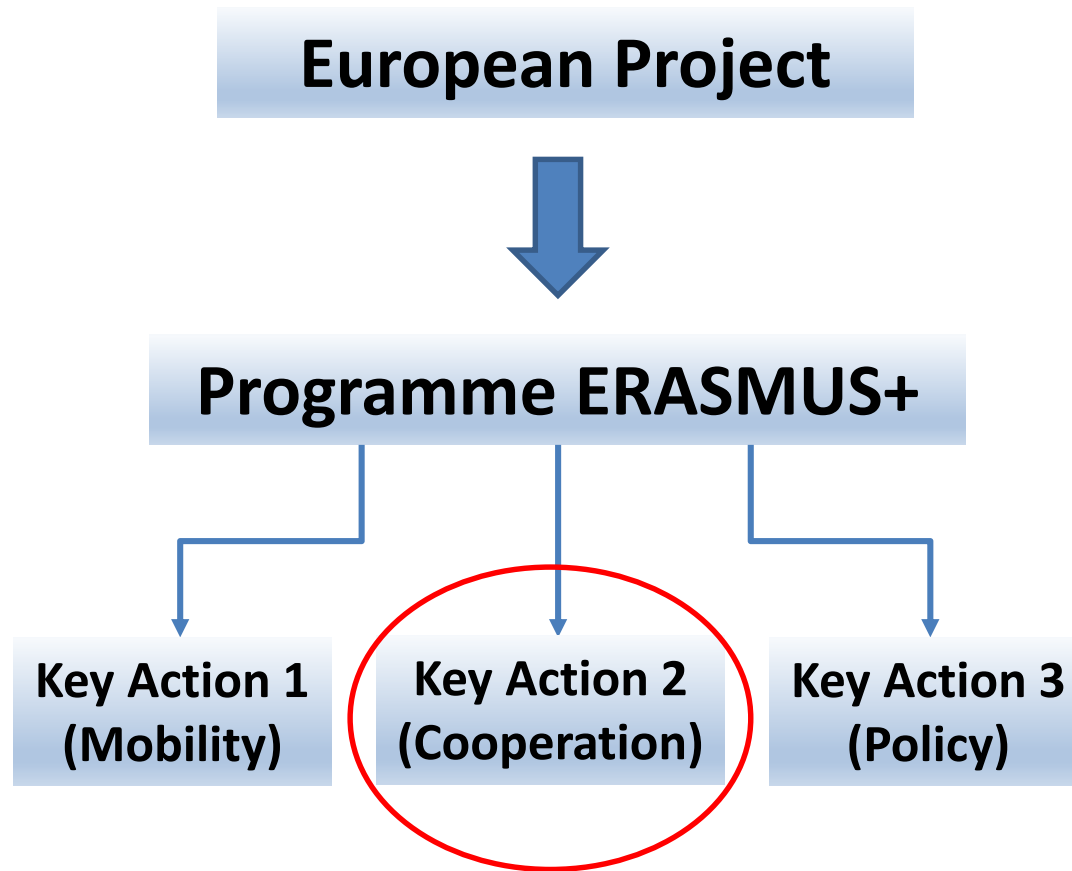
VR4STEM

Virtual Reality for STEM Entrepreneurship Training

2015-3-RO01-KA205-022949

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What is VR4STEM?



Key Action 2

Cooperation for Innovation and Exchange of Good Practices

- Cooperation among institutions for improvement of provided education and sharing of innovative practices.
- Financing of institutions of different countries for cooperation towards this direction.
- Financed projects focus on the development and transfer of innovative practices to the education of young people among countries.
- It covers the levels of higher, vocational and secondary education, adult education and education of young people.

Key Action 2

Cooperation for Innovation and Exchange of Good Practices

Decentralised Actions

Strategic partnerships for higher education

Strategic partnerships for VET

Strategic partnerships for schools

Strategic partnerships for adult education

Strategic partnerships for youth

Strategic partnerships in more than one sector

Central Actions

...

VR4STEM

Start: February 2016 **End:** January 2018

General target:

Assist young people gain entrepreneurship skills in STEM domain (Science, Technology, Engineering and Mathematics) related ICT industry.

Specific targets:

- Attract young people to STEM domain
- Assist young people gain entrepreneurship skills
- Use of attractive technologies for teaching
- Creation of effective educational activities

Means to achieve targets:

- Creation of electronic courses
- Creation of “open educational resources” in many languages
- Use of virtual reality technologies (3D Worlds)
- Design of suitable educational scenarios
- Use of gamification

VR4STEM

Expected results:

- Improvement of provided education in STEM domain.
- The students obtain adequate entrepreneurship skills.
- Use of “open educational resources” at least at European level.
- Activate young people in the STEM domain to increase innovations.
- Contribute in fighting unemployment.

VR4STEM

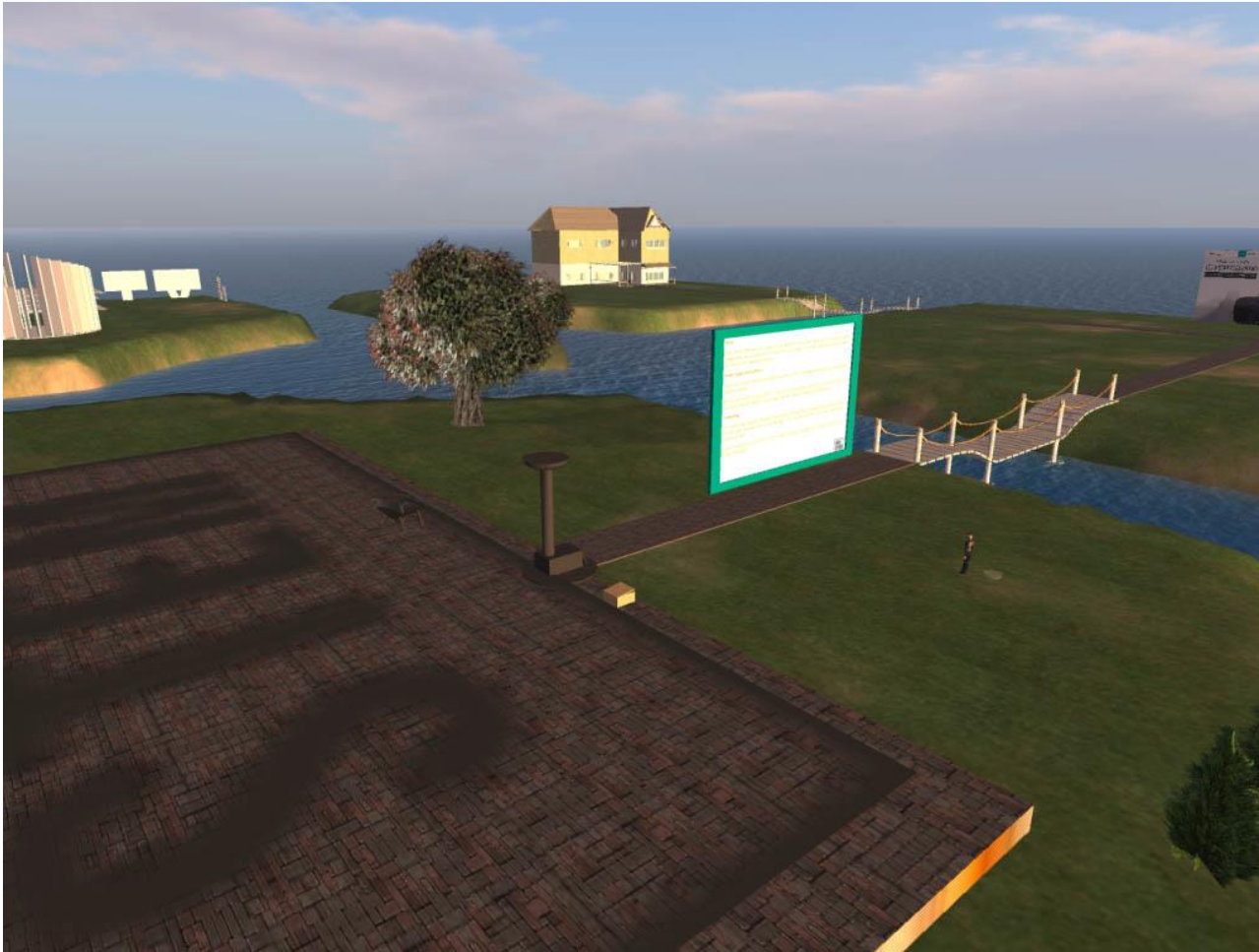
Outputs of the project:

- **O1:** Technical Reports on current educational and technological status
- **O2:** STEM Entrepreneurship Curriculum Design
- **O3:** Open Learning Resources (presentations, interactive multimedia, 3D objects).
- **O4: Not approved**
- **O5:** 3D Virtual World
- **O6:** User Guide
- **O7:** Piloting-Evaluation

Teaching topics

- Innovation and Start-ups
- Team work
- ICT and Entrepreneurship
- Modern Technologies and Entrepreneurship
- Unmanned Aerial Vehicles
- The world of lasers
- Robots world

3D World View



3D World Object (Drone)



Project Web Site

<http://vr4stem.ro/index.php/en/>

Project Web Site

The image shows a browser window displaying the VR4STEM project website. The browser's address bar shows the URL `vr4stem.ro/index.php/en/`. The website features a navigation menu with links for HOME, ABOUT US, OUTPUTS, PARTNERS, and CONTACT. A language dropdown menu is set to English. The main content area has a large banner with the text: "INTERESTED IN VIRTUAL REALITY? LET'S START LEARNING! VIRTUAL REALITY FOR STEM ENTREPRENEURSHIP TRAINING". The banner background is a photograph of a person sitting on a rock at sunset. In the bottom right corner, there is the Erasmus+ logo and the text "© VR4STEM 2015-3-RO01-KA205-022949".


Key Action 2: Cooperation f... Apply for youth partnership x Google Translate - Αναζητ... Home x +

vr4stem.ro/index.php/en/ VR4STEM

VR4STEM English

HOME ABOUT US OUTPUTS PARTNERS CONTACT

INTERESTED IN VIRTUAL REALITY?
LET'S START LEARNING!
VIRTUAL REALITY FOR STEM ENTREPRENEURSHIP TRAINING

 Erasmus+
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Partnership



UPAT

Partner

 www.upatras.gr



UPB

Coordinator

 www.upb.ro



CTI

Partner

 www.cti.gr



NEW EDU

Partner

 www.newedu.sk

**e-Training
Solutions**

ETS

Partner

 www.e-training-solution.de

WORLD OF PHYSICS

**An innovative virtual reality educational
environment for school physics education**

2016-1-CY01-KA201-017371

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WORLD OF PHYSICS

Start: October 2016 End: September 2018

General target:

Assist students in studying physics domain by utilizing innovative technologies like virtual reality.

Specific targets:

- Offer students an attractive, entertaining and efficient way to learn about various topics of Physics
- Use of attractive technologies for teaching Physics
- Modernize and enhance the performance and effectiveness of school physics education

WORLD OF PHYSICS

Means to achieve targets:

- Development of a 3D virtual reality educational environment
- Use of virtual reality technologies (3D Worlds)
- Create virtual physics laboratories
- Development of innovative educational approaches and training activities
- Creation of “open educational resources” in many languages

WORLD OF PHYSICS

Expected results:

- Improvement of provided physics education.
- Increase students interest in Physics.
- The students get a better understanding of basic physics concepts and processes.
- Use of “open educational resources” at least at European level.

WORLD OF PHYSICS

Outputs of the project:

- **O1: Reports on Physics Education in Schools around Europe and the state of the art in 3D Virtual Worlds**
 - ✓ Physics Education in Secondary Education Schools around Europe
 - ✓ Applications of ICT in Physics Education
 - ✓ State of the Art in Virtual Reality and 3D Worlds
 - ✓ Gamification and Learning Opportunities in Virtual Worlds
- **O2: Virtual 3D World for Teaching Physics**
 - ✓ 3D World environment (3 regions: mechanics, properties of matter, electricity and magnetism)
 - ✓ Trainers Handbook
 - ✓ Piloting Report
- **O3: Open Learning Resources for Trainers**
 - ✓ Web-based repository (CMS)

Project Web Site

<http://worldofphysics.etcenter.eu>

Project Web Site

The image shows a browser window displaying the homepage of the World of Physics Project. The browser's address bar shows the URL `worldofphysics.etcenter.eu/index.php/en/`. The website header includes the WOP logo (World of Physics), a language dropdown menu set to "English", and a navigation menu with links for HOME, ABOUT US, OUTPUTS, PARTNERS, and CONTACT. The main content area features a large banner image of two people wearing VR headsets, with a city skyline and a network diagram overlaid. The banner text reads "WORLD OF PHYSICS" in large, stylized letters, followed by "LEARN / PLAY / HAVE FUN!". In the bottom right corner of the banner, there is an Erasmus+ logo and the text "@WORLD OF PHYSICS PROJECT 2016-1-CY01-KA201-017371". Below the banner, the text "ABOUT US" is visible.

Εισαγόμενα (1) - chatzis1...
Σε κοινή χρήση με εμένα - ...
Εγγραφο Google
Partner Presentations - Go...
New Tab
Home

worldofphysics.etcenter.eu/index.php/en/ 90% Search

WOP
WORLD OF PHYSICS

English

HOME ABOUT US OUTPUTS PARTNERS CONTACT

WORLD OF PHYSICS
LEARN / PLAY / HAVE FUN!

Erasmus+
@WORLD OF PHYSICS PROJECT
2016-1-CY01-KA201-017371

ABOUT US

Partnership



cte
Asociația
Centrul de Training European

CTE

Partner

 www.etcenter.eu



University
of Cyprus

UCY

Coordinator

 www.cs.ucy.ac.cy/seit




ITD
CNR
Istituto per le Tecnologie Didattiche
Consiglio Nazionale delle Ricerche

CNR

Partner


 www.cnr.it



NEW EDU
www.newedu.sk

NEW EDU

Partner

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ΠΑΝΕΠΙΣΤΗΜΙΟ
ΠΑΤΡΩΝ
UNIVERSITY OF PATRAS

UPAT

Partner


 www.upatras.gr

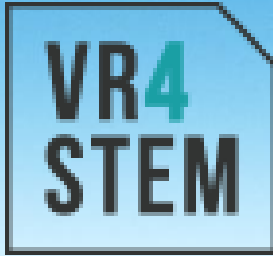


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**Thank you for
your attention!**