

DISTANCE TEACHING - AN EXPERIENCE FROM PETRUS

**(EDUCATION IN GEOLOGICAL DISPOSAL OF
RADIOACTIVE WASTES)**



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PETRUS Initiative

Introduction

- ❑ Renewing and reinforcing competences in the field of geological disposal of radioactive waste are the overall goals of the PETRUS group which considers the development of the academic education as a key instrument.
- ❑ Producing professionals that can address diverse issues related to the radioactive waste disposal requires a unified effort at European level since the very large diversity of the job profiles in this field is constrained by the very small size of the radioactive waste community which has been estimated in all less than 4000 specialists.

PETRUS Initiative

Introduction

- The main idea is to develop a common educational programme at the European level by sharing the best academic resources and pedagogic materials available.
- A cost-effective way to succeed in this challenge is to make use of the synchronous 2-way audio and visual Internet capability for broadcasting live lectures at multiple distance sites.

ENEN II-PETRUS Project

Tasks (2006-09)

- ❑ **Harmonisation strategy and framework for mutual recognition of education modules**
- ❑ **Plan for building a common educational programme**
- ❑ **Pedagogic materials needed: PETRUS syllabus**
- ❑ **Demonstration of a communication system and database on research needs**
- ❑ **Quality objectives and criteria for the educational programme**
- ❑ **Zero level pilot test**

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Distance Learning

Individualized self-paced
e-learning
online

Group-based
e-learning
asynchronously

Individualized self-paced
e-learning
offline

Group-based
e-learning
synchronously

groups of learners are working together in real time via the Internet. It includes:

- text-based conferencing
- two-way audio and videoconferencing



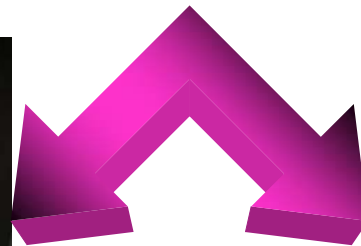
Virtual Classroom



Live broadcast

**Face to Face
remote
teaching**

Virtual Classroom

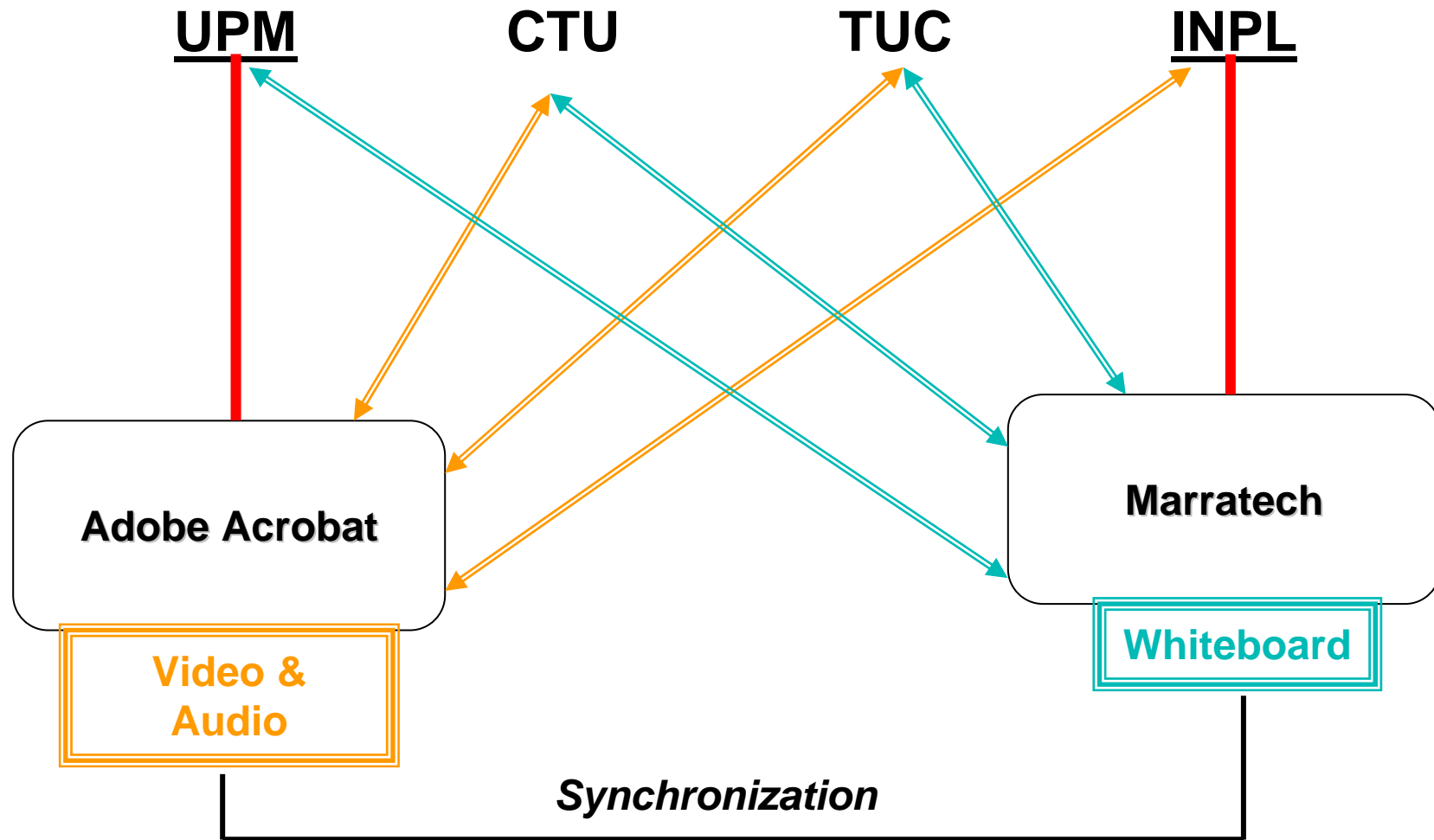


Technical aspects

2 high-performance multipoint Room-based videoconferencing systems have been tested.

	Adobe Acrobat Connect Professional	Marratech
Video	★ ★ ★	★
Audio	★ ★ ★	★ ★
Whiteboard	★	★ ★ ★

Simplified connection scheme

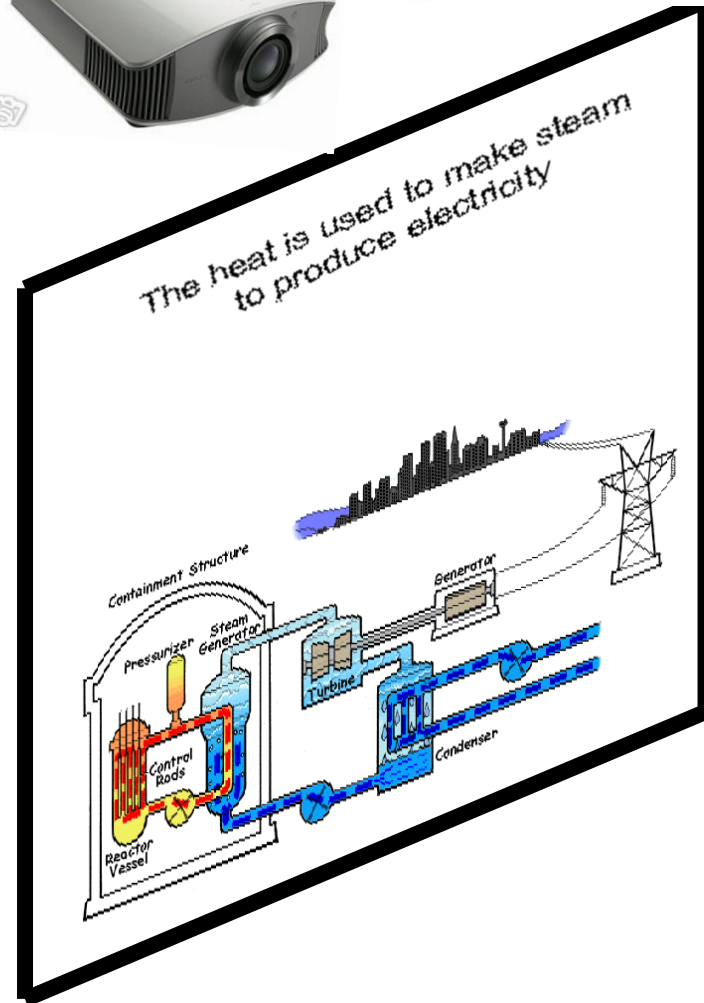


Adobe Acrobat



INPL classroom
equipment

Marratech



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Quality objectives and criteria for the Petrus educational programme

General strategy: improvement of contents and methodologies during term, after term, and after end of the Master program as well as a feed back from end-users concerning the quality of education with respect to their needs.

- 1. Evaluation of lecture success by teachers**
- 2. Evaluation of lectures by students**
- 3. Evaluation of academic program by WMOs and other “end-users”**
- 4. Implementation of quality control**

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Zero Level Pilot Test summary

- Four teaching sessions have been organized with the participation of a representative sample of Master's degree students.
- A questionnaire filled at the end of each session allows getting perspective from students' willingness to be involved in this new learning process.

3 Lectures in June 2008

INPL : Introduction to nuclear fuel cycle

Duration: 1hour

Support : Power Point

UPM : Introduction to numerical modeling

Duration: 1hour

Support : Power Point

CTU : Assessment of thermal proprieties of the host rocks

Duration: 1hour

Support : Power Point

***Half hour discussion
after each lecture***

1 Lecture in January 2009

TUC : Introduction to safety assessment

Duration: 1hour

Support : Power Point

The Whiteboard

Hors connexion - Marratech




Fichier Edition Objet Document Diapositives Outils Aide

cours_petrus.ppt - diapositive 03

Largeur

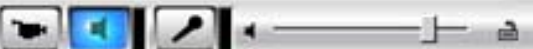
14

The nucleus of the U-235 atom comprises **92 protons** and **143 neutrons** ($92 + 143 = 235$). When the nucleus of a U-235 atom captures a moving neutron it splits in two (fissions) and releases some energy in the form of heat, also two or three additional neutrons are thrown off.



Public

Image #5 (propriétaire : fb)



Zero Level Pilot Test

Feedback from students

In total 37 students have attended

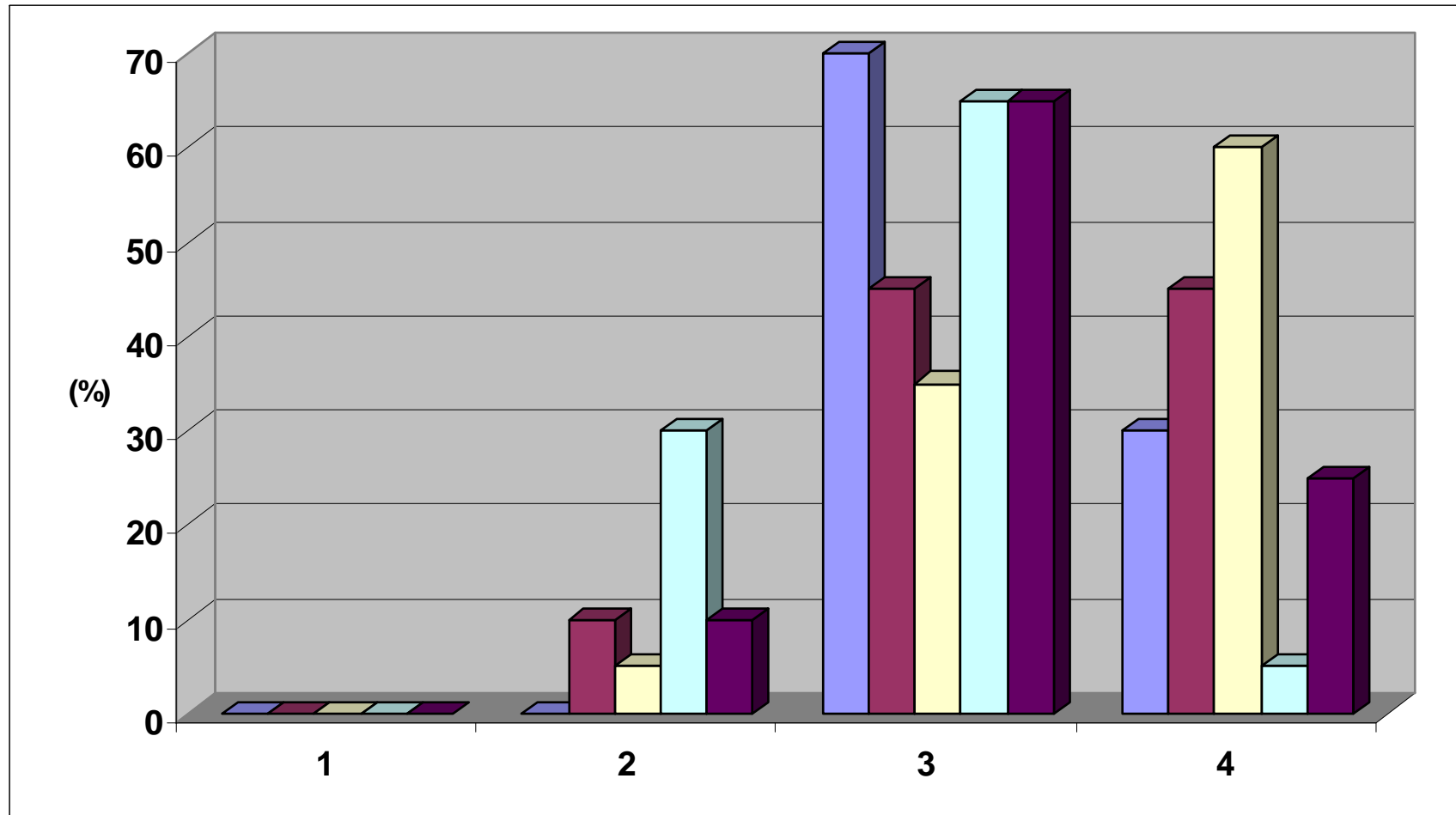
Questionnaire with 32 questions

- Learning outcomes **4/6**
- Efficiency of the remote teaching method **4.4/6**
- Quality perceived **4.1/6**
- Teacher performance **3.3/4**

Zero Level Pilot Test

Teacher Performances

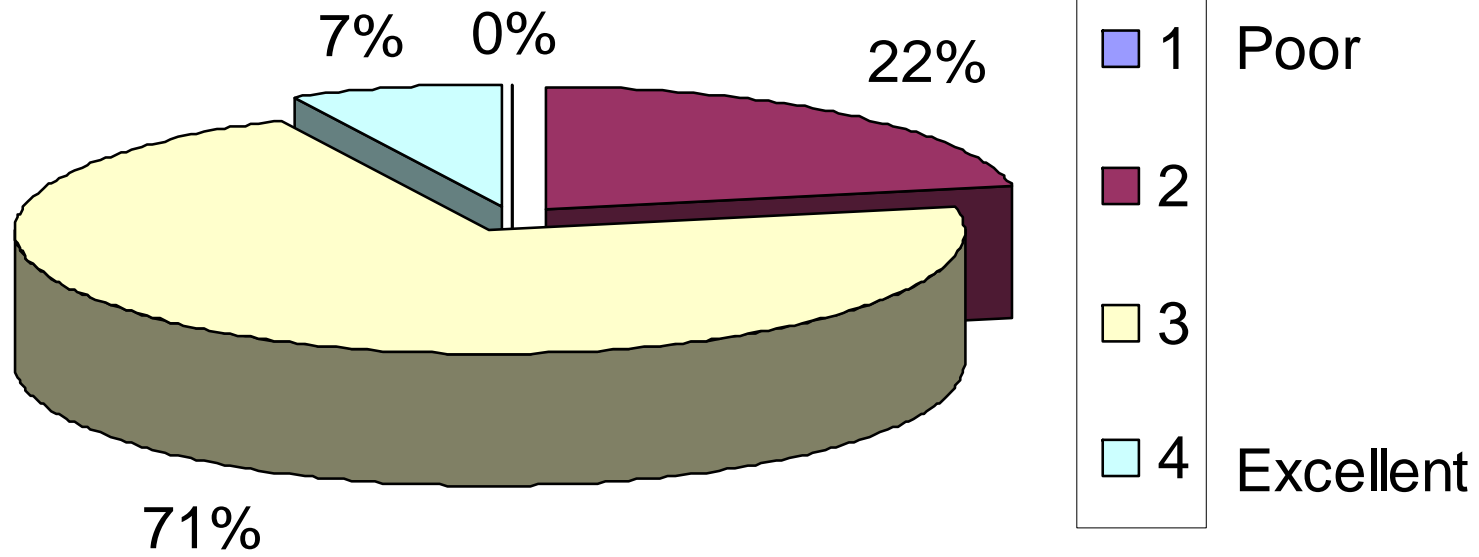
- Knowledge of subject
- Organization of sessions
- Obvious preparation
- Style and delivery
- Producing a good learning climate



Knowledge of subject

Organization of sessions

Style and delivery



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Zero Level Pilot Test detailed analysis

- ❑ • Compared with the “standard” teaching method, the amount and quality of interactions between the professor and (distant) students but also among different virtual class rooms must be increased in order to strengthen the collaborative learning environment.
- ❑ • Advance preparation of the technical materials (i.e. establishment and tests of the electronic connections) is a matter of great importance. Impoverishment of the image quality during a lecture or even unexpected delay in audio transmission would be a source of frustration for both teacher and students.

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Zero Level Pilot Test detailed analysis

- • Students must receive a paper copy of the lectures (texts and power point presentations) before the delivery of the courses. By providing pedagogic materials to students in advance, the students' fear of missing information is alleviated. This is particularly important when the lectures are not taught in the students' working language.
 - Finally, the most important difficulty concerns students' attention spans and their concentration for long period of time. Indeed, several surveys have shown a drastic drop of the "attention curve", typically after 15 minutes, when an individual watches a screen passively. Thereby, it is important to avoid too long monolithic lectures and manage periodic short discussion breaks.

Future improvements

- “teaching strategy” has to be reviewed:
More interactivity with distant students
- PPT presentations must be better adapted to the remote teaching: **Animation**
- Organisation must be reviewed: **Planning difficulties**
- Technical: **Recording quality**

PETRUS Initiative

Summary

- One of the key objectives of the PETRUS initiative dedicated to the Education and Training in geological disposal is to investigate how distance teaching techniques can be used to deliver courses, and how the use of such technology impacts students' perception of learning.
- This paper presents the outcomes of tests carried out by four PETRUS partner universities to evaluate the performances of the “face to face remote teaching methodology”.
- The paper also addresses problems linked with the technical quality and reliability of this technology and proposes a set of recommendations to overcome the challenges associated with shifting from the conventional pedagogical model to an online teaching and learning paradigm.