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On-line active learning at the University of Leon (Spain): experiences with a happy ending

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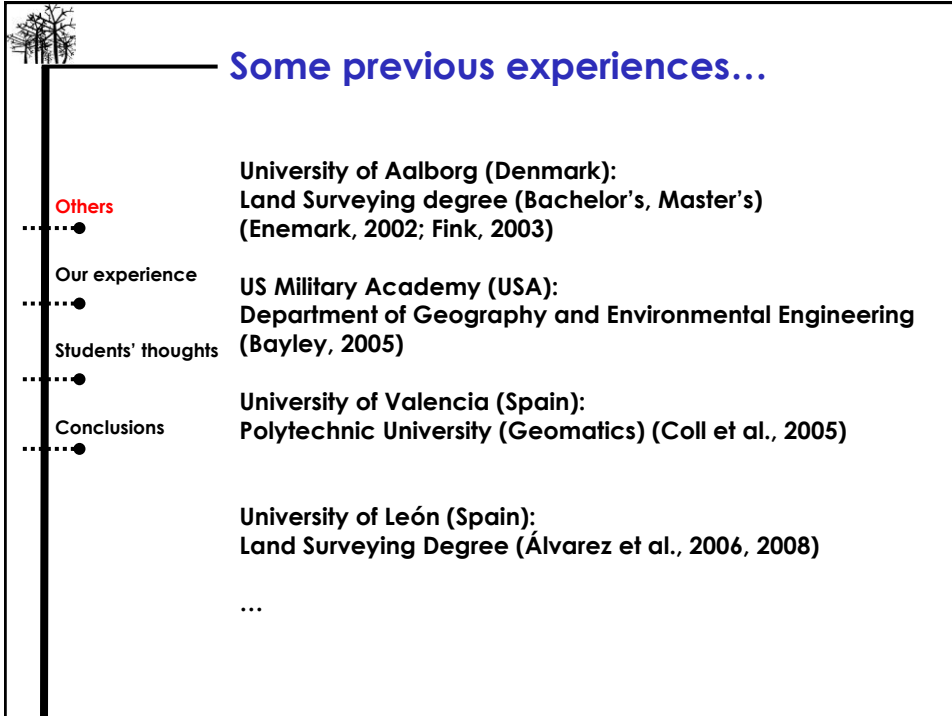
Universidad León (Spain)

2nd Conference of the Western Balkan Geodetic Forum
Mostar, October 2017



On-line active learning at the University of Leon (Spain): experiences with a happy ending

-•Some experiences with a happy ending
-•Our experience: PBL + on-line learning
-•What do our students think?
-•Conclusions



Some previous experiences...

Others

- University of Aalborg (Denmark):
Land Surveying degree (Bachelor's, Master's)
(Enemark, 2002; Fink, 2003)

Our experience

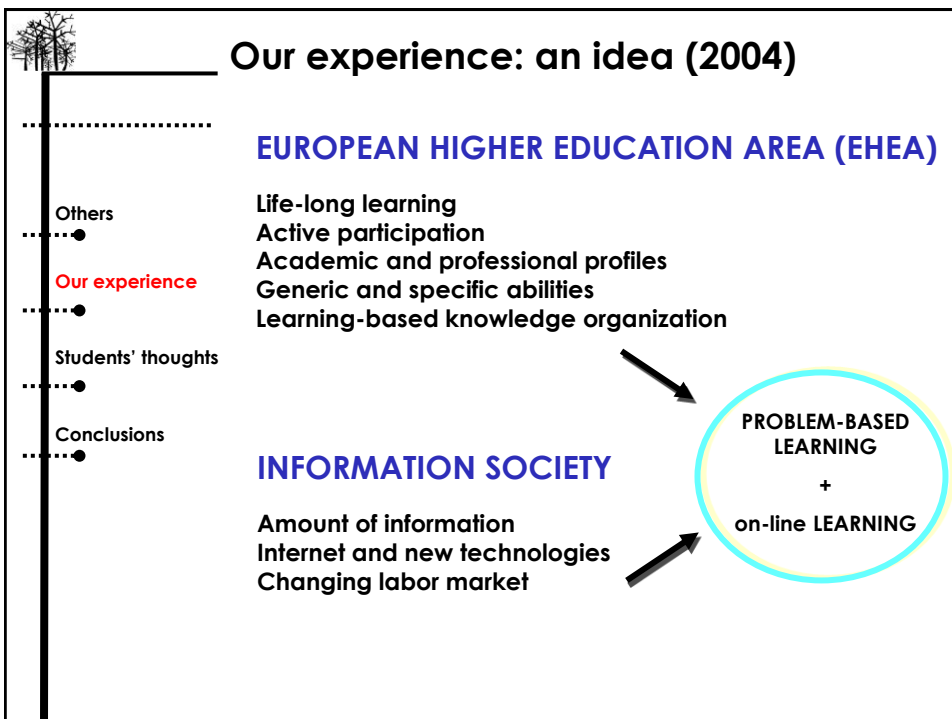
- US Military Academy (USA):
Department of Geography and Environmental Engineering
(Bayley, 2005)

Students' thoughts

- University of Valencia (Spain):
Polytechnic University (Geomatics) (Coll et al., 2005)

Conclusions

- University of León (Spain):
Land Surveying Degree (Álvarez et al., 2006, 2008)
- ...



Our experience: an idea (2004)

EUROPEAN HIGHER EDUCATION AREA (EHEA)

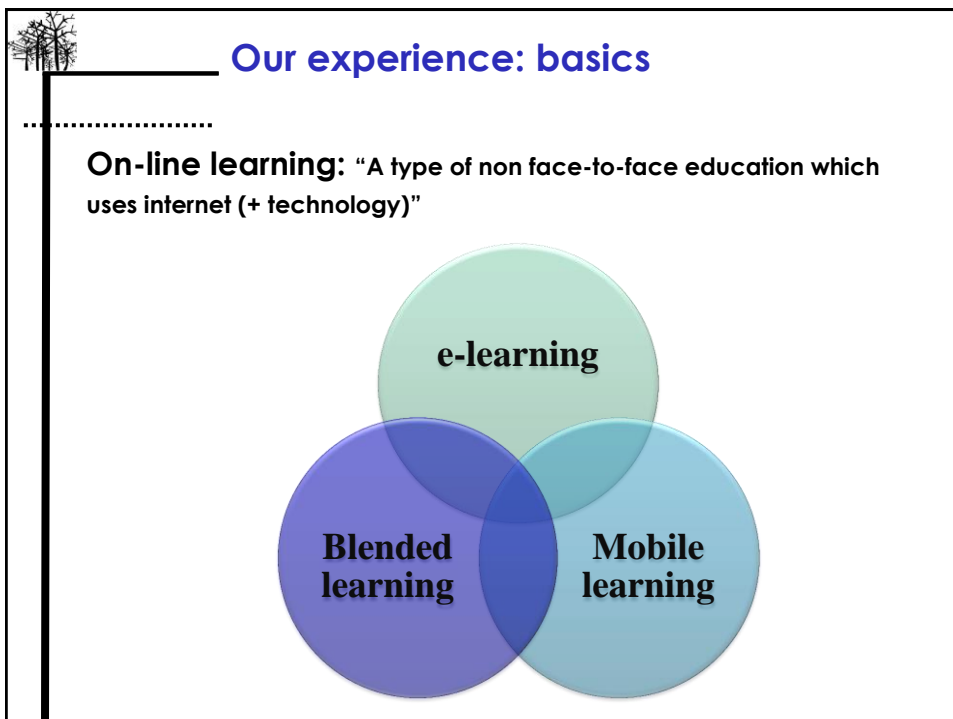
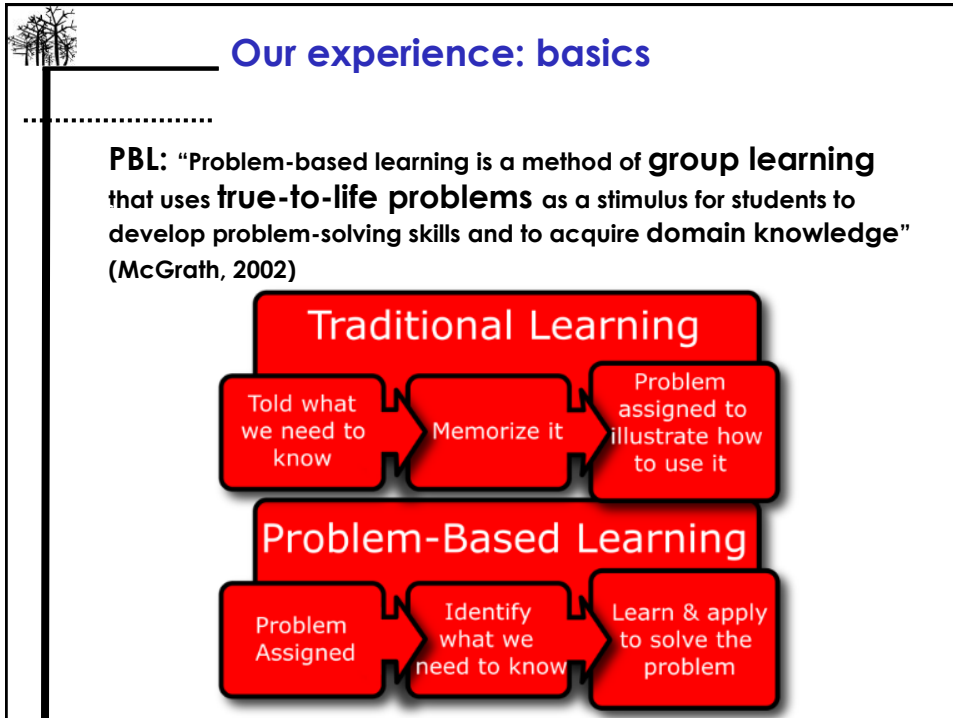
- Life-long learning
- Active participation
- Academic and professional profiles
- Generic and specific abilities
- Learning-based knowledge organization

INFORMATION SOCIETY

- Amount of information
- Internet and new technologies
- Changing labor market

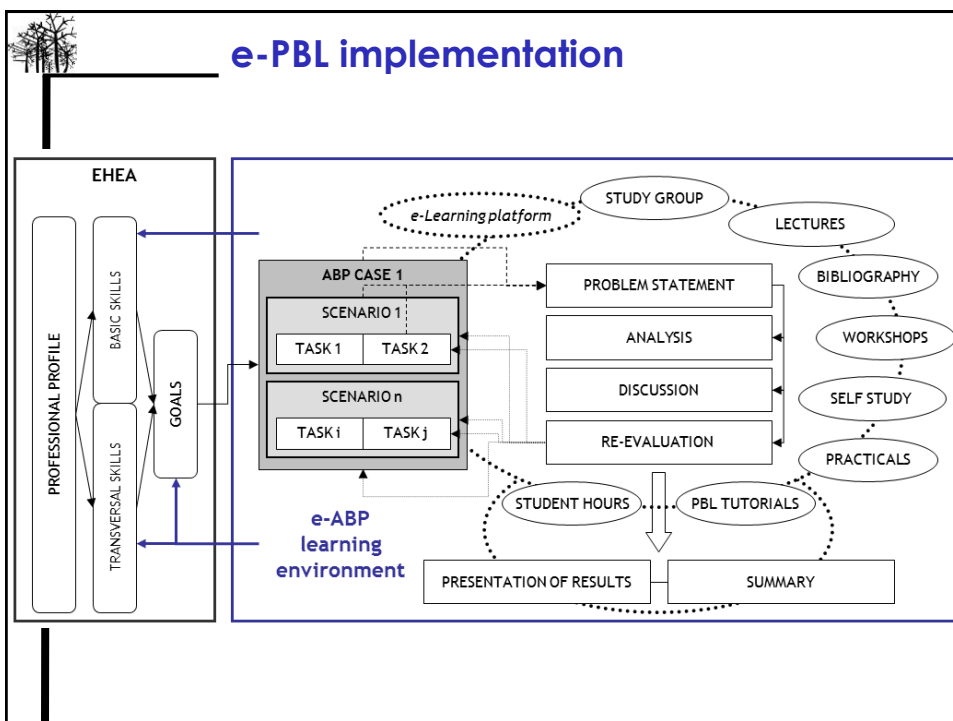
Arrows from the EHEA and Information Society sections point to a central circle containing:

PROBLEM-BASED LEARNING
+
on-line LEARNING




Course descriptions


	GIS*	Cartography*	Remote sensing I
Semester	2 nd	4 th	5 th
ECTS	4.5	4.5	6.0
Students	57	21	15
Objectives	GIS concepts, techniques and methods. GIS software. Data processing general strategies.	Workflow for mapping. Thematic mapping. Map element analysis and layout.	Image processing and information extraction (remote sensors). Validation.
Evaluation criteria (% final mark)	Test (30%)	Test (20%)	Computer Lab test (40%)
	Computer lab test (40%)	PBL (Maps) (60%)	PBL (final): 30%
	PBL tasks (30%)	Assigned tasks (20%)	PBL Tasks: 30%




On-line learning: Some tools we have used




Tasks
Surveys, Tests, Workshops, Wiki
Examples: <http://clilenlaule.blogspot.com.es/>



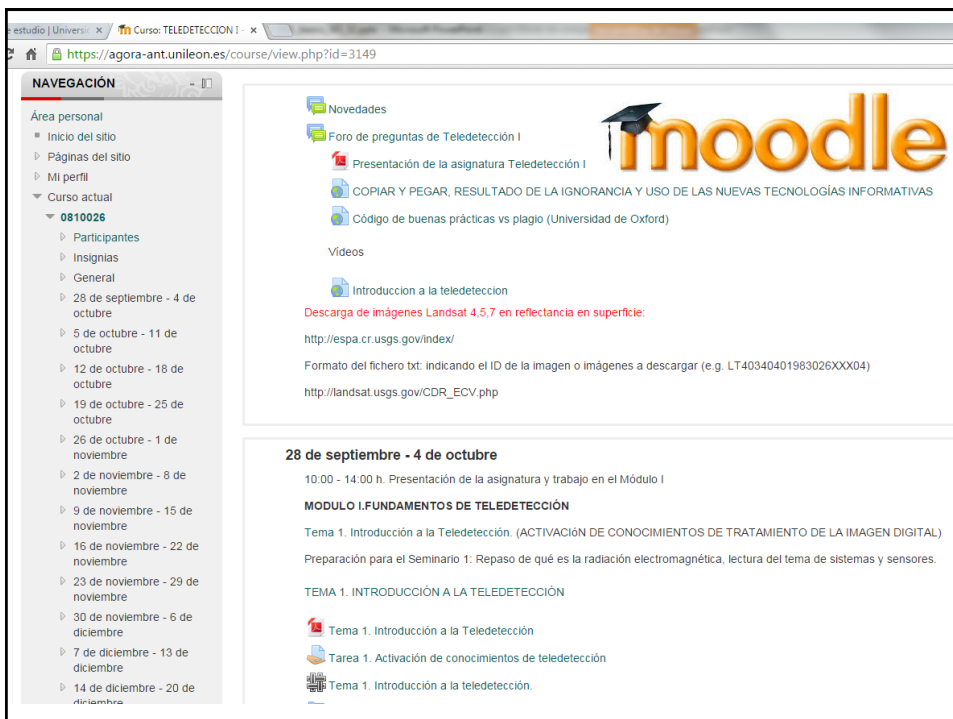
Real time collaborative work (GoogleDocs)



EDpuzzle Edited video (questions)
 Make any video your lesson



Augmented reality (AR)
Example: Scientific posters with links as QR



The screenshot shows a Moodle course page for 'Curso: TELEDETECCION I'. The URL is <https://agora-ant.unileon.es/course/view.php?id=3149>. The page features a navigation menu on the left and a main content area with the Moodle logo and course information.

NAVEGACIÓN

- Área personal
- Inicio del sitio
- Páginas del sitio
- Mi perfil
- Curso actual
 - 0810026
 - Participantes
 - Insignias
 - General
 - 28 de septiembre - 4 de octubre
 - 5 de octubre - 11 de octubre
 - 12 de octubre - 18 de octubre
 - 19 de octubre - 25 de octubre
 - 26 de octubre - 1 de noviembre
 - 2 de noviembre - 8 de noviembre
 - 9 de noviembre - 15 de noviembre
 - 16 de noviembre - 22 de noviembre
 - 23 de noviembre - 29 de noviembre
 - 30 de noviembre - 6 de diciembre
 - 7 de diciembre - 13 de diciembre
 - 14 de diciembre - 20 de diciembre

Novedades

- Foro de preguntas de Teledetección I
 - Presentación de la asignatura Teledetección I
 - COPIAR Y PEGAR, RESULTADO DE LA IGNORANCIA Y USO DE LAS NUEVAS TECNOLOGÍAS INFORMATIVAS
 - Código de buenas prácticas vs plagio (Universidad de Oxford)
- Videos
 - Introducción a la teledetección

Descarga de imágenes Landsat 4,5,7 en reflectancia en superficie:
<http://espa.cr.usgs.gov/index/>
 Formato del fichero txt: indicando el ID de la imagen o imágenes a descargar (e.g. LT40340401983026XXX04)
http://landsat.usgs.gov/CDR_ECV.php

28 de septiembre - 4 de octubre


10:00 - 14:00 h. Presentación de la asignatura y trabajo en el Módulo I

MODULO I.FUNDAMENTOS DE TELEDETECCIÓN

Tema 1. Introducción a la Teledetección. (ACTIVACIÓN DE CONOCIMIENTOS DE TRATAMIENTO DE LA IMAGEN DIGITAL)
 Preparación para el Seminario 1: Repaso de qué es la radiación electromagnética, lectura del tema de sistemas y sensores.

TEMA 1. INTRODUCCIÓN A LA TELEDETECCIÓN

- Tema 1. Introducción a la Teledetección
- Tarea 1. Activación de conocimientos de teledetección
- Tema 1. Introducción a la teledetección.



Cartography Case: "How do I make maps?"

7 escenarios + 16 tasks

Scenario 1: "How can I decide which type of mapping technique is the most suitable?"

Scenario 2: "How can I extract thematic information from the data?"


Scenario 3: "How can I set groups and classes in a map?"

Scenario 4: "Reference systems and generalization: how do I use them?"

Scenario 5: "Choropleth mapping. Making maps 1, 2, 3: population density in León, by province and municipality"

Scenario 6: "Isoline mapping. Making maps 4, 5, 6: temperature, precipitation, lightning"

Scenario 7: "Maps with points, and proportional symbols. Making maps 1, 6: population density, lightning"



Remote sensing cases (1/group)

Scenario 1.
 Identification and quantification of the burnt areas (caused by wildfires) in the province of León (Spain) in 2014 (from March to October, both inclusive). Required outcome: 1:50.000 map. Comparison with the extent and location of burnt areas in 2000. Write a 10 pages scientific paper with the findings.

Scenario 2.
 Identification and quantification of urban growth in Dubai from 1994 until 2014 (5-year update). Required outcome: 1:50.000 map. Comparison between dates. Write a 10 pages scientific paper with the findings.

...



Remote sensing: planning (4-5 students)

Tutorial 1: Presentation of the study case. Clarification. Problem statement.
Tutorial 2: Review. Work plan (NEW).
Tutorial 3: Review. Task: Image requirements. State of the art: previous works.
 Seminar about sensors: poster making (relevant characteristics, price...)
Tutorial 4: Review. Task: Data base building (prior knowledge + poster info).
Tutorial 5: Review. Task: Pre-processing (prior knowledge).
Tutorial 6: Review. Task: Information extraction (classification) (NEW)
Tutorial 7: Review and update of the work plan
 Lecture about the main classification methods (2 hours)
 Computer lab: practical about classification (2 hours)
Tutorial 8: Review. Task: Validation (NEW)
 Lecture about validation (2 hours)
 Computer lab: practical about validation (2 hours)
Tutorial 9: Review. Task: Change detection (NEW)
 Seminar: Discussion about the main classification methods (2 hours)
 Computer lab: practical about change detection (2 hours)
Tutorial 10: Review and update of the work plan
Tutorial 11: Review
Tutorial 12: Final review
 Seminar: Presentation skills
 Seminar: Final presentation/video.



Remote sensing: example of outcomes

<https://www.youtube.com/watch?v=i8AuUFJwC5M>

YouTube ES <https://www.youtube.com/watch?v=i8AuUFJwC5M>

USING LIDAR DATA TO ESTIMATE THE RISK OF DAMAGE TO BUILDINGS LOCATED CLOSE TO WOODLANDS IN CASE OF A FOREST FIRE

Robles de la Fuente, Alejandro
 Rodríguez Garrido, Miguel A.
 24/06/2014

universidad de León


Using LIDAR to estimate the risk of damage to buildings in case of forest fire

Geomática en Ponferrada (Geomatics)

What do students think?

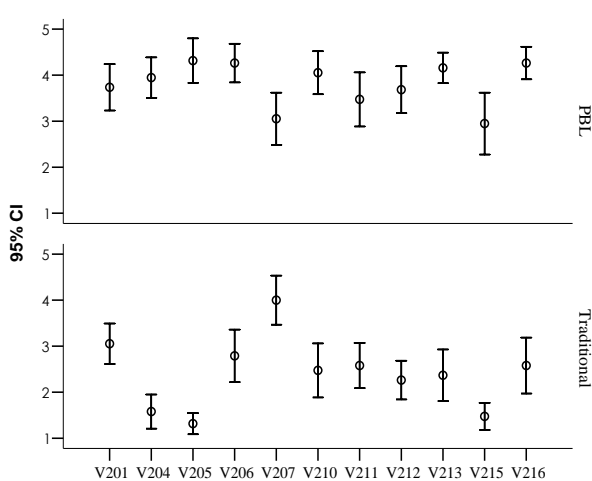
..... Evaluation tool: surveys (e-PBL vs traditional)

Survey	Issue	Type
EEME1	Actual Implementation (AI)	Scalar
EEME2	Actual Implementation (AI) Emotional Component (EC), Learning Effects (LE), Generalization (E)	
EEME3	Learning effects(LE)	
EEMSD	AI, EC, LE, GE	Semantic differentials
COLLES	e-learning	Scalar

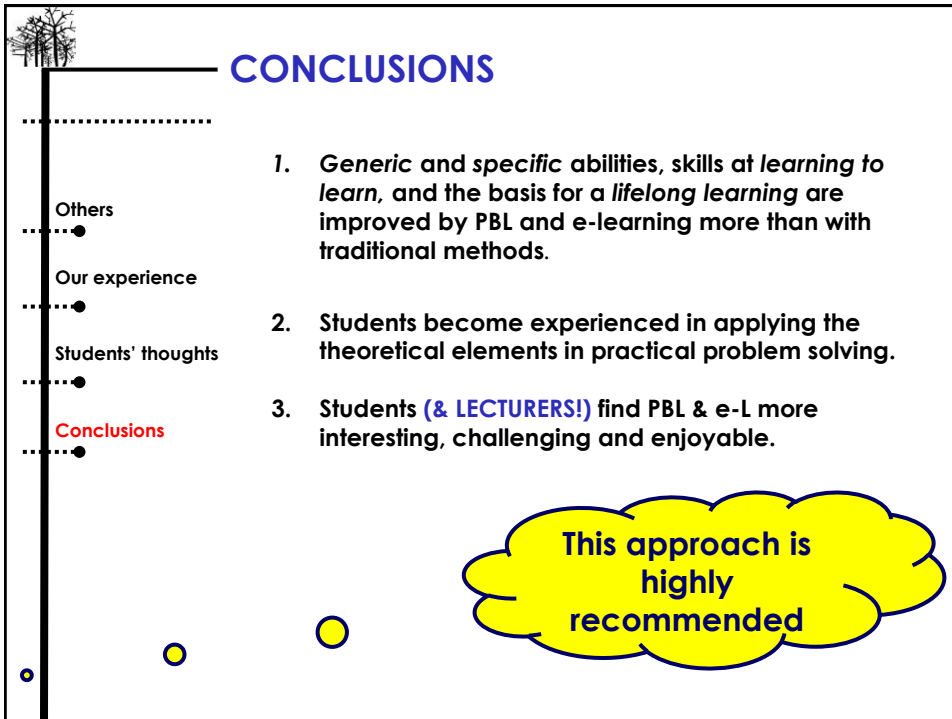


What do students think?

..... Error plots for *Actual implementation (EEME1)*



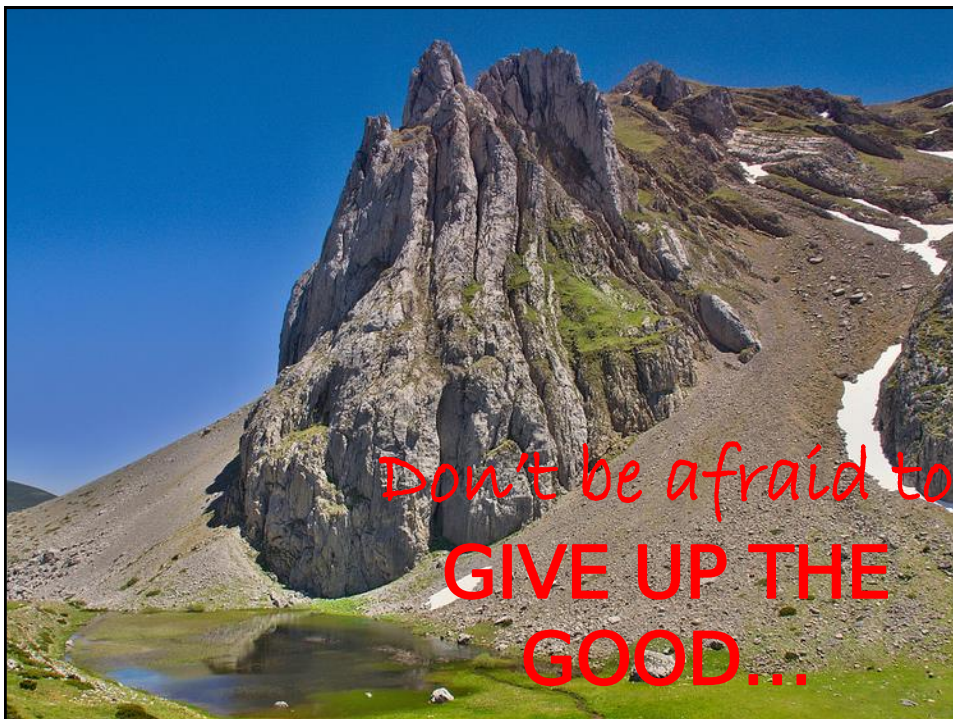
VAR	Item
V201	Know-how
V204	Oral reports
V205	Group work
V206	Student participation
V207	Regular class attendance
V210	PBL
V211	Student-teacher communication
V212	Frequent evaluation
V213	Resources use
V214	Connection to professional future
V215	Test exams
V216	Use of new technologies



CONCLUSIONS

1. *Generic and specific abilities, skills at learning to learn, and the basis for a lifelong learning are improved by PBL and e-learning more than with traditional methods.*
2. *Students become experienced in applying the theoretical elements in practical problem solving.*
3. *Students (& LECTURERS!) find PBL & e-L more interesting, challenging and enjoyable.*

This approach is highly recommended





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GEOWEB

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