Projects and Products Portal for Leonardo da Vinci

Ar.Key - Augmented Reality applied to training on key competences

2013-1-ES1-LEO05-66235

http://www.adam-europe.eu/adam/project/view.htm?prj=11341

Project Information

Title: Ar.Key - Augmented Reality applied to training on key competences

Project Number: 2013-1-ES1-LEO05-66235

Year: 2013

Project Type: Transfer of Innovation

Status: completed

Country: ES-Spain

Marketing Text: *Common training system that helps to achieve the objectives set out in “Strategy for the Sustainable Competitiveness of the construction industry and its companies”, "New skills for new jobs” or "Key Competences for Lifelong Learning - A European Framework".

*System adapted to refurbishment activities as well as the specific needs of each participant, based on a common map of competences, which promotes the transparency of qualifications and the mobility of workers, their training and continuous professional improvement.

*Know-how generated at regional or national level, encouraging its use at European level in other countries.

Summary: Data show that people with lower level of key competences have up to 1,8 times more probability to be unemployed than those with higher levels. Hence, these unskilled adults lack the necessary "skills" to carry on with higher level of training.

This is the problem that we dealt with: the EU construction industry is a common destination of people from school failure, whose low knowledge base (arithmetic, calculation), hinders them to learn and perform more complex tasks. This failure dooms, in the best-case scenario, these workers to perform tasks of peonage despite the fact that they could develop competencies of higher responsibility or, in the worst case scenario, to the long-term unemployment.

Thus, this project has designed and applied a training system (AR.KEY) for non-qualified workers from construction industry, with the aim of improving their mathematical competence and basic skills on science and technology, keys to successfully follow up their training and hence their professional career.

To do so, AR.KEY is organized in learning outcomes using EQF methodology and based on Augmented Reality (AR), which is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data, enhancing one’s current perception of reality. The final application is available for using on tablets and/or smartphones on markets such as Google Play (ANDROID) or Apple Store (APPLE).

Therefore, the training system allows the improvement of the professional skills of unskilled workers from the building sector in those productive processes related to the comprehensive refurbishment of a building. For this purpose, the system has been structured in training modules sequenced in a very easy way, being supported by AR as well as other multimedia resources, in order to train students in those key competences necessaries to better understand more complex procedures such as the refurbishment, maintenance and conservation of covers, installations, facades and structures, or the energy restoration (energy efficiency and/or renewable energy systems) of a building.

8 WP were set up to achieve project objectives:
1. Initial planning and overall management of the project
2. Identification of the commonest refurbishment processes
3. Identification of key competences needs
4. Definition of contents in terms of learning outcomes

Project Information

5. AR.KEY System Development
6. AR.KEY pilot
7. Valorization of results and sustainability
8: Project divulgation and communication

Partnership was formed by 7 partners coming from 5 different countries, experts in vocational training in the building industry.

Description: This project has designed and applied a training system aimed at non-qualified workers from construction industry, in order to improve their mathematical competence and basic skills on science and technology, keys to successfully follow up their training and hence their professional career.

The system has been organized in 17 learning outcomes that use Augmented Reality (AR) and other multimedia resources to teach trainees in these kinds of skills:

LO1. Smartphones and tablets or other similar devices
LO2. Operations with triangles and angles
LO3. Rule of three
LO4. Geometric shapes
LO5. Equivalences between several measures
LO6. Knowledge of materials behaviour
LO7. Geography
LO8. Knowledge of geology
LO9. Knowledge of climatology
LO10 Acoustic properties of the materials
LO11. Thermal properties of materials
LO12. Knowledge of building ventilation
LO13. Thermal bridges
LO14. New construction elevation and transportation machinery
LO15. New construction small machinery.
LO16. New technologies applied to maintenance and renovation
LO17. Thermography
Also, it is noteworthy that the system has an ex-ante test that assesses trainees' previous skills in order to set up specific training paths given the results obtained.
The final application is available for free on Google Play (ANDROID, https://play.google.com/store/apps/details?id=es.uv.ARTEC.arkey) or Apple Store (APPLE, coming soon).

Themes: *** Lifelong learning
*** Continuous training
*** Initial training
* Utilization and distribution of results
* Sustainability
* Recognition, transparency, certification
* Open and distance learning
* Enterprise, SME

Sectors: *** Construction
*** Education

Product Types: material for open learning
evaluation methods
teaching material

Product information: The ARKEY counts on five main products:
*Report on Commonest refurbishment processes: Selection of the productive processes associated with the conventional refurbishment as well as those related to energy restoration of buildings.

*Field study on key competences: Identification of basic math skills to make calculations and measurements related to refurbishment activities and identification of basic science and technology skills necessary to understand the physical and chemical characteristics of the materials applied in a building site.

Project Information

*Key competencies map: Map with the Key competencies that the field study detected as the most important for unskilled building workers to carry out properly renovation works.

*Learning outcomes:
- Elements of the programme specification
- Aims of the programme
- Learning outcomes of the programme:
+ Knowledge & understanding
+ Intelectual skills
+ Practical skills
+ Key/transferable skills
- Assessment criteria

*AR.KEY APP: this training system has three main using modules:
1. Assessment module, to identify the starting and final level of the user after using the application. Through a test the system scores students' performance in order to suggest them the most suitable training. After the training, the student can do the test again in order to know his/her improvement.
2. Training module sequenced in real working situations, supported by Augmented Reality and others media resources. It is composed by two sections:
- Lessons: 17 learning outcomes composed by text and/or supporting videos
- Exercises: 17 exercises to practice key skills with the support of Augmented Reality and others media resources.

Projecthomepage: www.arkeyproject.eu

Project Contractor

Name:	FUNDACIÓN LABORAL DE LA CONSTRUCCIÓN
City:	MADRID
Country/Region:	Comunidad De Madrid
Country:	ES-Spain
Organization Type:	employers' organisation
Homepage:	http://www.fundacionlaboral.org

Contact Person

Name:	JAVIER GONZALEZ LOPEZ
Address:	CALLE RIVAS Nº25
City:	MADRID
Country:	ES-Spain
Telephone:	+34 91 398 45 24
Fax:	+34 91 398 45 25
E-mail:	jgonzalez@fundacionlaboral.org
Homepage:	http://www.fundacionlaboral.org

Coordinator

Name:	FUNDACIÓN LABORAL DE LA CONSTRUCCIÓN
City:	MADRID
Country/Region:	Comunidad De Madrid
Country:	ES-Spain
Organization Type:	employers' organisation
Homepage:	http://www.fundacionlaboral.org

Contact Person

Name:	JAVIER GONZALEZ LOPEZ
Address:	CALLE RIVAS Nº25
City:	MADRID
Country:	ES-Spain
Telephone:	+34 91 398 45 24
Fax:	+34 91 398 45 25
E-mail:	jgonzalez@fundacionlaboral.org
Homepage:	http://www.fundacionlaboral.org

Partner

Partner 1

Name:	CENTRO DE FORMAÇÃO PROFISSIONAL DA INDÚSTRIA DA CONSTRUÇÃO CIVIL E OBRAS PÚBLICAS DO SUL
City:	Prior Velho
Country/Region:	Lisboa
Country:	PT-Portugal
Organization Type:	others
Homepage:	http://www.cenfic.pt

Partner 2

Name:	The Romanian- German Foundation, Centre for Vocational Training and Development Timisoara in Constructions field
City:	Timisoara
Country/Region:	Sud Est
Country:	RO-Romania
Organization Type:	others
Homepage:	http://www.frgtim.ro

Partner 3

Name:	ENTE PER LA FORMAZIONE E L'ADDESTRAMENTO PROFESSIONALE NELL'EDILIZIA.
City:	Rome
Country/Region:	Emilia-Romagna
Country:	IT-Italy
Organization Type:	others
Homepage:	http://www.formedil.it

Partner 4

Name:	BILDUNGSZENTREN DES BAUGEWERBES E. V.
City:	Krefeld
Country/Region:	Bayern
Country:	DE-Germany
Organization Type:	others
Homepage:	http://www.bzb.de

Partner

Partner 5

Name:	UNIVERSITY OF VALENCIA
City:	Valencia
Country/Region:	Este
Country:	ES-Spain
Organization Type:	others
Homepage:	http://www.uv.es

Partner 6

Name:	CENTRO EDILE ANDREA PALLADIO Per la Formazione Professionale delle Maestranze Edili della Provincia di Vicenza
City:	Vicenza
Country/Region:	Veneto
Country:	IT-Italy
Organization Type:	others
Homepage:	http://www.centroedilevicenza.it

Project Files

Commonest_refurbishment_processes.pdf

http://www.adam-europe.eu/prj/11341/prj/Commonest_refurbishment_processes.pdf

Report on Commonest refurbishment processes in Spain, Italy, Germany, Romania and Portugal. (Report in English)

Field_study_key_competences_report.pdf

http://www.adam-europe.eu/prj/11341/prj/Field_study_key_competences_report.pdf

Field study on key competences report

R10_Leaflet.rar

http://www.adam-europe.eu/prj/11341/prj/R10_Leaflet.rar

Leaflet of the Project in all the consortium languages

R11_Final conference report_EN.pdf

http://www.adam-europe.eu/prj/11341/prj/R11_Final%20conference%20report_EN.pdf

Final conference report

R4_Key Competences Map_EN.pdf

http://www.adam-europe.eu/prj/11341/prj/R4_Key%20Competences%20Map_EN.pdf

Key Competences Map

R5_Manual_Learning_outcomes.zip

http://www.adam-europe.eu/prj/11341/prj/R5_Manual_Learning_outcomes.zip

Learning Outcomes

R6_App_Report_EN.pdf

http://www.adam-europe.eu/prj/11341/prj/R6_App_Report_EN.pdf

App Report_EN

R6_App_Report_ES.pdf

http://www.adam-europe.eu/prj/11341/prj/R6_App_Report_ES.pdf

App Report_ES

R7_Pilot_Experience_Report_EN.pdf

http://www.adam-europe.eu/prj/11341/prj/R7_Pilot_Experience_Report_EN.pdf

Pilot experience report

R9_Official_Website.pdf

http://www.adam-europe.eu/prj/11341/prj/R9_Official_Website.pdf

Website of the project

Products

1 Commonest refurbishment processes report

2 Field study on key competences report

3 Key competences Map

4 Definition of contents in terms of learning outcomes

5 AR.KEY training system

6 Pilot experience report

7 Valorization of results and sustainability report

Product 'Commonest refurbishment processes report'

Title:	Commonest refurbishment processes report
Product Type:	evaluation methods
Marketing Text:	Partners of the project Stakeholders
Description:	The aim is to identify the commonest processes of building refurbishment both traditional and energy restoration ones that are keys to develop next phases. Thus, includes the following objectives: *Definition of traditional refurbishment procedures: covers, facilities, structural elements, facades and structures *Definition of energy restoration procedures: envelope (fences, thermal bridges of facade, covers, etc.), system of ventilation, renewable energy, air conditioning, etc.
Target group:	Partners of the project Stakeholders
Result:	* Documentary analysis of statistics and reports in order to identify what type of refurbishment activities are carried out most habitually in each country. * Documentary analysis of statistics and reports in order to identify what type of energy restoration activities are carried out most habitually in each country
Area of application:	
Homepage:	
Product Languages:	English

Product 'Field study on key competences report'

Title:	Field study on key competences report
Product Type:	
Marketing Text:	
Description:	
Target group:	Project partners Stakeholders (Education and labor public bodies)
Result:	
Area of application:	
Homepage:	
Product Languages:	English German Italian Portuguese Spanish

Product 'Key competences Map'

Title:	Key competences Map
Product Type:	
Marketing Text:	
Description:	
Target group:	Project partners Stakeholders (Education and labor public bodies)
Result:	
Area of application:	
Homepage:	
Product Languages:	Spanish English

Product 'Definition of contents in terms of learning outcomes'

Title:	Definition of contents in terms of learning outcomes
Product Type:	
Marketing Text:	
Description:	The methodology to carry out this work will take into account the following structure and the EQF basis elements: *Elements of the programme specification *Aims of the programme *Learning outcomes of the programme: - Knowledge & understanding - Intelectual skills - Practical skills - Key/transferable skills *Assessment criteria
Target group:	Project partners Stakeholders Trainers Training managers
Result:	
Area of application:	
Homepage:	
Product Languages:	Spanish Romanian Italian German English

Product 'AR.KEY training system'

Title:	AR.KEY training system
Product Type:	teaching material
Marketing Text:	Interactive Resource
Description:	To develop a AR.KEY system which will be based on the results got in previous phases. Thus, this phase includes the following objectives: *Definition of the functional design of the system. *Production of all necessary elements: software, interface, graphics, application image, etc. *Implementation of the system on devices *Testing of the system under specific parameters *Uploading the system to most famous applications markets
Target group:	Unskilled workers from building industry. Vocational trainers.
Result:	AR.KEY system will have three main using modules: 1. Ex-ante assessment module, to identify the starting level of the user. Through simple exercises the system will score students' performance in order to provide them the most suitable training. 2. Training module that will be sequenced in real working situations. 3. Ex-post assessment module, to assess the performance of the student after training.
Area of application:	1. Ex-ante assessment module, to identify the starting level of the user. Through simple exercises the system will score students' performance in order to provide them the most suitable training. 2. Training module that will be sequenced in real working situations. 3. Ex-post assessment module, to assess the performance of the student after training.
Homepage:	
Product Languages:	Spanish Italian Romanian English German

Product 'Pilot experience report'

Title:	Pilot experience report
Product Type:	evaluation methods
Marketing Text:	Report with the results which will show the effectiveness of the training carried out.
Description:	Report with the results which will show the effectiveness of the training carried out.
Target group:	Stakeholders Public bodies (education and labor) Companies
Result:	The report will have these sections at least: - Introduction - Description of the pilot carried out: Course details, dates, schedule, planning, facilities, trainers data, student data... - Quantitative and qualitative results of the pilot.
Area of application:	Each partner will make a report of results which will show the effectiveness of the training carried out, analyzing whether has helped to improve the peformance of unskilled workers regarding to key competences applied to refurbishment activities.
Homepage:	
Product Languages:	Spanish English Italian Romanian

Product 'Valorization of results and sustainability report'

Title:	Valorization of results and sustainability report
Product Type:	
Marketing Text:	
Description:	
Target group:	Stakeholders
Result:	
Area of application:	
Homepage:	
Product Languages:	English Italian Spanish

Events

Final dissemination day

Date	28.10.2015
Description	Final dissemination day of the Project.
Target audience	Training organizations, trainees, students.
Public	Closed event
Contact Information	E-mail: lmbarrios@fundacionlaboral.org E-mail: jgonzalez@fundacionlaboral.org Tlfno.: +34 91 398 45 00
Time and place	28 October 2015 in the facilities of the coordinator in Madrid (Spain)

Fifth meeting of the project

Date	01.10.2015
Description	Lsst meeting of the project with all the partners. - WP5. Last version of the application after pilots implementation, by Marcos Fernández. - WP5. Final revision of the App, by all partners. - WP6 Outcomes of the pilots and reports, by all partners. - Projects divulgation. The project ARCW – Health and safety procedures for curtain walls with the use of Augmented Reality Technology, by FLC. - WP7. Valorization of results and sustainability. Technical and pedagogical validation (questionnaires and focus group); Analysis of transfer of innovation to other related sectors; Project sustainability; Analysis of formal accreditation routes, debate all partners. - Quality plan. Final report, by FLC. Project summary. Meeting evaluation, by FLC.
Target audience	Partners of the project
Public	Closed event
Contact Information	E-mail: lmbarrios@fundacionlaboral.org E-mail: jgonzalez@fundacionlaboral.org Tlfno.: +34 91 398 45 00
Time and place	1st&2nd of Oct 2015 in the facilities of the romanian partner in Timisoara (Romania).

Events

Fouth partnership meeting

Date	13.04.2015
Description	Fourth meeting of the project with all the partners. - WP4. The Learning Outcomes so far. State of the art by Germany, Italy, Romania, Portugal and Spain. - Financial issues and interim report evaluation. Presentation by FLC and debate. - KPI-VET project. Focus group on “Key Performance Indicators in Vocational Education and Training” by BZB - Ongoing projects dissemination. INCOM-VET and "Construye 2020" initiatives by BZB and FLC respectively - WP5. State of the art. Pending works by Marcos Fernández (IRTIC). Debate. - WP5. Finalization of the APP. Expected date for its launching. Difficulties to deal with the final implementation of LO. Clarification by each LO leader. - WP6. AR-Key pilot. 1. Design of the pilot; 2. Training of trainers; 3. Assessment of trainees´ level; 4. Training of trainees. Next Activities: Wrap-up, scheduling. Next meeting definition. Meeting evaluation. End of the meeting.
Target audience	Partners of the project
Public	Closed event
Contact Information	E-mail: lmbarrios@fundacionlaboral.org E-mail: jgonzalez@fundacionlaboral.org Tlfno.: +34 91 398 45 00
Time and place	13rd&14th of April 2015 in the facilities of the German partner in Düsseldorf (Germany).

Events

Third partnership meeting

Date	06.11.2014
Description	Third meeting of the project with all the partners. - WP3. Results regarding key competences survey. - WP3. Wrap up. Decision regarding the competencies map. Open debate among partners to decide the tools and didactical resources to be incorporated to the AR application. - Interim report. Brief explanation and state of art. - Methodology to work out the learning outcomes associated with key competencies (WP4). FLC proposal and debate. - Proposals regarding the final APP format. UV proposal (WP5). - Quality plan. Dissemination and exploitation plan. Website. - Next Activities: Wrap-up, scheduling. Next meeting definition. Meeting evaluation.
Target audience	Partners of the project
Public	Closed event
Contact Information	E-mail: lmbarrios@fundacionlaboral.org E-mail: jgonzalez@fundacionlaboral.org Tlfno.: +34 91 398 45 00
Time and place	6th&7th of Nov 2014, in the facilities of the portuguese partner in Lisbon (Portugal)

Second partnership meeting

Date	09.05.2014
Description	Second meeting of the project with all the partners. - Presentation by each partens of the results of each Focus Group. - Decisions regarding the final perimeter of the project. - Methodology to carry out the identification of key competencies. - Proposals regarding final APP format. - Quality Plan - Interim report issues
Target audience	Partners of the project
Public	Closed event
Contact Information	E-mail: lmbarrios@fundacionlaboral.org E-mail: jgonzalez@fundacionlaboral.org Tlfno.: +34 91 398 45 00
Time and place	8-9 May 2014 in the facilities of Formedil in Rome (Italy)

Events

Kick Off meeting in Madrid

Date	14.11.2013
Description	First meeting of the project with all the partners of the consortium. Description of the projects, aims and WP, brief introduction of each partner, project expectations...
Target audience	Partners involve in the project.
Public	Closed event
Contact Information	E-mail: enovillo@fundacionlaboral.org E-mail: jgonzalez@fundacionlaboral.org Tlfno.: +34 91 398 45 00
Time and place	Madrid at headquarter of FLC. 14-15 November 2013

Project Tags

The project belongs to the following group(s):

EQF (http://www.adam-europe.eu/adam/thematicgroup/EQF)