The ACADEMICA e-course: an example of good practice to train e-learning new users

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ABSTRACT. ACADEMICA - Accessibility and Harmonization of Higher Education in Central Asia through Curriculum Modernization and Development - is a three-year project co-funded by the European Commission in the framework of ERASMUS Plus Program involving 15 partners coming from Europe (Bulgaria, Italy, Austria and Spain) and Central Asia (Kazakhstan, Uzbekistan and Turkmenistan).

The project's main objective is to support Higher Education lecturers in Central Asia in the improvement and modernization of scientific curricula through the introduction of new methodologies based on the use of technology, media supports and distance learning tools.

This paper describes the rationale underlying the project and provides an outline of the implementation of the planned activities. Particular attention is given to the design of the ACADEMICA e-course that represents the core element of the initiative and that, once completed, is expected to become a good practice to be transferred even to other institutions that are not partners of the project's consortium.

KEYWORDS: ACADEMICA, Curriculum modernization, Digital technology, Distance learning, E-learning, Harmonization

Introduction

Current education systems are changing following the rapid development of innovative digital technologies applied to learning environments and the labor market that always requires more advanced digital skills from learners. This assumption is fully justified by the Grand Coalition for Digital Jobs according to which more than 900.000 professionals will be required in the ICT sector supporting

economic growth. In order to satisfy this request, modern approaches will be used in delivering knowledge and ensuring quality standards, especially in Higher Education Systems.

In this context, ACADEMICA Project aims to support the improvement and modernization of Higher Education curricula in countries in Central Asia. ACADEMICA is a three-year project co-funded by the European Commission under ERASMUS Plus Programme that involves 15 organizations (including academic institutions, ministries of education, and associations) from 7 European and Central Asian countries: Bulgaria, Austria, Italy, Spain, Kazakhstan, Turkmenistan, and Uzbekistan. For the sake of completeness, the list of institutions divided by country is reported in Tab.1.

The main objective of ACADEMICA is to support the modernization of scientific curricula in Central Asian universities, particularly in the engineering sector, taking advantage of the massive experience of European HEIs in developing innovative learning practices and extensive international collaborations.

Project development

The first step of ACADEMICA Project involves the construction of a common body of knowledge for harmonizing and strengthening the accessibility to higher education (especially in the Engineering domain) in the three Central Asian countries involved, in line with the objectives defined by the Bologna Process and the Lisbon Strategy. In this respect, each partner has developed institutional reports on Engineering Sciences education within its own university, analyzing the following aspects: educational degrees and qualifications; internal and external quality assurance procedures; current state of the ICT-based services addressed to students; employability of graduates in the labor market; opportunities for students and teaching staff mobility, and lifelong learning policy of the institution.

The results of the need analysis summarized in the national reports clearly show that a large number of students in the three countries are familiar with modern technology and the Internet and that they often use these supports during their study. Unfortunately, the majority of this sample has never heard about distance learning and the possibility of exploiting technology for implementing a different teaching approach. Moreover - and this affects also the teachers involved in the analysis - only a small percentage has tried a modern ICT-based approach although many of them are aware of the potentialities and benefits it could produce. Surely, this is a common and country-independent situation. Very often teachers do not know they could facilitate the learning path of their students using technology and maintaining at the same time a so-called traditional approach in class. The reasons about this trend can be summarized as "fear to try something unknown or laziness to start something new". This negative trend can be reversed only by providing tools that can support instructors in the transition towards a technology-based approach with the precise aim of showing advantages and, even more important from an institutional point of view, clarifying that the implementation of those tools does not require significant investments.

Country	Institution
Bulgaria	Burgas Free University
Italy	Università degli Studi Guglielmo Marconi
Spain	Universitat Politecnica e Valencia
Austria	University of Applied Sciences FH Joanneum
Kazakhstan	Shokan Ualikhanov Kokshetau State University
	International Information Technology University
	Abay Myrzakhmetov Kokshetau University
	Kostanay State Pedagogical Institute
	Kazakhstan Association of Engineering Education
	Ministry of Education and Science of the Republic of Kazakhstan
Uzbekistan	Samarkand Agricultural Institute SAI
	Tashkent University of Information Technologies
	Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan
Turkmenistan	Turkmen State Institute of Culture
	Turkmen State Institute of Finances
	Institute of International Relations of the Ministry of Foreign Affairs of Turkmenistan

Table 1. List of institutions involved in the ACADEMICA project divided by country

To this end, the team of educational experts involved in the project has designed and developed the ACADEMICA e-course aimed at supporting lecturers in the introduction of innovative teaching methods and contemporary ICT-based pedagogical tools that meet European educational standards and best practices in Higher Education. The course will include key factors for the modernization of Higher Education, such as the deployment of digital educational technologies and the development and use of open educational resources.

The ACADEMICA e-course

As described in the previous section, the need analysis has shown that the goal of the Central Asian partners should be to modernize their curricula through the use of modern technologies.

One of the main constrains to attain this aim is the initial mistrust of the use of distance learning. For those who are not expert in technology applied to learning, this possibility seems to be far and not easy to realize. Moreover, the questionnaire shows that a large number of teachers think that the use of modern technology or, more generally, the shift from face-to-face to distance education implies strong investments in order to achieve results.

Another obstacle is apparently due to the required initial training for instructors and tutors.

The primary aim of the training course prepared for ACADEMICA project is precisely to show how simple can be to start curriculum modernization by using ICTs. For this reason, the course contains, inter alia, a brief history of the evolution of distance learning as well as easy instructions to find free open-source learning solutions on the web.

Due to its structure and contents, the training course developed for the ACADEMICA project can be regarded as a good practice in distance learning since it is a key tool to spread e-learning culture.

Course organization and pre-requisites

With reference to its structure, the training course developed for ACADEMICA is organized in audio lessons. Even if this solution is no longer used for modern distance learning, which prefers video lessons, the simplicity and the relatively low production costs of audio lessons make this solution optimal.

Not only instructors, but also technicians and administrative staff from each institution are involved in the realization of the lessons. This guarantees that the culture of distance learning is conveyed to all staff levels.

The training course lasts 36 hours distributed across 12 weeks. This means that lecturers are able to spend 3 hours per week to attend the lessons. According to the ACADEMICA training plan, each week includes 3 30-minute activities.

The course consists of 6 modules and each module is devoted to a specific topic. The structure of the entire course is reported in Fig.1.
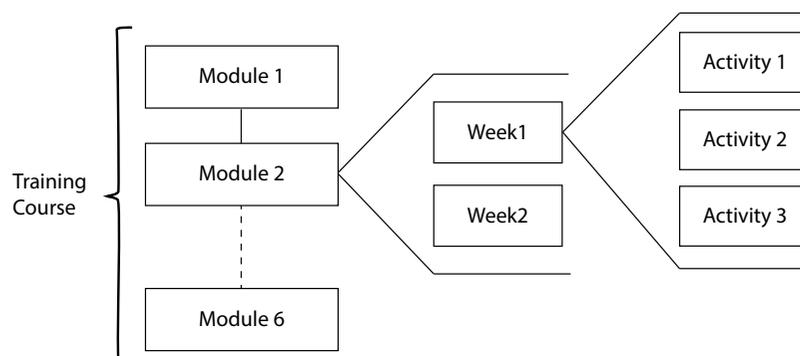
Figure 1. Training Course Structure

The activities included in each module are different and comprise of lectures, virtual class discussions, case studies and webinars.

One of the main difficulties encountered when working with Central Asian partners is the general low level of English. For this reason, a preliminary English course has been created; it contains not only the most common grammar rules, but also the most usual words and sentences used in distance learning jargon.

Before enrolling in the training course, each lecturer will be tested about his/her level of English. B2 is the passing level as per Common European Framework of Reference for Languages. In case the test is not passed, attendance of an English course will be requested before starting the training.

Course contents

As mentioned above, the training course consists of 6 modules devoted to specific topics. Tab. 2 lists the titles of each module.

Module	Argument
1	E-Learning Evolution
2	Distance Learning Fruition
3	E-Learning Pedagogical Aspects
4	Style and Formats
5	Social Enhanced Learning
6	Multimedia Products

Table 2. Module description

Each module consists of 5 audio lessons of 30 minutes that are always provided together with a lecture note. The last activity of each module envisages the organization of a virtual class for purposes of discussing with the lecturers, the topics dealt with in the lessons.
In the next paragraph, each module is discussed separately.

Module 1: e-learning evolution

Module 1 is dedicated to E-Learning Evolution and describes how the e-learning approach has changed and evolved over the years. The list of lessons and arguments is reported in Fig. 2.
By addressing these arguments, lecturers will be able not only to understand the origins of e-learning, but also to know what are the latest advanced solutions developed and adopted by expert institutions. Moreover, this module provides a description of MOOCs, which represent an important part of the current didactic offer in the distance-learning scenario. From a pedagogical point of view, it is important to emphasize that in the last lesson the roles of teachers and tutors are investigated in order to understand how those figures will change in the transition from traditional to distance learning.

Figure 2. Arguments of Module I

Module II: distance learning fruition

Module II deals with distance learning fruition. More specifically, it examines the tools that characterize distance-learning lessons.
The arguments of Module II are reported in Fig. 3.

DATE	Weeks 3-4 - Module II: Distance-Learning fruition

Learning activities	The Module Distance Learning Fruition is composed of the following activities:
	
	· **The Learning Management System**
	  a) LMS structure
	  b) LCMS
	  c) General overview
	
	· **Custom versus Open LMS**
	  a) Principal open source LMSs
	  b) Example of Custom LMS
	
	· **LMS functionalities**
	  a) Environment
	  b) System requirements
	  c) Browser requirements
	  d) Counters and statistics
	
	· **LMS users**
	  a) Admin
	  b) Publisher
	  c) Teacher
	  d) Instructors
	  e) Students
	
	· **Interactive whiteboard**
	  a) IWB introduction
	  b) IWB use
	  c) IWB functionalities
	
	· **Virtual Class**
	  a) Open Discussion on Module II arguments

Figure 3. Arguments of Module II

As shown in Fig. 3, this module also addresses the structure of Learning Management System and of Learning Content Management System. Moreover, all the functionalities are well explained, highlighting the added value that a correct use of the Interactive Whiteboard can give to an e-learning lesson. It is interesting to observe that some of the topics present in this module as well as in the whole course can be also exploited in traditional learning since they can be used in physical classrooms.

Module III: e-learning pedagogical aspects

Module III concerns the pedagogical aspects of e-learning. The arguments of this module are reported in Fig. 4.

DATE	Weeks 5-6 - Module III: E-Learning pedagogical aspects

Learning activities	The Module E-Learning pedagogical aspects is composed of the following activities:
	
	· **Traditional versus Distance Learning**
	  a) Basic comparison
	  b) Traditional learning unsolved problems
	  c) Student dropout
	
	· **E-Learning strong aspects**
	  a) Customized Learning paths
	  b) Modern communication
	  c) Interactive and guided courses
	
	· **Massive courses**
	  a) Massive Open Online Courses
	  b) Small Private Online Courses
	  c) Selective Open Online Courses
	  d) Final certification
	  e) Retention rate
	
	· **Flipped Classrooms**
	  a) Introduction to flipped classroom
	  b) Comparison between traditional and flipped class
	  c) Online activities
	  d) How to flip a fully online course
	
	· **Student-Teacher interaction**
	  a) Technological enhanced interaction
	  b) Teacher Role and students guide
	
	· **Virtual Class**
	  a) Open Discussion on Module III arguments

Figure 4. Arguments of Module III

In this module, particular emphasis is given to the comparison between traditional and distance learning in order to show strong and weak aspects of the two approaches.

From a strictly pedagogical point of view, the last trends, such as the flipped method, are examined with a focus on the evolution of the figure of instructors versus a class formed by digital native pupils. These aspects are certainly crucial when discussing distance learning, but they are also important since they can be considered as key elements of an updated course for any instructor who has to deal with an always-changing type of students.

Module IV: style and formats

Module IV includes all aspects related to styles and formats to be used when approaching distance learning. In order to provide guidelines for lectures, it is fundamental to explain how the structure of every learning object has to be prepared to achieve the best results. Unfortunately, those concepts are not clear even to institution that have already experienced the e-learning approach. Just to give an example, when recording video lessons using slides on an interactive whiteboard, it is fundamental to maintain correct margins on the sheet avoiding excessively crowded pages. In particular, those precautions help improve the learning path, especially for students endowed with the so-called photographic memory. Moreover, from a practical point of view, clear pages with right margins are readable even on small screens like in the case of mobile devices (m-learning). Fig.5 illustrates the arguments of Module IV.

DATE	Weeks 7-8 - Module IV: Style and Formats

Learning activities	The Module Style and Formats is composed of the following activities:
	
	· **Lessons**
	    a) Different software
	    b) Lesson Layout
	    c) Contents organization
	
	· **Virtual Class System**
	    a) Most used Software
	    b) Adobe Connect
	    c) Functionalities
	    d) How to organize a virtual class
	
	· **Virtual Class Session**
	    a) Lesson Organization
	    b) Chat
	    c) Discussion organization
	
	· **Syllabus**
	    a) Why a detailed syllabus
	    b) Syllabus organization
	    c) Required and additional information
	
	· **Didactical Unit**
	    a) Additional Contents organization
	    b) Didactical units preparation
	
	· **Virtual Class**
	    a) Open Discussion on Module IV arguments

Figure 5. Arguments of Module IV

Module V: social enhanced learning

When dealing with distance learning, we cannot forget, nowadays, that we are in front of a generation of pupils who have grown up in the era of social networks. This aspect has strongly influenced and changed the way to organize a lesson and to study at home. For these reasons, module V is completely dedicated to what has been called "social enhanced learning". This title was chosen not only to recall social networks, but also to transmit to lecturers the enormous advantages that can derive from properly using such tools.

The arguments of Module V are shown in Fig. 6.

DATE	Weeks 9-10 - Module V: Social Enhanced Learning

Learning activities	The Module Social Enhanced Learning is composed of the following activities:
	
	· **E-Learning and social networking**
	   a) Student-Teacher interaction
	   b) How to exploit social network for learning
	· **Facebook**
	   a) Profile creation
	   b) Functionalities
	   c) Group activities
	· **LinkedIn**
	   a) Profile creation
	   b) Functionalities
	   c) Group activities
	· **Researchgate and Google Scholar**
	   a) Profile creation
	   b) Functionalities
	   c) Group activities
	   d) Publications, co-authors and citations statistics
	   e) ISI/Scopus, first class journals and Impact Factor
	· **Twitter**
	   a) Profile creation
	   b) Functionalities
	   c) Group activities
	· **Virtual Class**
	   a) Open Discussion on Module V arguments

Figure 6. Arguments of Module V

The module includes an analysis of both personal social networks like Facebook and Twitter and professional platforms like ResearchGate and LinkedIn. All of them are examined to highlight the opportunities they offer to increase the student-teacher and the student-student interaction.

Module VI: multimedia products

Module VI deals with multimedia products intended as the most advanced technological solutions that can be specifically developed for distance learning.
Fig. 7 shows the arguments contained in Module VI.

DATE	Weeks 11-12 - Module VI: Multimedia Products

Learning activities	The Module Social Enhanced Learning is composed of the following activities:
	
	· **Copyright**
	   a) Policies
	   b) Different types of copyrights
	   c) Internet and contents rules
	· **Animated contents**
	   a) How to search and find free contents
	   b) How to modernized lessons and didactical contents
	   c) Group activities
	· **Virtual laboratories**
	   a) Examples of modern virtual laboratories
	   b) Free open-source contents
	   c) How to manage multimedia labs into didactical contents
	· **Mobile learning**
	   a) Introduction to M-Learning
	   b) Responsive Technology
	   c) How to exploit smartphone in lab activities
	   d) 3D smartphone based laboratories
	· **Virtual Class**
	   a) Open Discussion on Module VI arguments
	· **Virtual Class**
	   a) Conclusive Discussion

Figure 7. Arguments of Module VI

This modules deals with different topics such as animated contents, virtual laboratories, simulations, case studies and so on. Moreover, it includes information about the different types of exiting copyrights. The aim of this part is to give institutions willing to "start" a distance learning project or to modernize their curricula through technology-based tools some suggestions on how to find

free solutions on the web. In order to do that, it is mandatory to know the most used licenses and, consequently, if it is possible to use specific products.

The last lesson of the module refers to m-learning and all the aspects related to distance learning fruition on mobile devices. In this respect, a strong focus is given to the description of the advantages that can arise when properly using embedded sensors (e.g. for the realization of virtual laboratories). As reported in Fig.7, this module contains two virtual classes. The first one, as in the case of all modules, is devoted to a discussion of the arguments of the module. The second virtual class is a closure of the entire course and its aim is to debate the arguments of the training course as a whole.

Syllabus

An important learning object that can be provided to students is the syllabus. The syllabus is helpful not only for creating a detailed program of the arguments, but also for guiding students during their study. A well-defined syllabus must include not only the topics treated in the course, but also a suggested time schedule for the study.

For the training course of ACADEMICA, Marconi project team has developed a syllabus divided into sections that are reported in the next paragraphs.

6.1 General and course information

The first part of the syllabus provides general information about the course, the instructors and the general time schedule. In particular, this section describes the pre-requisites required before training starts, i.e. the English course, and the overall in-class and out-of-class hours required from lecturers. The in-class hours refer to the overall duration of the lessons while the out-of-class hours are an estimate of the average time required to study the concepts discussed in the lessons. Obviously, the number of out-of-class hours can considerably change from student to student, but it is important to give this indication to let students know beforehand the amount of time they are expected to devote to the course (Fig. 8).

Description, objectives and structure

Following the presentation of the course, a more detailed section provides a description of the course, its structure and its learning objectives (Fig. 8).

Course Description

The aim of the "Teacher Training" course, developed in the framework of ACADEMIACA project, is to provide to the instructors involved the necessary know-how to modernize traditional face-to-face lessons transforming them into pure distance or blended courses. Moreover, in this course are described the most recent technological tools useful to enrich learning materials fitting young students expectations. at the end of the course, the instructor will be able to develop or find autonomously technological learning materials, to define an appropriate standard for lessons and contents and to exploit tools offered by WEB 2.0.

Learning Objectives

At the end of this course, the instructor will be able to:
- Understand Distance Learning evolution;
- Define custom lessons layouts;
- Exploit social network to increase learning process and optimize students interactions;
- Find license-free learning materials;
- Develop learning materials in responsive technology;
- Use the most recent pedagogical technique both for traditional and distance learning.

Course Structure

The "Teacher Traning" course lasts 12 weeks and is organized into 6 modules of 2 weeks each.
Each module consist of 6 activities of 30 minutes. The activities are diffirent in each module and include: lectures, virtual class discussions, case studies, webinars, etc.

Figure 8. Section of the syllabus with course description, objectives and structure

Great attention is paid to the learning objectives. This section has been drawn up as per the guidelines of the Bologna process. In addition to providing a standard description of the course, we provide something that can be easily compared with other similar courses. Too often, both in traditional and distance universities, the objectives of a course are provided in a free form using text. This solution makes the comparison with others programs not simple, especially when we want to compare syllabi provided by different institutions (syllabi are usually written in different styles).

As regards the structure of the course, the syllabus provides a detailed description of how the total number of hours are subdivided into modules and lessons.

In short, if properly organized and filled out, the syllabus is a powerful learning object that can provide a guide for students thus reducing the dropout rate in the initial years of university courses. The syllabus prepared for the ACADEMICA course is itself a simple and low-cost learning solution. For this reason, these concepts are thoroughly described (and underlined) in the lecture note related to the syllabus in order to transmit this good practice to partners in Central Asia.

E-Course platform

The ACADEMICA e-course will be delivered through a virtual learning environment based on the Moodle E-Learning Platform as described in Fig.9.
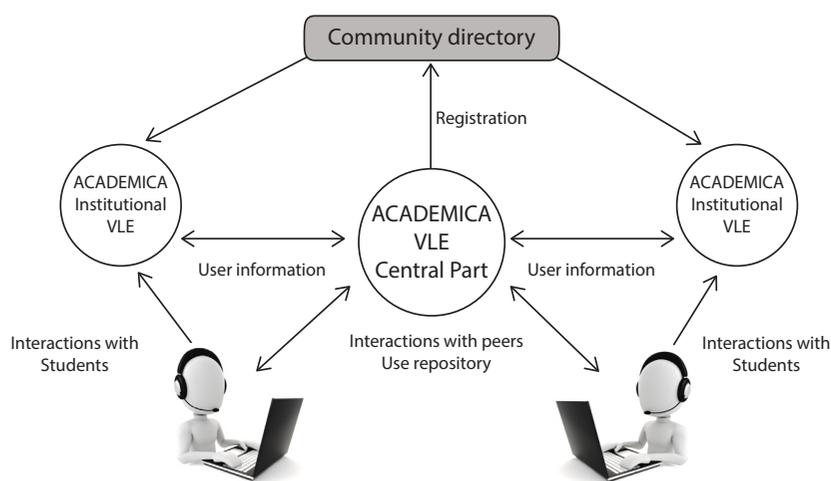

Figure 9. Moodle environment

The learning content will be developed in form of multimedia learning objects including:

- Multimedia Lessons - delivered through the e-learning platform built up by an audio explanation synchronized with a slide presentation and provided with a hypertextual index allowing the user to freely navigate the lesson
- Slides prepared by the subject domain experts converted
- Lecture Notes - textual documents presenting in detail the lesson's topics and/or a different perspective of the contents already explained

The lecturers can access the platform and attend multimedia lessons anytime and everywhere, exploiting modern e-learning solutions. During the course, some virtual classes will be organized with the aim of discussing arguments, creating a community and reinforcing collaboration among partners. The strictly didactical part consists of 36 e-hours of theoretical knowledge and lectures during which European partners offer their support to follow the advancements and answer any doubt.

Fig.10 shows the cover page of a lesson together with the index of the arguments.
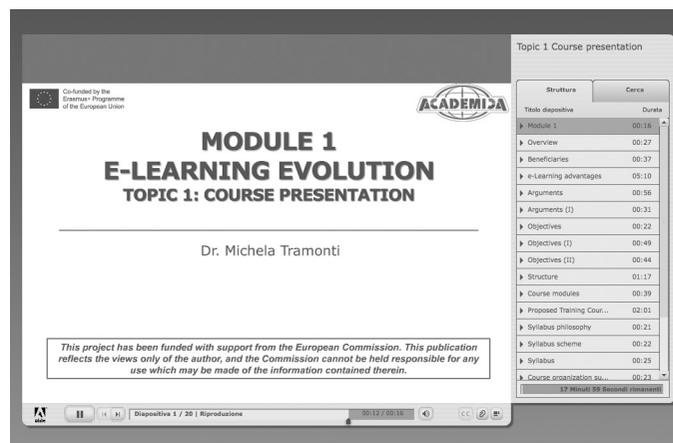

Figure 10. Example of Multimedia Lessons with index, text and voice synchronized

Conclusions

ACADEMICA is a project aimed at introducing innovative solutions in the scientific curricula of the universities in Central Asia.

The innovation in the training path can be summarized as follows:

1. 1 Innovative methodology: ACADEMICA training path integrates methodology and content, providing lecturers with transversal and key competences and skills necessary for their active inclusion in the global digital teaching and learning space
2. ICT-based educational opportunities: provision of more flexible accessibility to training opportunities thanks to ICT-based approaches
3. Modernized University curricula in Engineering Sciences where the contemporary technology-based approaches and contents are integrated
4. Establishment of a transnational co-operation system among universities and business organizations in order to improve the capacity of higher education institutions in Region 7 (Central Asia) thus achieving excellence by linking education, innovation and business

As previously mentioned, this course aims to provide lecturers with a tool that can assist them in the modernization of their curricula by using modern technologies. In particular, this modernization can be reached through different solutions that can be implemented with no or minor investments by universities. This course represents an important added value for the project since it can be considered as a good practice to train new users that want to launch a distance-learning project.

According to the schedule of the project, the course will be ready at the beginning of 2017 and will be open for all the lecturers selected by each institution. An important follow up is the satisfaction questionnaires that will be filled in by the course participants. Those data will provide important feedbacks, representing themselves a case study that will be presented in a future dedicated article.

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Sintesi

Nel quadro del Programma Erasmus +, la Commissione Europea ha cofinanziato il progetto di tre anni ACADEMICA, "Accessibility and Harmonization of Higher Education in Central Asia through curriculum modernization and development ", che coinvolge 15 partner provenienti dall'Europa (Bulgaria, Italia, Austria e Spagna) e dall'Asia Centrale (Kazakistan, Uzbekistan e Turkmenistan).

Il progetto intende supportare i docenti delle università dell'Asia centrale nel miglioramento e nella modernizzazione dell'attuale curriculum scientifico nell'ambito delle scienze ingegneristiche attraverso l'introduzione di tecnologie, supporto digitale e dell'e-learning.

L'articolo descrive e spiega le idee e i concetti principali che hanno condotto alla progettazione e allo sviluppo del programma didattico del corso online di ACADEMICA, che sarà erogato attraverso un ambiente virtuale di apprendimento, appositamente costruito. Il corso è rivolto principalmente ai docenti universitari che saranno coinvolti anche nell'applicazione pratica dei contenuti appresi durante il percorso formativo introducendo ed integrando nei propri sistemi didattici tradizionali la tecnologia adottata nell'e-learning. Durante questa fase di sperimentazione saranno raccolti dati qualitativi e quantitativi per verificare l'efficienza e l'efficacia del sistema formativo progettato. L'obiettivo è quello di costruire, al termine del progetto, una buona pratica da poter trasferire anche in altri contesti e paesi migliorando l'approccio didattico attraverso l'uso della tecnologia e l'implementazione di metodologie e-learning.