

Human Resources Management within Leonardo Da Vinci Project CELGAS – International E-Learning Initiatives in Gas Engineering Education

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Abstract: The paper describes the e-learning study programme "CELGAS", unfolded as a Leonardo da Vinci Project, from the point of view of its Human Resources Management and Quality Management module, organised by the "Lucian Blaga" University of Sibiu, Romania. The international programme is unfolded jointly by universities and research centres from Poland, Germany, Slovakia and Romania, each part being in charge of a specific module, but being partially involved also in other modules. Thus, an overview of the "CELGAS" programme is given here, with special emphasis on the module WP3.5, solved by the Romanian part. This study programme will be effectively unfolded starting with November 2006.

Key-Words: Leonardo da Vinci, E-learning, Educational network, Lifelong-learning, Gas engineering, Postgraduate studies

1 Introduction

The international "CELGAS" programme, approved by the European Commission and begun in October 2005, belongs to the category of **Leonardo da Vinci Vocational Training Action Programmes**, and is co-ordinated by the AGH University of Science and Technology of Cracow, Poland. Other members of the consortium are Technische Universität Bergakademie Freiberg, DBI-Gastechnologisches Institut GmbH, DVGW Deutsche Vereinigung des Gas- und Wasserfaches – Germany, Glowny Instytut Gornictwa - Poland, Technicka Univerzita v Kosiciach – Slovakia as well as the "Lucian Blaga" University of Sibiu, Romania. In this context, the paper's authors are part of the Romanian team that supports the module IV of the programme - Quality Management and Human Resources Management in Gas Engineering – Personquality.

The programme's general objectives are subordinated to the co-operation between the European Union and Eastern-European universities and research companies, as well as to the vocational educational area involving the domain of natural gases. For this, the programme has as general objectives:

- the promotion of lifelong, continuous education by creating an international network for continuous education;

- creating educational competencies for self-education and self-training;
- realising a flexible, open system for long distance learning between the participating countries;
- ensuring a transparency of qualifications.

The programme's main objective is to create a network capable of providing education and training to engineers from the natural gases industry, and also to encourage the understanding of the needs put forward by society, on the one hand to fight against joblessness and on the other hand in order to create possibilities for the individual's personal development. Furthermore, the technological distance between the European Union and the Eastern European countries must be reduced, starting from the educational, scientific and vocational progress.

By creating an environment for the technological transfer of information that could be used even on long distance, or, later, in an autonomous learning environment, the programme will promote the equality of access to education for persons that are disadvantaged from the social-economic or geographical factors' point of view.

The programme comprises no discriminatory aspects either with regard to ethnicity or sex, and may actually favour women who, having had time off for raising families, wish to refresh their

knowledge prior to re-entering the workplace. The cost of participation would be limited to that of a telephone connection, a PC and a moderate fee. For some specific topics the extra cost will be travel and accommodation costs for visiting one of educational meeting points (possibly 2 or 3 times per training). Furthermore, the programme wholly or partially satisfies the following directions:

- co-operation between universities and companies;
- transparency of qualifications
- self-training, open and distance learning.

Regional companies can benefit from this vocational education, but they also can contribute to the programme's activities. This international co-operation will develop a vocational training methodology based on quality management, which will serve to the local and regional needs with regard to companies' assessment.

The programme will allow the transfer of knowledge from universities and research centres to local-level companies. The participation of specialists from various countries will allow the finding of new opportunities for the study under this initiative.

The programme's main activities are divided among following work packages:

- WP1: Project management;
- WP2: Confirmation of needs and demand;
- WP3: Preparation of the mixed-eLearning system;
 - WP3.1: Gas Production
 - WP3.2: Underground Gas Storage and Sequestration problems
 - WP3.3: Gas Distribution
 - WP3.4: Gas Usage, End User Safety and Environmental Protection
 - WP3.5: *Quality Management and Human Resources Management in Gas Industry***
- WP4: Performing experiments;
- WP5: Evaluation, Corrections and Project Quality Management;
- WP6: Diffusion and Dissemination Process.

The package WP3 contains vocational educational methodology for scientific problems proposed by the regional and local gas companies. This package provides for the realising of the Web server and of multimedia interactive e-training software.

WP4 will be a control package, allowing to assess the educational system in a real situation. After the programme's start, the project quality management package - WP5 - will allow the assessment and correction of the system. In the post-pilot phase, all partners will continue the co-operation in vocational fields, based on the experience gathered during the Leonardo da Vinci programme. All partners have committed to continue

to build up the Long Distance Learning Vocational Centre by means of international experience exchanges, usage of the internet-based gas engineering vocational forum, etc. A new, Master of Science-level study programme for gas engineering in e-Learning system, will be launched.

The programme's main target group consists of the segment of specialists from the field-specific companies, who thus have the opportunity to improve their knowledge without needing to be taken out of activity. The contents transmitted via ITC, plus the tutorials for PC, together with the virtual laboratories can reduce part of the total costs of education. The lot size of students from Poland, Germany and Romania who will be enrolled in the programme will be over 50, and in the case of students from Slovakia over 20. Thus, the total number of students per year should be of over 170 specialists, coming from large and medium-sized companies.

A second target group is the educational environment itself. This will be enriched through new educational means, through thorough researches, through the creation of new educational software packages, through the realising of tutorials and other materials needed for the e-Learning environment. The programme's third benefit will be the creation of the Centre, which will allow each institution to select the topics according to its own interests and needs.

The programme's specific aims are, firstly, to create a European-level Centre for Conventional and E-Learning for Natural Gases Engineering, accessible via internet by all interested companies. This centre will function by ITC transmission and will be based on tutorials and virtual laboratories that could be used both in a formal environment and in a private learning environment.

The design of educational modules is done so that short-duration trainings can be offered (equivalent to 40 hours of lectures, 10 tutorials and a virtual laboratory class) as part of the qualification.

Also, another goal is the creation of a management unit, that would function as a company, with the task to manage all aspects that occur during the educational activity, in each participating country. This unit will be realised and financed outside of the "CELGAS" programme. It will be realised immediately after the programme's financing will start and it will have to continue functioning also after the financing will cease, this being one of the programme's long-term goals.

The programme is based on the general priorities of Leonardo da Vinci programmes:

1. provide access to new skills for people at work;
2. promote investment in human resources;

3. provide access to new knowledge by the use of innovation technology.

The proposed opportunities created in the context of life-long learning refer to:

- encouraging acquisition of new knowledge
- bringing educational institutions and the business sector closer together;
- combatting social exclusion;
- treating capital investment and investment in training on an equal basis.
- proficiency in three community languages (maternal, english, german).

2. Module WP 3.5: Quality Management and Human Resources Management

The module's role is to teach students about the basic problems of ensuring the services quality in the natural gases industry. This package is the key point of the whole programme and it has to be firmly integrated as a component of vocational education everywhere in the study programmes of Central and Eastern-European countries and not only there, due to the importance it bears for the future development of society. Modern educational techniques are to be used, such as the mind map, educational psychology, creativity methods, activity and organised group management, techniques for motivating the organisation's personnel, for increasing the intellectual performances in an organised environment etc. Also, the usage of varied e-learning types and instruments, such as the experts forum, chats etc., will all contribute to an acceleration of the learning and understanding of the discussed topics.

The main goal of the module is the enhancement of the individual's work quality and the creation of a quality of life, in first place of the organisational life, of the community life and then of the individual life.

At the end of the training period, those involved in the programme will know:

- how to organise their work schedule for the continuous life-long learning;
- how to use the new techniques for searching for and transferring learning materials;
- how to use the psychological elements in learning systems;
- how to carry out the human resources management within a company;
- how to implement the elements of quality management in the company.

This module, falling within the responsibility of the Romanian team in the programme, consists of following courses:

- P1: Personnel Management in the Gas Industry - 45 hours;
- P2: Self-education and creation of a system for the enhancement of personal skills – 30 hours;
- P3: Quality Management - 60 hours;
- P4: Workshops and projects - 45 hours.

3. Presentation of the course “Self-education and creation of a system for the enhancement of personal competencies”

The topics tackled during this course aim to increase the individual's awareness with regard to the need to continue his training, both from a cognitive point of view and from the point of view of social and human relationing, of communication and negotiation capabilities, of dis-inhibition and diminishing of the negative stress.

Therefore, starting from the determination of the own weak points and needs, each individual is then capable to more seriously address the areas he considers vulnerable, thus trying to build a complete and harmonious image of the specialist and his personality.

The goals targeted by going through this course are:

1. Determining the own weak points and needs of the students, from a cognitive, attitudinal and behavioural point of view.
2. Understanding the mechanisms that form the base for the motivation of the individuals' activities.
3. Detection of the personal motivation and of the possibilities to activate it.
4. Identifying the requirements of a good interpersonal communication, also from the point of view of empathy, persuasion, capability to convince.
5. Exercising of the communication types and techniques.
6. Understanding of negotiation from the point of view of requirements, rigours, the negotiator's personality and of the official requirements for the process.
7. Learning the ways in which stress can appear, and the ways in which it can be kept under control.
8. Identifying the main possibilities and ways by which the personal and interpersonal efficiency can be achieved.
9. Familiarising with the European legislation regarding the individual work contract, rights and obligations of the employee and of the employers.

In order to achieve a satisfactory unfolding of the programme, an important task for the Romanian team from the "Lucian Blaga" University of Sibiu is related to the management of e-learning activities, providing both the methodical assistance and the assistance with regard to the educational management of activities.

It should be mentioned that, by the nature of the proposed goals, the programme aims at introducing modern methods for teaching and learning, that would be based on the creativity methods, critical thinking and to stimulate/develop the emotional intelligence, both for the professors and for the students. Therefore, the team's involvement will be materialised in offering speciality counseling (references, trainings, case studies etc.), and in the advisorship of materials prepared for presentation during the teaching and tutorial activities, in practical applications etc. In this regard, attention will be focused on:

- the methodical modelling of the presented contents;
- realising of syntheses and conceptual maps;
- tutoring the Romanian students with regard to using/realising course materials;
- elaborating complementary and/or additional materials;
- intervention on the presented texts in order to make them interactive and to facilitate their understanding;
- management of stress or abandon states for those involved in the programme;
- creating the motivation for the actual activity.

The long-distance component within the Quality Management and Human Resources Management module is related and dependent on the usage of the Internet, by accessing it from the personal computers, in order to carry out the various activities. The teaching materials, courses, virtual laboratories, tutorials etc. are stored online as web pages, usually in .html, .pdf or .ppt format and are viewable by means of an Internet browser. The pages may contain text, images, sound and video recordings.

The Internet-based software instrument that allows this to be done in the case of the "CELGAS" programme is called MOODLE. Moodle is a course management system based on free, Open Source software package that has been specifically designed, using sound pedagogical principles, to help educators create effective online learning communities. It allows the creation of a web space where various types of information pertaining to the taught subjects can be uploaded and structured so that they fit the educator's

vision on the best way to transmit the educational contents. The students can access the information via customised channels (after registering and obtaining their own user name and password), but they can also enter into a message exchange with the professor, so that the learning experience can be brought to its full potential.

Other methods for online teaching and learning use e-mails, web-boards and chat. These learning methods, however, are simple only if they are accompanied also by other facilities.

Instructions that are given to students might include items such as:

- for each of the following steps, read carefully the items list;
- fill out the questionnaire given at the end of each section;
- after completing the first three stages, please print out the page in order to always have the instructions at hand.

When going through the activities foreseen for module WP 3, several stages will be initiated, emphasised through the steps presented below:

Step 1

A. Learning style

Students are presented with several learning styles and asked to choose the one that is best for them:

- interaction with a group and learning by means of discussions;
- listening to "experts";
- learning in their own rhythm;
- presentation of a more detailed learning structure;
- reading of printed materials, after which notes are taken;
- viewing images and video recordings;
- applying what has been taught in real tasks from the work environment;
- participation within learning scenarios such as: role games, jigsaw, survey, debate.

B. Time management

Students are questioned with regard to following aspects:

- do you consider that you are able to manage your time in an adequate manner?
- are you capable to attend online courses, maintaining a daily contact with the professors?
- how is the schedule organised at your workplace?

C. Personal motivations

Students are required to indicate:

- their chosen learning style;
- the goals which they have set for themselves.

Step 2

The technology requirements for the attendance of the course are as follows:

- a. Hardware for online learning:
 - connection to the Internet (modem, cable, Internet service provider)
- b. Software for online learning:
 - internet browser;
 - e-mail and instant messaging client;
 - text editor;
 - file compression/decompression software.

Students are asked to indicate in a questionnaire whether they possess the required technology:

- the needed hardware;
- the needed software;
- Internet connection;
- Internet browser

Step 3

Mandatory knowledge and skills

- a. Computer operating skills:
 - starting up - shutting down a computer;
 - skill to use a mouse: click, double click, drag/drop, right click;
 - starting and using the various software components of the Windows environment;
 - using the Windows Explorer: finding, saving files, working with directories, renaming, copying and moving files;
 - using text editors for text processing operations;
 - using the compression utility software.
- b. Using the Internet browser
 - ability to correctly input the desired location address;
 - ability to move forwards and backwards between web pages;
 - ability to reload or refresh a contents page;
 - ability to create bookmarks;
 - ability to save web pages;
 - ability to configure the browser;

- ability to configure the proxy server;
- ability to work in Java and JavaScript.

Test of computer operating skills

Within this test, students are required to confirm what skills they possess:

- basic skills for operating a computer;
- skills for correctly using a browser;
- skills for configuring a browser.

When realising the courses for long distance learning, professors should observe the following algorithm:

- a. Identifying of the goals of teaching - which can be done by:
 - a direct presentation of the offered courses and of the methods that are intended to be used (lecture, tutorial, seminar, workshop);
 - emphasising the major topic that will be taught during each class (materials, skills that need to be acquired etc.)
 - after this rigorous planning, sections that are not adequate or that must be completed, can be revised.
- b. Realising a written guide for using the course's web page.
- c. Creating the course's contents.
- d. Assessing the course (navigation, contents, accessibility, user-friendly interface)
- e. Indicating the manner in which students can register for the course:
 - personal details required (name, contact address, course title, institution, country, training level);
 - details on the course (professor, teaching manner, duration, prerequisite skills, exercises, help, comments).

For the preparation and carrying out of the teaching activities, a very important role belongs to the academic staff and to the auxiliary personnel, for realising all preparatory elements (table 1):

Table 1

Professors' training	Goals
<ul style="list-style-type: none"> - Forum - Internet navigation guide - Professional development - Training resources 	<ul style="list-style-type: none"> • Forming a virtual community for actual practice, where participants can learn and work in a collaborative manner on educational topics related to their daily work as professors, researchers and creators of new strategies. • Constituting a group of educators capable to use the new technologies in personal and professional interest and at a European level. • Creating models for the introduction of effective ways in the domain of collaborative learning by means of long-distance learning. • Acquiring, applying and tracking of the individual professional evolution by means of performance standards.

4 Conclusions

The "CELGAS" programme allows the transfer of knowledge from the university and research laboratories level with help of engineers and professors to the specific regional company level. One obvious way to improve participation would be to reduce its costs for companies, especially in terms of lost effective time. This can best be achieved by allowing participation at or near work places and allowing tutorials to be carried out during the spare time or leisure time. This in turn requires flexible teaching methods. One would be the ICT transmission of lectures. With regard to individuals, the cost of upgrading formal qualifications can be very high if they must take leave of absence from their workplaces. Furthermore, many countries do not provide for upgrading of qualifications in this way, thus reducing the incentive for individual participation in life long learning.

There are several anticipated specific results of the programme, among which can be mentioned:

- new curriculum of teaching with the help of ITC and PCs (stand alone), combined with traditional vocational teaching (two 1-2 days course meeting);
 - about 250 participants with higher qualification in the pilot phase;
 - new type of e-manual for self-study training in gas engineering;
 - international exchange of high tech;
 - international networking in education and training;
- about 1000 participants anticipated in the post- Pilot Phase of Project.

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