

## ИДЕЯ ЗА РАЗШИРЕНИЕ НА ВИРТУАЛНОТО ОБРАЗОВАТЕЛНО ПРОСТРАНСТВО ЗА УЧЕНЕ ПРЕЗ ЦЕЛИЯ ЖИВОТ

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### AN IDEA FOR EXTENSION OF THE VIRTUAL EDUCATIONAL SPACE FOR LIFELONG LEARNING

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*Abstract. This publication presents an idea of creating a model for non-formal education which can be implemented in the Virtual Educational Space. The model is based on andragogic approach and acquisition of competences. Intelligent agents will take care of training and educational and career guidance of the learners. A possible application of the model is a course in cognitive robotics.*

*Keywords: Lifelong learning, non-formal education, virtual education space, lifelong learning models, andragogic approach, competence approach, multi-agent systems, intelligent agents, cognitive robotics.*

#### Introduction

In the Faculty of Mathematics and Informatics at the Plovdiv University “Paisii Hilendarski” Virtual Educational Space (VES) has been worked out as the successor of the Distributed e-Learning Centre (DeLC) [1,2,3]. VES is built up as an intelligent, context-depending, personalized and adaptive environment for education, based on certain principles of Internet of Things and of Semantic web [4,5,6].

The adaptation of VES for lifelong learning supposes the developing of a model for implementing education considering the necessities and possibilities of the learners and adapted to the contemporary ways of life and learning.

The idea of accomplishing such a model is prompted by the European and the National strategies for intelligent growth of our society where the lifelong learning is regarded as the most important factor for personal development and improvement, for successful professional realization, for active social position and for the creating of an intelligent, competitive and economically stable society. From the analysis made of these documents are systematized several general conclusions which present the essence and the basic possibilities for organizing the lifelong learning and these are:

- The lifelong learning integrates equally all categories of educational activities (formal, non-formal and informal) and affords an opportunity for education and training of the individual from the earliest childhood to the end of his entire conscious life. In this sense the lifelong learning assumes anthropological approach of education. This means a different approach of education and upbringing for every stage of the human life – pedagogical approach for the early and the youth age, andragogical approach for the mature age and geragogical approach for the after pension age. Providing the opportunity for intelligent growth of the society determines the mastering of educational key competences through the entire life according to the quickly changing needs of the labor market. This can be achieved through problem-orientated education.
- Granting information for the possibilities of education and training as well as for career orientation through the entire life is an important element of the conception of the lifelong learning.
- The institutions of higher education could implement non-formal education.
- Knowledge acquired through non-formal education can be validated and certified. In the European Union YOUTHPASS certificate is issued.
- The standardized European instruments can be used for comparing the acquired knowledge, skills and competences no matter how or when they are achieved.

#### A Preliminary Model for Expanding the VES for Lifelong Learning (LLL)

On the basis of the specific character of VES the most suitable thing to be made proves to be the development of a module for conducting a non-formal continuing education expanding the limits of VES for lifelong learning. Subsequently the model could be extended for the needs of the informal learning.

The approach for implementing such an education contains the following steps and elements [7]:

*Introducing the theme (Preview)* – popular, brief and attractive presentation of the theme for provoking an interest in the potential learners.

*Defining the educational target group* – by the means of control tests (included in the Preview) and inquiries among the candidate-trainees is defined their belonging to a suitable educational group. The inquiries

must correspond to the actual conditions of the educational and information resources maintained in the VES. Criteria for belonging to a certain educational group could be different preconditions, for example available knowledge, interests and desires, intended application of the new knowledge, demanding a higher level of knowledge, etc. The VES must offer an appropriate classification of the possible types of educational groups while every type corresponds with a genetic educational plan. The user will be granted a personal portfolio including personal data, aims, desires and full set of standardized European documents (CV, language passport, mobility licenses, diplomas and certificates) describing his knowledge, skills and competences.

*Developing a personalized educational plan* – in principle the personalized educational plan is generated as an instance of the genetic educational plan according to the special features (the profile) of the particular learner.

*Conducting of the training* – the non-formal education which the VES suggests is not obligatory. Therefore, the users of this knowledge will be people striving for self-perfection, for increasing their standard of life or just to have fun.

In order to expand the methodological model of the space which already has given formal education based on the pedagogical principles and conforming to the potential target group, it is rational to develop an andragogical approach for the training. Consequently, it could be applied the geragogical approach as well.

With the andragogical model the learner is motivated, aware and pragmatically orientated and the trainer is an assistant, more qualified consultant, who helps, explains and consults. In the electronic training, that is what VES grants, the role of the trainer will be carried out by a **personal consultant (PC)**. The personal consultant is an intelligent agent which is individually generated for every certain trainee and is acquainted with his desires, studying habits and his knowledge. Except that the personal consultant will process the collected information, it will educate itself in order to adapt to the changes of the needs and potentialities of its “student”. The PC will stimulate the user to further development of the achieved progress and will undertake timely measures for avoiding failures in his education. For the mathematical model of self-education decisions will be sought for.

The methodology of the andragogical model of education supposes presenting the knowledge in the form of solving problems through different situations, simulations or games.

The concept for the educational innovations of the knowledge-based society moves the focus from training for achieving knowledge towards training for achieving competences (TAC). According to the National qualification frame (respectively European qualification frame) the criteria for assessing the learning are three – *knowledge* (theoretical and factological), *skills* (cognitive and practical) and *competences* (proved ability for using knowledge and skills in real educational, working or life situations). The TAC permits the learners to build up the achieved knowledge during the educational process in their own way while developing their skills and adding new knowledge on the basis of the given standards for competences. The competences necessary for a certain work place form dictionaries of competences. The most well-known dictionaries of competences worldwide are Workitect, NASA Competency Management System Workforce Competency Dictionary, Harvard, Georgia's Competency Dictionary, The European Dictionary of Skills and Competences (Disco).

*Assessment of the results of the education* – in order to finish the educational process, it is necessary to assess the acquired knowledge. In our model the personal consultant will assess educational competences through solving problems. A possible expansion of the assessment model is the inclusion of evaluation of key competences and soft skills. The acquired competences will be added in the personal portfolio of the learner.

*Continuation after the continuation* – the orientation during the whole life is an important element of the entire conception of the lifelong learning. Because of the lack of a national system for orientation during the whole life and a deficit regarding the given information, the idea of making of intelligent agent who will secure an easy access to the information about the possibilities for education and training, seems especially provoking. This **educational consultant (EC)** will facilitate the process of making decisions giving the user suitable information and helping him to choose the best direction for future development.

The educational consultant is acquainted with the personal qualities and the social characteristic of the user. He is familiar with his interests and operates with quality and quantity information for educational and training possibilities, including educational mobility which receives from a specific database of knowledge.

In this train of thought it looks absolutely logical to realize another intelligent agent – **career consultant (CC)** who will orientate the user in professional direction. For describing the existing professional possibilities, a specialized database is suitable again. The general architecture of the model is presented at fig. 1.

### **An Exemplary theme**

As an attempt for realizing such a model in the virtual educational space an electronic lesson book in cognitive robotics is worked at. The theme is interdisciplinary and very topical.

The presenting of the theme (fig.2) is made on Flash CC and AS3 and is realized as a SCORM-package [7]. We think over a redesign to AIR in order to play the program on mobile devices as well.

The interactivity is an important element of the electronic presenting of educational materials. The learner has the possibility to interact with the lesson book and every interaction will be reported in the intelligent

medium. The lesson book is based on a number of graphical, video and sound elements aiming more clear explanation, drawing the attention and giving pleasure. It is proved that the pleasure stimulates the memory and quickens the process of memorizing.



Fig. 1 General model architecture

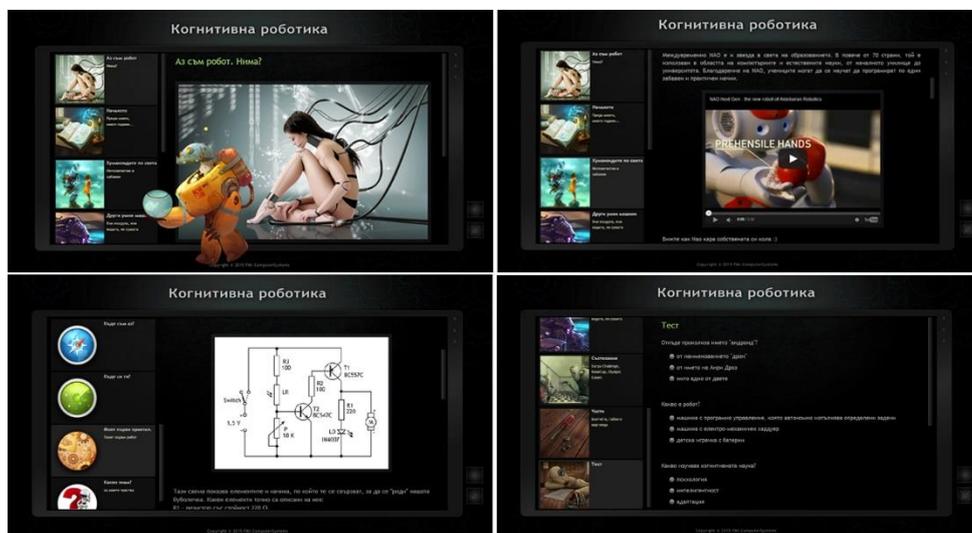


Fig. 2 Preview of the theme in cognitive robotics

### Conclusion

The module for lifelong learning in the virtual educational space made at the Faculty of Mathematics and Informatics at the Plovdiv University will suggest non-formal education. The personal assistant who will take care of the user will be an intelligent multi agent system. It will consist of personal consultant in charge of the chosen training course, educational consultant in charge of following educational orientation and career consultant in charge of the career orientation of the user. The personal consultant will follow the principles of the andragogical model of education. The educational content will aim at acquiring competences. As a possible realization of this model we are working on an electronic lesson book in cognitive robotics.

**Acknowledgements**

The study was partly funded by a project NAP of PU, IT15-CP-001 "Improving access to educational services in terms of continuing education," 2015-2016.

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