

Methods and Technologies for ICT workers Virtual Mobility

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Abstract. The use of information communication technologies (ICT) in continuing and professional development is one of the possibilities for ICT workers to be oriented to job mobility or virtual mobility. One of the main objectives of the research is to develop prototype of e-Academy for older workers to improve engagement with ICT and benchmark and validate skills and experience against the EQF and to develop a platform for older worker's that will be user friendly and will provide individuals with an opportunity to digitally their skills, experience and qualifications. ICT are important enablers of the new social structure. The aim of the paper is to present a prototype of the platform and virtual mobility, introducing software to the older workers for continuing and professional development. The role of ICT will be analysed for ICT workers in developing communication, cognitive, labour and business skills and competencies, to help them gather information (knowledge), to develop skills and abilities and creatively, to apply them in practice for achieving the teaching (learning) goals via e-Academy platform.

Key words: ICT, learning platform, prototype, ICT workers

1 Introduction

Looking from an employers' perspective, the researchers are focusing on policies and practices to foster the older ICT workers' virtual mobility. We are going to start a discussion about what employers and governments could do to support the mobility of older ICT workers in the field of geographic, job and virtual mobility, but in this paper we will discuss about the virtual mobility of ICT workers and their continuing and professional development. Currently not only in Lithuania but also in the whole world social and economic changes have evolved, which require more and more skills from the various specialists. In the rapidly changing society a person, who is trying to gain more knowledge and experience in his field of work due to trace of the social situations and adapts to modern life, becomes a successful one. An increasing number of the web-based software packages have been developed to enhance the teaching and design of control systems [5]. The rapid development of a permanent information and communication technology (ICT) changes and diversity also impacts the society changes. The developments and use of ICT is an important element of the European Union's strategy in order to ensure the educational effectiveness and competitiveness. Since 2007 the use of ICT in education has become one of the key issues [8, 9, 10]. The digital excellence is recognized as one of the eight skills necessary for all knowledge communities. The aim of the papers is to explore ICT applications, based on open source architecture for e-learning approach and to present the prototype of e-Academy for older workers to improve engagement with ICT and benchmark and validate skills and experience against the EQF.

2 Virtual Mobility

2.1 Overview on ICT and Methods for Virtual Mobility

The virtual mobility refers to ICT workers in continuing education in another institution outside their own country to study for a limited time, without physically leaving their home. The virtual mobility has been defined as an activity that offers an access to courses and study schemes in a foreign country and allows for the communication activities with teachers and fellow students abroad via the new information and communication technologies. The researchers are working on the prototype of the platform and tools using different technologies and allowing learners to communicate and collaborate with teachers, among themselves and with other internet users. On the technological side, trends towards high-quality, converging, mobile and accessible technologies, together with more sophisticated, user-friendly, adaptable and safe applications and services will integrate technology more and more into everyday life. As a consequence, technology will be more smoothly integrated into our daily lives and become a basic commodity [13, 14, 15] and e-learning is a general term for a variety of ways of combining different elements of on-line delivery. The use of technology may be integrated within the educational institution, either in class, or within lab work, or the technology use may be restricted to use by the students outside class time, possibly at home. Designing an effective use of technology to support teaching and learning, involves integration three different kinds of knowledge Content Knowledge, Pedagogical Knowledge and Technological Knowledge – as illustrated on Figure 1 diagram of the TPACK Framework.

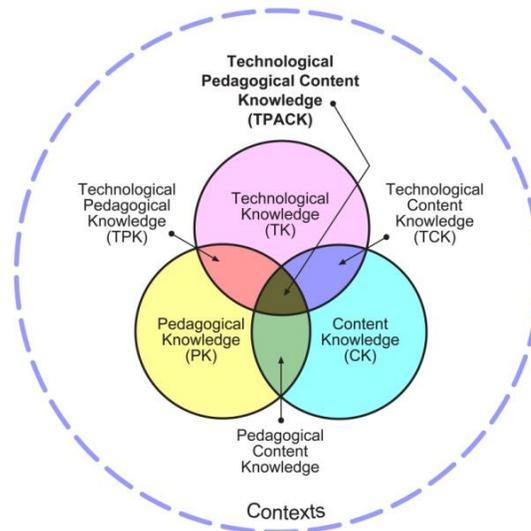


Fig 1. The role of ICT for future learning strategies [16].

There is a growing evidence that innovative ICT tools can enhance the learning delivery for learners and their engagement with mainstream education. The great strength of such learning tools is their capacity to support the informal learning, which provides a secure environment for acquiring knowledge and rebuilding confidence among learners. The innovation of web technologies will transform the teaching process into a student centred learning process. The technology should allow learners to upgrade themselves from being

a passive knowledge consumer (to whom knowledge is pushed) into an active contributor in a social constructionist process (knowledge building) [11, 12]. However for the new technologies of informatics and computer sciences a different approach is needed. For scientific collaboration the possibility to run a software developed by colleagues by internet is an essential. One can test directly results of other researchers by running their software with different data. Therefore the algorithms, software and the results published in the scientific papers can be investigated independently [3, 5].

2.2 Technological Solutions for Virtual Mobility

One can read a lot of articles on innovation, which suggests a set of tools that are considered to be an innovative and thus makes believe that the use of which could be important in education. Nowadays, in the fast moving and changing the world informational communication technologies play a significant role in the education, industry and business [1, 4]. The adult learners are no exception: they need to adapt to a more modern working environment, improve their ICT skills [2, 4]. General points are:

- ICT becomes an essential as the contemporary education system is focused on preparing learners for daily life & problem solving;
- Education should be adapted to volatile circumstances in a fast moving world: follow the changes of the new and upcoming ICT;
- Modern economy encourages global competition & education should not be limited to a traditional school environment;
- The popularity of ICT change the way how people communicate, find information & gain knowledge (computers, internet, radio, TV in various forms);
- Appropriate & competent usage of ICT improves education system. Nowadays this process is almost inevitable.

More specific points about the importance of ICT in the learning process (studies) are:

- Learning can be interactive & based on communication if ICT are used. This way a wider & more motivated learning environment in an education institution & beyond could be created. The learners solve problems communicating or working together;
- ICT usage allows learning to be applied according to the individual needs, learning content (what do we learn?) & methods (where & how do we learn?);
- Learning can be done anywhere, using a computer, mobile phone etc. In this situation it is important to make individual tasks for learners with special needs (blind, deaf or very talented ones);
- There is no a need to teach all learners at once, as ICT can control the process; this is very convenient for the adult learners who have a job or look after their children.

In addition, there is a subset of educational institutions in the world that have not applied (or just starting) ICT in classes. To tackle this problem, topic about ICT & institution integration should be discussed. Especially: teaching about information communication technologies, using information communication technologies in various lessons or lectures, applying newest technological solutions into the management of educational institution, creating a virtual learning environment. Another important thing about ICT is that it has a lot of useful features, related to continuous learning:

- Flexibility in respect of time & place (learning at home, using a virtual learning environment or distance learning).
- Flexibility in respect of learning material (courses are prepared for example according to organization needs).
- Easy access to information & other people.
- Convenient communication with other people using online resources.

- New approach to organizing learning (individualization of the process, better preparation & control of the learning material).

Despite many advantages of information communication technologies in adult learning, it is necessary to encourage adults to use ICT and show how they can facilitate the learning process. The researchers are working on prototype of e-Academy system that encourages learners' creativity, the ability to work in a team, ability to communicate in the global IT space [6, 7]. ICT can be very effective in developing the communication, cognitive, labour and business skills and competencies, to help students gather information (knowledge), to develop skills and abilities and creatively apply them in practice for achieving the teaching (learning) goals.

3 Prototype of e-Academy Platform

3.1 High Level Description of e-Academy System Design

The main idea how to meet purpose and requirements of the e-Academy is to build universal “My Jobs” plugin for Moodle, which can be installed not only into the e-Platform but also into other already existing Moodle based systems as it is required (Fig. 2).

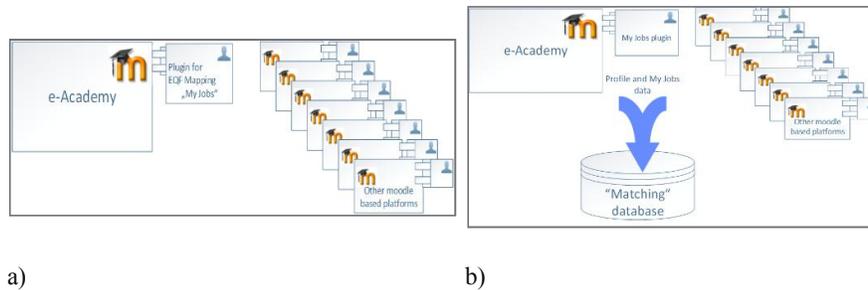


Fig. 2 “My Jobs” plugin can be installed on as many Moodle instances as necessary.

The plugin would collect data about user jobs and push it to “Matching” database, based on architecture then we have one “Matching” database and possibly many “My Jobs” plugin installation decisions for “Matching” database to be as a control centre of “My Jobs plugin” was made. All the data from “My Jobs” plugin will be pushed to “Matching” database (fig. 2 a), b)). This allows to control all the installed plugins from one place, update questions and other data instantly and without an interruption of Moodle admins. LMS for e-Academy - Moodle 2.7. This Moodle version was chosen because on e-Academy designing period it was latest stable Moodle version.

3.2 Functionality and Design

“My Jobs” plugin is seen as block on the left side of page. The middle part of the page is for courses list. The design is flexible, for example, in the first page can be shown the news, or other information about system, or project if necessary. By pressing “Manage your jobs” the link opens window, where the user can add, edit his jobs, qualification level and how the person meets standardized job description. By pressing “Edit” button on the top right side of qualification the user can change qualification name, level and

notes. By pressing “Not sure?” the user can access the test which helps to determine knowledge, skill and qualification level according to EQF description. By pressing “How I fulfil the description of this job profile” that opens standard description of selected job. The user can deselect parts which are not relevant to his/her actual job.

My Jobs

Job profile: Project Manager Edit

In my opinion my qualification for this job profile according EQF is:

Knowledge Level 3
 Skills Level 1
 Competence Level 4
[Not sure?](#) Opens evaluation questionnaire

How I fulfill description of this job profile: ^

Summary statement	Manages projects to achieve optimal performance conforming to original specifications.		
Mission	Defines, implements and manages projects from conception to final delivery. Responsible for achieving optimal results, conforming to standards for quality, safety and sustainability and complying with defined scope, performance, costs, and schedule.		
Deliverables	Accountable	Responsible	Contributor
	<input checked="" type="checkbox"/> Project Plan <input type="checkbox"/> Validated solution	<input checked="" type="checkbox"/> Solution documentation	<input type="checkbox"/> Quality Plan <input checked="" type="checkbox"/> Integrated Solution
Main task/s	<input checked="" type="checkbox"/> Organize, coordinate and lead the project team <input checked="" type="checkbox"/> Supervise project progress <input type="checkbox"/> Coordinate, record and ensure quality compliance <input checked="" type="checkbox"/> Circulate and distribute information from the project owner <input type="checkbox"/> Implement the new application or service <input type="checkbox"/> Plan maintenance and user support <input type="checkbox"/> Ensure specification compliance <input checked="" type="checkbox"/> Comply with budgets and delivery times <input checked="" type="checkbox"/> Update the project according to changing circumstances		
e-competences (from e-CF)	<input checked="" type="checkbox"/> A.4. Product or Project Planning		Level 4
	<input type="checkbox"/> E.2. Project and Portfolio Management		Level 4
	<input checked="" type="checkbox"/> E.3. Risk Management		Level 3
	<input type="checkbox"/> E.4. Relationship Management		Level 3
	<input checked="" type="checkbox"/> E.7. Business Change Management		Level 3

You can check your e-competence level at: <http://cep|secompetencebenchmark.org/>

[Add more](#)

Fig. 3 Functionality and design.

EQF Mapping page accessible by pressing “Not sure?” link on My Jobs page. How EQF Mapping page looks can be seen on Fig.

Table 1 Requirements and design solutions mapping

Requirement	Solution
Base of e-Academy should be LMS	Moodle is a Learning Management System with the features to provide environment for learning material, to categorize learning material for EQF and has an integration into existing systems via SAML, CAS, LDAP and web services
Ability to provide the environment for learning material	
The feature to be integrated into the existing employers' systems	
The feature to digitalize map of jobs against EQF	“My Jobs” plugin with EQF Mapping functionalities enables description and collection of the jobs and evaluation of qualification levels by taking questionnaire.
Extra benefit	Solution to use Moodle plugin for EQF Mapping opens extra sources of potential employees providing possibility to install plugin into many Moodle based systems

The implementation of educational concepts/models and the new learning and teaching methods, based on modern ICT, needs an involvement of competitive teachers and support staff. This is particularly very important where the investments to infrastructure and the new equipment should be planned together with the large scale of ICT users on how to use ICT, based on innovative learning and teaching methods in their learning practice.

4 Conclusions

The novelty of the research is shown in the technological solution to use semantic technologies for solving the meta data sharing according to the main objectives of the research, i.e. to develop prototype of e-Academy for older workers and to improve engagement with ICT and benchmark and validate the skills and experience against the EQF and to develop a platform for older workers that will be user friendly and will be provided for individuals with an opportunity to digitalize the map of their skills, experience and qualifications. According to the research, there is intended how to meet the purpose and requirements of the e-Academy where is built universal “My Jobs” plugin, which can be installed not only into the e-Platform but also into other already existing Moodle based systems if it is required. Despite many advantages of informational communicational technologies in adult learning, it is necessary to encourage adults to use ICT and to show how they can facilitate the learning process. ICT can be very effective for ICT workers in developing communication, cognitive, labour and business skills and competencies and to help them gather information (knowledge), to develop skills and abilities and creatively apply them in the practice for achieving the teaching (learning) goals through e-Academy platform.

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