



Market relevant vocational education and training on standardization in Bulgaria - needs and requirements

*Yanislav Zhelev**
*Evgeniya Nikolova**
*Mariya Monova- Zheleva**

1. VET and C-VET related to standardization – The ISTRA concept

It is internationally recognized that standards provide "ready-to-use" solutions for introduction of innovative methods and technologies with really proven up to date market relevance. The European dimension of this recognition is expressed in the in the European strategy for smart, sustainable and inclusive growth Europe 2020 [1] and in the EC flagship initiatives "An agenda for new skills and jobs" to modernize labor markets and empower people by developing their skills throughout the lifecycle with a view to increase labor participation and develop better matching between skills and labor market needs. Enriching the knowledge and skills provided by VET and C-VET with curricula on application of standards would be significant asset for the realization of this initiative. In this regard, the assuring possibilities for highly accessible education about standardization, using a wide spectrum of learning approaches including conventional and innovative ICT-based methods are key factors [7].

The project ISTRA is focused on the elaboration and promotion of open and innovative training programs, materials and e-tools for teaching and learning how to apply and use

internationally recognized standards: ISO/IEC 27000 series standards for information security management systems and ISO 31000 series standards for risk management systems [3, 4].

ISO/IEC 27000 – series standards specifying the requirements for establishing, implementing, maintaining and improving an information security management system within the organisation as well as for assessment and treatment of information security risks tailored to the needs of the organisation.

ISO 31000 – series standards for risk management systems – provides principles and generic guidelines on risk management. It can be used by any public, private or community enterprise, association, group or individual and is not specific to any industry or sector and can be applied to a wide range of activities, including strategies and decisions, operations, processes, functions, projects, products, services, assets. Training in standards and standardization will increase the quality and relevance of education as the ability for practical application of standards is a valuable asset to any professional qualification.

These series of standards are applicable for every business, organisation or institution and consequently, the developed e-learning courses will be suitable for a wide range of trainees.

In the ISTRA Project are involved 7 organisations from 4 EU countries – Bulgaria, Latvia, Romania, and Slovakia. In the consortium are involved the following organisations: Burgas Free University – Bulgaria, responsible for the overall project coordination, Bulgarian Institute for Standardization (BDS); Bureau of Standards of the Standardization, Accreditation and Metrology Centre of Latvia (LVS); Latvian College of Culture; Technological High School "George Bibescu" - Craiova, Romania; Secondary School of Technical and Electrical Engineering - Presov, Slovakia; Vocational Trade School - Burgas, Bulgaria.

Two of the three project target groups are VET students and C-VET learners who will benefit from the knowledge and skills in standards and standardization gained in addition to their basic studies/profession. As these series of standards are applicable for every business, organization, institution, etc. the training curricula will be suitable for wide range of trainees. The third target group is trainers that will be qualified to teach the standards curricula in digitalized virtual learning environment

* *Yanislav Zhelev, Burgas Free University, Bulgaria, jelev@bfu.bg*
Evgeniya Nikolova, Burgas Free University, Bulgaria, enikolova@bfu.bg
Mariya Monova- Zheleva, Burgas Free University, Bulgaria, mariyaj@bfu.bg



for VET and C-VET training.

The expected project outputs are as follows:

- The elaborated e-learning courses for the two series of standards providing up to date knowledge and practical skills in the standardization aiming to enhance the access to training and qualification through VET and C-VET.
- The development of modern virtual learning environment /VLE/ and train-the-trainers e-course “Teaching in Virtual Environment”, integrated in it, are to offer variety of training possibilities in accordance with different training needs and for different educational levels.

According documents of the European Centre for the Development of Vocational Training [2] the electronic learning (e-learning) is “education and training, mediated by information and communication technologies, including different formats and hybrid methodologies”. In the ISTR framework was conducted an extensive research focused on the vocational training in standardization delivered via VLE developed on the basis of the Moodle platform. Such virtual environment aims to ensure that the users can act naturally and carry out the tasks assigned. In this way users are involved in a learning environment that keeps the expectations of a real world and in the same time is safety for the users [8].

The next sections present the scope of the survey conducted, its methodology and used approaches and tools. Some important results obtained after the processing of collected data are also presented.

2. Scope, Methodology and Specifics of the Survey

The paper represents a national research, aiming the detecting needs and gaps regarding the provision of the tailored education and training related to standardization (especially standards ISO/IEC 27000 and ISO 31000) for the ISTR target groups. The project consortium takes into account the results of this survey as well as the outcomes of International Federation of Standards Users /IFAN/ Guide 4:2014 [5, 6] on the needs for education and training related to standardization in order to identify the different standardization education and training needs for different main functions of an enterprise or organization.

The survey is carried out in each partner

country of the project. The survey was attended by 160 trainers and 437 trainees, as 51.88% (84 responses) of the trainers and 24% (193 responses) of the trainees are from Bulgaria. This article presents the results of surveys conducted in Bulgaria.

The research methodology is based on a survey method. Two types of questionnaires have been developed:

- Type one – consists of 24 multiple choice questions where only 3 of them allowed more than one answer. Via this questionnaire was examined the opinion of the lecturers in the following areas: outlining the profile of the surveyed lecturers; establishing the common perceptions and attitudes of the surveyed lecturers on topics related to using the opportunities of ICT in teaching (developing application, personal experience, etc.); determination of the preferences and needs of the lecturers in developing e-training course through a virtual learning environment.

- Type two - consists of 44 questions (36 multiple choice questions with only one answer, 7 multiple choice questions with opportunity for more than one answer, and 8 questions with open answer). It was intended for pupils/students/trainees in the following areas: outlining the profile of surveyed pupils/students/trainees; establishing of some common perceptions and attitudes of the interviewed learners on using the capacity of ICT in the learning process; preferences and needs of the learners on the form and functionality of e-course training through a VLE; assessment of the degree of awareness of the learners of the ISO 31000 and ISO/IEC 27000. standards.

3. Selection and profile of the respondents

We have adopted the following strategy for selection of representatives of the main target groups for participation in the survey:

- Meetings with teachers from secondary vocational education where the objectives and content of the project were explained. One of the results of these meetings was contact lists with e-mail addresses of the teachers and students with different professional profiles, who would be interested in ISO/IEC 27000 and ISO 31000 standards.

- Invitations for participation in the survey were sent to university lecturers in the field of e-



learning or active users of electronic and distance learning, dealing with training for teachers or trainers.

- Establishing contacts with centers for vocational training and lifelong as well as with adult learners from companies interested in ISO/IEC 27000 and ISO 31000 and invitations for participation were sent to them along with the questionnaire under the survey.

- Meetings were held with members of the Bulgarian Institute for Standardization (potential trainers) staff who were interested in e-learning activities and they also received the questionnaire to participate in the survey.

As result of these steps the survey conducted in Bulgaria was attended by 277 respondents a total. From them 84 trainers and 193 are trainees. The responding rate for the respondents from Bulgaria for the first questionnaire is 75%, and for the second is 71%.

The first survey conducted in Bulgaria was attended by university lecturers who worked as lecturers for more than 5 years. For this reason, the majority of the interviewed trainers have a PhD (47,1 %) or a Master's degree (49,4%). Only 3,5% of the trainers have Bachelor degree. All the respondents are over 22 years old. 56% of respondents are between the ages of 25 and 45. In the sample women prevail – 69% a total. As is visible from the next figure the majority of the respondents are highly experienced trainers with more than 5 years practical experience, which is a guarantee for the high value of the obtained survey results.

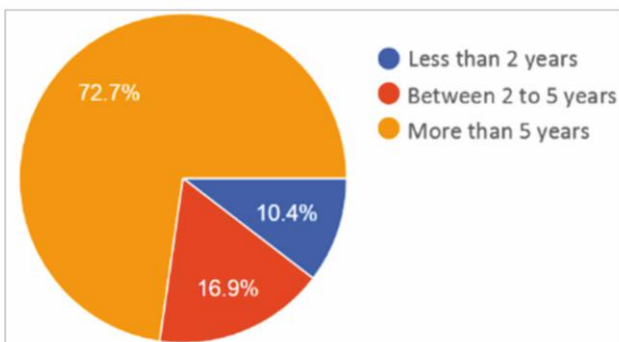


Figure 1. Distributions of the surveyed trainers according to their practical experience

The main characteristics of the second target group - trainees from Bulgaria are represented by graphs in the figures 6-8. Women also predominate in the group of students surveyed – 66% a total. In

the Bulgarian sample we have participants from all five mentioned degrees - High School (39,8%), Bachelor (50,3%), Master (2,6%), Doctor (1%) and Continuing Professional Development (6,3%).

Around 47% of respondents are aged between 20 and 25 years and the degree to which they are taught, is BA. As is shown on the figure below 42,4% of the trainees are pupils in vocational schools and the rest 10,5 of the respondents are aged over 25 years.

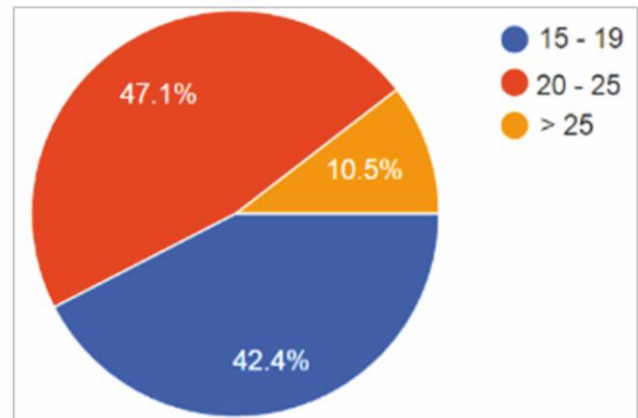


Figure 2. Distribution of the trainees according to their age

4. Expectations of the Trainers and Trainees towards an E-Course in Standardization

The main focus of the project is associated with the use of the educational platform Moodle. Therefore, of particular interest for the research team was the identification and assessment of the possibility of application of this platform in the main activity of the trainers, as well as to create a template of courses providing effective training based on needs and requirements of the trainers and trainees. The Figure 3 presents the questions (from the first questionnaire) which are designed to determine the preferences and needs of the trainers in developing e-training course delivered through a Moodle based virtual learning environment.

According to the majority of the surveyed trainers (97,47%) each e-training course through a virtual learning environment using Moodle should start with a brief introduction to the objectives of the course, its duration, requirements, etc. More than 97% of them consider that it is important each e-course to have a logical arrangement of topics and each topic to be briefly presented at the beginning

(about 80%).

The course should be structured so that the transition to the next topic to be only possible if the trainee has shown positive test result. In the opinion of the majority of respondents, the course should support the development of e-collaboration as the team activity can improve learning outcomes.

The expectation of the trainers is that the developed courses under the project will cover different topics in the field of standardization. The online content can be in the form of educational materials, which may be created by the trainees. The courses should allow the trainees to work above the level of the group and to attend additional advanced courses if preferred. About 76% of the respondents from Bulgaria prefer creating practical skills in an e-course than to give priority to theoretical basis. About 72% of them will benefit from the opportunity for a Web Conference. Only above 40% of the trainers from Bulgaria recommend limiting access to blended learning.

The course should be structured so that the transition to the next topic to be only possible if the trainee has shown positive test result. In the opinion of the majority of respondents, the course should support the development of e-collaboration as the team activity can improve learning outcomes.

The expectation of the trainers is that the developed courses under the project will cover different topics in the field of standardization. The online content can be in the form of educational materials, which may be created by the trainees. The courses should allow the trainees to work above the level of the group and to attend additional advanced courses if preferred. About 76% of the respondents from Bulgaria prefer creating practical skills in an e-course than to give priority to theoretical basis. About 72% of them will benefit from the opportunity for a Web Conference. Only above 40% of the trainers from Bulgaria recommend limiting access to blended learning.

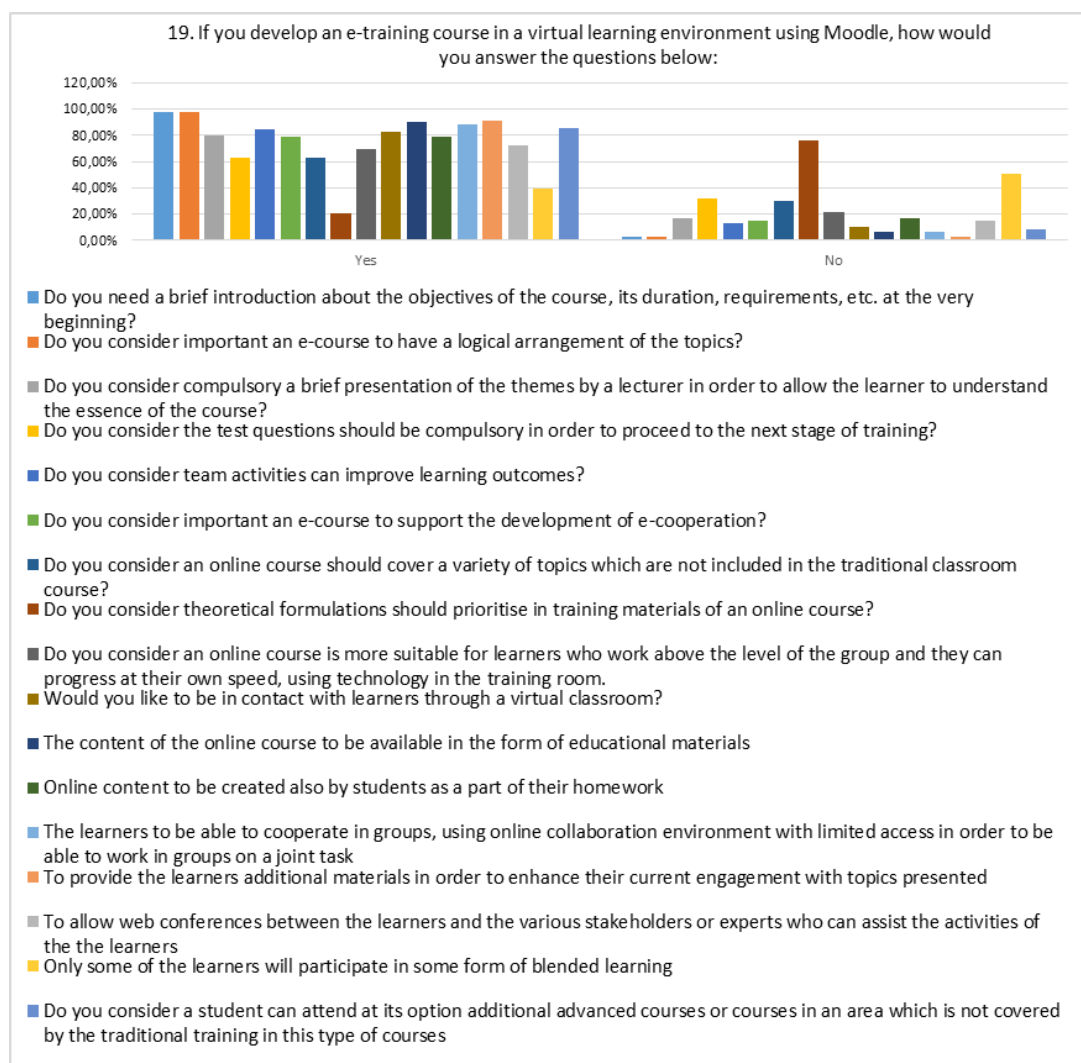


Figure 3. Opinions of trainers about the capabilities of an e-training course in a VLE



The preference of the respondents from Bulgaria is The Flex Model – an learner centered e-course with dynamic content is the most preferred course content format. 73.4% of trainers from Bulgaria point to "Lessons and/or sections with self-assessment questions at the end of each section" as the organizational structure of the e-course. As an approach to access to learning materials, the preference is "Free access to all subjects of the course materials throughout the course".

The most important items for an online training course according to the trainees are the variety of teaching materials (79,6%), the possibility for on-line communication with the users and teachers (58,1%), and the possibility for self-organization of the curriculum (47,3%).

The respondents specify as most important characteristics of the virtual learning environments the simplicity of the operations (50,5%) and the available functionality in general (64%). A large percentage of the trainees give their preference to the organizational structure consisting „Lessons and/or sections with questions for self-assessment at the end of each section“. (Please, see Figure 4).

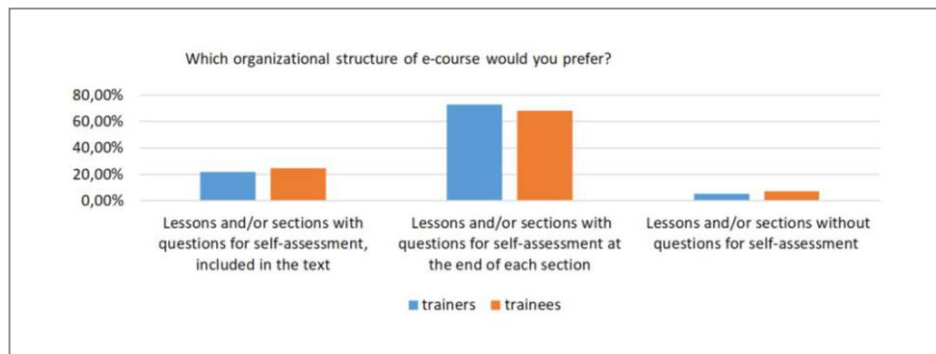


Figure 4. Opinions of the trainers and trainees about the e-training course organizational structure

Comparison of the opinions of the trainers and trainees for the organizational structure of the e-course shows a common position on the matter. The favorite approach for access to learning materials is "Free access to all topics of educational materials during the entire course".

Comparison of the opinions of the trainers and trainees for access to learning materials shows a common position on the matter. The respondents indicated as a most preferable educational technology "Content Management (Wikipedia, a wiki, blogs and etc.)". The positive response to questions regarding participation in the "problem solving" related discussions (more than 80% positive feedback) shows that in the majority of the trainees are established habits to participate in such activities on regular basis.

More than 70% of the trainees prefer to participate in the project oriented teamwork and about 43% of them would prefer every month to be assigned tasks that require the use of web space.

The preferred form of organization of the e-courses predetermines the preference when to assess knowledge/competence: "During the lesson or course" (36,2%). Despite the desire to exploit the

opportunities of e-courses and experience of their participation in joint training, 25,9% trainees prefer classic exam, expecting the examination variant to contain quizzes with multiple choice and open questions, and questions with short answers.

The comparison of the views of the trainers and trainees from Bulgaria on the form of self-assessment shows the different positions on the subject - for the trainers, this is a "Practical assignment" or "Individual course project", while for the trainees it is "Online exam" or "Classic test" (Figure 5).

Comparison of the opinions of the trainers and trainees from Bulgaria for the form of self-assessment again shows the different positions on the matter. While the majority of the teachers preferred „Test containing open questions and test tasks with multiple choices“, the preferred form of a self-assessment of the student's is "Test tasks with multiple choices" only.

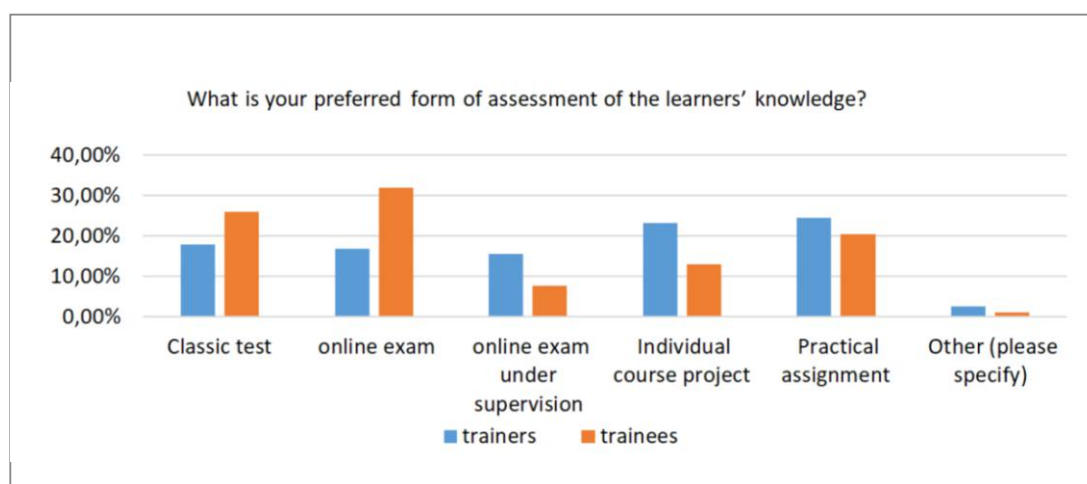


Figure 5. Results of the evaluation of the opinions of the trainers and trainees about the form of assessment of the learners' knowledge

Taking into account the results obtained through elaboration of the collected data, the following requirements regarding the e-courses dedicated to training in Standards ISO 31000 and ISO 27000 could be summarized:

- Friendly and intuitive interface and functionality providing possibility users easily to operate in the environment and course itself;
- Support of student-centered learning;
- Modular structure consisting individual lessons and self-assessment objects at the end of each section;
- Access to all topics during the entire training;
- Support of active communication among the participants via chat provision.

These requirements specify the main accents in the learning environment and e-content development in order to be assured the provision of a wide variety of learning experiences, instructional approaches, and academic-support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students and groups of students.

Conclusions

One of the main focuses and particular interest for the research team during the conducted research was the identification the possibilities for efficient usage the educational platform Moodle for the establishment of a tailored virtual learning environment for provision of VET and C-VET in standardization, as well as the provision of

templates for the development of courses providing effective training based on the needs and requirements of the main identified target groups – trainers and trainees.

The survey's results show that the existence of intuitive interface and useful functionality implemented through mechanisms based on simple operations is key factor for achieving the effectiveness of the vocational e-training focused on standardization. Too complex and sophisticated tools and mechanisms take lot of time to be learned and mastered by the users instead the participants in the training to be focused on the key elements of the learning and the content matter itself. This conclusion is especially in force for the participants in the training from vocational schools and C-VET organisations.

Concerning the organizational structure of the e-course all respondents show a common position on the matter. The e-courses have to be organized in modular basis. The majority of the both target groups, the trainers and the trainees, consider that it is important the course content to have a logical arrangement of topics where each topic to be briefly presented by a lecturer in order to allow the trainees better to understand the essence. Taking this result into account we conclude that the blended learning methodology is the most appropriate in this case. The favorite approach for access to learning materials is the free access to all topics of the educational material during the entire course.

The comparison of the views of the trainers and trainees from Bulgaria on the form of self-assessment shows the different positions on the



subject. For the trainers the most efficient forms are the practical assignments and the individual course projects, while the trainees show preferences toward online exams and classic tests. In order to provide flexible way for course activities arrangement all of these self-assessment methods should be considered in the course template development. In the opinion of the majority of respondents, the course should support the development of e-collaboration as the team activity can improve learning outcomes.

Acknowledgements

The present research was carried on in the framework of “International Standards training in VET for promotion of market relevant education” /ISTRA/ № 2016-1-BG01-KA202-023738 financed by European Commission under the Erasmus + programme, KA2 - Cooperation for Innovation and the Exchange of Good Practices, Strategic Partnerships for vocational education and training.

This document reflects only the author's view and that the NA and the Commission are not responsible for any use that may be made of the information it contains.

References:

1. Europe 2020 in a nutshell http://ec.europa.eu/europe2020/index_en.htm
2. European Centre for the Development of Vocational Training <http://www.cedefop.europa.eu/>
3. ISO/IEC 27000 family - Information security management systems <https://www.iso.org/isoiec-27001-information-security.html>
4. ISO 31000:2009 - Risk management -- Principles and guidelines <https://www.iso.org/standard/43170.html>
5. International Federation of Standards Users /IFAN/ <http://www.ifan.org/ifan-publications.html>
6. IFAN - Education and Training about Standardization <http://www.ifan.org/IFAN-GUIDE%204-Education-2014-09.pdf>
7. Joint Working Group on Education about standardization (JWG-EaS), Masterplan on Education about Standardization <https://www.cencenelec.eu/standards/Education/Jo>

[intWorkingGroup/Pages/default.aspx](http://www.cencenelec.eu/standards/Education/Jo)

8. Monova-Zheleva M., Tramonti M.(2015) Uses of The Virtual Worlds for Educational Purposes, Electronic Journal for Computer Sciences and Communications, Vol. 4, № 2 (2015), p. 106-125, ISSN: 1314-7846