

# INTEGRATING THE TRAINING IN STANDARDIZATION IN UNIVERSITY CURRICULA – EUROPEAN DIMENSIONS AND CHALLENGES

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DOI: <https://doi.org/10.31410/ERAZ.2020.217>

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**Abstract:** *Standardization and standards play a key role in today's competitive landscape. It is already broadly recognised the importance of the standards and standardization regarding the knowledge and best practices transfer, global supply chain networks building and management, the achievement of economic efficiency and sustainability as well as boosting the innovations.*

*Taking into consideration the importance and the urgent need outlined by the business and the industries for a workforce equipped with relevant knowledge and skills regarding standardization and standards, this paper is focused on the following questions: (i) what are the reasons the standards-related training are still not adequately represented in the academic disciplines; (ii) what is the University lecturers and students' levels of awareness about the international and European standardization systems and their readiness to improve their knowledge and competencies in the field of standardization; (iii) what are the main aspects to improve the training in terms of standards and standardization in university education.*

*The authors of this paper propose answers to these questions on the base of the results achieved through a comprehensive study conducted in five European countries in the framework of the international project "Standards Teaching in University Education" /STUNED/, funded by the Erasmus plus program of the European Commission.*

**Keywords:** *Training on standardization, Standards-related learning and teaching, Higher education, E-learning.*

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## 1. INTRODUCTION

Globally, there is a strong consensus regarding the fundamental contribution that higher educational institutions can give to standardization in terms of standards-related teaching provision, contribution and participation in the standards development processes as well as academic studies and research work on standardization (ISO, 2014). At the European level, a strategy for promotion of education and training in standardization was developed (European Commission, 2016). Moreover, the European Committee for Standardization /CEN/ and the European Committee for Electrotechnical Standardization /CENELEC/ in close collaboration established policy on Education about Standardization (CEN-CELENEC, 2011). The International Federation of Standard Users (IFAN, 2018) observes in their annual report that while the use of the standards "as a strategic tool to underpin innovation, strengthen the professional performance and competitive advantage of an organization" is becoming more and more important, many companies and other stakeholders take

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insufficient advantage of them. In the report is outlined that these opportunities are sometimes not fully exploited due to a lack of awareness of the importance of standards, as well as insufficient ability to translate awareness into relevant actions. Currently, improving the understanding of the added value of standardization amongst the academia, business executives, government and relevant authorities is a priority of key importance. Next sections of the paper present the main results of a study conducted in 2020 as a part of an international initiative supported by the European Commission in the framework of the project STUNED aiming to support Universities to enrich their curricula by developing and integrating into them innovative educational modules in the area of standardization and application of selected set of international standards of the International Organization for Standardization /ISO/, some of which are adopted also as European standards.

## 2. THE OBJECTIVES AND THE METHODOLOGY OF THE SURVEY

The study covers five European countries: Bulgaria, Finland, Greece, Latvia, and Romania. The following strategy for selection of representatives of this main target groups for participation in the survey was adopted: (i) meetings with the management board and the lecturers from the concrete University were held in each partner country where the objectives and content of the project were explained; (ii) discussion with the managerial body and selection of the specialties and disciplines to be modernized; (iii) contact with the lecturers who teach the selected for modernization courses and inviting them to take part in the online survey as well as sending the link to the questionnaire via e-mail and all other institutionally and personally used channels for e-communications. The research methodology is based on a survey method. Two types of e-questionnaires have been developed, which consist of 18 multiple choice questions, and addressed to the university lecturers and students. The questionnaires were answered by a total of 25 lecturers and 365 students and had been designed to cover the following aspects of the sample: General personal data; Common perceptions and attitudes of the interviewed learners on using the capacity of ICT in the learning process; Assessment of the opportunities that universities offer for standardization training; Assessing the degree of awareness of the learners of the standards. Figure 1 represent the distribution of participants' lecturers and students in the survey by partner countries in the project.

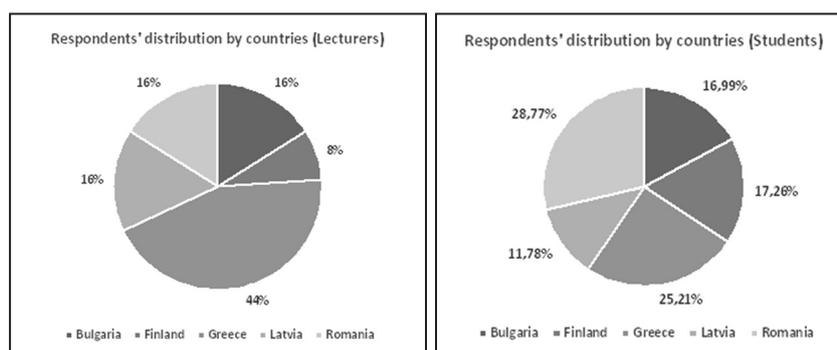


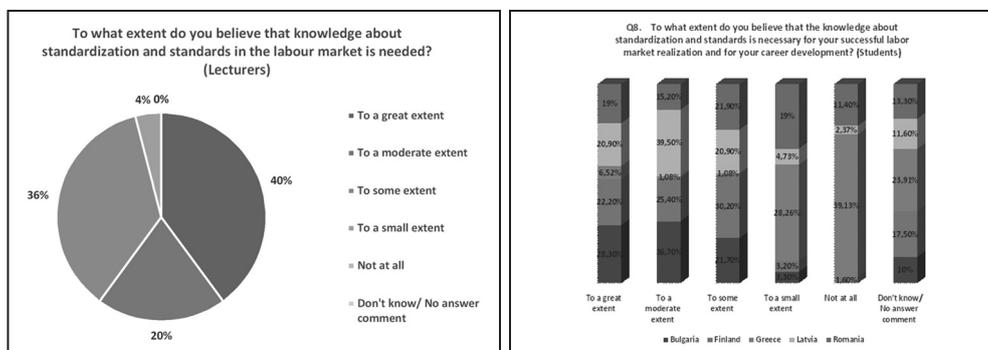
Figure 1. Distribution of lecturers and students in the survey by countries

## 3. RESEARCH RESULTS

The particular interest to the research team conducting the survey was the identification and evaluation of the University lecturers and students' levels of awareness about the international and European standardization systems and their readiness to improve their knowledge and competencies in the field of standardization, as well as the main aspects to improve the training in terms of standards and standardization in university education.

### 3.1. Assessment of the opportunities for standardization and standards-related training that universities currently offer

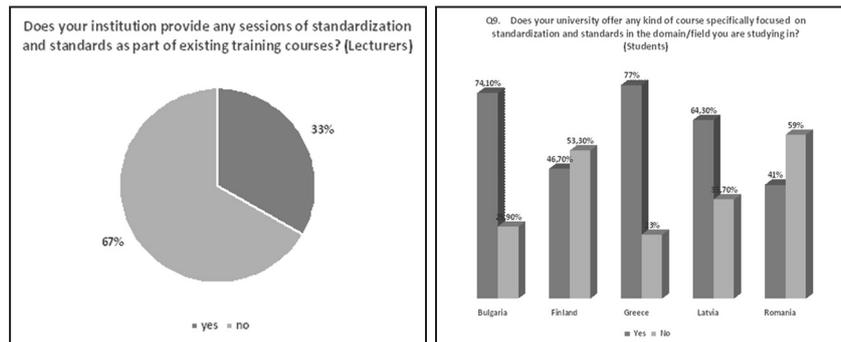
The first question in this group of questions aims to identify needs of education and training activities, addressed to standardization and standards. The responses collected with this question shows that the knowledge of standardization and standards necessary for successful realization on the labour market and for career development, is highly rated by the respondents-lecturers. The data are summarized in the Figure 2. A very big part of them (40%) consider that the knowledge of standardization and better awareness of domain-specific standards contribute to a great extent for successful realization on the labour market, as well as for career development. Respondents-students' opinions are diverse and most likely this is due to their not very good knowledge of this subject (Figure 2). 36.7% and 39.5% respectively of the respondents from Bulgaria and Latvia believe that this knowledge will be of moderate use for their professional realization, and for 30.2% and 21.9% respectively of the students from Finland and Romania knowledge of standards to a some extent support for successful realization in the labour market, while Greek students indicate „Not at all” (39.13%).



**Figure 2.** The importance of the knowledge of standardization for the labor market realization

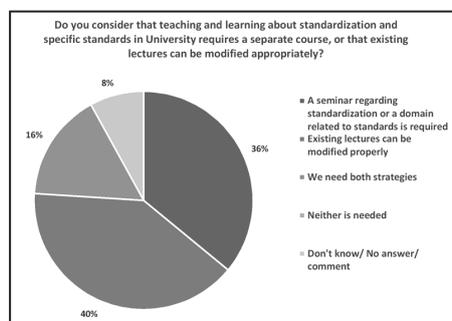
The following questions establish the current situation regarding provision of standards-related training as a part of University education. The diagram presented in Figure 3 illustrates the current state regarding the provision of standardization and standards-related training in the form of University courses specifically focused on the standardization and standards. Only 20% of the respondents-lecturers declare that in their Universities as a part of the curriculum offered some courses specifically focused on standardization and standards. According to students' opinion, the universities from Bulgaria, Greece and Latvia offer possibilities for students' participation in course specifically focused on standardization and standards or a training on standardization and standards as part of existing training courses, while the predominant groups of students from Finland and Romania answered "No" to the question "Does your university offer any kind of course specifically focused on standardization and standards in the field/area you are studying?".

Regarding the provision of training session(s) focused on standardization and standards as a part of other University courses included in the current curricula, 67% of the respondent-lecturers declare that their organization doesn't offer any to training sessions on standardization and standards. The predominant groups of the respondent-students from Bulgaria and Greece declare that they have the opportunity for training(s) on standardization and standards as part of existing training courses in the curriculum, unlike the majority of respondents from Latvia, Finland and Romania who state „No" as the answer.



**Figure 3.** Provision of standards-related training in universities - current state

Taking into account the feedback provided by the respondents in the survey becomes clear that there is a big gap between the education and training activities, addressed to standardization and standards, currently needed and those being delivered in the form of separate courses focused on standardization and standards as well as in the form of training sessions which are parts of other University courses. The respondents-lecturers were also asked to express their expert opinion regarding the further enhancing and enrichment of the educational offers provided by their Universities through the integration of training about the standardization and standards. The Figure 4 shows that according to the respondents the both proposed strategies for improvement of the University education (development of separate standards-related courses and modification of the existing courses involved in the University curricula via integrating standards related modules) are appropriate. 16% of the respondents declare that both strategies need to be supported. 40% of the lecturers express the opinion that the modification of the existing courses is the most appropriate strategy and nearly the same number of the respondents (36%) consider the development of separate standards related courses (seminars) as a more suitable solution.



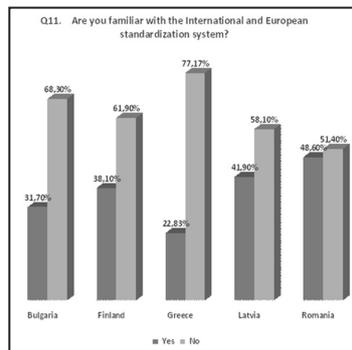
**Figure 4.** Strategies for improvement of University education through the integration of training about standardization and standards

The application of one strategy or another depends from the discipline specifics, the administrative and academic rules for modification of the existing curriculum as well as from the concrete educational context in a given University.

### 3.2. Assessing the degree of awareness of the learners of the standards

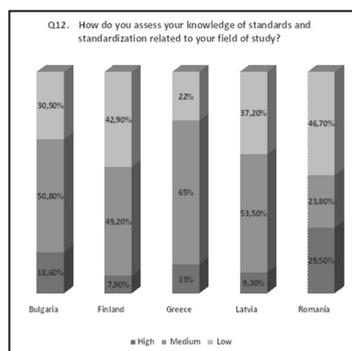
The last group of questions in the questionnaire for the students determines the level of knowledge of standards and standardization from the surveyed learners. The answers to this group of questions indicate awareness of the respondents and the lack of knowledge of the subject standardization. As the chart in the Figure 5 shows, predominate students' groups are not familiar with the international and the European standardization system, and most of the respondents

give a low score for their knowledge of standards and standardization related to their field of study (Figure 6). 51% of respondents indicate the „No” option in response to the question „Are you familiar with the International and European standardization system?”.



**Figure 5.** Assessing the degree of awareness of international and European standardization system

The diagram of Figure 6 shows a predominance of students, participating in the survey, with intermediate and low levels of knowledge of standards and standardization as a 50.8% of the Bulgarian students indicate the option „Medium”, as well as Finland, Greek and Latvian students (49.2%, 65% and 53.5% respectively), and Romanian students indicate the option „Low” (46.7%).



**Figure 6.** Assess of knowledge on standards and standardization related to student field of study

#### 4. FUTURE RESEARCH DIRECTIONS

On the base of the results from the analysis of all collected data and information and with the active involvement and collaboration with the representatives of the National Standardization Bodies of Bulgaria and Romania will be designed a training concept as a fundament of a training solution addressed to the university lecturers, which aims to improve, extend and enrich the lecturers’ awareness and knowledge about the standardization and about some standards which are specific for their domains. The lecturers successfully completed the training will develop, adapt and contextualize standards-related training modules which will be integrated into as a part of their university courses’ curricula. All developed standards training modules will be piloted with control groups of students. After the piloting stage, the developed contents will be stored into a database as open educational resources which will be accessible for all academic society. Thus, all interested lecturers/universities will be able to use the existing standards-related learning objects in order to modernize their study programmes through their integration into the existing curricula after appropriate adaptation, enhancement and contextualization. On

each step of the pathway, described above, is foreseen the impact and effect of the outcomes achieved to be analysed so the next stages to be updated accordingly and thus optimal efficiency and high quality of the university education on standardization and standards can be ensured.

## 5. CONCLUSION

This paper presents some of the results of a study conducted in five European countries. One of the aims of this study is to outline a momentary picture of the current opportunities that universities provide for acquiring knowledge in the field of standardization and also to provide an assessment of the degree of the students' awareness in the area of standards. Based on an analysis of the study results, the following conclusions could be drawn:

- Need of education and training activities, addressed to standardization and standards;
- The knowledge and competencies related to standardization and standards play an important role regarding the formation of qualitative fundamentals for future professional realization and successful career development;
- There is an urgent need of training focused on the improving the level of the lecturers' knowledge of standards and standardization in their field of activity which is evaluated by themselves as low to medium;
- Taking into account the feedback provided by the respondents in the survey becomes clear that there is a big gap between the education and training activities, addressed to standardization and standards, currently needed and those being delivered in the form of separate courses focused on standardization and standards, as well as in the form of training sessions which are parts of other University courses.

## ACKNOWLEDGMENT

This research was supported by the international project „Standards Teaching in University Education”, funded by the Erasmus plus program of the European Commission, KA2 - Cooperation for innovation and the exchange of good practices, Strategic Partnerships for higher education.

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