

METROLOGY, QUALITY, STANDARDIZATION AND CERTIFICATION

COMPARATIVE ANALYSIS OF EXPERT EVALUATION OF QUALITY CRITERIA OF THE EDUCATIONAL PROGRAM FOR THE FIELD OF COMPUTER-INTEGRATED TECHNOLOGIES

Tetyana Gordiyenko, Dr.Sc., Prof.

State University of Telecommunications, Ukraine; e-mail: t_gord@hotmail.com

Oleh Velychko, Dr.Sc., Prof.

State Enterprise "Ukrmetrteststandard", Ukraine; e-mail: velychko@hotmail.com

Alexandru Salceanu, Dr.Sc., Prof.

Gheorghe Asachi Technical University of Iași, Romania; e-mail: salceanualexandru@yahoo.com

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Abstract. The article presents the results of comparative expert research to establish the importance of the applied national criteria for the quality of the educational program (CQEP) of higher education institutions (HEIs). For these studies, a group expert assessment of the importance of the CQEP for the educational program (EP) in the field of computer-integrated technologies was applied. The teaching staff of two universities is involved in conducting such an evaluation: The State University of Telecommunications (Ukraine) and the Gheorghe Asachi Technical University of Iași (Romania). To conduct this research, the existing CQEP and their sub-criteria and a special algorithm of group expert evaluation were used. It has been established that the most important CQEP and their sub-criteria include, first of all, CQEP regarding human resources, the educational environment, material resources, and the structure and content of the EP. The greatest spread of experts' opinions (from the weightiest to the least weighty) can be stated for the sub-criteria of CQEP regarding access to EP and recognition of training results and transparency and pub-

licity. With this in mind, this CQEP sub-criteria requires close attention when revising them for a better balance of the CQEP sub-criteria system. Harmonization of the list of fields of knowledge and specialties for which higher education students are trained with the International Standard Classification of Education, as well as the national terminological and conceptual apparatus with the international one, should be considered extremely appropriate in Ukraine. The issue of prioritizing the preparation of higher educational institutions for the accreditation of the EP, meeting the most essential requirements of the sub-criteria of the CQEP, and taking into account their significant number, remains relevant. This also determines the relevance and necessity of conducting special expert studies on the comparison of the importance of CQEP for different fields of knowledge.

Key words: Computer-integrated technologies, quality criterion, educational program, the institution of higher education.

1. Introduction

In the countries of the European Higher Education Area (EHEA) [1–4] or the countries participating in the Bologna Process, the paradigm of higher education based on scientific research operates. For the EHEA, there is a European Credit Transfer and Accumulation System (ECTS) and national qualifications frameworks. In Ukraine, the National Framework of Qualifications with the corresponding dictionary has been approved [1, 5].

A comprehensive statistical description of national education systems and methodologies for them are established by the International Standard Classification of Education (ISCED), which is the main international classification system of education [1–2]. ISCED is based on educational programs (EPs), which are classified by fields of knowledge, orientation, and purpose of the EP. In Ukraine, the list of fields of knowledge and specialties does not fully correspond to ISCED. Instead of 10 such fields, ISCED at the national level trains higher education seekers in 29 fields. Therefore, there is a problem with compliance of the national classification of fields of knowledge with the international classification [7].

The appropriate accreditation of EPs of higher education institutions is aimed at establishing the conformity of the quality of OPs, according to which higher education applicants are trained by national institutions of higher education (HEIs) [8, 9]. This facilitates the integration of national HEIs into the EHEA. Accreditation of EP is carried out following the criteria for evaluating the quality of the educational program (CQEP), each of which has its own defined sub-criteria. Evaluation of EP and educational activities of HEIs according to EP is carried out for each CQEP per the established scale.

The issue of prioritizing the preparation of HEIs for the accreditation of the EP, meeting the most essential requirements of the sub-criteria of the CQEP, and taking into account their significant number, remains relevant. This also determines the relevance and necessity of conducting special expert studies on the comparison of the importance of CQEP for different fields of knowledge.

2. Drawbacks

The development of a worldwide standard for the transfer and accumulation of credits in higher education

is considered in [10], and overcoming the problems and experience of implementing ECTS at the national level within the framework of the Bologna process is devoted to [11–15], research on the establishment and application of criteria for expert evaluation of the effectiveness of HEIs is presented in [16–18]. There are practically no scientific publications on the comparison of the established and applied CQEP, the comparison of their importance for the EP of higher education in specific fields of knowledge, so this question remains an urgent task.

3. Goal

The purpose of the study is to compare group expert evaluation of the importance of criteria for evaluating the quality of educational programs carried out by higher education institutions of different countries.

4. Group expert evaluation of criteria and sub-criteria for evaluating the quality of the educational program

To achieve the set goal, the following tasks were solved: the results of group expert evaluations of the importance of CQEP carried out by HEIs of different countries were analyzed; a comparison was made and the priority of the sub-criteria of the CQEP was established based on the conducted evaluations.

A total of 9 criteria for evaluating the EP are used during the accreditation of the EP of HEIs, which contain a total of 54 sub-criteria. Criterion C1 (EP design and objectives) has four sub-criteria (C1.1–C1.4); C2 (structure and content of EP) – 9 (C2.1–C2.9); C3 (access to EP and recognition of learning outcomes) – 4 (C3.1–C3.4); C4 (studying and teaching according to EP) – 5 (C4.1–C4.5); C5 (control measures, evaluation of higher education applicants and academic integrity) –

4 (C5.1–C5.4); C6 (human resources) – 6 (C6.1–C6.6); C7 (educational environment and material resources) – 6 (C7.1–C7.6); C8 (internal quality assurance of EP) – 7 (C8.1–C8.7); C9 (transparency and publicity) – 3 (C9.1–C9.3); C10 (learning through research) – 6 (C10.1–C10.6) [9, 17].

Algorithms of group expert evaluation implemented on a scale from 1 (least important) to 9 (most important) points are given in [17]. Exceeding the average score for all CQEP (sub-criteria of CQEP) is a case of their importance. According to the results of the processing of the received expert evaluations of CQEP (sub-criteria of CQEP), a ranked list of the most important CQEP (sub-criteria of CQEP) is formed. Clarity of the obtained results is achieved by using their graphic representation in the form of corresponding diagrams.

The group expert evaluation was carried out with the involvement of the teaching staff of two universities: the State University of Telecommunications (Ukraine) and the Gheorghe Asachi Technical University of Iași (Romania). These universities have highly qualified specialists in the field of computer-integrated technologies and implement EP in this field. A proportional number of experts from each university (10 each) was selected for the group evaluation.

A comparison of the importance of the CQEP and the ranking of the CQEP by weight in order of decreasing points are shown in Fig. 1 and 2 (a – State University of Telecommunications, b – Gheorghe Asachi Technical University of Iași). The diagram with unranked results (Fig. 1) demonstrates the difference in the expert evaluations of the CQEP experts from the specified universities. The diagram with the ranked results (Fig. 2) shows the difference in the evaluation of the importance of the CQEP by the experts of the two universities. Dashed lines in Figs 1 and 2 show the average values of CQEP.

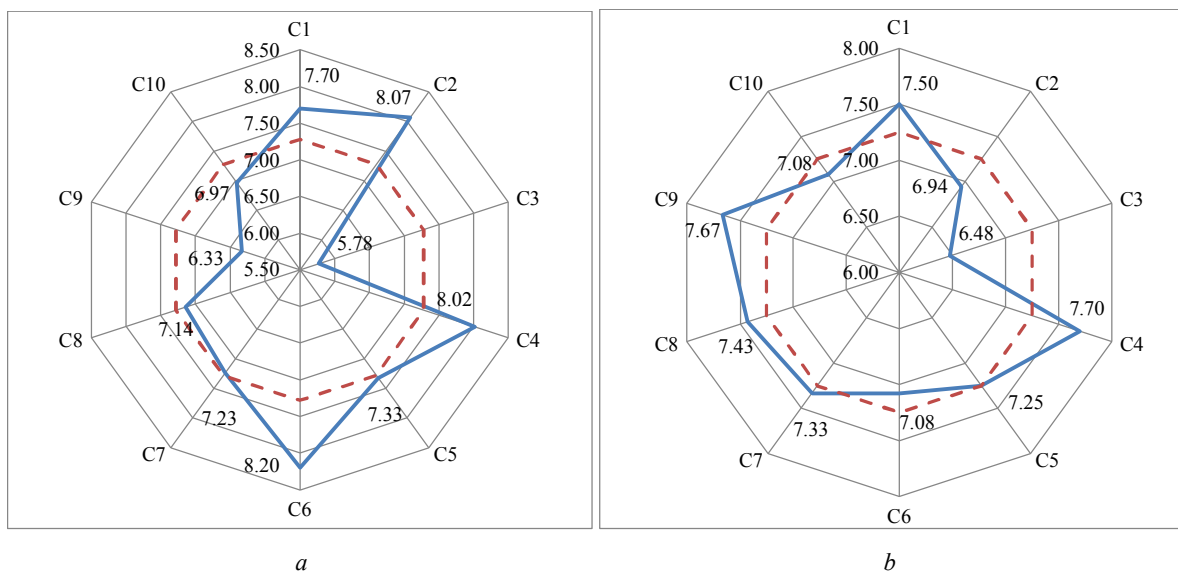


Fig.1 The comparison of the weight of the CQEP

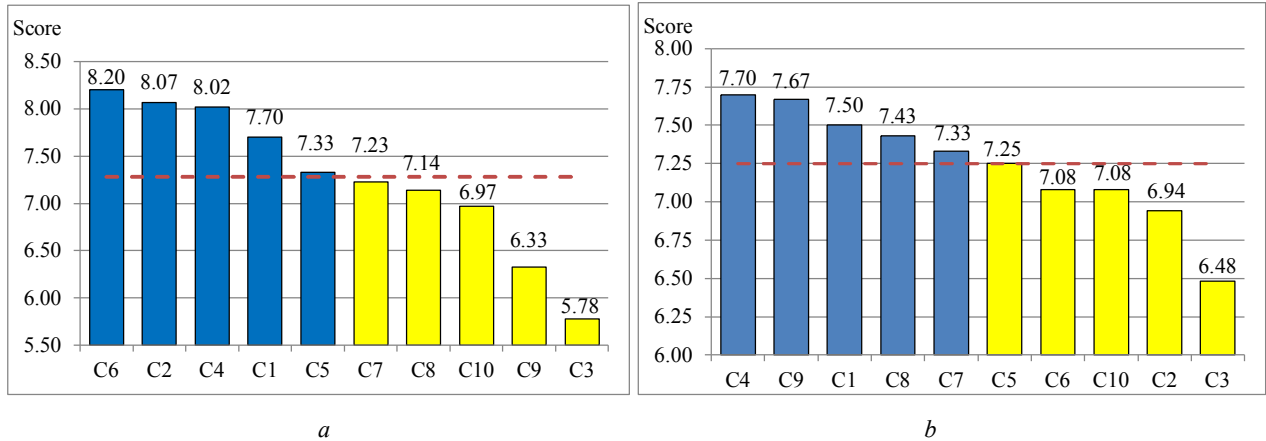


Fig.2 The comparison of ranking of the CQEP by weight

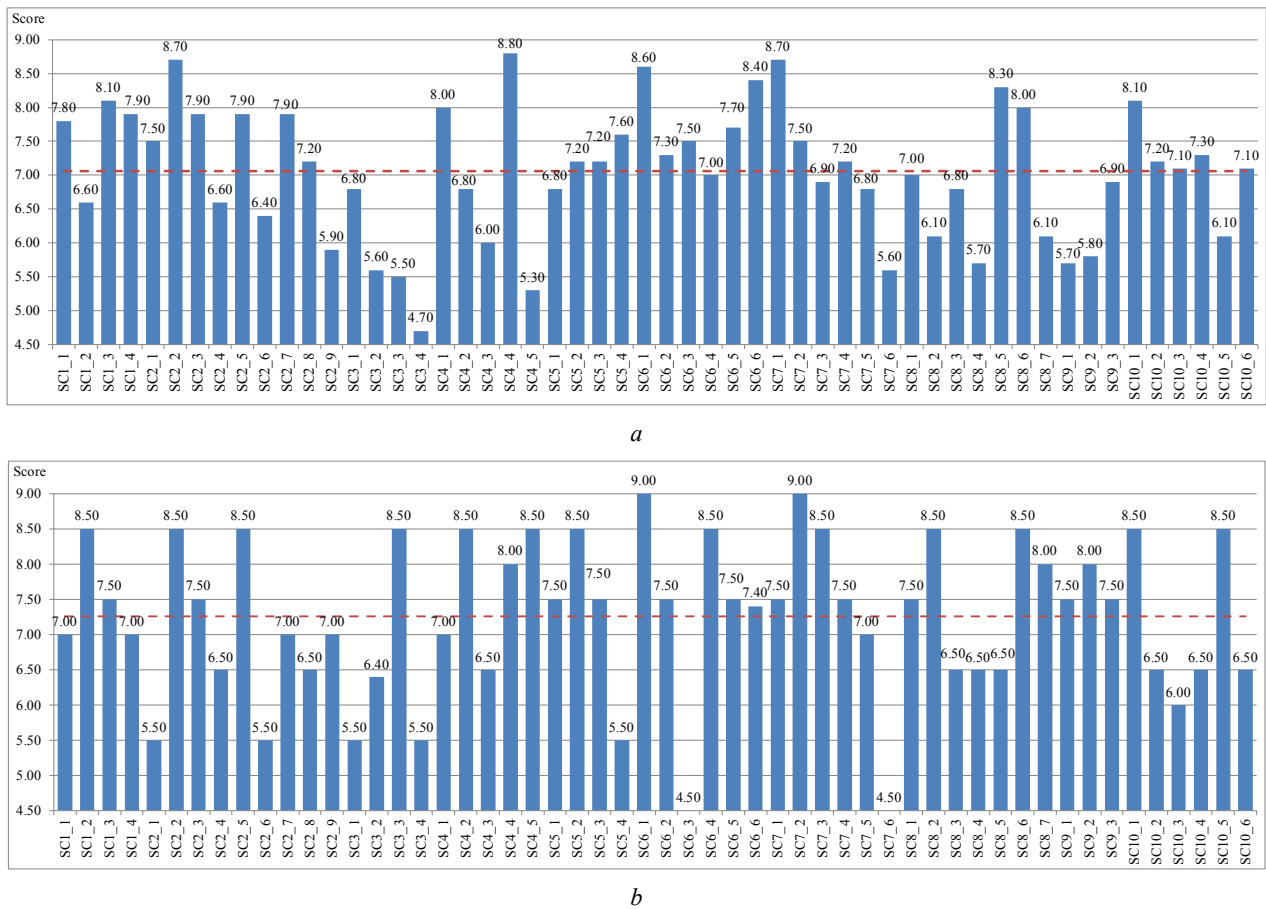


Fig. 3. The comparison of the weight of the CQEP sub-criteria

For the most important CQEP, expert evaluations coincide only for C1 (7.70 and 7.50 points, respectively) and C4 (8.02 and 7.70), and for less important CQEP only for C3 (5.78 and 6.48) and C10 (6.97 and 7.08). This shows a significant spread of the obtained CQEP scores and the existing significant differences in the priority tasks of the two universities.

A comparison of the importance of the sub-criteria of CQEP is shown in Fig. 3 (a – the State University of Telecommunications, b – Gheorghe Asachi

Technical University of Iași). The dashed lines in Fig. 3 show the average values of the sub-criteria of CQEP.

For the most important sub-criteria of the CQEP, expert evaluations coincide for 16 sub-criteria out of 54 (only 29.6 %): C1.3, C2.2, C2.3, C2.5, C4.4, C5.2, C5.3, C6.1, C6.2, C6.5, C6.6, C7.1, C7.2, C7.4, C8.6, C10.1, and for less weighty CQEP – only for 10 sub-criteria out of 54 (18.5 %): C2.4, C2.6, C2.9, C3.1, C3.2, C3.4, C4.3, C7.5, C8.3, C8.4. This shows a significant spread of the obtained CQEP grades and the existing significant

differences in the priority tasks of the two universities. At the same time, the selected sub-criteria of the CQEP may become the subject of consideration during their next review, especially less weighty ones.

5. Discussion of the results of the evaluation

The analysis of the received expert evaluations gave a spread of the CQEP evaluations of the experts of the State University of Telecommunications from 5.78 to 8.20 points (average score 7.28), and the experts of b – Gheorghe Asachi Technical University of Iași – from 6.48 to 7.70 points (average score 7.25). The range of scores for the CQEP sub-criteria was, respectively: from 4.70 to 8.80 points (average score of 7.06) and from 4.50 to 9.00 points (average score of 7.25).

It should be noted that the expert evaluations coincided in general for 4 of 10 (40%) CQEP and 24 54 (44%) sub-criteria of CQEP. Among the sub-criteria of the CQEP, the coincidence of expert evaluations was recorded for the following CQEP: C1 (1 sub-criterion out of 4); C2 (6 of 9); C3 (3 of 4); C4 (2 of 5); C5 (2 of 4); C4 (2 of 5); C5 (2 of 4); C6 (4 out of 6); C7 (4 out of 6); C8 (3 out of 7); C10 (1 of 6). Only for the sub-criteria of CQEP C9, no coincidence was recorded.

For the most important sub-criteria of the CQEP, expert evaluations (score above the average) are the same for the following CQEP: C1 (1 sub-criterion out of 4); C2 (3 of 9); C4 (1 of 5); C5 (2 of 4); C6 (4 of 5), C7 (3 of 6); C8 (1 of 7); C10 (1 of 6). For the less weighty sub-criteria of the CQEP, expert evaluations (score below the average) are the same for the following CQEP: C2 (3 sub-criteria out of 9); C3 (3 of 4); C4 (1 of 5); C7 (1 of 6), C8 (2 of 7). No coincidence was recorded for the heaviest CQEPs C3, and C9 and for the less important CQEPs C1, C5, C6, C9, and C10.

The experts of the two universities considered the most important CQEP: design and goals of EP (C1) and learning and teaching for EP (C4). The experts of the two universities considered the least weighty CQEP: access to EP and recognition of learning results (C3) and learning through research (C10).

The experts of the two universities considered the following to be the most important sub-criteria of CQEP:

- EP goals and program learning outcomes are determined considering trends in the development of the specialty, labor market, industry, and regional context (C1.3);

- the scope of EP and individual educational components meets the requirements of the legislation regarding the educational load for the corresponding level of higher education and the corresponding standard of higher education (C2.2);

- the content of the EP corresponds to the subject area of the specialty determined for it (C2.3);

- EP and the curriculum provide for practical training of students of higher education, which provides an opportunity to acquire the competencies needed for further professional activity (C2.5);

- the university provides a combination of training and research during the implementation of the EP by the level of higher education, specialty, and goals of the EP (C4.4);

- attestation forms of higher education applicants meet the requirements of the higher education standard (C5.2);

- clear and understandable rules for conducting control measures are defined, which are available to all participants of the educational process, and which ensure the objectivity of examiners (C5.3);

- the academic and/or professional qualification of the teachers involved in the implementation of the EP ensures the achievement of the goals and program learning outcomes defined by the corresponding EP (C6.1);

- procedures for the competitive selection of teachers are transparent and provide an opportunity to ensure the necessary level of their professionalism for the successful implementation of the EP (C6.2);

- the university promotes the professional development of teachers through its programs or in cooperation with other organizations (C6.5);

- the university stimulates the development of teaching skills (C6.6);

- financial and material and technical resources, as well as educational and methodological support of the EP guarantee the achievement of the EP goals and program learning outcomes (C7.1);

- the university provides free access for teachers and students of higher education to the relevant infrastructure and information resources necessary for training, teaching, and/or scientific activities within the EP (C7.2);

- the university provides educational, organizational, informational, advisory, and social support for higher education students studying under EP (C7.4);

- the results of external quality assurance of higher education are taken into account when reviewing the EP (C8.6);

- the content of the EP corresponds to the scientific interests of graduate students and ensures their full preparation for research and teaching activities in the specialty (C10.1).

Among the significant sub-criteria of the CQEP, experts singled out first of all the sub-criteria regarding human resources (C6), educational environment and material resources (C7), and the structure and content of the EP (C2). Experts had the most doubts about the sub-criteria of CQEP C9 regarding transparency and publicity. The greatest spread of experts' opinions (from the weightiest to the least weighty) can be ascertained for the CQEP sub-criteria C3 (access to EP and recognition of training results) and C9 (transparency and publicity). With this in mind, this CQEP sub-criteria requires close attention when revising them for a better balance of the CQEP sub-criteria system.

In total, 5 (out of 10 – 50%) CQEP and 29 (out of 54 – 54%) CQEP sub-criteria were identified.

6. Conclusions

Harmonization of the list of fields of knowledge and specialties for which higher education students are trained with ISCED, as well as the national terminological and conceptual apparatus with the international one, should be considered extremely appropriate in Ukraine. Differences in the results of the assessment of CQEP and their sub-criteria by experts from universities of countries that have a long and a shorter period of work within the framework of the EHEA and the Bologna process should be noted.

The question of preparing HEIs for EP accreditation and meeting the most essential requirements of the sub-criteria of the CQEP, which include sub-criteria regarding human resources, the educational environment, material resources, and the structure and content of the EP, remains relevant. Also, a large number of existing sub-criteria of CQEP cause opposite assessments of university experts. This makes it necessary to carry out regular expert studies on the comparison of the importance of the CQEP for different fields of knowledge.

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