The Influence of the Internal Quality System on the External Quality Assessment of Higher Education Institutions in Croatia

Budimir, Verica; Župan, Mario; Jeleč Raguž, Mirjana

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Verica Budimir, Ph. D., Assistant Professor
Faculty of Tourism and Rural Development Požega, Croatia
E-mail address: vbudimir@ftrr.hr

Mario Župan, Ph. D., Assistant Professor
Faculty of Tourism and Rural Development Požega, Croatia
E-mail address: mzupan@ftrr.hr

Mirjana Jeleč Raguž, Ph. D., Assistant Professor
Faculty of Tourism and Rural Development Požega, Croatia
E-mail address: mjelecraguz@ftrr.hr

THE INFLUENCE OF THE INTERNAL QUALITY SYSTEM ON THE EXTERNAL QUALITY ASSESSMENT OF HIGHER EDUCATION INSTITUTIONS IN CROATIA

ABSTRACT

Ensuring the quality of higher education is imperative for a modern knowledge-based society. The internal quality assurance system is expected to improve all aspects of institutional activity in accordance with its learning and teaching mission. This paper analyses the results of the re-accreditation of Croatian higher education institutions with the aim to research the link between the quality level of the internal quality assurance system and the quality level of other evaluation areas (1. internal quality assurance and the social role of higher education institutions; 2. study programmes; 3. teaching process and student support; 4. teaching and institutional capacities; 5. professional/scientific/artistic activities). To achieve the research goal and confirm the main hypothesis of the paper, the results of the re-accreditation procedures of Croatian higher education institutions in the second cycle were taken, and specific statistical tests were performed: Spearman correlation test, Kruskal-Wallis test and Dunn's test. The results prove the existence of a correlation between the development of the internal quality assurance system and the external quality assessment in all areas of evaluation. The implementation of a high-quality and comprehensive internal quality system can improve the quality of all areas of higher education and therefore higher education as a whole.

Key words: *Croatia, higher education, quality, ESG, re-accreditation.*

1. Introduction

The most important factor in economic success is human capital, i.e. the knowledge, skills, independence and responsibility possessed by individuals. Developed world economies have long seen that the quality of the education systems significantly affects the economic development of a country. Higher education represents the highest level of formal education, so knowledge-based economies focus on the continuous development and improvement of this system. The role of higher education in today's global economic environment is multifaceted. Higher education institutions (HEIs) should prepare students for the labour market, which is continually shifting due to constant global changes and innovative processes. To offer quality

support to the industry and businesses in general, HEIs should ensure the achievement of relevant knowledge and adequate skills that will improve the social cohesion (involvement) of the population and enable the country's economic progress. Modern HEIs should be the drivers of innovation and new technologies. The above-mentioned imperatives, along with the growing internationalisation of HEIs, strengthen the need for quality education and thus ensure the quality of higher education.

Quality assurance is a collective process by which HEIs ensure compliance of the educational process quality with the given standards (Wilger, 1997). Quality assurance activities have a dual purpose - *accountability and improvement* (ENQA, 2015). A successfully implemented quality assurance system provides information to all stakeholders about the quality of HEI's work (responsibility), and advice and recommendations on how that work can be improved (improvement). The HEI quality evaluation as a whole or evaluation of an individual programme carried out by an accreditation body to formally determine compliance with the minimum criteria or standards is called accreditation (Vlăscenau et al., 2007). The result of the accreditation process is usually an award of temporary status or a decision (yes or no) on a licence to work. Accreditation agencies develop quality standards and procedures used to instruct HEIs to continuously improve all activities to ensure the quality of the educational process. Expert committees base their decision-making and recommendations for improvement on the above standards.

In the European Higher Education Area (EHEA), the Bologna process particularly emphasises quality assurance. To promote the employment of European citizens and the international competitiveness of the EHEA, and to encourage mobility by overcoming obstacles to free movement, this process promotes European cooperation in the development of comparable criteria and methodologies for quality assurance of the higher education system (The Bologna Declaration, 1999). The European Association for Quality Assurance in Higher Education (ENQA) in cooperation with the European Students' Union (ESU), the European University Association (EUA), and the European Association of Institutions in Higher Education (EURASHE) created a set of common standards, procedures and guidelines for quality assurance in higher education published in the document Standards and guidelines for quality assurance in the European Higher Education Area (ESG) (ENQA, 2005). The standards were revised in 2014 and adopted by the EHEA ministers in 2015. The document content is sufficiently broad, which enables its use at the national level by all signatory countries of the Bologna Declaration, regardless of cultural and historical heritage, adopted legal framework, etc. The aforementioned Standards and guidelines cover three main areas of the quality assurance system: (1) internal quality assurance; (2) external quality assurance, and (3) external quality assurance agencies. Their purpose is to create a common framework of the "quality assurance system at the European, national and institutional levels and to enable the assurance and improvement of the quality of higher education. The standards aim to foster mutual trust and provide information on quality assurance in the EHEA" (ENQA, 2015).

In accordance with ESG (ENQA, 2015), HEIs are primarily responsible for the quality of their own work and its assurance. HEIs, therefore develop their own quality assurance models in accordance with ESG, national standards, strategic documents, and other organisational specifics. For the model to be successful and ensure the quality of the work of the entire institution, it is important to include all areas of activity in accordance with the mission, vision, and strategy of the institution and to include different stakeholders in its creation, implementation and evaluation. According to Budimir (2020), "a well-established internal quality assurance system that enables continuous implementation, supervision and evaluation

of all activities of the institution contributes to the quality of the higher education institution and higher education as a whole." In the re-accreditation process, the accreditation body performs the external evaluation of the quality of the institution's work in accordance with defined standards. Considering the clear connection between internal and external quality assurance, and since no similar studies were found in the literature, this study investigates whether there is a link (correlation) between the quality level of the internal quality assurance system and the quality level of other evaluation areas in the re-accreditation procedures of HEIs in Croatia. The main hypothesis of the paper is that a well-established internal quality assurance system ensures the quality of all areas of the institution.

This paper consists of five structurally connected parts. After the introduction, the second chapter explains the quality assurance of HEIs in Croatia, internal systems, and external assessment. The third chapter presents the research methodology, and the fourth presents the results of the conducted research. The fifth chapter offers a discussion of the results, recommendations for improvement and conclusions.

2. Ensuring the quality of higher education institutions in Croatia

The Bologna Process encourages HEIs in the EHEA to promote the transparency and accreditation of study programmes. External quality evaluation starts with the expectation at the national level that institutions will develop independent internal processes that lead to quality improvement (Kristensen, 2010). "Higher education institutions are expected to develop a culture of quality that contributes to the realisation of the vision development and better recognition at the national and international level" (Legčević & Hećimović, 2016). The aforementioned trends have increased interest in the development of internal quality assurance systems of HEIs to support external evaluation processes and meet defined standards and criteria (Huet et al., 2011).

Higher education in Croatia includes undergraduate, graduate and postgraduate levels in accordance with the Bologna system. According to data from the MOZVAG system (ASHE, 2022a), 131 higher education institutions in Croatia offer 1,667 study programmes. By signing the Bologna Declaration in 2001, Croatia undertook the promotion of European cooperation in quality assurance with the aim of developing comparable criteria and methodologies. The quality assurance systems of HEIs in Croatia are organised in accordance with ESG. Education and science are closely related, and the primary responsibility for the quality of higher education and science at higher education institutions lies with the institutions themselves. The fundamental act, which regulates quality assurance and improvement in science and higher education, is the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09).

HEIs in Croatia should establish an internal system for quality assurance and improvement in accordance with the Act (Official Gazette 45/09, Article 18.). Each institution regulates its internal system by its general act. The internal system includes measures and activities by which HEI ensures its responsibility for the efficiency and achievement of quality outcomes of educational and scientific activities (Act, 45/09, Article 2). The following is important for establishing a functional internal quality assurance system (ASHE, 2019):

- The internal quality assurance system encompasses the entire work of the HEI and all its activities (study programmes, teaching process, student support from different

groups, learning resources, professional/scientific/artistic activity, international cooperation, etc.).
- The HEI adopts a quality policy as a part of strategic management. The policy is enacted through action plans with measurable indicators of success, monitoring of implementation, and reporting that contains an analysis of success, an assessment of effectiveness and proposals for improvement.
- All plans, activities, processes, resources and results are documented and available for effective management and improvement of all activities and further development.
- The HEI uses different methods to collect information about the quality of all its activities (student surveys about teaching and studies, collaborative evaluation, feedback from graduates and employers, etc.) and performance indicators (e.g. pass analysis, graduate employment, dropout rates, etc.), and uses them to ensure and improve quality and inform the community.
- All stakeholders (employees, students, entrepreneurs, local community, vocational and professional associations, and alumni) are actively involved in the internal quality assurance system.
- The HEI is dedicated to management development, teaching/scientific/artistic, administrative, professional, and technical potentials in accordance with the principles and standards of the profession.

Each HEI aligns its internal quality assurance system with ESG, which in its Part 1: Standards and guidelines for internal quality assurance, includes (ENQA, 2015):

"1.1. Policy for quality assurance
1.2. Design and approval of programmes
1.3. Student-centred learning, teaching and assessment
1.4. Student admission, progression, recognition and certification
1.5. Teaching staff
1.6. Learning resources and student support
1.7. Information management
1.8. Public information
1.9. Ongoing monitoring and periodic review of programmes
1.10. Cyclical external quality assurance"

Through an internal quality system, HEIs accomplish their vision and mission. To accomplish the vision and mission, and meet the user needs, HEIs develop mechanisms and procedures that they use for planning, implementing and controlling various activities (Daromes & Ng, 2015). The fundamental processes by which HEI ensures quality are:

a) Planning – plans of measures and activities for the implementation and improvement of the quality assurance system, action plans, financial plans, improvement plans, etc.
b) Implementation – performance of all activities in accordance with plans and other internal acts.
c) Verification - presentation of performed analyses and performance monitoring, internal judgement.
d) Change - based on collected and analysed information from all stakeholders, the results of internal and external assessment, and performance measurement, the HEI quality assurance system is developed and improved.

The Act defines quality evaluation procedures and the activities of the Agency for Science and Higher Education as a public institution that ensures and improves quality in science and higher education. In accordance with the Act, the Agency independently and separately performs

evaluation procedures, namely, initial accreditation, re-accreditation, thematic evaluation, and external independent periodic assessment of internal quality assurance and improvement systems (audit).

Re-accreditation is a mandatory external evaluation procedure that all HEIs in Croatia undergo. This procedure evaluates the fulfilment of the necessary conditions (academic threshold) along with the evaluation of the quality of HEIs according to the defined quality standards. "The purpose of the procedure is to encourage further quality development in the main aspects of the activities of HEIs and to ensure that student study at HEIs/study programmes that meet the necessary conditions" (ASHE, 2021, 12). The procedure is carried out in five-year cycles, and the outcomes are a licence, a letter of expectation, or denial of a licence.

The first cycle of re-accreditation was from 2010 to 2016. The outcomes of the procedure were the issuance of licences for 76 higher education institutions, letters of expectation for 51 higher education institutions, and denial of licences for 4 higher education institutions and 28 study programmes (ASHE, 2021, 12). After its completion, the model was improved and the standards for quality evaluation in the re-accreditation process were defined (ASHE, 2019) and aligned with ESG from 2015. The second cycle is aimed at reviewing the improvements made by HEIs according to the recommendations for quality improvement from the first cycle and meeting the re-accreditation standards (ASHE, 2021, 12). The standards for quality evaluation cover five areas of institutional activity (topics) aligned with ESG (ASHE, 2019):

1. "Internal quality assurance and the social role of the higher education institution (ESG 1.1., 1.2., 1.8.) (6 standards),
2. Study programmes (ESG 1.2., 1.9.) (6 standards),
3. Teaching process and student support (ESG 1.3., 1.4., 1.6.) (10 standards),
4. Teaching and institutional capacities (ESG 1.5., 1.6.) (6 standards),
5. Professional/scientific/artistic activity (5 standards)."

Within each topic, standards are defined and compared with actual achievements (33 standards). The key standards are discriminatory, and failure to fulfil them impairs the quality of the entire HEI. For each standard and topic, the expert committee in the re-accreditation process specifies one of four grades: (1) unsatisfactory, (2) minimal, (3) satisfactory or (4) high-level of quality. The outcome of the procedure depends on the fulfilment of the key standards as well as the overall quality assessment.

3. Methodology

Upon completion of the re-accreditation procedure, the evaluation results are published on the Agency's website (ASHE, 2022b). For each higher education institution, documents (report of the Expert Panel - in Croatian and English, a statement of the higher education institution, an accreditation recommendation and a decision of the Ministry of Science and Education) and outcomes (ASHE/MSE - issuance of a confirmation on the fulfilment of conditions, issuance of a letter of expectation with a deadline for resolving deficiencies, or denial of a licence) are published. For the purposes of this study, the accreditation recommendations of the Agency for Science and Higher Education were analysed during the re-accreditation process of higher education institutions. The recommendations listed in the *Quality assessment* item show the assessment of the quality level by topics and standards (from (1) unsatisfactory to (4) high). The analysis includes HEIs that underwent the re-accreditation procedure in the second cycle from 2017 to 2021 (undergraduate and graduate level). The aforementioned procedure was

completed for 89 higher education institutions, of which 38 received confirmation, and 51 received a letter of expectation. (ASHE, 2022b). To determine the average results and the deviation from the average, descriptive statistics were used (minimum, maximum, mean value and standard deviation by topic).

Since this study investigated the existence of a link between the quality level of the internal quality assurance system and the quality level of other evaluation areas in the re-accreditation procedures, specific statistical tests were performed. Through key standard 1.1. *The university has established a functional system of internal quality assurance*, the development of the internal quality assurance system was evaluated, then it was separated and used for comparison with topics (1–5). The non-parametric Spearman correlation test was performed to determine the correlation between standard 1 and each topic as well as the correlation between topic 1 *Internal quality assurance and the social role of higher education* and the remaining topics. The Spearman correlation coefficient (product of rank correlation) is used to measure the connection between variables. It is based on measuring the connection consistency between the rank variables while disregarding the type of connection (Horvat & Mijoč, 2022). The Spearman correlation coefficient can be calculated using the following formula:

$$r_s = 1 - 6 \sum_{i+1}^{n} \frac{d_i^2}{n(n^2 - 1)}$$

where d is the difference between the two ranks of each observation, and n is the number of observations. Value -1 indicates an inversely proportional strong correlation while 0 indicates no correlation between the two variables, and 1 indicates a compelling positive correlation.

The Spearman test results were verified with two statistical tests: Kruskal-Wallis and Dunn's test. The Kruskal-Wallis test is a non-parametric test used to compare the results of a continuous variable (Newbold et al., 2010, 647). This is calculated using the following formula:

$$H = (N-1)\frac{\sum_{i=1}^{g} n_i \left(\bar{Y}_{i.} - \bar{Y}\right)^2}{\sum_{i=1}^{g}\sum_{j=1}^{n_i}\left(Y_{ij} - \bar{Y}\right)^2}$$

"N is the total number of observations across all groups
g is the number of groups
n_i is the number of observations in group i
Y_{ij} is the rank (among all observations) of observation from group
$\bar{Y}_{i.} = \frac{\sum_{j=1}^{n_i} Y_{ij}}{n_i}$ is the average rank of all observations in group i
$\bar{Y} = \frac{1}{2}(N+1)$is the average of all the Y_{ij}"

Based on the main hypothesis of the paper, that a well-established internal quality assurance system ensures the quality of all areas of the institution, hypotheses H0 is defined:

- *H0 (the null hypothesis): the median grades of the observed three groups are equal*

Three groups are defined. The groups indicate grades from (2) minimum to (4) high. The Kruskal-Wallis test requires at least 5 measurements, and due to only two institutions receiving grade 1, the grade 1 distribution was not considered. The conducted test rejected the null hypothesis (H0) for an equal relationship between all distributions, so we switched to Dunn's test to assess the relationships between the distributions of individual grades (Dunn, 1964). e.g. if grade 2 for Standard 1 is significantly different from grade 2 for topic 1. This is a non-parametric test based on the arithmetic mean, as opposed to the Kruskal-Wallis test based on the median. It is calculated using the formula:

$$z_{A,B} = \frac{\overline{W_A} - \overline{W_B}}{\sigma_{A,B}}$$

$$\overline{W_i} = \frac{W_i}{n_i}$$

W_i is group's summed rank
n_i is sample size
The results of the conducted tests are presented in the next chapter.

4. Results

The structure of the analysed higher education institutions by type and category is shown in Table 1.

Table 1: Structure of re-accredited higher education institutions

Structure of HEIs		Number of HEIs
Type	Private	18
	Public	71
Category	Faculty	50
	Polytechnic	16
	College	13
	University centre	2
	University department	6
	University	1
	Arts academy	1

Source: Authors according to https://www.azvo.hr/ishodi-vrednovanja/

Through the structure analysis of re-accredited HEIs, it is concluded that the procedure covers different HEIs both by type and structure, and the results are summarised for the entire sample. The re-accreditation results can be seen in Table 2.

Table 2: Results of re-accreditation (grades by topic)

Value	Topic				
	Internal quality assurance and the social role of HEI	Study programmes	Teaching process and student support	Teaching and institutional capacities	Professional / scientific / artistic activities
Topic number	1	2	3	4	5
Mean	2.86	2.83	3	2.92	2.53
std	0.63	0.63	0.52	0.63	0.59
min	1	1	1	2	1
max	4	4	4	4	4

Source: Authors according to https://www.azvo.hr/ishodi-vrednovanja/

According to result analysis, the higher education institutions achieved the highest grades in topic 3 *Teaching process and student support*, and the lowest in topic 5 *Professional/scientific/artistic activity*. The standard deviation ranges from 0.52 for topic 3 to 0.63 for topic 4. The highest score (4) high-level of quality was achieved in all topics, while none of the HEIs achieved the lowest score (1) unsatisfactory quality score in topic 4. The quality level of the internal quality assurance system was assessed in topic 1 through key standard 1.1 *The higher education institution has established a functional system internal quality assurance system*. This standard will be used in further analyses; therefore, it has been highlighted. The analysis determined that the average grade of this standard is 2.79, with a standard deviation of 0.66, a minimum grade of 1 and a maximum of 4.

Since the paper determined whether there is a connection between the quality level of the internal quality assurance system and the quality level of other evaluation areas, a correlation was made between standard 1 and all topics, i.e. between topic 1 and the remaining topics. Spearman correlation was used and the results are shown in Table 3 and Figures 1 to 5.

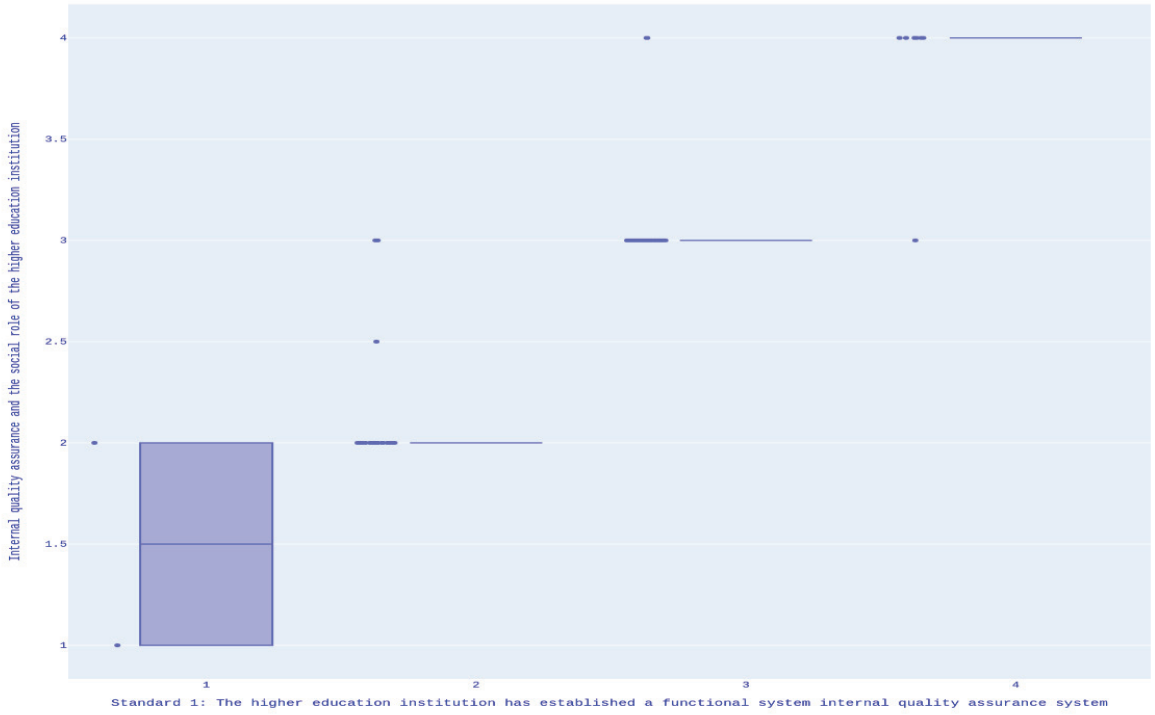
Table 3: Correlation analysis (Spearman's rho) findings

Standard / topic	Topic	Spearman's	P
S 1	1	0.90	2.06e-33
	2	0.52	1.70e-07
	3	0.39	0.00
	4	0.56	8.55e-09
	5	0.32	0.00
T1	2	0.44	1.30e-05
	3	0.42	4.69e-05
	4	0.50	6.29e-07
	5	0.30	0.00

Source: Authors according to https://www.azvo.hr/ishodi-vrednovanja/

Figure 1 shows the connection between standard 1 *The higher education institution has established a functional system internal quality assurance system* and topic 1 *Internal quality assurance and the social role of the higher education institution*.

Figure 1: Correlation between standard 1 and topic 1

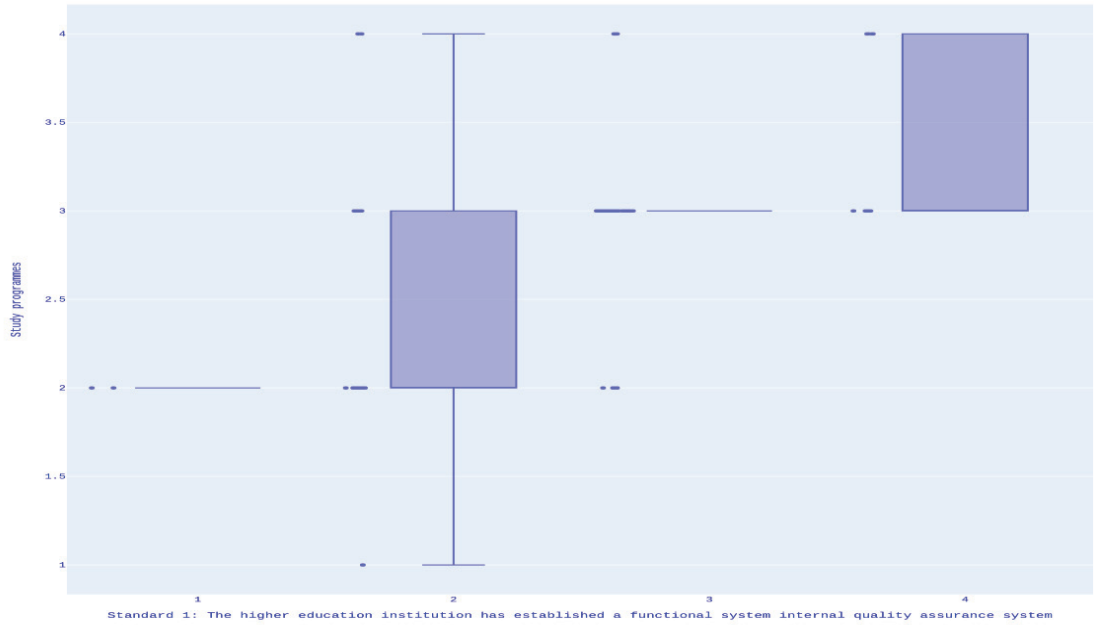


Source: Authors

By analysing Figure 1 results, it can be concluded that there is a linear connection between standard 1 and topic 1. The Spearman correlation proves the same. HEIs with unsatisfactory quality of standard 1 were rated unsatisfactory to minimal quality in topic 1 with a median of 1.5, while HEIs with a high-level of quality in standard 1 achieved the same rating in topic 1. Since standard 1 represents a key standard in topic 1, which emphasises its importance in the evaluation of the entire topic, this result is expected.

The connection between standard 1 and topic 2 *Study programmes* is shown in Figure 2. The results point to the conclusion that there is a substantian connection between standard 1 and topic 2. All HEIs that were assessed as having an unsatisfactory level of quality in standard 1 achieved the minimum level of quality in topic 2. Most HEIs with the minimum quality level in standard 1 achieved grades from minimum to satisfactory in topic 2 with a median of 2. The median of HEIs that achieved a satisfactory grade in standard 1 is also a satisfactory (3) level in topic 3, while the grades in topic 2 for HEIs with a high-level of quality in standard 1 range between satisfactory (3) and high levels (4). Spearman correlation test for standard 1 and topic 2 also shows a specific connection.

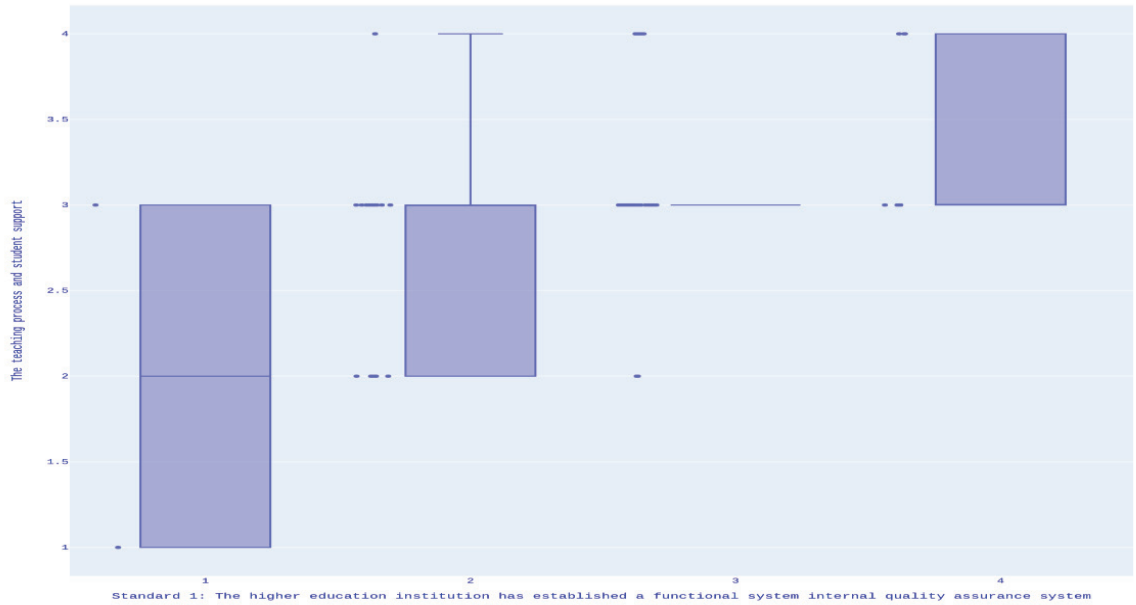
Figure 2: Correlation between standard 1 and topic 2



Source: Authors

The relationship between standard 1 and topic 3 *The teaching process and student support* is shown in Figure 3.

Figure 3: Correlation between standard 1 and topic 3



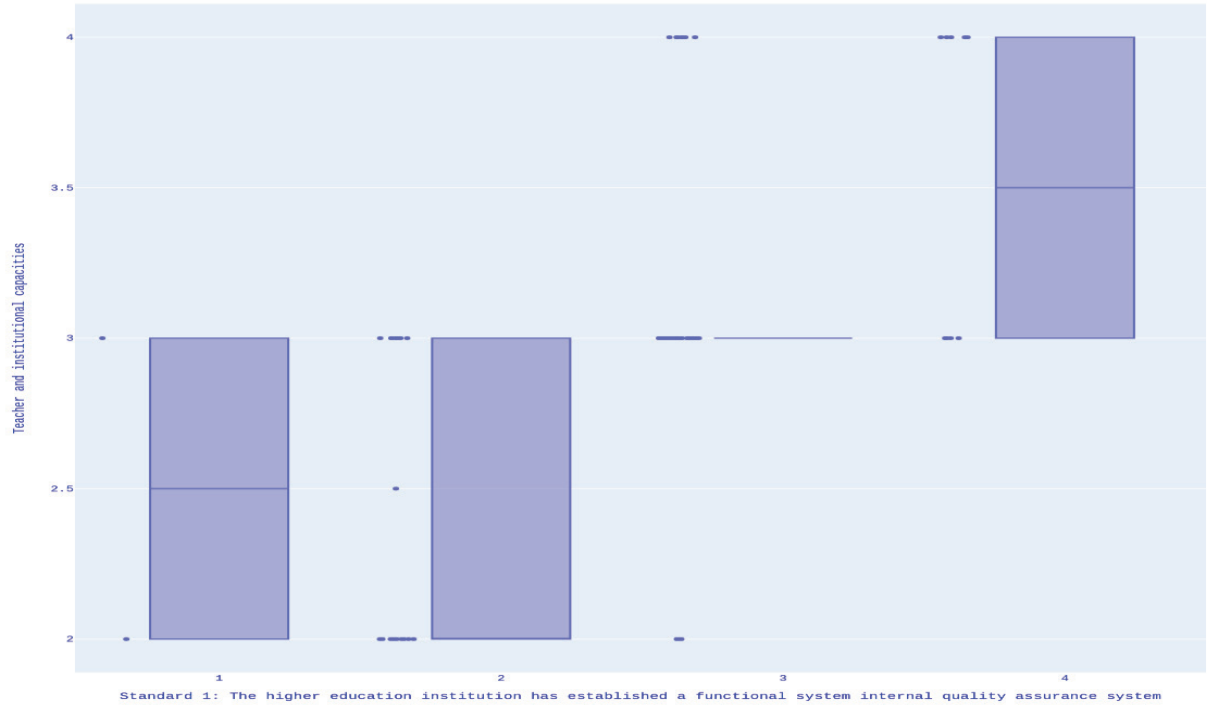
Source: Authors

The results shown in Figure 3 show that there is a low correlation between the grades in standard 1 and topic 3 with a coefficient of 0.39. HEIs that were evaluated with lower grades in standard

1 also achieved lower grades in topic 3, while HEIs with higher grades in standard 1 also achieved higher grades in topic 3. The median grade of topic 3 is (3) a satisfactory level of quality for HEIs that were rated (2) minimal, (3) satisfactory and (4) high-quality level for standard 1.

The connection between standard 1 and topic 4 *Teacher and institutional capacities* is shown in Figure 4.

Figure 4: Correlation between standard 1 and topic 4.

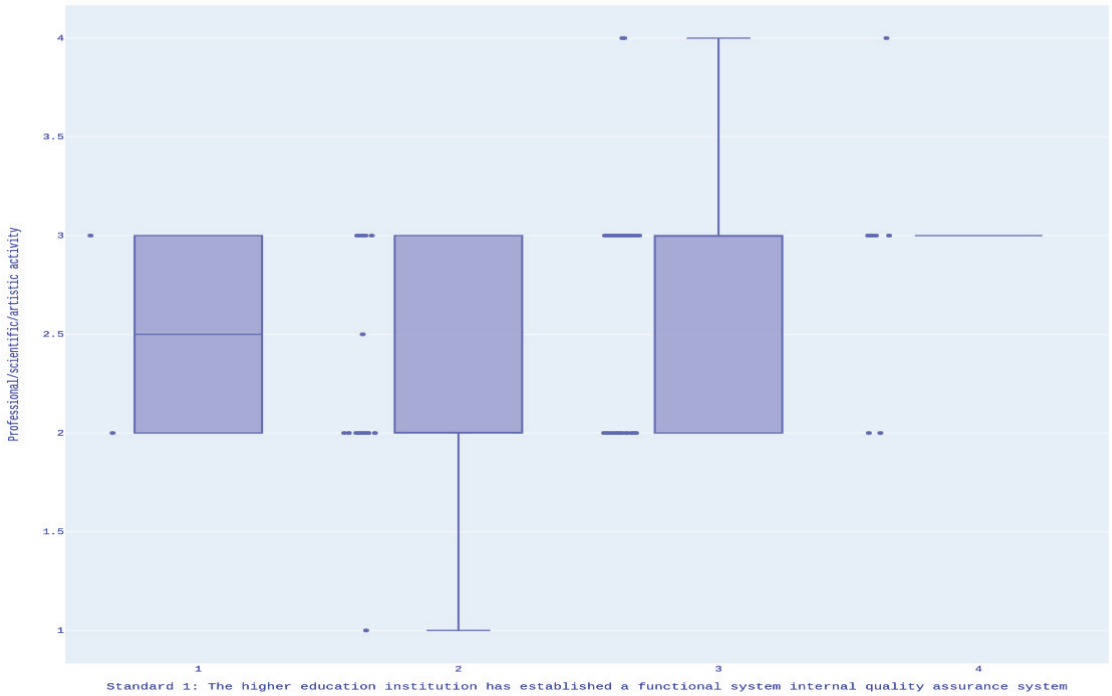


Source: Authors

Figure 4 also indicates the substantial connection between the grades in standard 1 and topic 4 with a correlation coefficient of 0.56. HEIs with lower grades in standard 1 achieved lower grades in topic 4, while HEIs with higher grades in standard 1 also achieved higher grades in topic 4. The median of HEIs that achieved grade (3) high-level of quality in standard 1 is also (3) high-level quality in topic 4.

Figure 5 shows the relationship between standard 1 and topic 5 *Professional/scientific/artistic activity*. The grades for topic 5 show the lowest level of correlation with the grades in standard 1, with a coefficient of 0.32. Topic 5 scores for most HEIs range from (2) minimal to (3) developed. The medians of HEIs with a grade (3) satisfactory and (4) high-quality level in standard 1 are (3) satisfactory quality level in topic 5. The median grade in topic 5 for HEIs that achieved grade (2) minimum quality level in standard 1 is also (2) minimal.

Figure 5. Correlation between standard 1 and topic 5



Source: Authors

The Spearman test confirmed there is a correlation between standard 1 and the topics as well as between topic 1 and the remaining topics. To verify the result, the Kruskal-Wallis test of hypothesis H0 was performed. Based on the Kruskal-Wallis test, it was proven that there is a significant difference between the standard 1 grade and the distribution of grades in all topics. The results are shown in Table 4.

Table 4: Kruskal-Wallis analysis

Standard / topic	Topic	Statistics	P	H0
S1	1	68.83	0.00	reject
	2	20.48	0.00	reject
	3	11.87	0.00	reject
	4	27.72	0.00	reject
	5	9.50	0.00	reject
T1	2	18.18	0.00	reject
	3	16.22	0.00	reject
	4	22.98	0.00	reject
	5	7.45	0.02	reject

Source: Authors

Based on the Kruskal-Wallis test, the null hypothesis (H0) was rejected for all distributions. The test proves that the distribution of standard 1 grades is significantly different in relation to the distribution of grades in individual topics. The P value (probability) is slightly lower for topic 5, but still significant.

A test between the score distribution in topic 1 and the remaining topics was also carried out. Here, too, the test showed that the score distribution in topic 1 differs significantly from the

score distribution in individual topics. The P value (probability) is the lowest for topic 5, but it is still significant because it is less than 0.05.
As the Kruskal-Wallis test generalised and rejected the null hypothesis for the relationship between all distributions, we used Dunn's test to assess relationships between the distributions of individual scores. The results are shown in Table 5.

Table 5: Dunn's test

S1 vs T1	**2**	**3**	**4**
2	1.00e+00	8.69e-10	7.97e-14
3	8.65e-10	1.00e+00	4.22e-04
4	7.97e-14	4.22e-04	1.00e+002
S1 vs T2	**2**	**3**	**4**
2	1.00	0.00	0.00
3	0.00	1.00	0.12
4	0.00	0.12	1.00
S1 vs T3	**2**	**3**	**4**
2	1.00	0.01	0.00
3	0.01	1.00	0.65
4	0.00	0.65	1.00
S1 vs T4	**2**	**3**	**4**
2	1.00	0.00	0.00
3	0.00	1.00	0.15
4	0.00	0.15	1.00
S1 vs T5	**2**	**3**	**4**
2	1.00	0.07	0.01
3	0.07	1.00	0.41
4	0.01	0.41	1.00
T1 vs T2	**2**	**3**	**4**
2	1.00	0.00	0.00
3	0.00	1.00	0.22
4	0.00	0.22	1.00
T1 vs T3	**2**	**3**	**4**
2	1.00	0.00	0.00
3	0.00	1.00	0.72
4	0.00	0.72	1.00
T1 vs T4	**2**	**3**	**4**
2	1.00	0.00	0.00
3	0.00	1.00	0.37
4	0.00	0.37	1.00
T1 vs T5	**2**	**3**	**4**
2	1.00	0.05	0.07
3	0.05	1.00	1.00
4	0.06	1.00	1.00

Source: Authors

At first glance, it can be seen that the distributions of all grades in standard 1 versus topic 1 (probability) are far below 0.05, which is solid evidence that the dataset comprising institutions that received a grade 2 in standard 1 is significantly different from institutions that received 3 or 4 in topic 1. The same applies to grades 3 and 4.

But such results were not obtained for all topics. E.g., the grade 3 distribution of standard 1 is the same as grade 4 in the topic *Study programmes* (p=0.12) while the grade 3 distribution of standard 1 is significantly different from the grade 2 distribution in the aforementioned topic (p=0.00). A similar situation is visible in the remaining topics. For example, the grade 3 distribution of standard 1 and the grade 2 of the topic *Teaching process and student support* are the same (p=0.01). While the grade 4 distribution of standard 1 and grade 2 of the same topic differed significantly (p=0.00).

The results of Dunn's correlation test on topic 1 and the remaining topics showed similar results. For example, the grade 2 distribution of the topic *Internal quality assurance and the social role of the HEI* is significantly different compared with the grade 3 (p=0.00) and 4 (p=0.00) distribution of the topic *Teaching and institutional capacities*. The grade 3 distribution of topic 1 and the grade 2 distribution of topic 4 are significantly different (p=0.00), while the grade 3 distribution of topic 1 and the grade 4 distribution of topic 4 are statistically the same (0.37).

Through the analysis of Dunn's test results, it can be concluded that HEIs that got a lower grade for standard 1 and topic 1 have little or no chance of getting high grades in other topics. The reverse is also true. The topic that deviates from these results is 5 *Professional/scientific/artistic activity*. There are no significant differences in the correlation between the distribution of grades in standard 1 and topic 5, and the distribution of grades in topic 1 and topic 5 (except for grade 4 in standard 1 and grade 2 in topic 5, where p=0.01). This result is expected because HEIs associate internal quality assurance systems with the improvement of learning and teaching, while they are less oriented towards the improvement of scientific, professional and/or artistic work. ESG, on which quality assurance systems are based, is primarily focused on quality assurance in the field of learning and teaching, but the importance of connecting with science and innovation is also emphasised.

5. Discussion and conclusion

Higher education represents the last step in the formal education of the population. The higher education system is continuously changing and adapting to market needs. To meet the growing market needs for highly educated staff, the number of HEIs in Croatia, as well as in numerous other countries, has grown significantly in recent times. Existing HEIs are expanding or merging, study programmes are changing or new ones are being offered. All these changes affect the expansion of the population's educational opportunities, and the provision of knowledge and skills needed by society. However, the intensity of changes in scope, coverage, employees and costs raise the issue of ensuring the quality of the higher education process and its final output - a graduate.

The Bologna process encouraged the European Higher Education Area, to which Croatia also belongs, to introduce formal mechanisms of evaluation and quality assurance, thus re-accreditation was accepted as one of such mechanisms. Through the re-accreditation process, independent bodies (agencies) evaluate and assess the quality level of higher education institution according to defined standards in all areas of activity and give recommendations for further improvements. The purpose of this procedure is to ensure that student study at HEIs that meet the necessary conditions and to encourage further development of the quality of HEIs, and the educational system as a whole. In the Croatian system of higher education, re-accreditation procedures are managed by the Agency for Science and Higher Education, and evaluation is

executed in accordance with the Act and standards for quality evaluation that are coordinated with ESG.

HEIs are responsible for ensuring the quality of all their processes and results, and defining their own internal systems for quality assurance in accordance with national standards, strategic goals and institutional specificity. A well-established internal quality assurance system covers all HEI's processes and activities, their planning, implementation, evaluation and improvement. The Agency performs evaluation and the quality level grading of all HEI activity areas through the re-accreditation process. To investigate the link between the quality level of the internal quality assurance system and the quality level of other evaluation areas, the results of re-accreditation were analysed for all Croatian HEIs that underwent this procedure in the second cycle. The results of the research confirmed the main hypothesis of the paper, that a well-established internal quality assurance system ensures the quality of all areas of the institution's activities.

The implementation of quality assurance processes in the context of comprehensive management of study programmes includes various activities related to programme development and improvement. The aim of these activities is to assess and improve the appearance, content and performance of study programmes (Henard & Roseveare, 2012). "All quality assurance initiatives are aimed at improving the overall academic quality of study programmes. This is especially important in the context of international accreditation, which confirms the compliance of the study programme with the European quality standards" (Roskosa & Stukalina, 2018).

The development of internal quality assurance systems creates formal mechanisms for evaluating and monitoring the teaching and learning process. The developed quality system focuses more on the role of teachers and teaching methods, and students are at the centre of teaching and their perspectives and interests are considered (Brennan & Shah, 2000). Alternatively, some research shows that quality assurance creates certain effects, although they are more related to management and accountability issues than to teaching and learning (Stensaker & Harvey, 2011; Mårtensson et al., 2012).

Teachers are important stakeholders in quality assurance because the quality of their teaching activities determines the competencies and success of students. In addition to teachers, the infrastructural and technical equipment of HEI and the library services offered to students play an important role in the teaching process. The quality of teaching and institutional capacities has a positive effect on students' knowledge and skills, i.e., competencies, and their employability in the labour market (Gora et al., 2019). Higher education based on competencies and focused on employability in a knowledge society needs education through research. Research abilities are important and useful to employees, and only research-related higher education can provide such competencies (Commission of the European Communities, 2002; Simons & Elen, 2007).

The results of the research presented in the paper show a weak connection between the development of the internal system for quality assurance and the assessment of the quality of scientific, research, and/or artistic work of Croatian HEIs. It is concluded that HEIs, when defining and implementing internal quality systems, pay considerable attention to the planning and implementation of study programmes, the teaching process, and student support, but there is room for improvement and development of internal quality systems in the field of

scientific/professional/artistic work. HEIs should develop their internal quality systems in order to better plan and monitor internal processes related to scientific and professional work.

The scientific contribution of this paper and the conducted research is visible in the research results that determine the link between the development of the internal quality system and the external quality assessment of HEI as a whole. The research results presented in this paper represent a scientific contribution to the field of economics in the theoretical and applied areas. The scientific results have a special value for managers of Croatian HEIs, the responsible Ministry and Agencies, and they clearly point to the importance of developing the internal quality system and the areas that need to be improved in the future.

The observed period is the period from 2017 to 2021, and it covers 68% of HEIs. It is a representative sample, and the results are expected to be relevant for the remaining HEIs. The paper analyses the results of re-accreditation of all HEIs, regardless of category (faculty, polytechnic, department, etc.), which is a limitation of this paper. Given the structural differences in the operations of these HEIs the authors encourage future research in which the data for each group of HEI will be analysed. The fundamental limitation of the research is that it is based on the analysis of the topic evaluations without considering the qualitative descriptions of the achieved results and recommendations for improvement. A more detailed analysis of the complete report of the expert committee, their qualitative analysis of the achieved results and recommendations for improvement for each topic and standard, would give a better insight into the real quality of HEIs, therefore research in this direction is encouraged.

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