Independent Evaluation of Learning Outcomes as a Tool of the Internal Quality Assurance System

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Abstract **– The article deals with the organization and conduct of the independent evaluation of student learning outcomes in the form of computer testing in 2021-2022. 402 first-year undergraduate students who were divided into 23 groups at 4 faculties took part in the evaluation. The novelty of the research includes the description of the procedure and mechanism of independent evaluation, as well as requirements for the structure of tests, the volume of the test bank, etc. The analysis and generalization of the results indicate the improvement of the performance indicators, quality of knowledge during the second periodic module control.**

Keywords **– internal quality assurance, independent assessment, learning outcomes, higher education, student.**

DOI: 10.18421/TEM122-13
https://doi.org/10.18421/TEM122-13

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Received: 13 January 2023.
Revised: 06 April 2023.
Accepted: 08 April 2023.
Published: 29 May 2023.

1. Introduction

Modern society is constantly facing various challenges, which are connected with ecology, economy, as well as political, religious and military confrontations. At the same time, we observe technological development, the emergence of new professions, types of creativity, and methods of communication. Under these conditions, higher education plays an important role in achieving the goals of sustainable development, ensuring the economic growth of the country, and forming both civil and inclusive society.

A significant number of European states have joined the creation of a single educational area which ensures an opportunity to obtain quality education and increase one's competitiveness on the international labor market in accordance with the Bologna Declaration, European Standards and Guidelines (ESG), and other documents. The integration of Ukraine into the European Higher Education Area (EHEA) has led to the emergence of new approaches and requirements for ensuring the quality of higher education, it has simplified the mechanisms for the correlation of the national framework of qualifications with foreign educational systems, and it has created conditions for the effective exchange of experience and the use of the best educational practices. At the same time, the issues of improving the quality of higher education and its compliance with the developed regulatory documents draws attention of researchers, heads of higher education institutions (HEIs) and civil servants [1], [2].

Monitoring and improvement of the quality of higher education are implemented through external and internal quality assurance systems. Authors Mursidi et al. [3], Aleksandrova et al. [4] analyzed the factors that affect the implementation of these mechanisms in the activities of HEIs. On the other hand, external and internal quality assurance systems should be evaluated in terms of their effectiveness [5], [6], [7] and they should be modernized according to the obtained results.

The implementation of processes and procedures of the internal quality assurance system in higher education (IQASHE) is within the competence of HEIs. Due to its relevance, IQASHE attracts the attention of many researchers. It includes the development of criteria and an algorithm for conducting internal evaluation of the quality of education [4], the definition of the current state of IQASHE and the main approaches to its improvement [2], the functionality and rights of the guarantor of the educational program [8], as well as the use of Learning Analytics mechanisms for evaluating and improving the quality of educational process [9].

All participants of the educational process take part in quality assurance [10], [11], [12]. Among them, the key place is occupied by the student, who is both the customer of education and the employer. He/she independently chooses a university for study, participates in various surveys, joins the project group for the development of an educational program, influences the educational processes which take place there [5], [13], etc. As a result, measuring and evaluation of student learning outcomes is an important component of IQASHE.

At Dmytro Motornyi Tavria State Agrotechnological University (TSAU), independent evaluation of educational achievements in all disciplines is conducted twice a semester for first-year students. The purpose of the study is to report on the mechanism of independent evaluation regarding student learning outcomes during the periodic module controls, as well as to carry out the analysis of the obtained results.

2. General background of research

The quality of education is one of the important factors that guarantee the competitiveness of higher education institutions on the market of educational services. It means the implementation of external and internal quality assurance procedures, functioning of relevant institutional facilities and agencies at the state and international level. The internal quality assurance system is an important component of the university activity, within which internal regulatory documents are developed, relevant events are conducted, and educational programs are improved. The main source for determining the effectiveness of the internal quality assurance system is the results of student surveys and their academic results.

2.1. Structure and directions of the internal quality assurance system

The quality of education has a developed structure and consists of the quality of academic resources and material-technical facilities, the quality of teaching and learning, the quality of educational programs [7], the quality of internal and external interaction [4] and other components. Varouchas et al. [5] defined the following quality indicators: preparation time, industry alignment, engagement, skill set, technology infusion, interaction with practitioners, research work depth, and interdisciplinary character. P. Grudowski [1] divides indicators of the quality of education into several groups: reliability, responsiveness, provision, empathy, tangibility.

According to the Law of Ukraine “On Higher Education”, the quality of higher education implies compliance of HEIs’ educational activities and learning outcomes with higher education standards, professional standards, society requirements, needs of interested parties, etc. Among the weaknesses of the Ukrainian quality system, researchers mention only partial provision of achieving the goals of sustainable development in educational programs [14], insufficient interaction of the guarantor with administrative management [8], a low level of students and interested parties’ involvement in ensuring the quality of education [2], the dominance of formal methods providing the quality of education [4].

At the same time, the domestic educational space is rapidly being modernized in accordance with international quality standards and it is getting better. Improving the quality of higher education is ensured by the implementation of external and internal quality assurance mechanisms, the procedures and measures of which are defined in Article 16 of the Law of Ukraine “On Higher Education”. Based on the analysis of future specialists’ training standards and publicly available information located on the websites of Ukrainian HEIs, Stukalo and Lytvyn [14] determine the compliance of external and internal quality assurance procedures with the goals of sustainable development and provide recommendations for their organization.

External quality assurance is the responsibility of institutional authorities and quality control agencies. In Ukraine, these functions are entrusted to the Ministry of Education and Science of Ukraine and the National Agency for Quality Assurance of Higher Education (NAQA).

HEIs are in charge of the implementation of the internal quality assurance system in higher education (IQASHE). HEIs within their autonomy: a) carry out self-assessment of all types of activities in the educational institution [7], [15], b) develop a set of procedures and measures that affect education quality, as well as the formation of general and professional competencies declared in the educational program, c) contribute to students' self-realization and self-development, d) form personnel potential, e) improve the management structure in accordance with normative documents [2].

IQASHE is regulated by a number of documents at the local, state and international levels. These include regulatory documents of higher education institutions, provisions on accreditation of educational programs, according to which students are trained, the Law of Ukraine "On Higher Education", etc. Within the framework of student training in certain specialties, the main documents are educational-professional and educational-scientific programs, which contain a list of general and professional competencies, educational components, program learning outcomes, etc. The guarantor [8] plays a key role in the formation of the educational program, as well as in the coordination of educational activities depending on the chosen management model. The periodic review and update of educational programs by interested parties directly affect the quality of future specialists training in the chosen specialty [16]. The process of monitoring and improvement of educational programs is divided into several stages: 1. Inventory; 2. Analyzes and peer review by critical friends; 3. Evaluation; 4. Planning change; 5. Realizing change [11]. This will ensure the continuity of the process of improving the quality of educational services within a specific educational program.

IQASHE can provide the following measures: development of internal regulations that define the procedures and tools for ensuring the quality of education; mid-semester and/or annual evaluation of students' educational achievements with further analysis of the obtained results; monitoring and update of educational programs; teacher training, annual review of their professional and academic qualifications; periodic updating of material and technical facilities taking into account the needs of every educational program; use of information systems for the effective management of the educational process; popularization of the principles of academic integrity and culture of quality; presentation of public information on the official website of the HEI and its structural units.

At the same time, since HEIs use different mechanisms and resources for ensuring the quality of education, the results can be different [3].

The important factor of the internal quality assurance system in education is that all the participants of the educational process should be aware of its importance [10]. They must bear a certain responsibility for the quality of education in accordance with the mission of the university, the goals of the educational program, etc. [15]. It is expected that in this way systematic improvement of educational services, improvement of the culture of quality, rapid adaptation to external and internal conditions, as well as increase in the level of satisfaction of interested parties will be ensured in all educational institutions [1]. Otherwise, the activities of the academic community and management will be process- and bureaucracy-oriented instead of being oriented at results and continuous improvement [16].

2.2. Use of surveys and evaluation of student learning outcomes to ensure quality

The internal quality assurance system means self-assessment provided by the institution of higher education and the introduction of appropriate mechanisms and activities in the educational process. For this, data collection is used in various directions [17]: quality of teaching and learning, graduates' career growth, teachers and students' satisfaction, stakeholders' opinions, etc. The important ways of obtaining data on the quality of educational activities implementation within the university are the surveys meant for the participants of the educational process and analysis of student learning outcomes.

Student surveys are often considered a basis for analysis and improvement of internal quality assurance [6]. In the process of student surveying, it is possible to learn about their attitude to the quality of the educational process organization, satisfaction with the quality of teaching in certain disciplines, forms and methods applied, professionalism of teachers, etc. It should be noted that, in accordance with academic freedom, teachers use the forms and methods of teaching that they consider to be the most effective within a specific discipline. Under modern conditions, it is well recommended to use a mixed form of learning [18], which allows combining the advantages of traditional and distance education, mass open online courses [19] as a form of informal education, immersive technologies as a modern means of visualization and immersion in the educational environment [20], and also project methodology [21] for the development of social and research skills.

A separate issue concerns compliance with the principles of academic integrity, which is one of the important components of education quality. At the end of the control measures, it is recommended to conduct a student survey regarding the transparency and comprehensibility of the evaluation procedures in a specific discipline, their compliance with the goals of the educational program and the evaluation procedures adopted in the higher educational institution [2]. The survey is conducted anonymously or through personal identification, depending on the expected result.

The results of the survey make it possible to implement a method of control by the administration, to identify weaknesses in teaching and the educational environment, and to apply the necessary corrections. The author's [13] own practical experience and research results confirmed the fact that the quality of teaching improved after taking into account the results of the student survey. On the other hand, monitoring of learning and teaching should be carried out periodically. Otherwise, the positive effect will be temporary.

Evaluation of student learning outcomes is an important component of IQASHE [7]. Gaftandzhieva et al. [9] used the students' performance and the quality of education as measurable indicators within the scope of Learning Analytics Tools. Usually, the measurement of learning outcomes is based on the established indicators of performance [16]. Current grades, test and exam results [22], final projects [23], etc. can be analyzed. In turn, the educational program [11] and individual educational components are improved based on the evaluation of the quality of students' education and the development of their competencies. In their work such authors as Liew et al. [12] recommend to distribute the obtained results according to several levels. This will make it possible to determine the level of quality both of education and teaching, to pay attention to weaknesses, to make appropriate decisions on their elimination [22].

The periodicity and procedure of evaluation are determined by the administration of the higher education institution [24] and reflected in internal regulatory documents. Such documents can be "Regulations on the organization of the educational process", "Regulations on the procedure for organizing and conducting of control measures", etc. Storage, processing and display of evaluation results are done using learning management systems (LMS), specialized information systems [13], web environments [6], software tools [9], [22], including those with artificial intelligence [17].

3. Methodology

The purpose of the research is to describe the procedure of independent evaluation of the TSAU student learning outcomes and to analyze the obtained results.

Independent evaluation is a form to monitoring the TSAU student learning outcomes; it is carried out in the form of periodic module controls (PMC), independent evaluation of knowledge and residual knowledge of educational components. The procedure for carrying out the mentioned forms of control is reflected in the University's internal documents: "Regulations on the assessment of TSAU students' knowledge", "Regulations on checking the residual knowledge of the TSAU students", "Regulations on the organization of testing at TSAU", etc. The independent evaluation of student learning outcomes was organized and conducted by the Center for Independent Assessment (CIA), which is a structural division of TSAU. The powers and duties of the CIA are regulated by the "Regulations on the TSAU Center for Independent Evaluation". Some authors of the article are the CIA employees who conducted the independent evaluation. Other authors of the article were involved in the organization and analysis of the computer testing results.

The independent evaluation was conducted in 2021-2022 during the first and second periodic module controls (PMC 1 and PMC 2, respectively), which take place during the semester. It was conducted in the form of a computer-based test that students take on the TSAU Educational Portal. It was taken by 402 first-year undergraduate students who were divided into 23 groups at 4 faculties: Mechanical Engineering Faculty (MEF), Faculty of Agricultural Technologies and Ecology (ATE), Faculty of Economics and Business (FEB), Faculty of Power Engineering and Computer Technology (ECT). Each group consisted of 5 to 33 students, depending on the enrollment for a specific specialty. For some specialties, the enrollment was large enough, so students were divided into groups. For example, students majoring in Agricultural Engineering were divided into two groups: 11 AE, 12 AE. Part of the students who studied according to an individual plan or a dual form of education did not take the test and were not taken into account in the research.

On average, students of each group were tested in 6-8 disciplines, depending on the specialty. The analysis of the test results was carried out according to three criteria: the student attendance at the test, total performance and total quality for each group.

The student attendance of group A for computer testing is calculated according to the formula (1):

$$A = \frac{Na}{N} * 100\% \quad (1)$$

where:

N is the total number of students in the group;

Na is the number of students who participated in computer testing.

The total group performance P_p is calculated according to the formula (2):

$$P_p = \frac{\sum_{i=1}^{n}(S_{fj})_i}{N_a J} * 100\%, i = 1,2, \dots n \quad (2)$$

where:

f – the student's number;

j – the discipline number;

J – the number of disciplines in which students are assessed;

N_a – the number of students who are present at the computer testing;

$n = N_a J$ – the total number of grades received by all students N_a in all subjects J;

S_{fj} – an element of the sum, where $S_{fj} = 1$, if the student numbered f received one of the grades "3", "4" or "5" and $S_{fj} = 0$, if the student numbered f received "2".

The total quality P_q of the group of students in all disciplines is calculated according to the formula (3):

$$P_q = \frac{\sum_{i=1}^{n}(S_{fi})_i}{N_a J} * 100\%, i = 1,2, \dots n \quad (3)$$

where:

S_{fj} – an element of the sum, where $S_{fj} = 1$, if the student numbered f received "4" or "5" and $S_{fj} = 0$, if the student numbered f received "3" or "2".

Computer tests for the disciplines were available in the student's personal account on the University's Educational Portal. In this way, the student identification and data collection for further analysis were ensured. The obtained test results were stored in the University information system and were taken into account during the student evaluation. The summarized data demonstrating the results of the students' independent evaluation were reported to the Rectorate, the Academic Council of the University and they were made public on the CIA website.

4. Result

At the first stage of the research, the authors describe the procedure for conducting the independent evaluation, which involves determining the terms of testing, creating a bank of test tasks, preparing normative documents, as well as taking into account and storing the obtained results. The next stage involves the quantitative analysis of the results of the independent evaluation during PMC 1 and PMC 2 according to several criteria: faculty, group, quality of knowledge, academic progress, and students' attendance. Conclusions are drawn regarding the reasons of improvement in quality indicators during PMC 2.

4.1. Description of the mechanism to carry out the independent evaluation

At the beginning of the academic semester (by September 15 in the first semester, by January 15 in the second semester), teachers upload test tasks to the discipline page on the Educational Portal. For each periodic module control, you need to create 60 test tasks. Therefore, the total number of test tasks (test bank) for different forms of control is the same, and it is 120 for each discipline. The created test bank can be used by the teacher during the exam and evaluation, and the test tasks can be part of the exam paper or credit module. This will make it possible to compare the results of the independent evaluation with the results of the final control in a certain discipline.

Tasks for computer testing are developed by the lecturer in accordance with the topics specified in the syllabus of the discipline. They must have a closed form and involve choosing one correct answer from four options. The questions included in the test tasks should be clearly formulated and not too long. It is assumed that in order to find the correct answer, the student needs the knowledge obtained at lectures, practical, laboratory classes and when familiarizing with the recommended literature during independent work.

A few weeks before PMC 1 and PMC 2, the deans of the faculties submit the lists of students who will be tested to the CIA. In the same period, the educational department prepares an order on conducting the independent evaluation. On the basis of the Rector's order to conduct the PMC, the head of the CIA issues an order specifying the terms and procedure, as well as executives to organize and conduct the independent evaluation.

The CIA employees, in coordination with the educational department, develop a schedule for conducting the independent evaluation in the computer classrooms of the University. The issues of organization of students' independent evaluation, preparation of test tasks, etc. are addressed at thematic seminars conducted by the CIA staff at every faculty.

According to the developed and published schedule of the independent testing, students must come to the specified computer classroom in an organized manner. They are registered on the CIA's general lists and in the security log before the independent evaluation begins in the classroom. In addition, all students must prove their identity with an official document containing a photo (a student identity card, passport, driver's license, etc.). If a student cannot be physically present in the classroom, he/she takes the test remotely. In this case, he/she identifies his/her identity using video communication. Students must know their login and password to access the TSAU Educational Portal. In case a student does not know his/her login and password, he/she must know his/her e-mail address and e-mail password in order to receive new login details for the Education Portal.

Student testing on the Educational Portal takes place in the presence of CIA's executive or other university employees involved in the independent evaluation. Executives are assigned to the computer classroom by the relevant order on conducting the independent evaluation.

In the classroom, students can use computers or other digital gadgets (mobile devices, tablets) to take the test. The student is given 30 minutes to complete the test tasks, after which the test form will be closed. The student has only one attempt to take the test tasks. Upon successfully completing 30 test tasks, a higher education student can receive 10 points. The test tasks in the amount of 30 are randomly selected from the test bank.

If a student did not appear for the independent evaluation, the leading teacher of the discipline informs the tutor of the academic group in which the student studies. The tutor determines the reason for the student's absence and submits the information to the dean's office. After that, the dean's office gives permission to the student to take the test beyond the schedule. The student has the right to take the independent evaluation within two weeks after the completion of the main stage, determined by the schedule of the educational process, and in coordination with the head of the CIA.

All the results of the independent evaluation are automatically stored in the Educational Portal database. Within 1-2 days after taking the test, the lecturer transfers the results to the electronic journal (TSAU information system). They are taken into account during the periodic module control and are combined with points for classroom and independent work.

Within two weeks from the day of the independent evaluation, the CIA employees analyze the obtained results for all faculties and groups. The head of the CIA reports the processed results to the Vice-rector for scientific and pedagogical work, and later the results are reported to the Academic Council of the University.

Before the second module control, the same procedure of the independent evaluation is carried out.

4.2. Data analysis

After conducting organizational and consultative activities on the part of the University administration and the CIA, students' independent evaluation took place during PMC 1 and PMC 2 in 2021-2022. The obtained results of PMC 1 for 4 faculties are shown in Table 1.

Table 1. Results of students' independent evaluation during PMC 1

Group, specialty	Number of students	Quality of knowledge (%)	Academic progress (%)	Students' attendance (%)
Mechanical Engineering Faculty (MEF)				
11 AE	28	52	74	81
12 AE	28	55	58	79
11 AM	21	73	89	95
11 IE	20	67	86	96
Total	97	61.75	76.75	87.75
Faculty of Agricultural Technologies and Ecology (ATE)				
11 CS	11	100	100	66
11 FT	22	86	94	95
11 HRB	10	75	91	99
11 AG	23	57	66	99
12 AG	23	65	83	99
11 GL	7	82	91	98
11 EC	25	72	89	92
11 HV	16	58	74	94
Total	137	74.4	86	92.75
Faculty of Power Engineering and Computer Technology (ECT)				
11 EET	33	63	81	94
11 CSC	25	88	95	95
Total	58	75.5	88	94.5
Faculty of Economics and Business (FEB)				
11 AT	6	79	90	100
11 FB	11	65	79	100
11 TR	10	77	88	100
11 MK	19	83	95	100
11 MN	30	77	90	100
11 PA	10	80	94	100
11 ET	9	78	91	100
11 EE	5	86	90	93
11 EC	10	93	96	90
Total	110	79.8	90.3	98.1
Summary	402	72.9	85.3	93.2

When analyzing the obtained data (see Table 1), we can state that the first-year students (402 persons) are well prepared, they do not have low indicators of performance and quality of knowledge. This fact is explained by a high percentage of attendance (93.2%) at current classes and at PMC test days by the first-year students. The best student attendance during PMC 1 is observed at the Faculty of Economics and Business (98.1%). The smallest percentage of attendance is observed at the Mechanical Engineering Faculty (87.75%). The low attendance at the test is due to the fact that part of the students is studying by a dual form and takes PMC 1 according to a different schedule, which is not taken into account in this study.

The generalized results of the independent evaluation at the University during PMC 1 are shown in Fig. 1.

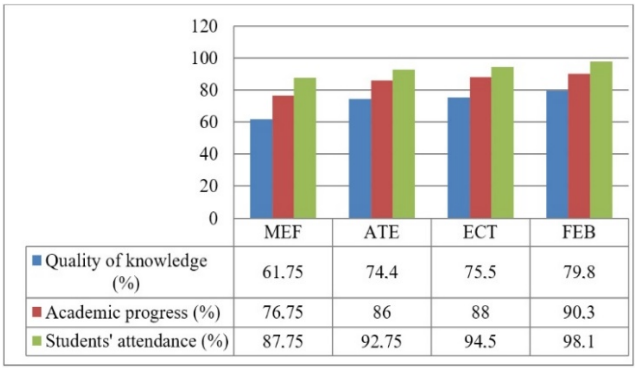


Figure 1. Generalized results of PMC 1 at the University

Analyzing the indicator of the quality of knowledge, we can state that it is quite high. None of the groups that took part in the independent testing showed a quality of knowledge below 50%. The range of the quality of knowledge at TSAU faculties is 61.75%–79.8%. The average value of the students' quality of knowledge according to the results of PMC 1 is 72.9%.

The performance of students at 4 faculties according to the testing results during PMC 1 is in the range of 76.75%–90.3%. The average performance rate at the University is 85.3%. Students of the Faculty of Economics and Business showed high performance and maximum test attendance. This can be explained by a good preparation for the disciplines studied in the first semester. Most of them are general disciplines. It may also indicate the high level of training of the school graduates who entered the Faculty of Economics and Business this year.

Before the beginning of the evaluation and examination session, PMC 2 was organized and conducted for students in the form of computer testing. It also involved 4 faculties, 402 people from 23 academic groups.

Students had to show their own educational achievements in the same disciplines that were tested during PMC 1. That is, the independent evaluation of students during both PMCs took place in almost similar conditions. The only difference is that the test tasks belonged to the second part of the educational topics provided by the syllabus of the discipline. The obtained results regarding the quality of knowledge, performance and student attendance during PMC 2 are presented in Table 2.

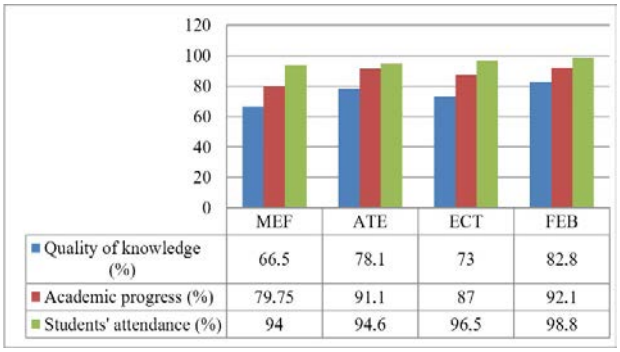
Table 2. Results of students' independent evaluation during PMC 2

Group, specialty	Number of students	Quality of knowledge (%)	Academic progress (%)	Students' attendance (%)
Mechanical Engineering Faculty (MEF)				
11 AE	28	60	77	93
12 AE	28	60	64	93
11 AM	21	75	87	96
11 IE	20	71	91	94
Total	97	66.5	79.75	94
Faculty of Agricultural Technologies and Ecology (ATE)				
11 CS	11	100	100	66
11 FT	22	82	93	95
11 HRB	10	74	90	100
11 AG	23	74	89	100
12 AG	23	74	87	100
11 GL	7	73	91	100
11 EC	25	74	90	96
11 HV	16	74	89	100
Total	137	78.1	91.1	94.6
Faculty of Power Engineering and Computer Technology (ECT)				
11 EET	33	59	77	94
11 CSC	25	87	97	99
Total	58	73	87	96.5
Faculty of Economics and Business (FEB)				
11 AT	6	83	90	100
11 FB	11	79	91	100
11 TR	10	82	92	100
11 MK	19	74	87	100
11 MN	30	84	95	100
11 PA	10	87	97	99
11 ET	9	87	96	100
11 EE	5	77	86	100
11 EC	10	92	95	90
Total	110	82.8	92.1	98.8
Summary	402	75.1	87.5	96

According to Table 2, the quality of students' knowledge during PMC 2 is in the range of 66.5%–82.8%, which is 75.1% on average. If we analyze the student attendance, it has improved compared to PMC 1.

The range of student attendance was 94%–98.8% with an average value of 96%. The quality of knowledge has also improved, which according to the results of PMC 2 ranged from 66.5% at the MEF faculty to 82.8% at the FEB faculty. The average quality of knowledge by faculties was 75.1%. We can explain better indicators of performance, quality of knowledge and attendance during PMC 2 by several reasons: a) students understand the necessity of quality training; b) teachers apply effective teaching and learning methods in their subjects. The survey provided for the participants of the educational process, who were involved in the independent evaluation, showed that they were well acquainted with the procedure in real conditions during PMC 1. Therefore, they did not waste extra time on organizational issues and could prepare better for the test tasks.

The generalized results of the independent evaluation during PMC 2 at the University are shown in Fig. 2



	MEF	ATE	ECT	FEB
Quality of knowledge (%)	66.5	78.1	73	82.8
Academic progress (%)	79.75	91.1	87	92.1
Students' attendance (%)	94	94.6	96.5	98.8

Figure 2. Results of the independent evaluation during PMC 2

Based on the obtained results of PMC 1 and PMC 2, it is possible to calculate the average values of the quality of knowledge and performance of the first-year students. The quality of knowledge by faculties as for PMC 1 and PMC 2 has the following indicators: MEF – 64%; ATE – 76.25%; ECT – 74.25%; FEB – 81.3%. The average indicator of the quality of knowledge at the University was 74%, which is a sufficient value as for the level of evaluation required by the Ministry of Education and Science of Ukraine. The performance rate of the first-year students by faculties in terms of PMC 1 and PMC 2 has the following indicators: MEF – 78.25%; ATE – 88.55%; ECT – 87.5%; FEB – 92.55%. The average rate of performance at the University was 86.7%.

5. Discussions

Today, we can state that higher education institutions realize the importance of ensuring the quality of higher education as one of the factors of their competitiveness [17].

At least, this applies to the educational institutions of Vietnam [7], [10], Indonesia [3], Slovakia [6], Poland [1], Sweden [11], etc. The academic community and educational institutions of Ukraine are also involved in assuring quality and goals of sustainable development [2], [8], [14]. At the same time, institutional assurance of higher education quality has certain weaknesses and therefore needs improvement.

In order to ensure continuous improvement of quality, higher education institutions develop and implement various mechanisms and measures within their autonomy. In this context, Dmytro Motornyi Tavria State Agrotechnological University is no exception either. To ensure IQASHE, it introduced independent evaluation of the first-year students. The purpose of independent evaluation is as follows: a) to ensure transparency and objective evaluation of the level of students' educational achievements by educational components, b) to prevent the cases that violate the principles of academic integrity, c) the obtained results are the basis for further improvement of IQASHE.

According to the results of the independent evaluation, the average indicator of the quality of knowledge at the University was 74%. The University administration decided to develop a number of measures aimed at improving teaching skills, the quality of the educational content, and popularizing academic integrity among teachers and students. In addition, the obtained results can be compared with the results obtained in previous years. Comparing the results by specialties and disciplines will allow us to reveal the dynamics of quality and performance indicators, to create new educational programs in a timely manner and train specialists in accordance with the demands of the labor market [4].

It should be noted that internal quality assurance must depend on all the participants of the educational process [1] within the limits of their functional responsibilities. Undoubtedly, the administration is interested in quality education at the University, since it affects the ranking of the university and its competitiveness among other HEIs. Support staff provides technical support of the organization and quality improvement activities. Teachers are the main actors in improving the quality of education. They give lessons, keep to student feedback, apply new methods and technologies [12], participate in the development of educational programs [8], [11], etc.

Special attention should be paid to the CIA employees who were in charge of creating schedules and orders, conducting independent evaluations, processing test results and making them public. They worked closely with deans, tutors, students and teachers, engineers of computer laboratories.

Authors Nguyen et al. [10] emphasized the importance of professionals who provide quality assurance. At the same time, employees of such structures must be responsible, understand the importance of quality assurance, be well organized [3], and they must have direct contact with the university administration.

Unfortunately, it is not always possible to establish a stable and operational connection between different structures of the university, in particular between the administration and teachers [24]. In this case, teachers may have concerns about the need for continuous quality improvement [12]. It can have a negative impact on the educational process and the objectivity of the given grades in the disciplines. For this purpose, before the independent evaluation and after each PMC, seminars were held at TSAU, where the testing procedure and the rules for writing test tasks were explained. In addition, computer testing itself ensures the objectivity of knowledge assessment, provided that the test tasks are correctly composed.

One of the important factors of IQASHE is the coverage of information about the results of the self-assessment of the educational institution [15], respondents survey [13], conducted activities, etc. This will help to carry out external quality control by relevant structures, to spread best practices, to inform employees about the university activities. In this context, TSAU strictly adheres to information disclosure requirements. The results of the independent evaluation are reported to the Rectorate and the Academic Council of the University, and they are posted on the CIA page on the University's website.

6. Conclusion

In modern conditions, the quality of education is one of the important factors of the HEIs' competitiveness on the market of educational services. HEIs, within the limits of institutional autonomy, form a culture of quality for all participants of the educational process; they ensure the quality of learning and teaching, compliance of educational programs with approved standards and needs of the labor market.

In order to ensure IQASHE, TSAU introduced independent evaluation of student learning outcomes, which took place in the form of computer testing. For this purpose, the University developed a mechanism for conducting independent evaluation; it created relevant internal orders and appointed executives. The organization and conduct of the independent evaluation was carried out by a separate structural unit.

402 first-year students who studied in 23 groups at 4 faculties took part in the independent evaluation. The analysis of the results of the independent evaluation during PMC 1 showed the student attendance at the test at the level of 87.75%–98.1%. This is explained by the fact that part of the students is studying by the dual form of education, and they were tested according to a different schedule. The range of the quality of knowledge of the first-year students is 61.75%–79.8%. The average value of the students' quality of knowledge according to the results of PMC 1 is 72.9%. At 4 faculties the students' performance is in the range of 76.75%–90.3% according to the results of testing during PMC 1. The average performance at the University is 85.3%. The analysis of the results of the independent evaluation during PMC 2 showed the student attendance at the test at the level of 94%–98.8%. The range of the quality of students' knowledge according to the test results is 66.5%–82.8%. The average value of the students' quality of knowledge according to the results of PMC 2 is 75.1%. The students' performance according to the test results is in the range of 79.75%–92.1%. The average performance at the university is 87.5%.

We have improved all indicators according to the results of PMC 2. This is explained by students' better acquaintance with the procedure of independent evaluation, and more in-depth preparation for testing. At the same time, students who studied by a dual form of education and an individual study schedule did not take part in the independent evaluation. Therefore, we consider to be promising the verification of the educational achievements of these students with the help of independent evaluation.

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