

DEVELOPMENT OF A SYSTEMATIC APPROACH TO ASSESSING THE COMPLIANCE OF UNIVERSITY EDUCATIONAL PROGRAMS WITH THE UN SUSTAINABLE DEVELOPMENT GOALS*

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Abstract. The *purpose* of the article is to develop and test in practice a systematic approach to assessing the compliance of educational programs of universities with the goals of sustainable development of the United Nations. The systematic approach includes the development of a sequence of development and approval of a questionnaire to determine the degree of compliance of educational programs of universities with the goals of sustainable development. *Methodology.* The survey was based on a comparison of the data of three groups of respondents (developers of educational programs and their curators at three levels of higher education). Approbation of the approach took place on the basis of the National Transport University (Kyiv, Ukraine). In total, 64 curators and developers of educational programs took part in the survey (this is 60% of educational programs of NTU). The *results* of the survey showed that educational program developers understand the importance of including the tasks of the United Nations Development Program in separate educational components or modules of disciplines in order to form relevant competencies in students. However, respondents noted the need to review educational programs and their components, as well as the educational process in the context of compliance with the goals of sustainable development and its ecologization. *Practical implications.* The results of this research will be used during the regular review of educational programs and their components at the National Transport University, and will also serve as a basis for further improvement of the concept of sustainable development of the NTU. The research data can be distributed to other universities. Also, the research results will be used in the project the Transformational Learning Network for Resilience – Enabling Ukrainian higher education to ensure a sustainable and robust reconstruction of (post-war) Ukraine (TransLearnN). The results of this study will contribute to the development of the program of sustainable development of universities in Ukraine. *Value / Originality.* The obtained results will make it possible to determine prospective directions for improving the educational process and educational programs of universities, taking into account the goals of sustainable development and trends in the ecologization of education.

Keywords: sustainable development goals, environmental knowledge, educational programs, higher education, evaluation of educational programs.

JEL Classification: A20, I23, Q56, C13

1. Introduction

In 2019, the United Nations General Assembly adopted a resolution calling on the international community to expand the scope of education

in the interests of sustainable development to achieve the goals of the 2030 Agenda (United Nations Development Programme, 2022). The inclusion of higher education as an important

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component in the implementation of the UN's sustainable development goals was immediately reflected in the quality and quantity of scientific research in this direction. In particular, the work (Murillo-Vargas, 2020) carried out a large-scale bibliometric analysis of 871 publications (535 documents in Scopus and 336 in Web of Science) from 1998 to 2019, which confirmed the rapid growth of researchers' interest in the issue of integrating sustainable development goals into higher education. However, recent studies in the direction of analyzing the compliance of educational activities of universities with the goals of sustainable development have shown that there is an obvious need to develop approaches, methods and tools that will help higher education institutions systematically implement the goals of sustainable development as an integral part of educational programs (Leal Filho, 2021; Leal Filho, 2023; Nhamo, 2020). Thus, the relevance of developing a systematic approach to assessing the compliance of educational programs of universities with the goals of sustainable development of the United Nations is beyond doubt.

2. Research Analysis

A thorough analysis of the reflection of sustainable development goals in the sections of the academic disciplines of the undergraduate educational programs of the School of Social Sciences of the University of Évora was described in a study (Chaleta, 2021). Based on the results of the analysis, it was concluded that students can acquire the knowledge and skills necessary to respond to and promote sustainable development at this University, and a significant number of teachers recognize the importance of reflecting the goals of sustainable development in their subjects. It should be noted that the survey was more about the disciplines themselves, and not about the educational programs of the University as a whole.

The study (Albareda-Tiana, 2020) emphasized that in order to provide higher education students with competencies in the context of sustainable development, it is necessary to conduct an analysis (monitoring) of educational components, to find out directions, ways and the need to adjust disciplines. In the study (Kioupi, 2020) it is proposed to analyze the components of educational programs according to long-term

goals grouped into eight attributes of sustainable development. The evaluation was carried out by reviewing the achieved learning results, which is undoubtedly useful from the point of view of comparing different educational programs and their further development.

Researchers (Leal Filho, 2021; Leal Filho, 2023) emphasize the need to pay attention to the concept of sustainable development goals in university programs and the development of recommendations for improving educational programs, and also emphasize the relevance and need for a greater emphasis on sustainable development goals in the context teaching, research and operational initiatives in institutions of higher education.

Thus, the analysis of recent studies confirms the need for systematic approaches to assessing the compliance of educational programs of universities with the goals of sustainable development.

3. Survey Methodology

Assessment of the compliance of educational programs of universities with the goals of sustainable development of the United Nations, like any assessment in general, should be based on the application of an effective tool. Preliminary research analysis showed that the most relevant tool for determining the degree of compliance of educational programs of universities with the goals of sustainable development, as well as clarifying the need to include new modules and components in the educational program that meet these goals, is a questionnaire (Chaleta, 2021). The development and approval of such a questionnaire should include the following stages (Figure 1):

1. Preparatory stage. At this stage, the focus group for the survey is determined.
2. Development stage. The list of questions that will be included in the questionnaire is determined and the concept of the survey is developed (goals and expected results are set).
3. Questionnaire stage. This stage determines the survey in time and space.
4. Analysis stage. The results of the survey are analyzed, summaries are drawn up, and conclusions are drawn regarding the achievement of the objectives of the survey.
5. Project stage. Proposals for improving the educational programs of the university are being developed.

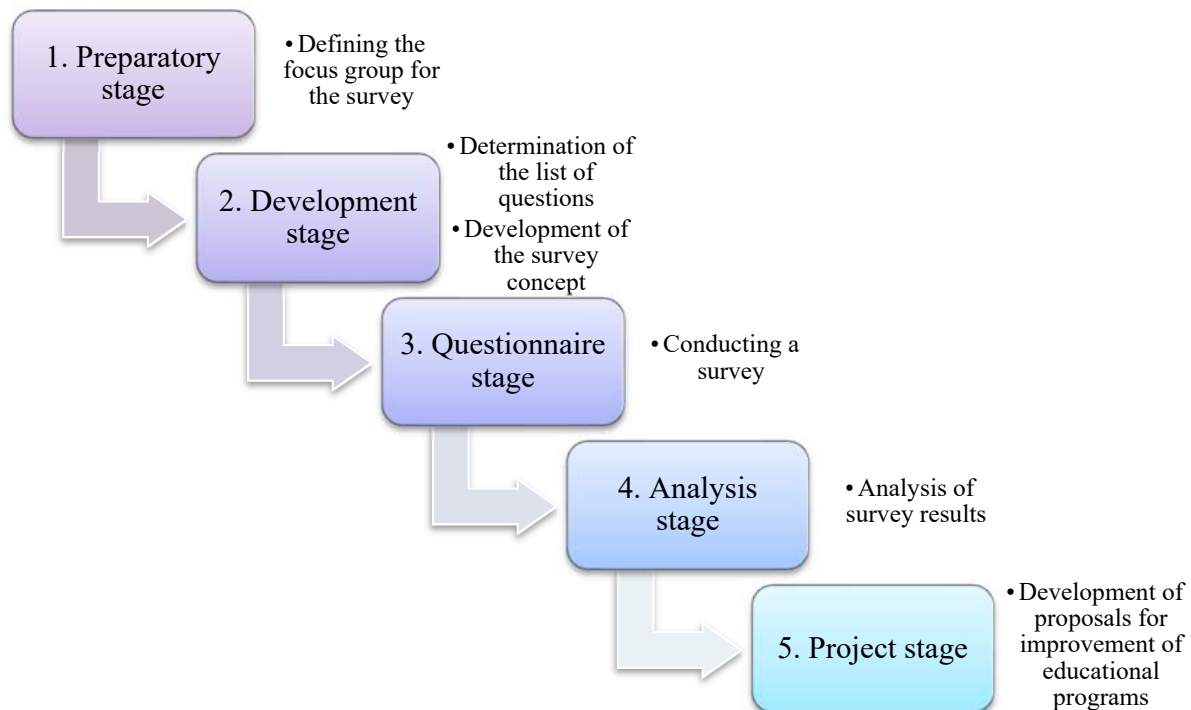


Figure 1. Stages of the questionnaire development and approval on determining the degree of compliance of universities educational programs with the goals of sustainable development

Source: developed by the authors

From February 19 to March 1, 2024, a survey was conducted at the National Transport University (NTU, Kyiv, Ukraine) based on the questionnaire developed by the authors, which aimed to find out the degree of coverage of the UN's sustainable development goals by the educational programs of the NTU. The survey form was created using the Google Forms service (Figure 2).

The focus group included developers of educational programs and their curators. Respondents were asked 7 questions:

1. Enter the name of your educational program.
2. Specify the level of higher education.
3. Does your educational program include a discipline related to the formation of environmental knowledge?
4. If you answered "yes" to the previous question, indicate the name of the discipline.
5. Specify the status of the discipline that you indicated in point 4.
6. Indicate other disciplines of your educational program that are related to the formation of environmental knowledge in applicants (if you believe that there are several disciplines in the educational program that form environmental knowledge in the applicant, then in point 4 indicate the main discipline).

7. Rate the degree of compliance of the learning outcomes of your educational program with the UN sustainable development goals from 1 to 5 points (where 1 – learning outcomes hardly meet the goal, 5 – fully meet). For more detailed information on each goal, visit <https://ukraine.un.org/uk/sdgs>

64 curators and developers of educational programs took part in the survey (this is 60% of educational programs of NTU). In particular, 54.7% of 64 representatives of educational programs were from the first (bachelor's) level of higher education, 37.5% – from the second (master's) level, 7.8% – from the third (educational and scientific, PhD) level (Figure 3).

In particular, curators of educational-professional and educational-scientific programs "Ecology", "System Analysis in Transport Construction", "Environmental Protection Technologies", "Intelligent Traffic Management Systems", "Smart Transport and Logistics for Cities", "Environmental engineering of motor vehicle activity", "Automobile transport", "Geodesy", "Automotive engines", "Management" and others took part in the survey.

82.8% of respondents answered "yes" to the question "Does your educational program

Survey of the curator of educational program

In 2019, the UN General Assembly adopted a resolution calling on the international community to expand the scope of education in the interests of sustainable development to achieve the goals of the 2030 Agenda. This form is designed to find out the extent to which the university's educational programs cover the goals of sustainable development of the United Nations. More details at the link - <https://sdgs.un.org/goals>

Sustainable development goals of the United Nations



Figure 2. General view of the form

Source: developed by the authors

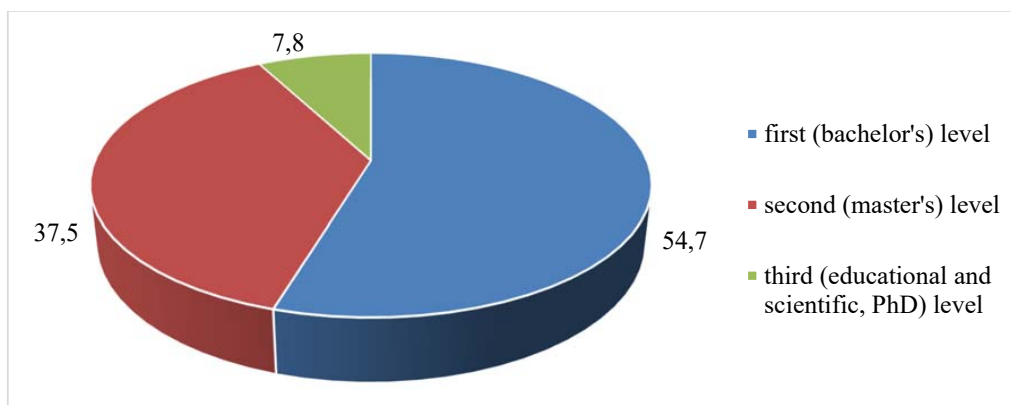


Figure 3. Distribution of educational programs by levels of higher education, the curators of which took part in the survey

Source: developed by the authors

include a discipline related to the formation of environmental knowledge?" (Figure 4).

Practically 73.6% of the disciplines available in the educational programs, which form ecological knowledge based on the results of their study,

are mandatory to study, 26.4% have the status of a selective educational component (Figure 5).

Among the disciplines that form environmental knowledge in the educational program, the respondents included educational components:

"Environmental support systems of transport infrastructure objects", "General ecology and neocology", "Strategies of sustainable development of transport infrastructure", "Transport ecology", "Impact on man and the environment, safety and sustainability", "Sustainable development and optimization technologies of global environmental management processes", "Ecology", "Geoinformational ecomonitoring", "Transport ecology", "Ecologically responsible management of projects and programs", "Basics of ecology" ,

"Management of social and environmental safety projects in transport systems", "Environmental problems of transport", "Management of environmental protection activities", "Management of environmental protection activities", "Inclusive circular economy", "Fundamentals of sustainable development", "Ecological tourism", "Macrologistics systems and sustainable development", "Environmental protection during the life cycle of a road", "Environmental safety of passenger transport in cities", "Systems for

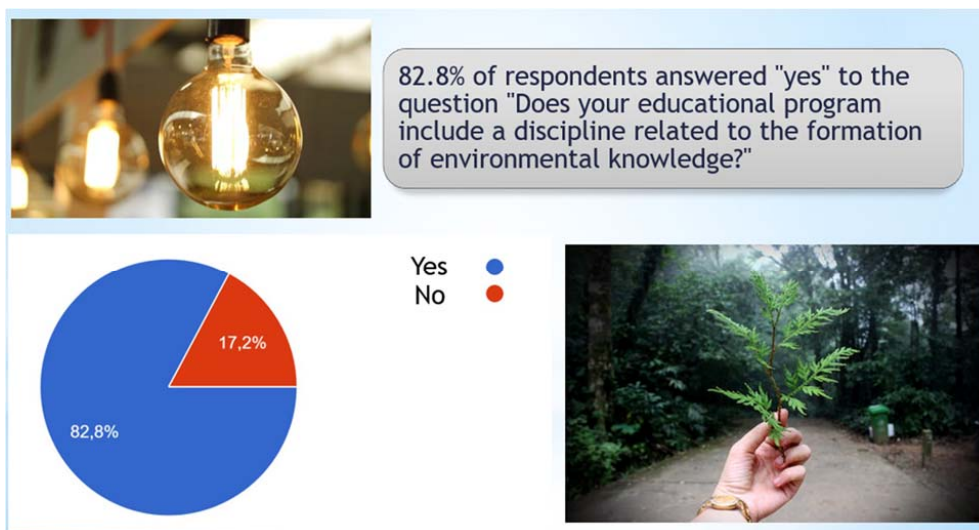


Figure 4. Distribution of respondents according to the presence of a discipline that forms environmental knowledge in the educational program

Source: developed by the authors

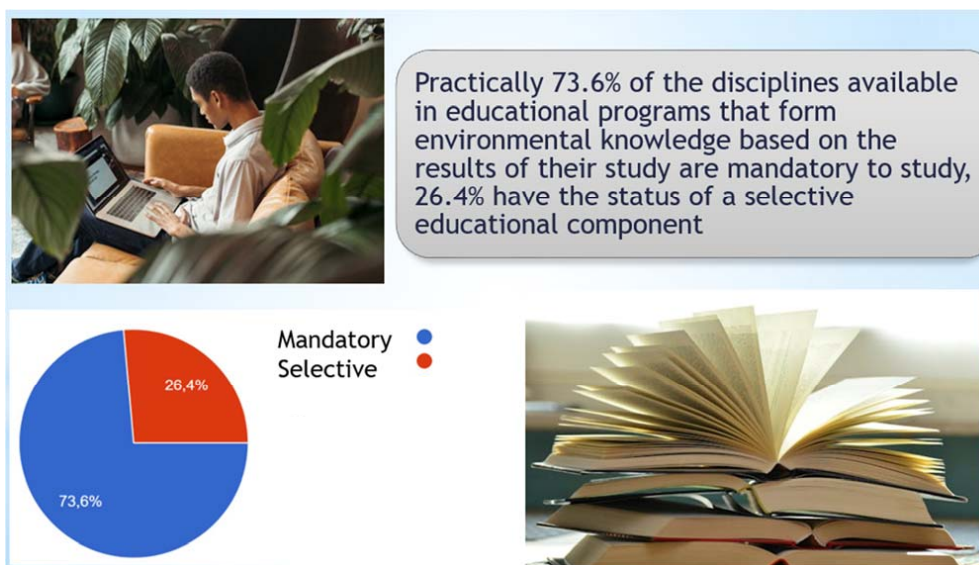


Figure 5. Distribution of the statuses of disciplines forming environmental knowledge in the educational program

Source: developed by the authors

monitoring the technical condition of automobile engines", "Basics of ecology and economics of nature use", "Ecological and economic evaluation of the use of property potential and economics of nature use", "Environmental ecology", "Environmental law" and others.

Analyzing the given list, it can be concluded that most educational programs have an educational component that is capable of clearly forming environmental knowledge by student. Separately, it should be noted the presence in the names of some a specific direction disciplines. In particular, this concerns the educational components of the technical profile programs of Auto Mechanics Faculty, Transport Construction Faculty, and Transport and Information Technologies Faculty.

In addition, respondents noted the disciplines that, in their opinion, deepen the knowledge of higher education students in the direction of understanding the goals of sustainable development. In particular, these

are: "Environmental monitoring", "Atmospheric air protection technologies at the enterprise", "Environmental management and audit at the enterprise", "Fundamentals of ITS functioning", "Road traffic safety", "Environmental monitoring and methods of measuring environmental parameters", "Urboecology", "Metrology, standardization and certification in the field of environmental protection", "Environmental safety", "Waste management technologies in the transport sector", "Theoretical foundations of environmental engineering" and others.

A separate task for the respondents in this survey was to assess the degree of compliance of the learning outcomes of their educational program with the UN sustainable development goals from 1 to 5 points (where 1 – the learning outcomes hardly meet the goal, 5 – fully meet).

According to the results of the assessment of the degree of compliance of educational programs of NTU with the goals of sustainable development (Fig. 6-7), the largest number

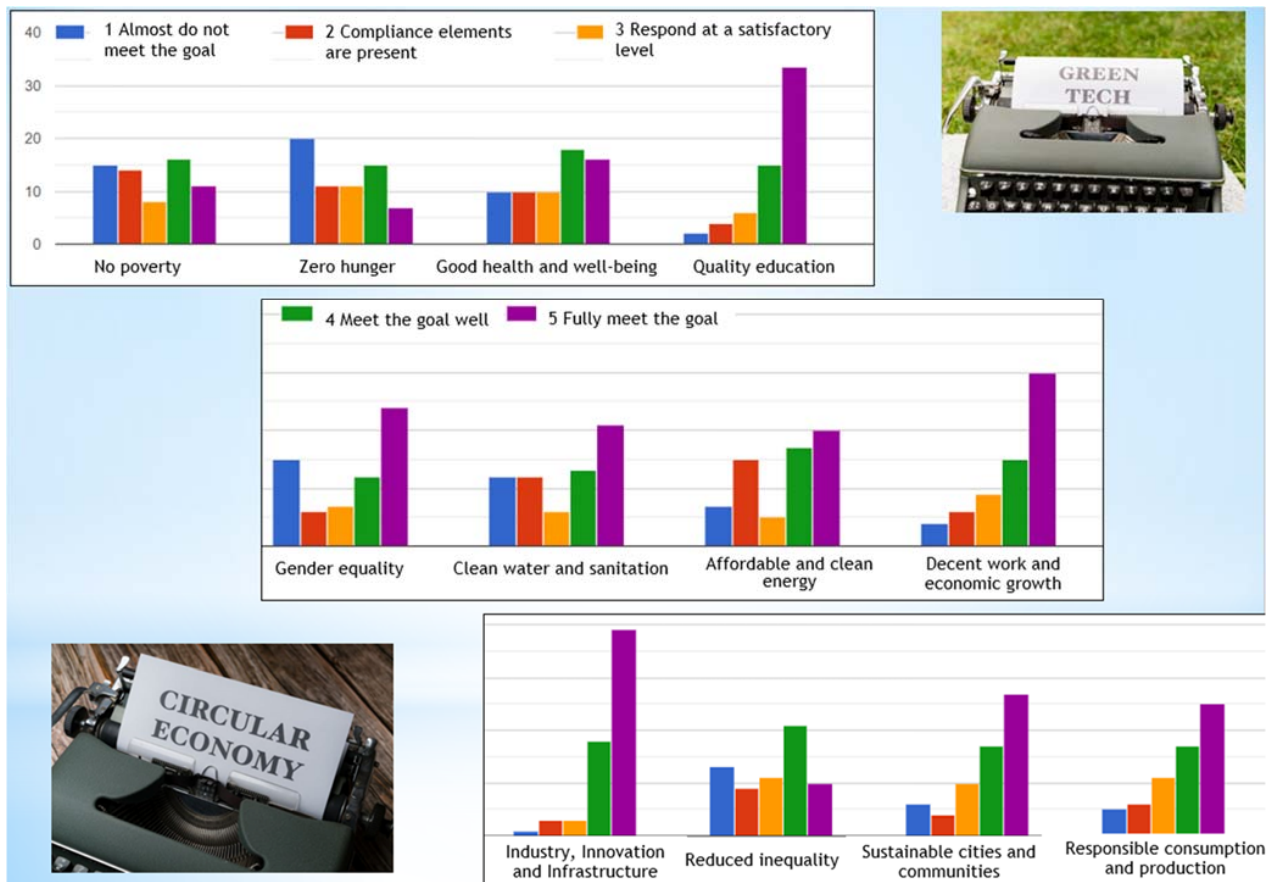


Figure 6. Point-by-point assessment of the degree of compliance of the results of studies under the educational programs of NTU with the goals of sustainable development of the UN (goals 1-12)

Source: developed by the authors

of respondents believe that educational programs fully meet goal 4 "Quality education", goal 8 "Decent work and economic growth", goal 9 "Innovation and infrastructure", goal 17 "Partnership for sustainable development". The vast majority of respondents gave an average score (3.5-4 points) to goal 5 "Gender equality", goal 7 "Affordable and clean energy", goal 11 "Sustainable development of cities and communities", goal 12 "Responsible consumption", goal 13 "Fight against climate change", goals 16 "Peace and justice". Other sustainable development goals received an average score of around 3-3.5 points.

The analysis of the answers to the question "Assess the degree of compliance of the study results of your educational program with the UN sustainable development goals" shows that the developers of educational programs understand the importance of including this issue in separate educational components or modules of disciplines in order to form relevant competencies in higher education students.

At the end of the survey, respondents were given the opportunity to leave their suggestions,

recommendations, and questions on the topic of the survey. In particular, some of them noted the following – it is necessary (Fig. 8):

1. To increase the number of elective disciplines that will be aimed at realizing the goals of sustainable development.
2. To introduce elements of sustainable development into other professional disciplines of educational programs.
3. To introduce elements of informal education on environmental topics.
4. To ensure the availability of educational series on sustainable development among students and teachers on a public platform.
5. To develop recommendations for updating the content of educational components taking into account the tasks of the goals of sustainable development.
6. To add (revise) in the educational programs those issues that were brought out by separate points in the evaluation of the compliance of the educational program with the goals of sustainable development of the UN, namely overcoming hunger, overcoming poverty, gender equality, affordable and clean energy.



Figure 7. Point-by-point assessment of the degree of compliance of the results of studies under the educational programs of NTU with the goals of sustainable development of the UN (goals 13-17)

Source: developed by the authors

7. To consider issues related to the war in Ukraine.

According to the results of the research, the university management should make a decision on the next organizational steps in the direction of bringing the competencies of educational programs students closer to the UN sustainable development goals. In particular, this stage is called the "Project stage" according to the proposed sequence (Figure 1).

Based on the results of this survey, which took place in the spring of 2024, the management made the following strategic decisions at the National Transport University (Figure 9):

1. Low compliance with the goals of educational programs of technical and economic specialties.
2. Homogeneity of environmental elective disciplines.
3. The need for understanding the goals of sustainable development by students and teachers.
4. The need to update the legal framework of the educational process of the university.
5. The need to take into account in the disciplines the processes of recovery of Ukraine in the post-war period.

Thus, the identified problems were discussed at the meetings of the Academic Council of the National Transport University.

The solutions to these problems proposed at the Academic Council of NTU were as follows:

1. Revision of educational programs, inclusion of new disciplines. In particular, new disciplines should strengthen the competencies of students of educational programs in the direction of compliance with the goals of sustainable development of the UN.

2. Viewing the catalog of elective disciplines, updating the catalog. The updated catalog will contain courses, including those developed as part of the Transformational Learning Network for Resilience – Enabling Ukrainian higher education to ensure a sustainable and robust reconstruction of (post-war) Ukraine (TransLearnN) project.

3. Development of informational and educational content, placement on the Moodle platform of NTU. Informational and educational content will be devoted to environmentalization of education and production, resource-saving technologies, energy efficiency and sustainable development goals. It is also planned to develop a training course for teachers in this direction.

4. Regular updating of the regulatory framework of the university's educational process. It is planned to prepare a package of changes to the University's internal legal framework in the direction of compliance with the UN sustainable development goals. In addition, in 2025, it is planned to adopt the next

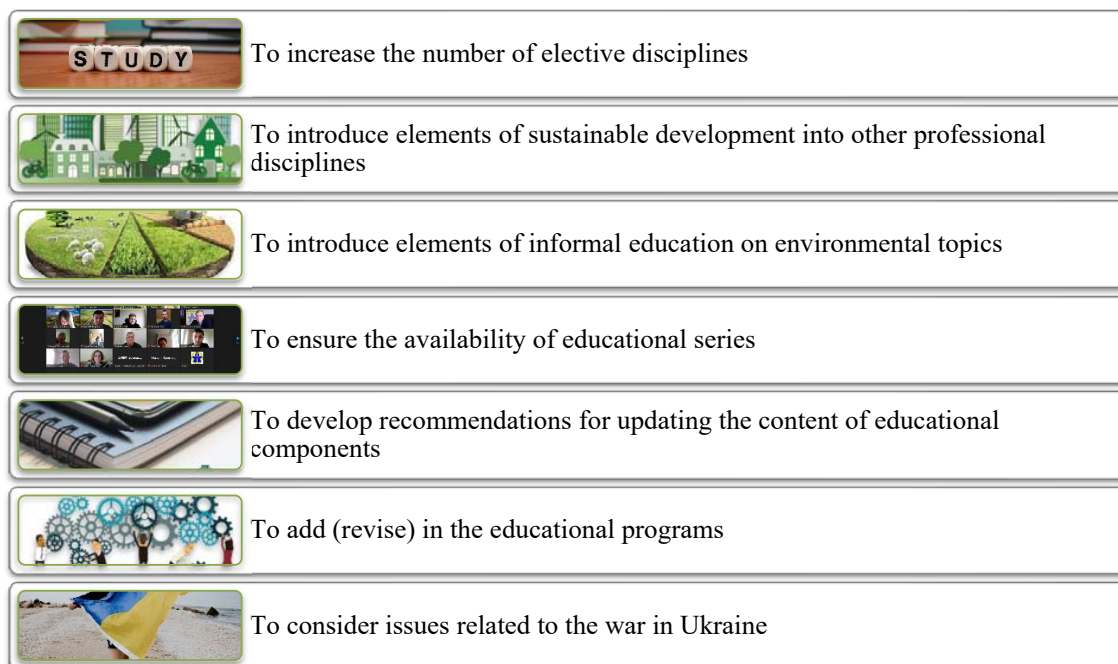


Figure 8. Suggestions and recommendations of respondents under NTU's survey

Source: developed by the authors

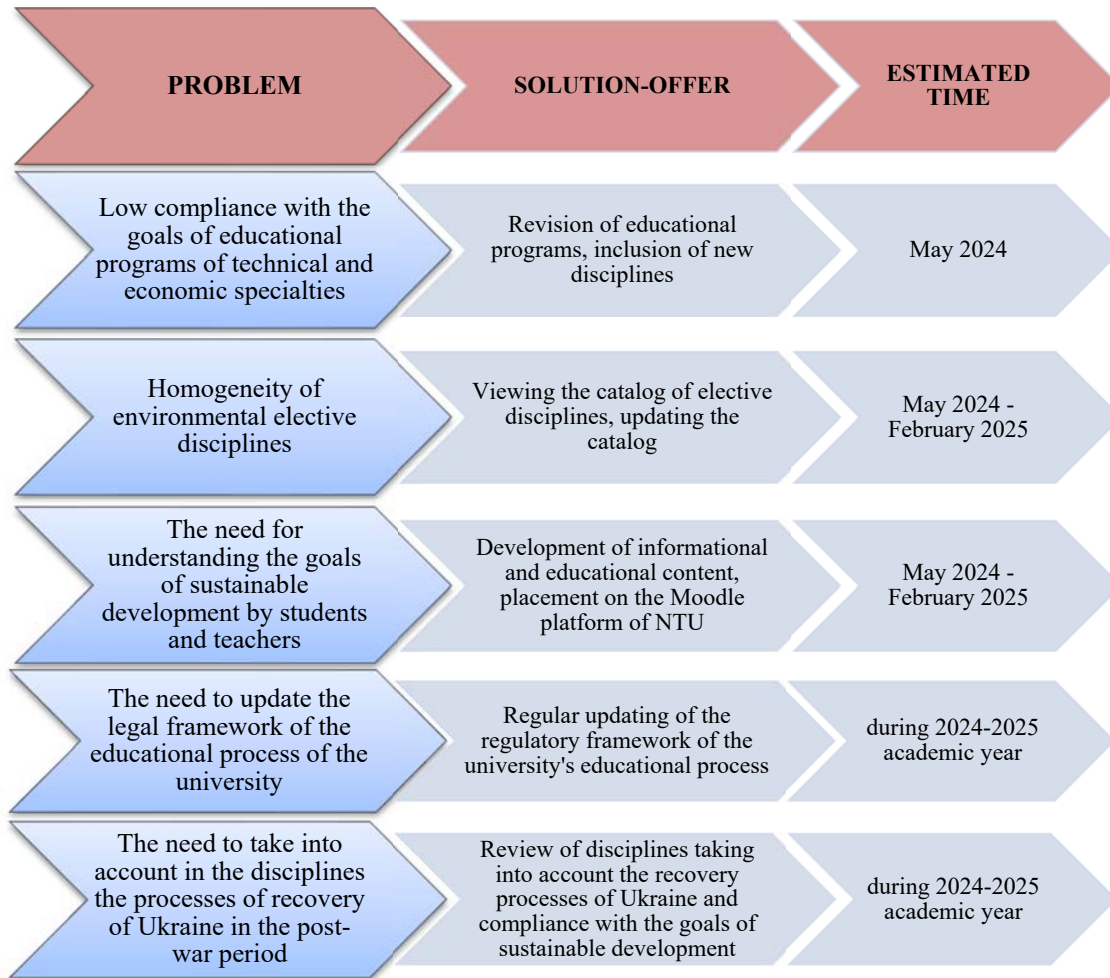


Figure 9. Project of changes to educational programs of NTU for the 2024-2025 academic year, taking into account the results of the survey

Source: developed by the authors

Development Strategy of the University for the next 5 years.

5. Review of disciplines taking into account the recovery processes of Ukraine and compliance with the goals of sustainable development. Since the National Transport University provides the labor market with specialists in the construction and transport industries, these specialists will become participants in the recovery processes of Ukraine in the post-war period. Thus, the updating of disciplines in this direction is very important to ensure the necessary competencies of professional specialists.

Thus, solutions will be the basis of changes not only in educational programs, but also in the University Development Strategy as a whole.

4. Conclusions

Within the framework of this study, the role of higher education in the acquisition of competencies by graduates was determined in accordance with the goals of sustainable development of the United Nations. At the same time, it was noted that there is a need to analyze and improve educational programs of universities in the context of achieving the goals of the program of sustainable development of society through education. The authors proposed a systematic approach to this study. It includes the stages of developing and approving a questionnaire to determine the degree of compliance of educational programs of universities with the goals of sustainable development.

Also, in 2024, a corresponding survey was conducted at the National Transport University (Kyiv, Ukraine). The results of this survey will be taken into account as part of the National Transport University's participation in the Transformational Learning Network for Resilience – Enabling Ukrainian higher education

to ensure a sustainable and robust reconstruction of (post-war) Ukraine (TransLearnN) project. Also, the results of this survey will be taken into account during the regular updating of educational programs at the university, development of new courses, updating of modules of educational components.

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