METHODOLOGY OF ASSESSMENT MANAGEMENT IN THE EDUCATIONAL PROCESS: TOOLS AND APPROACHES

Amurova N.Y.
University of Information Technologies, Republic of Uzbekistan
https://doi.org/10.5281/zenodo.11176184

Abstract*. This paper explores teaching methods for students in the field of energy engineering, with a focus on developing interpersonal and technical skills. The application of project-based learning methods and the assessment of individual student competencies are evaluated in the context of contemporary enterprise requirements. The role of interpersonal skills and the importance of technical knowledge for the successful implementation of projects in the energy sector are analyzed.*

Keywords*: education, energy engineering, project-based learning methods, student competencies, interpersonal skills, technical skills, competency assessment, contemporary enterprise requirements.*

Introduction: Assessment management methods, such as modular assessment, portfolio, and individual cumulative index, play a significant role in the educational process. They represent various tools and approaches used by educators for collecting, analyzing, and evaluating student performance data. These methods not only provide a systematic approach to assessment but also offer valuable feedback to both teachers and students. They contribute to monitoring progress in the learning process and help adapt educational strategies according to students' needs [1].

Within the course "Power Supply of Information and Communication Systems," the application of criteria such as experimentally-active, creatively-productive, and creatively-reflexive assessment effectively integrates with assessment management methods like modular assessment, portfolios, and individual cumulative index within the context of project-based learning.

In modern university education, focused on information and computer technologies, the emphasis is placed on preparing students for the dynamic realities of the job market. This entails the development of multifaceted skills such as analysis, classification, symbol usage, decision-making, and self-assessment. Additionally, communicative skills are cultivated to facilitate effective interaction, experiment planning, formulation of reasoned conclusions, and result evaluation [2].

These processes are supported by various assessment and educational process management methods, facilitating the purposeful development of students in line with the requirements of the modern educational environment.

Main part: The question of assessment management - including preliminary, ongoing, intermediate, final, internal, and external control - is integral to any educational system, being an inseparable part of educational activities [3].

When considering the assessment of students' professional competencies using key criteria such as "experimentally active," "creatively productive," and "constructively reflexive," control is determined by a set of indicators reflecting various aspects of their academic activity, cognitive processes, and practical skills. These indicators serve as conditions for successful socialization, identification, and professionalization of the student's personality. They include the goals, content

of the educational process, teaching methods, access to relevant resources and professional equipment, as well as the presence of qualified instructors [4].

Thus, to summarize the outcomes regarding these three criteria, levels, and methods of assessment management, it is proposed to create a special table that will reflect the main results and analysis of the assessment conducted:

Assessment Criteria	Assessment Levels	Assessment Management Methods
Experimentally Active	Motivational	Modular Assessment
Creatively Productive	Intellectual	Portfolio
Constructively Reflective	Practical	Individual Cumulative Index

This table provides a summary showing the combination of assessment criteria with specific assessment levels and methods of assessment management. Optimal combinations depend on specific educational objectives, the nature of the curriculum, and the preferences of the instructor. For instance, to assess students' creativity and productivity, it may be appropriate to use a portfolio or an individual cumulative index, which considers not only the results of individual assignments but also the overall progress of the student throughout the course [5].

The assessment process is conducted within a 100-point scale, where each criterion is evaluated based on objective indicators and expressed as a numerical value. Preliminary assessment involves analyzing the initial level of knowledge and motivation of students. Ongoing and interim assessments entail systematic monitoring of the learning process and regular evaluation of students' progress according to established criteria. The final assessment is conducted at the end of the academic period to determine the overall level of achievement of set goals and assess the development of students' competencies [6].

These assessments serve to evaluate the effectiveness of the learning process and the achievement of educational goals, as well as provide feedback for improving the quality of education. For example, a portfolio can be used to showcase various experiments and projects completed by students during the course, reflecting their active participation and creative abilities. Modular assessment allows for the evaluation of students' productivity and creative approach to problem-solving across different modules of the course. The individual cumulative index, in turn, can reflect the development of reflective skills and students' ability to analyze and evaluate their work during the learning process. Such methods of assessment management not only assess students' knowledge and skills but also identify their creative potential, self-development capability, and professional growth [7].

Modular assessment technique represents a tool within the context of innovative approaches to monitoring and evaluating the educational process. In this methodology, a module is defined as an independent and logically complete unit of educational material used to assess learning outcomes within the credit-modular system applied at TUIT. Assessment is conducted in the form of a numerical indicator on a 100-point scale, where the minimum rating is 70% of the maximum. Converting the assessment to a conventional five-point scale is done according to specific score ranges: from 70 to 80 points - "3", from 80 to 90 points - "4", from 90 to 100 points - "5".

The algorithm for implementing module-based assessment includes the following stages:

Structuring educational material into learning modules with detailed pedagogical requirements for mastering them.

Defining control stages and developing a working program with a calendar plan for checking the material's assimilation.

Establishing requirements and expected learning outcomes at each stage of control.

Selecting the form of control and methods for assessing student achievements.

Determining the importance of administrative stages and their significance.

Setting maximum and minimum scores for each stage of testing, as well as for each test.

Developing a procedure for distributing incentive points for presentations, projects, models, participation in competitions, olympiads, and other types of extracurricular activities [8].

Portfolio assessment method is an effective tool in the context of project-based learning as it allows for a more precise evaluation of students' knowledge and abilities. The primary idea of this method is to identify and assess what students already know and can do in a specific subject area.

This approach combines qualitative and quantitative assessment, promoting the development of students' self-assessment. The achievement method also serves several functions, including diagnostic, motivational, significance, developmental, and evaluative. It helps students understand their progress, motivates them to achieve new milestones, and ensures continuous personal development across all levels of education [9].

Thus, portfolio assessment is an important tool for supporting and guiding students in achieving their academic goals and demonstrating their academic achievements. The achievement method represents a systematic approach to assessing students' knowledge, skills, and creative activities within the educational process. Within its framework, various types are identified, including working (document collection), procedural, demonstrative, and evaluative. Achievement assessment methods are aimed at monitoring students' achievement levels and developing their communicative skills [10].

When using the achievement method, students actively participate in the selection and evaluation of their work, which contributes to the development of their reflexivity and responsibility for their own success. This approach also fosters the development of self-assessment culture and communicativeness among participants in the educational process. The results of assessment activities are discussed both individually and in groups, allowing students to receive feedback and collaborate with each other for the overall improvement of the learning process [11].

Engaging in the achievement method, students acquire skills of critical thinking and analysis, the ability to evaluate both their own and their peers' achievements. They develop the skill to assess results adequately and select the best ones for demonstration and discussion.

The assessment criteria of the achievement method include:

Development of cognitive abilities, including flexibility, rationality, and openness of thinking.

Substantiation in the ability to identify and solve problems.

Development of practical skills, such as the ability to solve practical problems and apply new technologies to solve them.

Development of communication skills, including teamwork, report writing, and expressing thoughts orally and in writing.

Formation of self-control and self-assessment skills, such as the ability to self-criticize, cope with mistakes, and adequately evaluate one's abilities and achievements

Self-assessment, as an integral part of self-regulation and self-analysis of educational activities, involves a range of procedures [1]:

- Developing clear criteria and indicators in collaboration with the instructor to assess various student performance outcomes.
- Fostering psychological attitudes conducive to analyzing one's own achievements.
- Creating situations where students apply familiar assessment criteria and compare their results with them.
- Providing students with the opportunity to develop their own activity program based on the results obtained.

Feedback can take various forms, such as opinions, reviews, feedback, summaries, essays, and recommendation letters. Interaction and feedback help students identify priorities in their personal and meaningful sphere within the educational process. The reflection process, where the student's personal experience is analyzed with the help of the instructor, plays a key role in this process. Teachers, as professionals, can anticipate and forecast possible directions for the development of their students. Significant attention is paid to how students study materials, what technologies they apply, and what skills they acquire through various learning tasks. This reflects their values, motivation, and attitude towards the achieved results [3].

In educational practice, achieving students' orientation towards their personal and meaningful sphere requires respect from teachers for the individuality of each student. They should support and encourage students' choices of content and teaching methods, thereby promoting their self-realization and personal development. Collaboration with students in the process of interaction plays a key role in achieving this goal.

This method is not limited to gifted students only; it can be successfully applied to all students, even those who study without interest. Involving students' personal experiences in the learning process creates the most favorable conditions for their personal growth. This changes the perception of individuals from practical and everyday to valuable and philosophical, enriched with an understanding that education is an important element for both the individual and society [5].

The Individual Cumulative Index represents an assessment method that raises assessment standards to a new level, crucial in the contemporary environment. This method allows companies to accurately determine the need for a particular student in real-world conditions of modern enterprises and subsequently make effective changes to their competency set. An employer anywhere in the world can, based on infographic data, select a suitable workplace for each potential employee, taking into account their strengths [2].

The essence of this assessment method lies in creating a comprehensive indicator of competencies acquired by students, identifying a set of qualities and competencies necessary for specific activities and educational courses. It relies on benchmark indicators developed by the department and includes factors that meet the requirements of future specialists.

This assessment method also helps identify students' inclinations in their chosen educational direction.

Conclusion: The results of the conducted experiments at TUIT using this assessment method, along with interactive teaching methods within the framework of project-based learning, have shown that students can autonomously regulate the process of acquiring competencies essential for attracting the attention of potential employers. Observing successful changes reflected in the graphs, they can independently adjust their motivation and modify knowledge acquisition.

However, some methodological and methodical shortcomings were identified during the experiment. The lack of appropriate tools for a comprehensive assessment of the collected competencies is not reflected in the assessment system used at TUIT, based on a point scale. Teachers design tests that play a key role in assessment; however, this approach does not always correlate with the verification of the presence of developed competencies.

The study conducted at the Department of Power Supply Systems within the subject "Power Supply for Information and Communication Systems" revealed that the application of interactive teaching methods, including relevant instructional materials, demonstrates maximum effectiveness in achieving results. These findings require further confirmation using the assessment criteria developed during the experiment [7].

The application of an approach focused on interpersonal and soft skills represents an effective method of utilizing engineering knowledge and skills to achieve set goals. In the context of educating future power engineers, active participation in the processes of creating competitive developments and their successful implementation becomes a necessity. This enables engineers to meet the modern requirements of enterprises, the labor market, as well as national and international standards.

The concept of "technical skills" refers to professional qualities, abilities, knowledge, and skills necessary for the qualitative performance of assigned tasks. For example, among complex skills may be the following: deep understanding of the complex of electric power stations; skills in working with electrical networks; ability to develop action algorithms in emergencies; proficiency in using software for power grid control; equipment selection skills; knowledge of computer programs. It is also important to be able to express thoughts correctly and clearly, as well as to have good speech.

In conclusion, the effective combination of technical knowledge with soft skills is the key to a successful career in engineering. Only with both components can outstanding results be achieved in today's industry.

REFERENCES

1. Амурова Н.Ю. (2024). ASSESSING THE EFFECTIVENESS OF SOLAR PANELS IN URBANIZED AREAS: AN ANALYSIS OF BENEFITS AND CHALLENGES. *Web of Discoveries: Journal of Analysis and Inventions*, *2*(3), 115–120. Retrieved from https://webofjournals.com/index.php/3/article/view/1043
2. Амурова Н.Ю. ПРОЕКТНО-СОЗИДАТЕЛЬНАЯ ДЕЯТЕЛЬНОСТЬ: НАУЧНОЕ ОБОСНОВАНИЕ И МЕТОДОЛОГИЯ //INNOVATSION IQTISODIYOTNI SHAKLLANTIRISHDA AXBOROT KOMMUNIKATSIYA TEXNOLOGIYALARINING TUTGAN O ‘RNI. – 2023. – Т. 1. – №. 1.
3. Амурова Н.Ю. ВОЗМОЖНЫЕ ЭТАПЫ ПРОЕКТИРОВАНИЯ МЕТОДА ОБУЧЕНИЯ //ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ. – 2023. – Т. 33. – №. 3. – С. 13-17.
4. Амурова Н.Ю. ФОРМИРОВАНИЕ ПРОФЕССИОНАЛЬНЫХ КОМПЕТЕНТНОСТЕЙ У СТУДЕНТОВ В ВЫСШИХ ОБРАЗОВАТЕЛЬНЫХ УЧРЕЖДЕНИЯХ //ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ. – 2023. – Т. 33. – №. 3. – С. 18-22.

5. Амурова Н.Ю. НАПРАВЛЕННАЯ ПОДГОТОВКА СПЕЦИАЛИСТОВ В ОБЛАСТИ ЭНЕРГОСНАБЖЕНИЯ В СФЕРЕ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ //ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ. – 2023. – Т. 33. – №. 3. – С. 23-27.
6. Yurevna, A.N. (2023). FACTORS OF ENSURING THE IMPLEMENTATION OF A PROJECT-BASED CREATIVE TRAINING METHODOLOGY IN A CREDIT-MODULAR SYSTEM. *AS-Proceedings*, *1*(1), 253–255. https://doi.org/10.59287/as-proceedings.69
7. Amurova N.Y. (2023). METHODOLOGY OF SCIENTIFIC SUBSTANTIATION OF THE INTRODUCTION OF DESIGN AND CREATIVE METHODS IN THE EDUCATIONAL PROCESS WHEN TEACHING THE COURSE "POWER SUPPLY OF INFOCOMMUNICATION SYSTEMS". International Journal of Education, Social Science & Humanities. Finland Academic Research Science Publishers, 11(7), 185–194. https://doi.org/10.5281/zenodo.8149830
8. Amurova N.Y. (2023). A MODEL FOR THE FORMATION OF PROFESSIONAL COMPETENCE OF SPECIALISTS IN ENERGY AND POWER SUPPLY IN THE FIELD OF INFORMATION TECHNOLOGY BASED ON DESIGN AND CREATIVE TRAINING. International Journal of Education, Social Science & Humanities. FARS Publishers, 11(3), 71–77. https://doi.org/10.5281/zenodo.7699446
9. Белухин Д.А. Общие основы личностно – ориентированной педагогики. – М., 2002. – Ч.1.
10. Калошина И.П. Психология творческой деятельности: Учеб. пособие для вузов/ И.П. Калошина. – М.: Юнити-Дана, 2003. – 431 с.
11. Гребенюк О.С. Общие основы педагогики: учебник для студентов высших учебных заведений / О. С. Гребенюк, М. И. Рожков. – М.: Издательство ВЛАДОС-ПРЕСС, 2003.