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## MULTIDIMENSIONALITY OF THE PROCESSES OF ASSESSING STUDENTS' LEARNING OUTCOMES IN THE NEW UKRAINIAN SCHOOL

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The article conducts a systematic study of the processes of assessing students' learning outcomes in the New Ukrainian School. It is shown that the assessment process in the system of general secondary education determines an important characteristic of the educational process – its quality.

It is proved that the assessment process is one of the most important aspects of the educational process, since assessment corresponds to the cornerstone systemic-cybernetic principle of the functioning of any system – feedback, which in the education system is implemented between participants in the educational process mostly in the form of processes of assessing educational achievements of education subjects.

It is argued that assessment as a multidimensional and one of the most important components of the educational process can be characterized on the basis of various features/characteristics (by types, forms and methods of assessment; by the level of interaction of participants in the educational process; by the differentiation of tasks according to cognitive levels; by the method of grouping learning outcomes; by approaches to assessing competencies; by the method of expressing assessments, etc.), which are important and equivalent, therefore, comprehensive consideration of their features in the process of assessing the learning outcomes of participants in the educational process is of great importance for the specified process.

Assessment is considered in a broader (systemic) sense as a process consisting of certain stages/components (definition of goals and criteria, assessment, analysis and correction), which should be implemented taking into account the features of the assessment characteristics (levels of differentiation of the educational process, interaction of participants in the educational process, cognitive levels of learners' activity, etc.).

The basic characteristics of the assessment process are considered, a model for forming an overall assessment for a subject/integrated course is built (using the example of the mathematical educational field), a model for implementing assessment stages at different levels of differentiation of the educational process is developed.

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**Keywords:** assessment, educational process, types, forms, assessment methods, levels of interaction, cognitive levels, competence, groups of results.

### БАГАТОВИМІРНІСТЬ ПРОЦЕСІВ ОЦІНЮВАННЯ РЕЗУЛЬТАТІВ НАВЧАННЯ УЧНІВ У НОВІЙ УКРАЇНСЬКІЙ ШКОЛІ

# О. В. Пастовенський, О. В. Вознюк

У статті здійснюється системне дослідження процесів оцінювання результатів навчання учнів у Новій українській школі. Показано, що процес оцінювання у системі загальної середньої освіти визначає важливу характеристику освітнього процесу – його якість.

Доводиться, що процес оцінювання постає одним із найважливіших аспектів освітнього процесу, оскільки оцінювання відповідає наріжному системно-кібернетичному принципу функціонування будь-якої системи – зворотному зв'язку, який у системі освіти реалізуються між учасниками освітнього процесу здебільшого у вигляді процесів оцінювання навчальних досягнень суб'єктів освіти.

Стверджується, що оцінювання як багатовимірний і один із найважливіших компонентів освітнього процесу можна характеризувати на основі різних ознак/характеристик (за видами, формами і методами оцінювання; за рівнем взаємодії учасників освітнього процесу; за диференціацією завдань відповідно до когнітивних рівнів; за способом групування результатів навчання; за підходами до оцінюванням компетентностей; за способом вираження оцінок тощо), які є важливими і рівнозначними, тому комплексне врахування їхніх особливостей в процесі оцінювання результатів навчання учасників освітнього процесу має вагоме значення для зазначеного процесу.

Оцінювання розглядається в ширшому (системному) розумінні як процес, що складається з певних етапів/складових (визначення цілей і критеріїв, оцінювання, аналіз і корегування), які доцільно реалізовувати з урахуванням особливостей характеристик оцінювання (рівнів диференціації навчального процесу, взаємодії учасників освітнього процесу, когнітивних рівнів діяльності учнів тощо).

Розглянуто базові характеристики процесу оцінювання, побудовано модель формування загальної оцінки з предмета/інтегрованого курсу (на прикладі математичної освітньої галузі), розроблена модель реалізації етапів оцінювання на різних рівнях диференціації освітнього процесу.

**Ключові слова:** оцінювання, освітній процес, види, форми, методи оцінювання, рівні взаємодії, когнітивні рівні, компетентність, групи результатів.

Introduction of the issue. Assessment of students' learning outcomes is one of the most important aspects of the educational process, since assessment corresponds to the cornerstone systemic-cybernetic principle of the functioning of any system feedback. In the education system, feedback within the participants in the educational process is realized mostly in the form of assessing the educational achievements of education subjects. At the same time, as Wilhelm Windelband noted, any assessment takes for a criterion a goal and has meaning significance only for those who recognize this goal [17].

**Current state of the issue.** The assessment process in the system of general secondary education determines an

important characteristic of the educational process - its quality. Thus, the research of Eric Hanushek from Stanford University and Ludger Woessmann from German Institute for Economic Research has shown that the quality of school education in the context of its assessment helps to predict how much a country will prosper in the long term [13]. Significant results in studying the problem of the quality of education in its connection with the assessment of academic success have been achieved by foreign scientists [11-13; 16]. At the same time, the assessment process focus of attention of many researchers in the context of its various aspects - psychological and motivational, educational, target-oriented, formative [14; 15; 19-21]. The phenomenon of formative

assessment is of particular importance both in the domain of Ukrainian [6] and foreign research [9; 10; 18].

However, the system of assessing student learning outcomes in the New Ukrainian School in the context of a systematic generalization of the mentioned process has not yet been the subject of scientific and pedagogical research.

**Aim of the research** presupposes the investigating of the multidimensionality of the processes of assessing learners' learning outcomes in the New Ukrainian School.

**Research methods:** theoretical analysis of scientific literature and educational documents, including synthesis, comparison, and modeling, which allows building a model of the assessment process in the context of the New Ukrainian School.

**Results and discussion.** Assessment as a multidimensional entity and one of the most important components of the educational process should be characterized based on the analysis of the requirements of regulatory legal acts on education – specifically the requirements to the assessment process, to the results of students' educational activities, to the method of expressing the assessment, etc. [6].

Article 17 of the Law of Ukraine "On Complete General Secondary Education" defines the main types of assessment of students' learning outcomes, include: formative, current, final (thematic, semester, annual) assessment, state final certification (SFC), external independent assessment (EIA) [1]. Considering that formative assessment is, in fact, an effective current assessment (along with traditional current assessment), SFC and EIA are summative assessments at certain levels of education (primary, basic and specialized secondary education), and the annual assessment is based on the overall grades for the first and second semesters, we highlight the following types of assessment most common in the general secondary education system:

- current assessment (traditional, formative);
- summative assessment (thematic, semester).

Each of these types of assessment has its place and role in the educational process and is regulated by certain legal educational documents.

In addition, since assessment is an integral part of the educational process, it can be carried out in individual, group or frontal **forms** [3].

It is obvious that during frontal assessment, the individual characteristics of learners are not taken into account fully enough.

In the process of organizing group forms of work based on a differentiated approach, it is much better to take into account the learners' educational needs. Group forms of assessment are more objective and more effectively contribute to improving the learning outcomes of the participants in the educational process.

During the implementation of an individual form of assessment, additional opportunities appear for analyzing the features of individual educational trajectories and objectively assessing children's learning outcomes.

Let us note that although all forms of assessment are used in practice, experience confirms pedagogical the positive impact of differentiation and individualization of assessment on ensuring effectiveness the ofthe educational process and the successful implementation of learners' individual educational trajectories.

At the same time, it is important to emphasize that a crucial role in ensuring effectiveness and objectivity assessing the results of learners' educational activities is played by the rational use of various assessment methods, we among which distinguish:

- observation methods: observation of learners' activities, learning outcomes (in particular, portfolio analysis), etc.;
- oral assessment methods: learners' story, explanation, reading of the text, diagrams, conversation, oral test, etc.;
- written assessment methods: solving problems, exercises, dictations, recitations, compositions, written answers to questions, tests, essays, etc.;

- practical assessment methods: laboratory, practical, graphic, calculation work, educational projects, work with maps, diagrams, creation of tables, diagrams, models, etc.;
- digital assessment methods: online testing, IT product assessment, working on simulators, remote assessment using video conferencing capabilities, etc. [5].

It is clear that the reasonable choice of assessment methods depends on the specifics of the content of educational disciplines (integrated courses), their volume, age and psychological characteristics of learners in a particular class, the forms of organization of the educational process, etc.

It is also obvious that the effectiveness of assessment, as a component of the educational process, largely depends on the level of **interaction** between participants in the educational process.

In our opinion, the interaction of participants in the educational process (teachers, learners, parents) in the process of assessing the learning outcomes can be implemented at the following three levels:

- the level of *authoritarian influence* (the teacher alone assesses the learners' learning outcomes);
- the level of *constructive communication* (the teacher assesses the learning outcomes based on constant exchange of information with learners and their parents);
- the level of *horizontal cooperation* (the assessment of learning outcomes is carried out within the interaction of all participants in the educational process on the basis of the principle of equality, in particular in the process of organizing mutual assessment and self-assessment).

It is clear that the assessment of learners' learning outcomes, depending on the specific situation, can be carried out in the interaction of participants in the educational process (teachers, learners, parents) at any of the three specified levels.

In particular, in conditions of authoritarian influence, the teacher singlehandedly controls the educational process, however, under these circumstances, as practical experience shows, not all the features of assessment in a particular class are always taken into account.

At the level of constructive communication, the teacher more successfully implements the assessment requirements based on systematic and constructive communications with learners and parents. At this level, real steps are taken to improve the effectiveness of assessment.

At the level of horizontal cooperation, the teacher successfully implements the assessment requirements together with learners and parents. *Self-assessment and mutual assessment* of learning outcomes are of particular importance, which in most cases should precede the teacher's assessment. We emphasize that it is at this level that the assessment potential is most effectively realized [7].

It should be noted that in the process of assessing academic successes, it is important to take into account the level of learners' *cognitive* activity in the educational process.

It is advisable to differentiate the tasks for assessment taking into account the taxonomy of educational goals by **cognitive** levels of activity:

initial level tasks should presuppose learners' ability to recognize and reproduce elements of the content of education;

intermediate level tasks – learners' understanding and application of the elements of educational material;

sufficient – learners' skills in analyzing educational information (its classification, comparison, generalization, integration, etc.):

high level tasks – learners' ability to evaluate educational information, reflection, recording information (from text to schematic or graphic forms and vice versa), creating and producing information [5].

Each subsequent level of tasks (from initial to intermediate, sufficient and high) should cover the indicators for assessing the learning outcomes at preceding levels and contain new indicators that allow assessing learning outcomes at higher cognitive levels.

Let us consider another characteristic of assessment, which is determined by the

features of the current State Standard of Basic Secondary Education. One of these features expresses the requirements for mandatory learning outcomes for the learners in grades 5-6 and 7-9 in educational fields and the corresponding benchmarks for assessment are defined in terms of **groups of outcomes** that cover closely connected general outcomes [8].

In accordance with the groups of results and assessment guidelines being defined for each educational field, the assessment criteria for educational fields of learning outcomes of education seekers have been developed. This, of course, is also reflected in the certificate of learners' achievement, where marks are also given by groups of results [5]. The scheme for forming an overall assessment for studying disciplines (using the example of the mathematical field) is shown in Fig. 1.

Requirements for mandatory learners studying outcomes according to the state standard of basic secondary education	Criteria for evaluating learners studying outcomes by educational field in accordance with the state standard for basic secondary education	Characteristics of studying outcomes (by groups of outcomes according to the certificate of achievement)				
Mathematical educational field						
Investigating situations and	Outcome Group 1.	Learning Outcome				
identifying problems that can	Investigating situations and	Investigating situations and				
be solved using mathematical methods	creates mathematical models	creates mathematical models				
Modeling processes and	Outcome Group 2.	Studying Outcome				
situations, developing strategies and action plans to solve problem situations	Solving mathematical problems	Solving mathematical problems				
Critical assessment of the	Results Group 3.	Studying Outcome				
process and <b>result</b> of solving problem situations	Interpreting and critical analyzing the results	Interpreting and critical analyzing the results				
Development of mathematical thinking for cognition and transformation of reality, mastery of mathematical language		1				
		OVERALL RATING				

Fig. 1. Model for forming an overall assessment for a studying subject/integrated course (using the example of the mathematical educational field)

Another feature of the assessment process is that the assessment of learning outcomes should be carried out in accordance with the requirements for mandatory learning outcomes defined by State Standard based competency-based approach [8]. After all, complete general secondary education in regulatory legal acts is considered as a learning set outcomes and competencies determined by the relevant state standards and acquired by a person

at the relevant levels of complete general secondary education [1].

Considering that the competence structure includes knowledge, skills, abilities, values and attitudes [2], as well taking into account practical experience in carrying out assessment, let us note that currently the assessment of competencies is most often carried out on the basis of such approaches of knowledge; 1) assessment 2) assessment of knowledge, skills and

abilities; 3) assessment of knowledge, skills, abilities, attitudes and values.

Sadly for all of us, the assessment of mainly the knowledge component of competencies is still quite common in This is due to both the schools. imperfection of assessment methods and technologies, and the insufficient professional training of some pedagogical workers as for the requirements of the New Ukrainian School regarding the assessment of competencies. At the same time, it is important to note that the development and provision of objective assessment of competencies are one of the most important tasks of the New Ukrainian School.

And finally, the assessment process is also characterized by the way of expressing **the assessing evaluation/marks,** the main ones being: verbal, level, and point assessments. It should be noted that a retrospective

analysis of the experience of the functioning of various educational systems confirms the importance of assessments for ensuring the effectiveness of the educational process.

It should be noted that verbal and level assessments can be expressed both orally and in writing. The learning outcome of children in grades 1-2 is expressed by a verbal assessment, and grades 3-4 – by a verbal or level assessment, at the choice of the educational institution [8].

The learning outcomes of learners in basic and senior vocational schools are expressed by points from 1 to 12. In the case of introducing its own scale for assessing learning outcomes, the educational institution must determine the rules for converting such assessments to a 12-point scale [2].

The generalized/systemic characteristics of the assessment process are given in Table 1.

 ${\it Table~1}$  The generalized/systemic characteristics of the assessment process

Nº	Name of the sign	Characteristics of the assessment process			
1	By type of	- current assessment (traditional, formative);			
	assessment	- summative assessment (thematic, semester).			
2	By assessment	- frontal assessment;			
	forms	- group assessment;			
		- individual assessment.			
3	By assessment	- observation methods (observation of learners' activities,			
	methods	learning outcomes (including portfolio analysis), etc.);			
		- oral assessment methods (learner's story, explanation,			
		reading text, diagrams, conversation, oral test, etc.);			
		- written assessment methods (solving problems, exercises,			
		dictations, recitations, compositions, answers to written			
		questions, tests, essays, etc.);			
		- practical assessment methods (laboratory, practical,			
		graphic, calculation work, educational projects, working with			
		maps, diagrams, creating tables, diagrams, models, etc.);			
		- digital assessment methods (online testing, evaluation of IT			
		products, work on simulators, remote assessment using			
		videoconferencing capabilities, etc.).			
4	By the level of	- assessment based on methods of authoritarian influence of			
	interaction	the teacher;			
	between	- assessment based on methods of constructive			
	participants in the	communication of participants in the educational process;			
	educational	- assessment based on methods of horizontal cooperation of			
	process	participants in the educational process (in particular, in the			
		process of organizing mutual assessment and self-			
		assessment).			

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5	By differentiating	- assessment of knowledge of the material (initial level);			
	tasks according to	- assessment of understanding and application of content			
	cognitive levels	elements (intermediate level);			
		– assessment of the ability to analyze educational information			
		(sufficient level);			
		- assessment of the ability to evaluate the material, reflect,			
		recode, and produce information (high level).			
6	By the method of	- assessment of learners' learning outcomes in educational			
	grouping learning	fields without division into groups of outcomes;			
	outcomes	- assessment of learners' achievements in educational fields			
		by separate groups of outcomes.			
7	By approaches to	- assessment of knowledge;			
	competency	– assessment of knowledge, skills and abilities;			
	assessment	- assessment of knowledge, skills, abilities, attitudes and			
		values.			
8	By the way of	- verbal assessment;			
	expressing	– level assessment;			
	grades/marks	<ul><li>point assessment.</li></ul>			

It should be emphasized that the considered characteristics assessment process are equivalent and independent, therefore, in the process of assessing the learning outcomes, it is important to take into account all their peculiarities. For example, in the process of final (semester) assessment in a group (frontal, individual), the written, practical or digital assessment methods can be used; assessment can be carried out on the basis of the teacher's authoritarian influence, constructive communication or horizontal cooperation of participants in the educational process; using tasks of initial, intermediate, sufficient or high cognitive levels; with the assessment of knowledge or knowledge, skills and attitudes: with determination of point, level or verbal assessments, etc.

We also note that assessment can be considered in a broader (systemic) sense as a process consisting of the following stages:

- formulation (definition) of the goal and objectives of learning (*goals* in a short way of expressing);
- development of criteria for assessing learning outcomes (*criteria*);
- actual assessment of the results of educational activities (assessment);
- analysis of assessment results (analysis);

- correction (if necessary) of the educational process (*correction*) [4].

It should be noted that the specified components of the assessment process is to be implemented taking into account the features of the above-mentioned assessment characteristics (levels of differentiation of the educational process, interaction of participants in the educational process, cognitive levels of learners' activity, etc.).

For example, the implementation of assessment stages at different levels of differentiation of the educational process (frontal, group, individual) can be schematically presented as shown in Fig. 2 [7].

Thus, taking into account the characteristics of the assessing process as fully as possible at all stages will contribute to increasing the effectiveness of the assessing process.

Conclusions and research perspectives. The conducted analysis gives grounds to assert that assessment as a multidimensional and one of the most important components of the educational process can be characterized on the basis of various features, in particular:

types, forms and methods of assessment;

level of interaction of participants in the educational process;

differentiation of tasks according to cognitive levels;

method of grouping learning outcomes; approaches to assessing competencies; method of expressing assessments, etc. It should be emphasized that the considered assessment characteristics are important and equivalent, therefore, the comprehensive consideration of their features in the process of assessing learning outcomes will have a significant positive value.

It should also be noted that assessment can be considered in a

broader (systemic) sense as a process consisting of such stages as defining goals and criteria, assessment, analysis and correction. It is also advisable to implement the specified components of the assessment process taking into account the features of the assessment characteristics considered above (levels of differentiation of the educational process, interaction of participants in the educational process, cognitive levels of learners' activity, etc.).

Assessment stages	•			
Adjustment	Adjusting the educational process in the classroom	Adjusting the educational process in groups	Adjusting individual educational trajectories	
Analysis	Analysis of the results of the assessment of learners in the class (reflection)	Analysis of the results of the assessment of learners in groups (reflection)	Analysis of the results of the individual assessment (reflection	
Assessment	Classroom assessment (self- assessment, peer assessment, teacher assessment)	Group assessment (self- assessment, peer assessment, teacher assessment)	Individual assessment (self-assessment, peer assessment, teacher assessment)	
Criteria	Joint development of adapted criteria	Joint development of adapted criteria	Joint development of adapted criteria	
Goals	Setting class goals	Setting group goals	Setting individual goals	
	Frontal form	Group form	Individual form	Assessment forms

Fig. 2. Model of implementation of assessment stages according to different levels of differentiation of the educational process

Research perspectives. Taking into account the characteristics of such a multidimensional process as assessment at all its stages within the concept of the New Ukrainian School will lead to an increase in the positive role of assessment

and to an increase in the effectiveness of the educational process as a whole. This thesis requires further scientific exploration of the problematic field of research.

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