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Assessment in Secondary Vocational Education and Training

Handbook

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Authors' Preface

This handbook is devoted to VET school teachers to develop their attitude towards testing and assessment of students' achievements – to conceive assessment in this way and to develop skills of continuous tracking of students so that they become professionally competent persons. The handbook is the basis for a teacher training programme aimed at developing docimological skills and application of testing and assessment procedures.

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The students of the Faculty of Technical Sciences in Cacak, pedagogical orientation and the VET school teachers in Cacak with whom we realised a part of the training programme for assessment contributed to the final version of this handbook with their questions, comments and suggestions.

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Cacak, January 2005 The authors

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Assessment in VET education

Assessment as a learning process

- I General Section –

Testing and assessment are traditionally perceived by stakeholders as target activities in the instruction process. The vocational education and training (in short: VET) development strategy, which is based on competences and the definition of teaching effects as expected changes in student behaviour (the phrase "expected changes" means learning outcomes)[1], requires that a special role be given to the assessment in a relevant context – to serve as a basis for the continuous learning process of individuals and the whole community. All assessment methods and strategies, as well as facilitating modes of the learning process, need to be focused on obtaining this goal. The application of various testing and assessment methods and procedures has a significant impact on students' view of their role in the education and instruction process.

The main idea is that assessment, teaching and learning are integrated processes that enable the direction of all processes towards learning outcomes. Assessment is not treated as the final product of the teaching and learning process, but rather as a continuous process providing feedback to students and teachers on the extent of implementation and possible implementation of teaching and learning. A good assessment is based on national learning assessment standards (NLAS), tied to the curriculum standards, which are defined for school years/school cycles and for subjects. In the absence of NLAS and their corresponding methods and instruments of assessment, the assessment of students remain entirely teacher-based, because it is done in accordance with the experience and judgment of each teacher which ensures no comparability of assessments between teachers and schools.

The main purpose of this document is to analyse some of the basic notions essential for assessment in outcome based VET. The goal is to initiate a discussion on the implementation of outcome based VET, particularly on assessment procedures characteristic for VET. The design and development of the curriculum is a process of integration where outcomes, assessment criteria, descriptions of levels, modularisation and handbooks are considered as interactive processes. The document has the following tasks:

- To facilitate the harmonisation of practice and assessment procedures;

- To propose operational criteria and guidelines for assessment in the context of outcome based VET.

Objectives and Outcomes in Vocational Education and Training

The development tendency of educational systems oriented on mastering and/or developing learning skills and knowledge structure, requires explicitness concerning the expected effects in each type of teaching and pedagogical procedure. The traditional organisation of the instruction highlights the role of school subjects and classes' objectives and outcomes, while the new concept is oriented towards the definition of the objectives and expected outcomes of the teaching and learning process. The outcomes can be determined, and modified in practice, on two levels:

- General outcomes need to be set at the level of the curricula, modules and teaching areas;
- Operational outcomes need to be defined at the level of the concrete class and they have to be measurable and verifiable.

Table nº 1: Educational Objectives and Outcomes

Educational Objectives	**General Educational Outcomes**	**Operational Outcomes (class outcomes, module outcomes etc.)**
Refer to expectations and intentions. They represent an indicator of fundamental values and determinations in the field of education. They are a starting point for projecting and designing the educational process. They serve as a basis for selecting educational outcomes (authentic effects).	Refer to results that can be obtained through education. Characteristics and capacities of the educational system, as well as conditions of the educational system's operation, are taken into account during their definition. They are harmonised with the developmental characteristics of the students. They are harmonised with the needs and interests of both students and the whole society. They are liable to testing and measuring, which makes the basis for systematic monitoring and validation of defined educational outcomes'	Refer to verifiable and measurable results that can be obtained in the class. The specifics and characteristics of the learning environment are taken into account during their definition. They are harmonised with the developmental characteristics of students in a certain class and their individual differences.

[1] The term "outcome" comprises meanings of the following notions: teaching effects obtained at the level of student behaviour and outcomes, teaching effects reflected on the behaviour of students; forms of competences.

	realisation.	
Example: Development of functional literacy.	Example: a student is able to present relations through use of simple formulas, graphs, charts, schemes and present them through a model and an experiment.	Example: a student is able to present a simple electrical circuit through a scheme; he/she is able to use the symbols of electric circuit elements.

Learning outcomes are present from the very start of the teaching and learning process in the form of expectations, and during the process they are gradually formed, developed and become authentic, sustainable student achievements.

Operationalised teaching objectives enable focusing of the teachers' attention on the matters that should serve as a basis for finding out what happens with students while attending the instruction. Testing of objectives and outcomes' realisation presents the basis for further modification of the instruction process, and it means the interaction between the planned issues and their implementation.

Educational standards, curricula, feedback and corrections are all interconnected and interdependent. They should enable a student to acquire criteria patterns enabling him to discern situational requirements which will give him direction in the future learning process to repertoires of behaviour and how to learn.[2]

Regardless of how curricula are formulated they should represent all learning opportunities that can make a difference in the student's achievements (the cyclic process of curricula development is shown in figure 2).

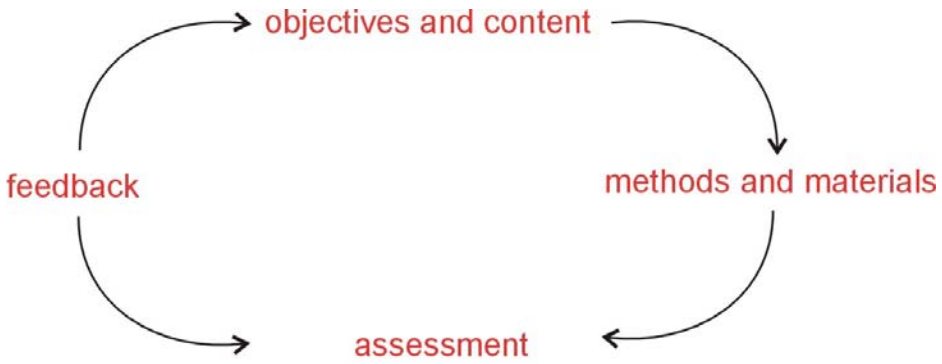

Figure 2. Curriculum and Assessment Process

[2] The criteria pattern (demand/requirement imposed by ongoing circumstances) – a control mechanism that channels the learning process, and defines what is required in a certain teaching situation, what the needed activities are. The repertory of behaviour – several reactions that may be logically and functionally connected and they present a response to the criteria pattern. If the criteria pattern is clear it will make a solid basis for the development of these reactions. They provide auto-regulation of behaviour and learning

The VET education objectives and outcomes are elaborated in detail in the “Strategy of VET education” (“Educational Review”, 2003).

Key Terms – Terminological Explanations

The teacher shall test, assess and validate student achievements, and these are completely different activities.

Testing is the systematic data collection on how and to which extent students and teachers obtain achievements and educational objectives set. This activity can be conducted in various ways: verbally, in writing, through observation of psychomotor activities and so on. In principle, the results of testing are not assessed.

Assessment is the qualitative analysis aimed at determining the extent of achieving certain objectives. It is based on the classification of answers in qualitative categories, and then determining their quantitative value (the grades). Assessment is the process of testing and measuring learning achievements and making pedagogical decisions. It presents an integral part of both teaching and learning, it is not just the climax of the instruction process. The first step in effective school assessment is: defining the criteria pattern (requirements imposed by current circumstances) and the expected repertory of behaviour that students should adopt to meet the requirements.

The term ''assessment'' is interpreted in different ways, and it is mostly interpreted as testing and ranking. Assessment is usually used to inform students about their progress and their results achieved in the instruction process.

Validation is the activity related to determining the extent of realisation of the educational objectives, taking into account the conditions under which the results are made.

Though the term “validation” is often equalized with the term “evaluation”, these are not necessarily terms with the same meaning. Sometimes “evaluation” means “validation” defined in the aforementioned way, thus it is possible to avoid use of the term; and sometimes “evaluation” means a wider process, so it is not possible to find another adequate term in Serbian language. Therefore the term “evaluation” is used in the case of the wider meaning.

Evaluation [3] is the pedagogical process of monitoring, measuring and validating educational outcomes and processes.

Docimology[4] defines fundamental principles through study of the testing and assessment processes. Crucial **docimology principles are the following**:

- **The principle of evaluation objectivity** refers to the structure and organisation of evaluation: students' results should be expressed and evaluated in a realistic and relevant way; the principle is aimed at limiting the influence of external factors;

[3] Evaluation is the pedagogical process with a wider meaning than other activities, encompassing all of them.

[4] Docimology is the scientific discipline that deals with assessment.

- **The principle of evaluation interactivity** means that evaluation of students is also necessarily connected with evaluative activities performed by teachers and self-evaluation activities performed by students;

  The principle of connectivity between student achievements and the context means that during evaluation the achievements shall be taken into account that are measured by assignments reflecting the reality and abilities of students to adjust their adopted knowledge to a wide range of situations.

Types of testing, assessment and validation

In accordance with the mode and the extent of the impact which the results of testing, assessment and validation have on the teaching and learning process, there are different approaches: the formative (process) approach and the summative (final) approach.

Table nº. 2. **TYPES OF TESTING, ASSESSMENT AND VALIDATION**

	DIAGNOSTIC APPROACH	FORMATIVE	SUMMATIVE
Function	*Position.* Determination of the presence or absence of needed skills. Determination of the student's prior learning level. Classifying students by different characteristics related to alternative forms of instruction. Searching for the causes of constant repetition of learning difficulties.	Student and teacher feedback on student progress in the instruction. Identification of mistakes made in respect of the structure of the teaching units serves as a basis for suggestions on alternative educational techniques.	Student assessment at the end of teaching unit, the semester or school year.
Timeframe	Determination of the position at the start of the teaching unit, the semester or school year. During the instruction process when the student shows a constant disability to benefit from regular (everyday) teaching.	In the course of instruction.	At the end of the teaching unit, the semester or school year.
Evalua-tion Focus	Cognitive, affective, psychomotor behaviour. Physical, physiological and environmental factors.	Cognitive behaviour.	General cognitive behaviour: dependence on school subject; Sometimes psychomotor, too; at times - affective behaviour

Table nº. 2. **TYPES OF TESTING, ASSESSMENT AND VALIDATION**			
	DIAGNOSTIC APPROACH	FORMATIVE	SUMMATIVE
Instrument	Formative and summative aimed at prior (initial) testing. Standardised tests of achievements. Standardised diagnostic tests. Instruments designed by teachers. Observations-based monitoring and check-lists.	Specially designed formative instruments.	Final or summative examinations.
Sample	Specific sample of prior behaviour. Sample of measured teaching objectives. Sample of the variables whose relations with certain types of instruction are known or assumed. Behaviour sample of relevant physical, emotional or similar tasks.	Concrete sample of all similar tasks in the hierarchy of the teaching unit.	Sample of measured teaching objectives.
Difficulties with Certain Items	The diagnosis of prior skills and abilities; a great number of simple individual items, 65% difficulties or more.	It cannot be determined in advance.	Process weight, from 35% to 70%,with some very easy and some very difficult items.
Scoring. Method of Announcing Results	Normative and criteria-based. Individual profile based on the demonstration of specific skills.	Criteria-based. Individual pattern of points scored for each task in the hierarchy, presented in the mode: passed/failed.	General, normative, but it can also be criteria-based. Total score or subscores, by objectives.

According to the hierarchical and organisational level at which assessment is performed in a school system (from individual to state level) **three basic assessment types in school systems** are recognized (Stoica, 2004): classroom assessment, public (national) examination, national assessment.

1. Classroom-based and school-based assessments

Teachers and/or schools check progress against curriculum goals, students receive marks, and parents receive report cards.

Advantages:

- Assessment is closely linked to classroom work;
- Assessment is performance-based (oral questioning, practical work);
- Assessment is continuous over a semester or a year.

Disadvantages:

- Teachers are subjective in their judgement of students' performance;
- Encourages memory based and superficial questioning;
- Few teachers are adequately trained to assess the development of higher level thinking skills linked to national standards.

2. Public (national) examinations

Examinations are the assessment of students done: (i) not by the teachers who taught their students, but by somebody else (i.e. examination institutions, research institutes, ministries of education, other teachers or specialists etc.), and (ii) in standardized conditions (i.e. all students receive the same tests, in the same format, on the same day and at the same time, the marking procedures of the tests are similar across the country etc.).

Advantages:

- Competitive and bring benefits to those who succeed;
- Select the most able, on the basis of merit rather than wealth, birth, or connections.

Disadvantages

- Better-off, urban, and majority-language students have advantages over poor, rural and minority-language ones.

3. National assessments (whole population or sample-based)

These measure typical levels of learner achievement in relation to national standards. They are based on the same curricula and use many of the same assessment methods as the public examinations. However unlike the public examinations they measure performance of the *system* rather than of individuals and the results are used as a "snapshot" of general achievement among a particular age group or level, and as a basis for monitoring national standards over time.

Assessment

The term "assessment" is interpreted differently in various contexts , and it mostly means testing and ranking. Assessment is usually used to inform students about their progress and obtained results in the instruction process. Also, it can be defined as the process of "making

decisions on relevant subject, examining or testing individual performance, evaluating or making judgements, according to the following criteria: accurateness; validity and empirical evidence; the process and the outcome of assessment at the same time - grade.'' (*Withers, 1994: 13, see: SAQA*). “Class-based assessment serves the collection, interpretation and usage of information aimed at enabling teachers to make pedagogical decisions.'' (*McMillan, 1997: 5, see: SAQA*).

Hence, assessment is: (a) the process covering testing, measuring and evaluation and (b) it leads to making pedagogical decisions.

Philosophical Foundations of Assessment

Vocational education is conceptually determined by both educational philosophy and a pragmatic framework. This segment's purpose is to identify and focus on philosophical principles of outcome-based VET that are highly related to assessment:

- Development of the lifelong learning society;
- Integrativity;
- Expanded framework of opportunities for students;
- Continuous process;
- Openness and transparency;
- Responsibility;
- Equity;
- Quality;
- Flexibility.

Annex nº 1: Philosophical Foundations of Assessment

Development of the lifelong learning society: One of the main objectives of outcome-based VET is to lay the foundation for the development of the lifelong learning society. Therefore it is possible to define the basic value of assessment through providing an answer to the following question: Does assessment provide students with learning opportunities?

Integrativity: Perception of assessment, teaching and learning as mutually integrated processes that create the synergy and facilitate focusing the educational process on learning outcomes. Therefore, assessment is not the final product of teaching and learning (complementary processes of the instruction) - it is a continuous process providing feedback to students and teachers on teaching and learning outcomes. The principle of ''integrity'' is related to the term ''authentic'' assessment (Welch, 1999: 14). Since assessment, as a form of feedback, is to enable students to act efficiently in the real world, authentic assessment is directly linked with achieving the highest extent of integration of the instruction with the reality as possible.

Expanded framework of opportunities for students: It is necessary to implement various modes of assessment in order to provide equal assessment for all students in respect of a high extent of individualisation of the instruction process and the opportunity to express the highest levels of their achievements.

Continuous process: This is a crucial principle, that defines assessment as a ''continuous'' and ''current'' process; therefore, the students' progress is monitored consistently, in the context of lifelong learning. The continuum of the assessment process underlines the importance of self-assessment.

Openness and transparency: This principle requires the continuous information of students on the assessment criteria applied, methods and context, as well as the explicitness of expectations. It is necessary to enable students to take part in the definition of operational criteria, which facilitates the meeting of requirements (demands) set. If a student has a clear

picture of the requirements imposed by ongoing circumstances and the criteria patterns of learning and behaviour, he/she will adopt the repertory of behaviour far more easily.[5]

Responsibility: This principle re-channels the responsibility for learning from institution to student. In the context of outcome-based VET students have to accept responsibility for their own learning progress. Self-assessment and peer assessment of students contribute to this principle.

Equity: This principle is determined by social and economic opportunities and accessibility of education to various categories of the student population. On the other hand, it is needed to implement valid assessment methods and techniques – they have clear measuring contents that are not caused by social identity, the social status of students, etc.

Quality: Setting the minimum limit for the criteria on outcomes' realisation leads to the establishment of certain standards. They serve as a landmark for determining the extent of realisation of the expected outcome, i.e. to what extent expected knowledge is adopted or expected skills mastered.

Flexibility: The idea of a flexible assessment strategy providing feedback to students on their learning achievements is the basis of outcome-based VET assessment. When students are willing to demonstrate that they have obtained a certain outcome, it is ideal to offer them an opportunity to do that. The focus on the individual progress of each student in obtaining learning outcomes means that assessment should be flexible and that it should provide a feedback on student progress which is useful for each student.

The flexibility is also reflected on the usage of various assessment methods and procedures in the VET outcome-based process, because the variety of assessment procedures induces more active learning.

Assuming that a certain motivation already exists, both summative, informal and formal assessment all have a certain position in outcome-based VET, but the most important role should be kept for informal and formal assessment, and summative assessment shall be treated as one of several possible assessment strategies.

Assessment Development Vision

The latest assessment development vision defines assessment as the dynamic process of continuous data collection on students' progress aimed at achieving learning objectives. In this development vision the emphasis is put on the fact that, when gathered information is in accordance with learning objectives and it is adequately implemented in the instruction, it can significantly contribute to the learning process and document it. Assessment is not an activity which is separated from the instruction, but it represents an integrated part of both teaching and learning – it is not just the climax activity of this process.

Learning in the educational process encompasses mastering a set of skills, procedures and terminology; students' assessment is focused on testing the level of mastered contents. The most frequent way of testing the extent of mastered teaching contents is by examining to what extent the students are able to recall the information from their memory. Traditional examinations and knowledge tests, implemented as one of the testing modes, usually test knowledge and skills independently of relevant problems. They do not test whether the students understand key notions, whether they are able to put together information and knowledge in resolving practical problems.

[5] The criteria pattern (demand/requirement imposed by ongoing circumstances) is a control mechanism that channels the learning process, and defines what is required in certain teaching situations, what the needed activities are.

The repertory of behaviour is several reactions that may be logically and functionally connected and they present a response to the criteria pattern. If the criteria pattern is clear it will make a solid basis for developing these reactions. They provide the auto-regulation of behaviour and learning.

The findings of some studies show that some students who provide correct answers at a test maybe even do not understand the answer or the problem that lies behind it.

Since teaching objectives have been changed in the direction of developing functional knowledge, there is a discrepancy between traditional assessment and the expected students' results.

The current reform trend in assessment should induce teachers to think about assessment in a wider perspective than in terms of pure examining, testing and the usage of test results' in determining of student achievement levels and ranking. There are **two general assessment principles:**

- The **principle of teaching contents assessment**: the assessment shall reflect the most important contents to be adopted by the students;
- The **principle of learning process assessment**: the assessment shall induce the learning of a relevant school subject and improve the instruction practice.

These principles lead to the implementation of alternative assessment forms the purpose of which is to receive more complete information about the knowledge adopted by students and their abilities to implement their knowledge, as well as to receive more prompt and more detailed feedback from students in order to estimate the quality of their knowledge. Garfield proposes the following alternative assessment methods: portfolio – the assessment made of the instruction process (on a piece of paper), authentic assessment and assessment of practical work. Before traditional or alternative modes of testing and assessment are selected, it is important to consider the criteria for their adequate implementation (see: Efficient Assessment Criteria, p. 11).

Assessment Objectives

The question: "What are the reasons to modify the assessment and testing procedures applied by teachers" is often asked. The main reason is the fact that traditional assessment forms rarely lead to improvements in the teaching and learning of our students. What attitudes and beliefs do students have? What is their opinion about a particular school subject and do they comprehend the school subject's contents? To what extent are they able to implement their knowledge? Without answers to these questions it is difficult to determine the way to make changes or plan the instruction in order to improve learning.

The primary objective of student assessment is to improve the learning process.

Secondary assessment objectives are:

- To provide students with individual information on their achievement of the outcomes set, the adoption of the module and learning difficulties;
- To give inputs to the teacher on the mode and the extent of students' realisation of the planned activities, as well as on the acquired module contents;
- To provide teachers with diagnostic information on difficulties that students cope with in the adoption of contents and suggest supplementary activities to be introduced in order to improve the instruction;
- To provide teachers with the information on how students see and respond to realised contents and module structure;
- To harmonise the instruction with instruction objectives/outcomes on a continuous basis.

Annex 2: Assessment Functions

What are the benefits of assessment for students? **Student-oriented assessment functions** have already been mentioned **(***Havelka & al.* 2003**):**

- **Informative function:** on the basis of monitoring the student's activities and achievements the teacher provides feedback to the student on his/her learning progress and performance;
- **Instructive or development function**: the teacher gives suggestions to the student about the next step in learning or defines it in cooperation with the student;
- **Motivational function**: through the teacher's comments and behaviour the teacher makes affects on the self-confidence and interests of students;
- **Evaluative function** (assessment of assessment): the teacher makes a general judgement on student performance through the analysis and validation of available information, according to the given criteria.

What are the benefits of assessment for the instruction process? **Instruction-oriented assessment functions are (***Havelka & al.* 2003**):**

- **Informative function:** the information on student performance presents the most authentic data on the quality of planning, organisation and delivery of the instruction;
- **Analytical-evaluative function**: is the mode where the teacher connects content oriented activities with evaluation criteria on outcome quality and realisation;
- **Corrective-innovative function**: on the basis of this function the teacher designs an operational plan for the instruction period to come.

Evaluation criteria on testing and assessment procedures, that define assessment instruments and procedures that need to be harmonised with development tasks and outcomes (*Garfield, 1994*), are based on the following principles – that is - effective and efficient assessment should:

- Provide information that will contribute to decision-making in respect of instruction improvement;
- Be aligned with instruction objectives/outcomes;
- Provide information on the contents of acquired knowledge by students;
- Offer other possible assessment results in respect of a general description of students' knowledge and abilities.

These criteria require a testing process that encompass a wide range of activities, whose segments are examining and ranking. I doing so, assessment becomes an integral part of the instruction. It consists of multiple methods that are complementary to the sources of information on the student's learning, providing the student and the teacher with a more complete analysis of the instruction activities.

Disregarding the assessment objective, the integration of an assessment programme into everyday instruction practice offers an opportunity to demonstrate what we do and find out what really happens in our classes. *Garfield* (*Garfield, 1994*) offers a systematic way of gathering and evaluating information in respect of knowledge improvement - not only specific knowledge within an educational profile, but also general knowledge,. Through implementation of assessment aimed at

identifying strengths and weakness in the teaching and learning activities, we help students to become more aware of their performance in learning a certain school subject, as well as to upgrade the estimation of their own abilities and knowledge.

Assessment Structure

The assessment structure is determined by the following fundamental **assessment dimensions**:

1. The first dimension of this structure is - **WHAT is assessed**: notions, skills, application, attitudes and preferences.
2. The second dimension of the assessment structure is - the **PURPOSE of assessment**: why the information is collected and how it is used (for instance, informing students on strengths and weaknesses of learning, or informing teachers on ways of modifying the information).
3. The third dimension is - **WHO is to carry out the assessment**: the student, other students - members of a working group, or a teacher. It is important to underline that students' engagement in self-assessment is a critical and early segment of the assessment process, and that self-criticism shall be integrated in each important segment of this process. Students need to know how to form a critical attitude towards their knowledge, skills, as well as their implementation. The students should be given the opportunity to look back at their prior work and to see what they have done and learnt. In doing so, students are enabled to implement assessment criteria to their work, as well as to the work of other students, to learn how their ranking can be compared with the teacher's ranking.
4. The fourth dimension of the assessment structure is the **METHOD** of assessment**:** the quiz, the report, team and individual projects, written assignments, drawings).
5. The fifth dimension consists of: performed **ACTIVITY AND FEEDBACK** provided for students. This is a crucial component of the assessment process, providing the connection between the assessment and the students' learning progress.

This assessment structure does not mean that the outline of these dimensions' categories will ensure a reasonable assessment method. The challenge of this assessment structure is to cope with difficulties in the assessment of certain notions that are separated from another notions and skills.

Summarizing the above dimensions we obtain the following chart:

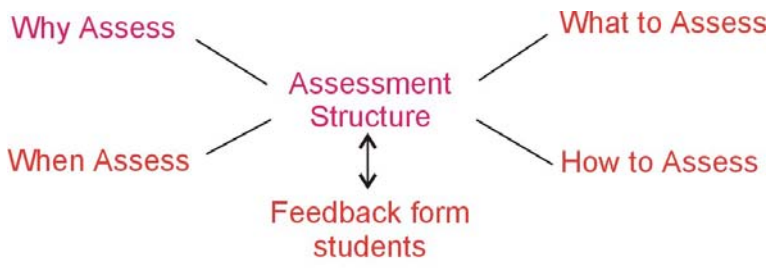

Figure 1. Dimensions of Assessment

Contents of Outcome-based Assessment

Since assessment is often treated as the stimulant in the implementation of the teaching plan and programme, students are taught to learn mostly the contents that will be the subject of testing; then we should assess the contents that we validate.

Firstly, it is needed to determine what students should know and be able to do in order to become able to work on the completion of a certain segment of the instruction process. Therefore the outcomes should be explicitly determined.

This information needs to be translated into clearly articulated objectives (wider and narrower ones), to define what assessment types are adequate for evaluation of their achievements. One of the approaches to main objectives is to define: What students need to know to manage in further education or jobs? One of the ways of determining key teaching objectives is to define what contents we want students to keep in their memory for a certain period of time upon the completion of the instruction in a certain school subject.

Apart from adopting concepts, mastering skills and developing various approaches, most teachers consider that one of the objectives of the instruction in a certain school subject is that students have to understand the role of the school subject in the system of scientific and practical disciplines.

Operationalised objectives enable us to focus our attention on finding out what happens with students during their attendance in the instruction. It is difficult to assess some objectives on an individual basis, and it is more appropriate to evaluate them as segments of the sets of notions and skills.

Strategies for ensuring consistency in the teachers' judgment include:

- sharing of understanding about the learning outcomes;
- collaborative planning;
- common assessment tasks;
- statements of anticipated evidence, or criteria sheets;
- moderation processes (formal and informal);
- sharing samples of typical responses.

Assessment Principles

In order to achieve a deeper understanding of the very nature of the assessment process, it is necessary to define the general principles that should be observed in assessment. Fundamental agreed assessment principles are (*Havelka & al.* 2003):

1. Assessment is planned as an integral part of the instruction.
2. It encompasses all actors and activities related to the instruction.
3. Assessment represents a very important professional skill of teachers.
4. Assessment should provide an answer to the question:
   How do students learn?
5. Assessment needs to support and channel students' progress.
6. Assessment is an important motivational factor in respect of learning and education.
7. Assessment is the driving force of students' emotions and their self-respect.
8. The students and other stakeholders are familiar with learning objectives and outcome assessment criteria.
9. Assessment is a developmental factor of student self-assessment skills.
10. Assessment is the activity that is to cover the whole range of students' achievements.

The assessment process is also based on the following operational principles:

- *Demonstrations of learning outcomes.* Students should be aware of what is being assessed and the evidence that will be used to judge their performance.
- *Comprehensive range of evidence.* A variety of assessment techniques and recording instruments should be used.
- *Valid and reliable evidence*. It is important that tasks assess what they are intended to assess and a broad range of evidence is used to make judgments.
- *Learners as individuals*. Students should have the opportunity to demonstrate learning outcomes in different ways and at different levels
- *Equity.* Students should be able to demonstrate learning outcomes in ways that are sensitive to, and inclusive of, their circumstances.
- *Responsibility for own learning*. Students should be self-monitoring and have the opportunities and the skills to set their own learning goals, to monitor their progress in relation to the

learning outcomes and to gather information that they and others can use to make decisions about future learning.

- *Opportunities to demonstrate learning outcomes*. Students should have numerous opportunities to demonstrate learning outcome over time and in a range of contexts.

Teacher's skill: assessment

In environments where the stable national assessment standards are not developed and applied, a teacher is the directly responsible agent of the school/ class assessment process. Therefore it is important for him/her to develop appropriate skills of testing, assessment and validation of students' achievements and development. Assessment competencies are important professional competencies[6] of the teacher and the basis for his role as assessor, evaluator.
Teachers very often adjust their behaviour with recognized or expected students' needs in the close school surroundings. How are the teacher's and the student's activities directly interrelated**?**

Role of the Teacher	Student's Needs
* Knows clearly what is to be learned	* I need to know what is expected of me
* Shares objectives with the student	

Previous Experience and Abilities

Role of the Teacher	Student's Needs
* Determines student's previous experience	* I need to know what I can do well, what
* Makes informed judgements based on sound assessment information	*I need to improve and my progress
* Matches tasks to student's experience and abilities	

Activities and Methodology

Role of the Teacher	Student's Needs
* Plans and sets achievable tasks (challenging, worthwhile, varied)	* I need to have some short term and achievable targets
* Provides rich contexts for learning for all	* I need to be offered strategies to help me learn more effectively
* Helps the student see the purpose of the tasks and of learning	* I need to be able to evaluate my value and own learning
* Considers each student's approach to learning	

[6] A teacher is professionally competent if he/ she is able to perform at high professional level all tasks related to teaching profession. Teacher's competencies should be based on national standards.

Classroom Interaction

Role of the Teacher	**Student's Needs**
* Encourages helpful, collaborative working classroom relationships * Has high expectation * Creates opportunities for success * Identifies and praises progress	* I need to recognise my own achievements and have these recognised by others * I need to feel valued and respected

A set of competences which is necessary for any teacher to apply the school-based assessment and their descriptions correctly are listed below:

- *Teachers continuously (permanently) assess not only the knowledge of the students but also their skills and aptitudes.*
- *Teachers use different methods and instruments of assessment*
- *. The teachers use the assessment results*
- *The teachers involve every student in developing higher order skills (problem solving, critical thinking, innovative writing etc.)*
- *The teachers promote and engage students in reflective and self-assessment*

Assessment in VET Education

II - Practice Section –

Assessment Procedures

-practice section-

Continuous Assessment Model

Assessment in outcome-based VET should integrate several evaluative approaches (formative, diagnostic and summative assessment). The model of continuous assessment (analogous to Integrated Assessment Model, according to SAQA, 2000: 28-29), requires the following:

- Integrated teaching plans and programmes (the curriculum based on modular principles);
- Extending the range of student achievements to be assessed;
- Reaching the comprehension of teaching contents and its monitoring (to cover and measure deeper levels of comprehension);
- Monitoring, measuring and assessment of student activities and learning process effects that enable (or present) developed professional competences; and
- Evaluation of the students' ability to integrate knowledge and skills (instead of the usual approach: assessment of the extent of adopting cognitive and working contents related to a single area/ the subject of learning).

To implement such an assessment model, it is necessary to develop a new teaching and learning environment:

Table nº. 3: Cooperation of pedagogical environments according to the requirements of continuous assessment

Characteristics of the traditional pedagogical environment	Characteristics of pedagogical environment needed for continuous assessment model
The teaching plan and programme are based on separate school subjects (very often there is no correlation);	The teaching plan and programme make an integrated whole that determines modules – a further differentiation by school subjects is made within modules, and there is a full coordination between them.
Administrative systems are not organised properly and the assessment of different school subjects is not coordinated.	Coordinated assessment of different school subjects that are the constituents of modules; administration and keeping evidence on students are unified.
Students, teachers, parents and other stakeholders are not trained for the outcome-based instruction system and assessment.	The social partners in the educational and instructional process (students, teachers, parents in the first place) are prepared for outcome-based instruction and assessment
An instruction modularisation strategy is missing.	The instruction process shall be designed by modules, and modules are to be defined on the basis of expected outcomes and competences.

The continuous assessment model demands that the feedback deriving from a single assessment activity affects the design of the further instruction, monitoring and assessment of students. Therefore, in the course of formative or diagnostic assessment teachers are obliged to

provide students with constructive feedback. It will serve as a basis for further channelling of their learning process, accepting mistakes as opportunities for further learning and their gradual correction.

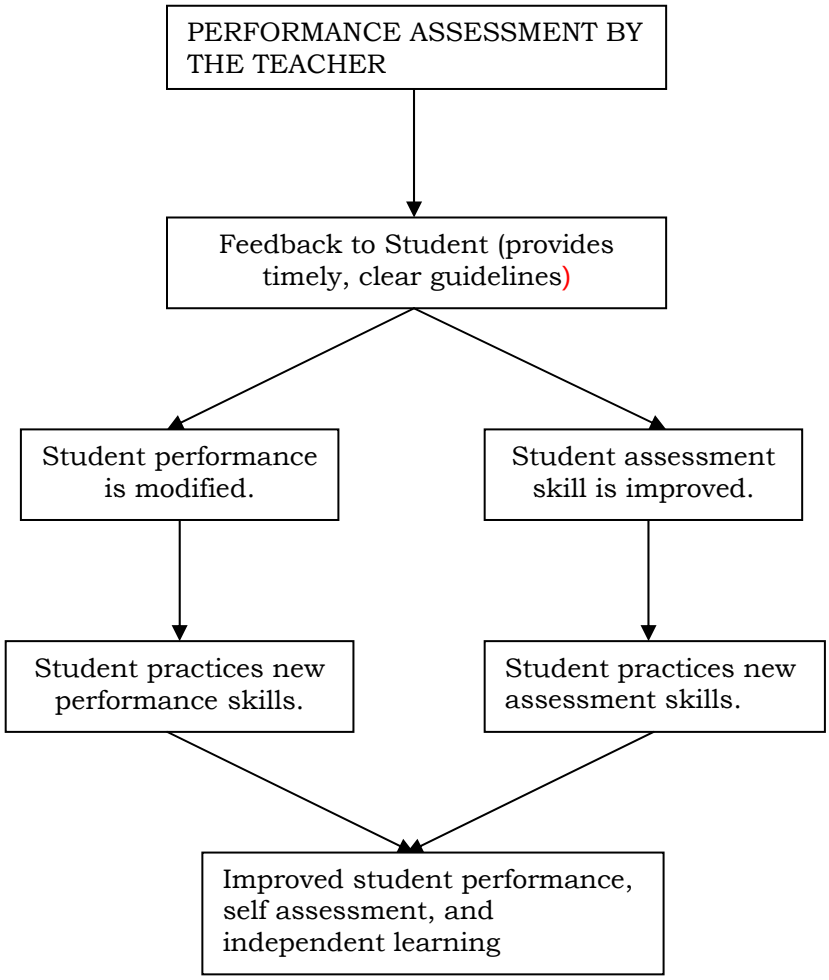

Figure 1 Role of Feedback

One of the preconditions for the formative and constructive impact of assessment is the implementation of various assessment types during modular instruction.

Assessment is the cyclic process through which the students' progress is monitored and students are enabled to make progress. The effective assessment process covers the following activities of students and teaches as partners:

- They are prepared for specific activities;
- They perform / monitor the task;
- They draw conclusions / complete the task;
- They put together various components of outcomes interactively;
- They implement all assessment approaches.

The Continuous Assessment Process

The possible course of the continuous assessment process can be described through the following steps taken by teacher: Gets familiar with module outcomes in detail and ensures their comprehension by the students;

1. Plans assessment;
2. Informs students on requirements and ensures their full comprehension of their roles and responsibilities in assessment;
3. Shapes and projects assessment through the selection of relevant methods, instruments and materials;
4. Conducts assessment, including data collection;
5. Makes judgement and provides students with feedback;
6. Meets administrative requirements;
7. Evaluates assessment process.

In doing so, continuous assessment is designed to cover a variety of different assessment methods, implemented at certain previously determined "points" of the learning process, aimed at facilitating learning..

Types of Assessment

The defined teaching objectives and outcomes determine the assessment objectives and procedures. The evaluation of the extent of expected student's autonomy is determined by the objectives and outcomes. The grade should not primarily depend on the information quantity (quantitative assessment criterion is to be avoided), but rather on the ability of the student to adopt/master relevant knowledge/skills autonomously or whether help is needed in the application of knowledge/skills.

In respect of the testing and assessment process function, there are three assessment procedures (table nº 4):

1. Informal-formative assessment;
2. Formal-formative assessment;
3. Summative assessment.

table nº 4: Types of Assessment

Types of Assessment	Examples	Record-keeping	Frequency
Informal-formative	Teacher's questions, pre-tests	No (they are not recorded))	In the course of each teaching & learning unit
Formal-formative	Assignments, portfolio, test, case study	Yes (they are recorded)	Enough, previously determined circumstances
Summative	Examinations, simulation, practice	Yes (they are recorded)	Enough, previously determined circumstances

Informal-formative assessment encompasses those procedures/methods of diagnostic assessment that are implemented by the teacher in everyday practice, aimed at monitoring the teaching and learning process. A typical example of this is the situation where the teacher asks the students to select and write down key contents, notions that they do not understand, in the course or in the end of teaching unit. Grading is not involved. The teacher uses these students' comments and the feedback that will affect the teaching and learning processes.

Formal-formative assessment is implemented in previously determined segments of the learning process, when students are supposed to demonstrate competences and the extent of outcome realisation. The results shall be recorded. These assessment methods are transparent in respect of assessment criteria and calculation of results in the process of determining the students' school performance. Formal-formative assessment has an important role in facilitating the learning process and it is aimed at modifying processes of teaching and learning and further assessment.

Summative assessment refers to assessment the purpose of which is to make judgements on achievements. Such assessment is often performed at the end of the programme or module. Its results are articulated through obtained competences related to defined learning outcomes. Traditional measurement of school–based achievement is also based on summative assessment.

It is necessary to provide the students with detailed information on assessment planned for the module-based instruction process. **Information for students on the assessment process** covers the following segments of this rather complex process:

- Design of assessment criteria;
- Determining dates & deadlines of assessment;
- Definition of outcomes that are supposed to be assessed;
- Determination of the purpose that will serve as a basis for the use of the results

Teachers are to be acquainted in detail with the assessment plan for the modules & programmes. The assessment plan shall comprise:

1) The list of expected effects (outcomes) to be assessed;
2) The number and types of assessment procedures and methods to be used;
3) Assessment criteria;
4) The description of modes related to the use of results in the instruction;
5) Dates and final deadlines;
6) The scheme of record-keeping;
7) Evaluation of assessment processes and procedures - upon receiving student feedback; and
8) Details related to assessment to be presented to students.

Assessment Criteria

The main question is: Are the assessment criteria the same for all objectives and programme activities and assessment instruments? The traditional assessment approach considers assessment criteria in respect of the quantity of knowledge (information) to be adopted by the student.

Outcome-based assessment has a different approach towards students' achievements, as well as assessment. **Developing assessment criteria means defining the level and quality of knowledge and skills to be adopted by students in the teaching/learning process**. Objectives and outcomes set in the teaching and learning process determine the assessment objectives and procedures. The grade shall not be primarily determined by the quantity of information provided by the student (quantitative assessment criteria should be avoided). The most important criterion should be independent mastering of relevant knowledge/skills by student, or application of knowledge including adequate teacher's support.

The assessment criteria do not represent a unique and universal category since they are determined both by the assessed contents and applied technique or assessment procedure. The criteria implemented in procedures through by which the quantity of adopted programme activities may be determined, are not the same as the criteria implemented in procedures that may primarily determine the qualitative dimension of the adoption of programme contents, even though both types of criteria determine the same level of adopted knowledge and skills.

If traditional knowledge tests, that are mostly used by teachers in measuring information quantity, are implemented, then intervals for individual grades are determined on a quantitative basis. When standardised knowledge tests are implemented (characteristics of the normal distribution model are typical for such tests), the intervals are already defined through the standardised procedure, so that the teacher has to apply certain norms. In case the teacher designs knowledge tests, i.e. "series of assignments of an objective type" (the term "knowledge test" is reserved for standardised, i.e. authentic knowledge tests), having in mind that for assessment only normative tests are used which encompass a continuum of assignments - from the most simple to the most complex ones - in that case equal intervals for school grades are determined. When the grading is conducted on the basis of verbal answers and other autonomous (independent) student activities, then the teacher shall use both qualitative measures and assessment dimensions showing the extent of selection and the integration of the way the students adopt the contents.

There are **two different approaches**:

- **Outcomes taxonomies** that determine the levels in the realisation of certain outcomes:
  - Bloom's taxonomy of objectives and outcomes has become a classical approach in pedagogical and educational domains (particularly the segment referring to the cognitive domain) - they serve as the basis for determining both assessment contents and criteria;
  - The SOLO-taxonomy of assessment (Beags and Collins, according to: *SAQA).* is also appropriate for outcome-based assessment

- **Ranking of achievements within the intervals:** discriminative intervals are defined primarily on the basis of quantitative parameters, although it is possible to take into account qualitative learning parameters.

Both approaches are functional because they provide the framework for the assessment of various categories of students' school achievements.

Outcome-based education requires grading of students based on achievements, i.e. outcomes. Through implementation of the traditional mode of assessment, however, teachers have developed numerous habits related to the modes of assessment, so a complete transition to outcome-based assessment has to be gradual and connected with the grading based on numeric school grades - from 1 to 5.

Implementation of the Taxonomy of Educational Objectives in the Assessment Process

Benjamin Bloom is the author of the Taxonomy of Educational Objectives in the three domains – cognitive, affective (feelings, preferences, values) and psychomotor (physical and perceptive activities and skills) – the cognitive domain is of great importance for the instruction process. Educational objectives and outcomes in the cognitive domain are classified into six basic categories, hierarchically sorted, according to the level of abstraction.

The taxonomy presents a useful structure for developing the criteria for the realisation of educational outcomes, and sorting out of questions, test assignments, testing and assessment procedures. It illustrates skills and abilities that the student might achieve at each of six levels in the cognitive domain (table nº 5). During the processes of mastering skills and adopting knowledge it is not necessary to comply with the hierarchic order because it is possible that the student is able to evaluate and implement the evaluation criteria, without reaching the level of synthesis.

For the purposes of implementation of assessment, based on Bloom's taxonomy, it is important that the teacher beforehand defines clear operational outcomes, the level and the type of outcomes that may be realised within a certain period (definition of general outcomes), as well as during certain classes (definition of operational outcomes), and then to monitor whether these outcomes are being achieved. The teacher operationalises the assessment procedures through defining outcomes in the form of terms (verbs) used in the Taxonomy.

Table nº 5: Bloom's Taxonomy in the Cognitive Domain – the Basis for Assessment	
Competence	Skills Demonstrated
Knowledge	Ability to perceive and list information. Knowledge of dates, facts, places Knowledge of main ideas **Requirements for testing outcome realisation at this level**: define, name, describe, identify, show, mark, select, explore, name - who, when, where etc.
Comprehension	Ability to:

	Understand the basic information; Translate from the one to another context; Interpret data, compare, differentiate; Arrange, put together separate ideas, find out the cause Foresee consequences. **Requirements for testing outcome realisation at this level**: summarise, describe, interpret, connect, discriminate between ideas, estimate, discuss, extend
Implementation	Ability to use information. Application of methods, notions, theories, in new situations Resolve problems through the usage of adopted knowledge or mastered skills. **Requirements for testing outcome realisation at this level**: implement, demonstrate, calculate, complete, show, resolve, explore, rearrange/modify, match, change, classify, experiment, examine
Analysis	Ability to: Disintegrate material into component parts and show their relations; Arrange parts of the structure; Grasp the meaning; Identify components. **Requirements for testing outcome realisation at this level**: analyse, separate, arrange, explain, classify, split into, compare, select.
Synthesis	Ability to: Put together old ideas and create new ones; Establish new relationships by connecting knowledge from one area with the information from another areas; Anticipate conclusions / draw conclusions. **Requirements for testing outcome realisation at this level:** rearrange / modify, integrate, replace, make plan, assume – what if ?, compose, formulate, prepare, generalise, rewrite.
Evaluation	Ability to: Compare, determine similarities and differences between ideas; Estimate the value of theories and assumptions; Make selection based on reasonable arguments; Verify data value; Recognise subjectivity. **Requirements for testing outcome realisation at this level**: estimate, decide, grade, check, test, measure/weigh out, suggest, select, judge, explain, discriminate, conclude, compare, summarise.

Table nº 6: Bloom's Taxonomy in the Affective Domain	
Competence	Skills Demonstrated
Perception	Increasing awareness of surrounding phenomena. Willingness and readiness to listen and observe things. Focusing (intentional attention) Examples: student listens to others with respect; remembers the name of the person he/she meets for the first time. **Requirements for testing outcome realisation at this level**: give, keep/maintain, identify, choose, name, use, emphasize, answer, locate position, describe, ask, follow, etc..
Responsiveness	Active participation Pays attention and responds passively to certain situations Willingly exhibits responsiveness

	Learning outcomes related to satisfaction based on reaction Examples: student participates in class discussion; presents opinions; asks questions on new ideas, notions, models, to understand them fully; knows safe rules and implements them. **Requirements for testing outcome realisation at this level**: answer, help, discuss, appraise, mark, do, apply, present, read, say, report, choose, write.
Valuation	Adoption of values. Preference of certain values. Valuation based on internalisation of a set of specific values reflecting on the student's behaviour and they are identifiable (identification with the values) Examples: student shows/demonstrates his beliefs in democratic procedures; he is sensitive towards individual and cultural differences; shows ability to resolve problems... **Requirements for testing outcome realisation at this level**: demonstrate, select, report, initiate/start, explain, arrange, divide, call, judge, read, study, work, discriminate, follow, etc.
Organisation	Ability to: conceptualise values, determine their contents; Organise and arrange values by priorities, harmonise them; Synthetise the values into value systems; Examples: student recognises the need to make a balance between freedom and responsible behaviour; accepts responsibility for his/her behaviour; explains the role of systematic planning in problem solving; accepts professional ethic standards; creates a life plan in accordance/harmony with his/her abilities, interests and beliefs; organises his/her time trying to harmonise needs of the organisation, the family and himself/herself. **Requirements for testing outcome realisation at this level**: identify, integrate, complete, explain, compile, shape, defend, connect, join, prepare, change, synthetise, compare, arrange
Internalisation of values. Characterisation	Internalisation of the system of values aimed at controlling the student's behaviour The student's behaviour is consistent, predictable, specific. The teaching objectives are focused on the general structure of the student's personality. Examples: the student shows self-confidence during independent working activities; cooperates in team activities showing a talent for team work; harmonisation of professional behaviour with professional ethics is demonstrated; estimates changes in behaviour in accordance with new data; respects people for who they are, not on the basis off their physical appearance. **Requirements for testing outcome realisation at this level:** student makes value judgements, draws conclusions, qualifies, modifies, asks, practices, anticipates, resolves, is ready to listen, influences

Table nº 7: Bloom's Taxonomy in the Cognitive Domain – the Basis for Assessment	
Competence	Skills Demonstrated
Sense Sensitivity Reflexive reactions	Ability to perform motor activity based on information received from the senses. The level of sensory stimulation and reflexes. Examples: the student recognises signals that his/her body emits; estimates the position of the ball and then decides where to hit it. **Requirements for testing outcome realisation at this level:** student chooses, detects, differentiates, identifies, selects, describes, connects.

Responsiveness	It covers mental, physical and emotional activity structures. Examples: student knows and gradually realises the steps in the production process; recognises abilities and limitations. **Requirements for testing outcome realisation at this level:** the student initiates, explains, starts, sets, predicts, presents, reacts, volunteers.
Guided Responsiveness	Early stages in mastering complex skills requiring imitation and learning by doing. Adequate realisation is achieved through exercising, applying in practice Examples: the student follows the instructions in model building; reacts on the instructor's hand signals in performing an activity. **Requirements for testing outcome realisation at this level:** student imitates, answers, responds, reproduces, follows, marks out.
Mechanisms	This is an intermediate stage in the development of complex skills. The reaction that is learned, soon becomes a habit and the movement can be made with increasing self-confidence. Example: student is able to use the PC; he/she drives a car. **Requirements for testing outcome realisation at this level:** constructs, measures, mixes, weights out, organises, guesses, demonstrates, combines, speeds up
Complex Reactions and Behaviours	It encompasses mastering and performing motor behaviours that require a complex series of motions. It is recognised in the speed, high extent of coordination, minimal required energy. Examples: car manoeuvres in the parking lot; fast and secure motions during work at the PC; competences demonstrated during piano-playing. **Requirements for testing outcome realisation at this level:** student builds, constructs, measures, manipulates, weights out, organises, improves, puts together parts, speeds up, strengthens.
Adaptation	The skills are very developed and the person is now able to adjust movements according to specific demands. Examples: student reacts efficiently in unexpected situations; changes instructions according to the needs of certain students; performs the task using the machine that he did not use during the learning process. **Requirements for testing outcome realisation at this level:** student adapts/adjusts, changes, starts, reorganises.
Innovativeness	The student is able to do series of movements in the case of specific situations or specific problems. He/she demonstrates creativity based on highly developed skills. Examples: student develops a new and more comprehensive training programme; he/she creates new gymnastic rules. **Requirements for testing outcome realisation at this level:** builds, combines, composes, constructs, creates, shapes, organises, initiates.

The development of these skills requires application and practice, and it can be measured through speed, precision, timing of realisation procedures or techniques. This analysis of the domain enables the teacher to define the possible outcomes' level, and foresee what is to be assessed.

Taxonomy of the Achievement Level – SOLO Taxonomy

The SOLO taxonomy of assessment is analogous to traditional school grading - the numeric system, grades: 1-5, and thus appropriate for a gradual transition to outcome-based assessment.

According to this, assessment is performed on the basis of five learning levels that students should go through on their way to achieving the outcomes. This system tries to enable a qualitative description of the gradual increase of student competences, related to the performance of the task in question.

The five achievement levels and five levels of grades are: pre-structural level, mono-structural level, multi-structural level, relational level and the level of expanded abstraction (see: table nº 8). This assessment level is primarily applicable to the assessment of students' verbal answers.

Table nº 8: SOLO Taxonomy of Assessment

Levels	Description
Pre-structural – analogous to "unsatisfactory" grade – 1	• The student states unimportant information and provides answers that make no sense. • The student simply says: «I do not know», repeats the question or quotes irrelevant facts. • The student mentions only the first (not necessarily an important) aspect that he/she recalls.
Mono-structural	• The student's response is focused on a single aspect. • All the responses may be equally accurate, but also mutually inconsistent. • The student is able to consider contents with comprehension, due to the fact that he is partly acquainted with the scope of contents; but he/she is not able to apply or transfer knowledge and its meaning to new contents or situations.
Multi-structural	• Separated, important facts. • The student draws conclusions on the basis of observing many aspects, but these aspects are not connected, resulting in inconsistent responses. • Two responses at this level may provide the same quantity of information, but there is no linkage, hence different conclusions are drawn.
Relational	• Putting together important facts. • The responses are based on real experiences and they are inconsistent from time to time. • Student's response provides a comprehensive concept based on explaination of various separated facts, characteristic for multi-structural types of answer, but he/she sticks to notions and contents previously adopted during the instruction process.
Generalised abstraction level (expanded abstraction) – analogous to "excellent" grade – 5	• The student is able to make generalised judgements and extend generalisations far beyond the limits of contents delivered by the teacher. • Able to make hypotheses. • The student is able to: make selection of facts, integrate all relevant facts and their mutual relations; modify them and present them as abstract theoretical structures; this level enables deduction and usage of information that was not originally included; therefore, the student is able to offer alternatives and consider solutions independently, even without drawing a final conclusion.
SOLO Taxonomy - see: Asquith & Lombard, 2000: 52; Lombard & Meyer, 2000:90	

This taxonomy facilitates specific assessment of knowledge and skills that can be expressed verbally, as a part of the student's answer, or a verbal interpretation of teaching contents; therefore, it facilitates monitoring and measuring of knowledge liable to verbalisation and generalisation.

Range of Achievements

In order to make a gradual transition to outcome-based assessment, the existing assessment system shall be replaced by assessment of achievements through their classification into separate intervals or ranges. That is the reason why the following classification of assessment intervals was developed (table nº 9).

Table nº 9: Intervals of Outcome Realisation (Adequate for Assessment)

Range		Description	Achievements in Knowledge Tests
0 - 20%		The absence of information or the lack of linkage between information.	A student does not know the answers/or performs only the most simple reproductive tasks that do not require further engagement
21% - 40%		Approach to knowledge and/or theoretic discussion without analysis and implementation.	A student responds to simple reproductive tasks and tasks requiring a basic level of engagement and interpretation.
41% - 60%		In order to obtain more than 40% a student shall demonstrate the ability to analyze at least a single relevant model, theory or principle from the teaching contents. He/she should identify key elements and emphasize their importance, offer alternatives and recommend an adequate solution.	A student knows almost all answers, which is a kind of reproduction, but he is also able to make links between contents and compare them. He/she should demonstrate the ability to solve rather simple assignments.
61% - 80%		In order to master more than 60%, a student shall explain the implementation of a model, theory or principle from the learning manual and course materials, in an integrative way.	A student is able to perform tasks referring to the following processes: implementation, analysis and synthesis, as well as deductive thinking.
81% - 100%	80%+	It is expected that a student is able to demonstrate implementation of models, theories and principles, as well as to compare models and theories, including critical analysis.	A student is able to perform tasks related to: implementation, analysis, synthesis; also, he is able to valuate and estimate contents (i.e. evaluate according to internal and external criteria) – therefore, he/she is able to conduct a critical analysis and suggest solutions.
	90%+	A student is able to outline models, criticisms and analyses even beyond the framework of planned activities.	

This classification of assessment intervals is particularly appropriate for assessment of achievements measurable by objective techniques, for instance – by properly designed knowledge tests. The intervals expressed in percentage are mostly applied. They are appropriate for assessment providing that the measuring instruments (tests, revision tests and other types of assignments) are created in accordance with metric demands of measurement instruments. Normative tests that are at the same time discriminative are appropriate for assessment. When properly designed knowledge tests encompassing all learning levels in continuum – from the simplest and easiest to the most complex and difficult assignments – are used, it is necessary to

define equalised intervals. In assessing verbal answers it is more difficult to apply intervals expressed in percentage.

In order to ensure the provision of discriminative grades on the basis of the intervals, they should be equal, and each interval shall be compatible with one grade; each reduction of range increases non-discriminativity of the scale. The precondition of the application of this scale is that instruments for the measurement of achievements are properly designed and that they encompass assignments – from the simplest to the most complex ones, in adequate proportion.

- Assessment Criterion- Levels of Autonomy in Performing Activities

The teacher may assess skills, activities, complex learning environment conduct, determining the extent of student autonomy in their realisation:

- Student performs an activity guided by teacher instructions;
- Student realises the activity encouraged by teacher suggestions;
- Student performs the activity according to the role model;
- At the beginning, student performs the activity on the basis of the teacher's initiative, and then by himself/herself;
- Student performs the activity independently.

Comment

Further comparison and adaptation of the traditional assessment system is needed for both concepts, but these changes cannot be general, they depend directly on the discourse of specific educational and scientific areas. Therefore it is necessary that the teacher makes adjustments in everyday practice (it requires integration of the teacher's programme and pedagogical competences). Basic integration criteria are the metric characteristics[7] of the grades (discrimination, objectivity, validity, reliability, normativity) that will be discussed further down – within the outline of knowledge tests.

One of the priorities in evaluation of assessment process and grades is the criterion of discrimination – the grades are to ensure the differentiation of subtle individual differences in students' achievements. To achieve discrimination of school grades, it is necessary to define the criteria (intervals and/or levels) by the normal distribution model, in order to ensure that the limits between grades are equal intervals.

Criteria of Defining Final Grades

Apart from general characteristics of the school grade as the measure of achievement, the final grades should also be composite. The final grades shall reflect different student achievements measured by different assessment techniques. The relation between grades achieved during the school year and the final grades reflects basic assessment functions in case it is a result of

continuous monitoring of student progress. Therefore, the final grade cannot go beyond the framework determined by the lowest and the highest grade obtained by the student, but it can be the highest obtained grade as well (special rulebooks on assessment determine the design of the final grade in case the school subject/module is implemented by several teachers, i.e. when the school subject consists of separate segments realised by different teachers).

Testing and Assessment Procedures and Techniques

When the teacher tests and assesses student achievements, several methods and procedures are applied:

- **Observation of student behaviour: the** teacher should observe and monitor student learning activities, and implementation of gained knowledge (process validation) – he/she is to observe the way of a work activity is performed, the development of motor skills and so on;
- **Validation of student learning outcomes** (effect validation) – the teacher is to assess products, projects, drawings, models, etc;
- **Examination: the** teacher asks questions or gives tasks to student and he/she is obliged to respond to them**.**

All these activities may serve as a basis for **student self-assessment.** Self-assessment is a significant aspect of assessment because it contributes to: criteria development and recognition of the requirements (demands) imposed by current circumstances and it is oriented on adopting a repertory of behaviour - through which the criteria pattern is met.

Procedures of testing and assessment: from self-assessment to portfolio assessment

The selection of assessment methods and instruments depends on the assessment objective - why the information is collected and how it will be used. If the assessment objective is to determine the quality of adopted subject matter and mastered skills, different instruments and approaches shall be applied than in the case where the objective is to provide students with prompt feedback, when they are allowed to check materials referring to certain teaching contents.

In accordance with the evaluation strategies, assessment can be conducted in the following forms:

- **Self-assessment;**
- **Mutual cooperative (peer) assessment of students;**
- **Teacher assessment of students;**
- **Self-assessment and assessment of team works;**
- **Portfolio assessment – assessment based on works representing basic outcomes**.

The purpose of self-assessment is to enable students to monitor and evaluate learning progress. It provides the means for wide perception and assessment of the learning process (not

[7] Metric characteristics of grades: discrimination, objectivity, validity, reliability, normativity.

only the effects). It is important that students know in advance what exactly is expected from them, as well as the purpose of the assessment.

The self-assessment effects are: students can practice to become intellectually independent (which enables a higher extent of self-control); they learn more efficiently; assume responsibility for their learning activities; participate in the development of assessment criteria.

The role of the teacher in student self-assessment might be the role of mediator whose task is to direct the self-assessment process and he/she is to comment only on the procedure, not the student's self-assessment.

Cooperative mutual (peer) student assessment (the process of informal formative assessment, when students assess other students), is the process of practising: assessment, developing the criteria on the evaluation of effects, engagement (invested efforts) and advantages and disadvantages of peer achievements.

The effects of peer assessment: students in the class/group gain knowledge and develop comprehension; participation in the assessment process lessens the monotony, improves concentration and motivation; students are inclined to express their attitudes (opinions) on achievements and expected outcomes; they are satisfied with the opportunity to compare their achievements; students believe that their further results will be far better; this process facilitates the process of self-assessment; it increases the extent of confidence in the assessment process and results in the increase of students' engagement in all segments of the teaching and learning process.

Weaknesses of this procedure: it is difficult to avoid personal bias and preferences among peers; they do not believe they are capable of conducting assessment and coping with dificulties in interpretation of the criteria; students show resistance related to their participation in the peer assessment process (many students treat assessment as a disciplinary measure, not as an opportunity to develop their skills and improve knowledge); students are not prepared for such an assessment form.

Teacher assessment of students is a kind of diagnostic process, the purpose of which is to provide students with an opinion on the extent to which the set criteria have been met. The report should encompass accurate information on knowledge and progress and pieces of advice to the student on how to continue with learning. Most assessment procedures in the handbook consider this assessment procedure.

Assessment of Student Task / Project

Product/Production/Live performance

			Grading criteria
Clarity of Purpose:		**statement of aim/s – clear, relevant**	**10**
Evidence of Research & Planning	**e.g.**	**background research, information gathering techniques used, sources of information, alternative solutions – product/craft etc., equipment, tools, designs, drawings, scripts receipts, patterns, costing work plan/time plan, sequencing, checklists of resources etc.**	**10**
Application of Skills	**e.g.**	**use of tools and materials, skills, appropriate to the task, skill factor, safety/hygiene etc.**	**20**
Meeting the Brief/ Suitability for purpose	**e.g.**	**Quality of product/production, finish of product, visual quality, safety, taste/flavour, suitability for purpose – related to aim/s, choice of technique, craft, materials, equipment etc., related to the purpose**	**20**
Creativity/Originality:	**e.g.**	**candidates own work, written in own words, selective use of transcription, graphics etc. (sources credited); originality demonstrated in selection/organisation of event/service; inventiveness, resourcefulness, layout of report, illustration, presentation etc.**	**10**
Self Evaluation:	**e.g.**	**critical evaluation of own work – process and product (or own contribution in the case of group tasks), proposal for modification in any part etc.**	**10**
Evidence and Integration:	**e.g.**	**extent and quality of integration achieved; relevance of integration etc.**	**10**
Effectiveness of Communication and Presentation:	**e.g.**	**(i) written: format, layout, neatness, legibility, e.g. use, appropriateness, and quality of illustrative material, table of contents etc.** **(ii) oral: oral communication skills, ability to convey ideas clearly, fluency and coherence etc.**	**10**

Annex no 3: <u>Portfolio assessment</u> is the systematic process of collecting student works and assessment on achieved basic tasks and outcomes of the instruction process. Traditional assessment strategies (written assignments, tests, final examinations etc.) are a segment of this assessment type. This method is applied in particular in the assessment of art disciplines (and it is

necessary). Involvement of teachers in developing the criteria on selection of materials and evaluation is of great importance.

In order to give assessment tasks to the students in the form of a portfolio, the following steps should be taken into account:

- Make sure the students "own" their portfolios
- Decide on what kind of work samples to collect
- Collect and store work samples
- Select the criteria by which to evaluate the portfolio
- Require students to evaluate their own portfolios continuously
- Involve parents in the portfolio assessment process

There are several ways of gathering information needed for assessment. The common point of all these types is that they consist of:

(1) an assignment or question (requirements imposed by current circumstances); (2) the student's response (the repertory of behaviour); (3) interpretation (made by teacher or the person in charge of reviewing the assessment information); (4) reporting and record-keeping (*Garfield, 1994*).

Assessment can be based on various procedures: observation, verbal and written forms of examination, testing, practical student works, home work. Different forms of these procedures are used in the teaching and learning process: quizzes, small-scale autonomous works, questions from selected sources and essays, projects and reports (individual or group), evidence (including selection of various contents), examinations (encompassing various types of materials), analyses of attitudes, written reports, open questions/problems to be resolved, multiple-choice assignments where the answers are selected to measure the extent of the students' comprehension.

Outcome Testing and Assessment Techniques and Instruments in secondary VET

Verbal and Written Examination Forms

The examination of students can be conducted verbally or in written format.

Verbal examination forms:

- individual;
- group discussions.

Verbal examination is performed through direct, personal contact between the teacher and student. In their immediate interaction, the teacher is able to direct the student's answers, ask further questions and in doing so determine what the student knows, and vice versa; what skills and habits he/she possesses or not. It is expected from the student to present the facts autonomously and clearly, give arguments, explain and provide arguments. Verbal examination has

an unquestionable advantage, due to the fact that the student's knowledge is fully expressed, but its measuring value is very low. There is a series of factors that diminish the objectivity of the assessment (see: the outline of systematic and non-systematic factors).

The weaknesses of verbal examination are the following:

- A small number of students can be examined;
- A fair relationship with all students is hindered;
- There may be a significant difference between question samples ;
- Teachers' subjectivity leads to wrong estimation of students' knowledge.

Despite the above mentioned weaknesses verbal examination is still necessary and constitutes an integral part of the complex assessment and validation process .

Individual verbal examination is a form of knowledge testing, seldom used in certain educational systems, and it is highly present in our educational system. It can be performed formally during a certain period of time by a single or several teachers, or at intervals during one module/theme. This kind of examination underlines the student's ability to formulate thoughts, provide answers, opinions, views and information. Through the implementation of this technique the teacher is able to determine the student's capacities or weaknesses in his work activities. If the teacher is not objective, it will lead to unfair assessment of the student's knowledge.

Group discussions – it is possible to organise oral group examinations. They can be held in the form of a discussion where personal contribution is of great significance. They can be organised in a rather formal manner so that a student should start with an answer, another would comment on it, and the others are allowed to comment in the end. Through this approach the same chance is provided for all students; naturally, the same questions are not asked.

Written examination forms:

- essays on proposed subjects;
- series of questions and/or assignments (revision tests, written assignments and so on);
- tests (standardised tests or "series of problems of an objective type").

During writing assignments students are to work independently, but without immediate interaction with a teacher. All the students have the same tasks, hence they are in the same position; in that way comparison and assessment on an equal basis is ensured. The teacher has more time for assessment of the written assignments and this activity does not have to be performed immediately upon the completion of the examinition, but after careful reading and sorting out the assignments into groups. These activities are aimed at eliminating the impact of non-systematic subjective factors on the school grade. Written examination has a large number of strengths, but several weaknesses are present as well.

Essay-assignment testing means that the student writes about a certain topic and elaborates it. It is hard to assess essays written by students because there is a problem in

separating two elements: assessment of the adoption and elaboration of teaching contents and assessment of the writing style and talent.

Knowledge Tests

The test is a measuring instrument consisting of a series of assignments or problems, systematically selected, through which the abilities, personality development and the knowledge of individuals are objectively examined.

The main criterion of test differentiation is the extent of objectivity. Standardised knowledge tests can be applied in the instruction (so-called «authentic tests»), as well as non-standardised knowledge tests, that are also called «series of problems of an objective type». Teachers mostly use series of problems of an objective type created by themselves.

Tests are classified into three groups: ability tests, personality tests and knowledge tests. Promptness tests or readiness tests (tests of readiness for the children before the start of schooling) belong to a special group. Knowledge tests, sometimes called instruction tests, are the tests that determine the extent of knowledge gained through a certain activity or during a certain learning period. They consist of series of assignments given in a special form aimed at measuring the knowledge.

Fundamental functions of knowledge tests (achievements) in the teaching and learning process are:

- ***Control function*** *– determines the extent of objective realisation, level of student achievement, knowledge quantity and quality;*
- ***Instructive function*** *– focuses student learning to possible situations in the future, supports development of learning strategies - including full comprehension - and the skills of selecting important points and their arrangement into a form of hierarchical structure.*

Tests present one of the student outcome measures and they are possible progress indicators. They improve test skills, i.e. increase the readiness to respond on assignments within a knowledge test. Does this improvement of responding skills mean upgrading of learning strategies? Are the students at the same time directed by knowledge tests how to respond and select information from further teaching contents, that is - how to study in order to prepare themselves for testing ? While certain researchers emphasize that knowledge tests improve learning strategies and skills, the others consider that knowledge tests present the form of explicit learning for transfer, because this is the way of learning the skills of responding..

The control function is of great importance from the teachers' point of view – teachers used to control the progress and effects of students' work and the instruction on the basis of results achieved in achievement tests. From the teachers' perspective, the instructive function is recognised

as the function where selected assignments directed the student to certain contents, instead of the teacher.

Annex nº 4: Due to the fact that three forms of selection make the basis for learning with comprehension – selective coding, selective combining and selective comparing – the tests direct students on how to select and shape their knowledge. Through the selection and the mode of formulating the test assignment, the tests highlight certain contents, and direct students to make a difference between relevant and irrelevant stuff, requiring implementation and presentation of programme contents in new ways; they pave the way for integration of new knowledge into previously adopted and structured knowledge. Adoption of general models and principles instead of mere adoption of separated information, serves as a basis for achieving a wider transfer in the instruction process. The transfer from one school activity to another is achieved if the students managed to find out how to select information during the solution of test assignments, and to implement the adopted principles in the learning of new contents and preparing for further testing.

Metric Characteristics of Knowledge Tests (Metric Characteristics of Grades)

A knowledge test is functional if it encompasses the following metric characteristics that are also relevant for school grades: validity, objectivity, reliability, discrimination and normativeness.

Validity is the instrument proving that process of drawing conclusions is correct; the test is valid if it fulfils its purpose, i.e. measures the relevant data.

Objectivity enables that the results depend solely on student's gained knowledge, not on subjective interpretation of the assessor. If the knowledge test is objective, different assessors, examining the same students, will obtain the same results.

Reliability presents measuring instrument reflecting the same or similar value of results obtained in two consecutive measuring of the same values. Consistency of measuring means that there is no impact of uncontrolled factors.

Discrimination is aimed at differentiating students in respect of knowledge that is the subject of measuring. A more discriminative test provides a larger number of different results.

Normativeness means that knowledge test results are articulated in numeric values classified in categories - to enable obtaining average results, above the average or under the average, which makes the individual result relative, depending on results of group members.

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Knowledge tests are economical; the knowledge of a large number of students can be tested through their use, which is very important for everyday practice in our schools. Another important requirement in the design of knowledge tests is that they have to have an adequate aesthetic design.

Knowledge/achievement tests are standardised procedures inducing various cognitive processes (memorising, thinking etc.). They result in students' reactions that are indicators of the knowledge gained through learning in various educational institutions.

Types of Test Assignments by Form

The test assignment and the simple question are two different notions. Knowledge tests (and test assignments) are classified by the form of assignment:

- **Reproduction tests** – open type tests requiring the student's active search for an answer to the question, its reproduction and writing down;
- **Recognition tests** – close type tests offering more options so that the student should select the correct one.

Reproduction tests require that the student looks for an answer on his own and reproduces the answer. Basic types of this form of knowledge test are the following:

- Tests – essays, where students are asked questions of a wide range and their response should be given in the form of a description of the subject matter. The weak point of this type is that its assessment depends on subjective factors, and its strong point is that it provides a higher extent of possibility for students to develop critical thinking and draw conclusions.

Name basic casting methods:
_____

- *Supplementing or recalling assignments – the assignment consists of one/two words or a sentence where some words are omitted, and the student should fill in the gaps. The main disadvantage is that comprehension of the problem cannot be properly tested, and the advantage is that a considerable amount of knowledge is needed to provide an answer.*

The formats consisting of two or more standard formats are called _____ formats.

Recognition tests – the student is required to choose from offered answers and recognise the correct one. Basic types of this form of knowledge test are the following:

Alternative tests or double-choice tests are the tests where it is required to determine whether the claims are true or false. Such assignments are easy to design and resolve, and their weakness is a high possibility of random guessing of answers.

The A4 format has the dimensions: 210 x 297 mm. a. Correct b. Incorrect

Multiple-choice assignments – the student is required to select one or more correct answers between more offered options. This kind of test is difficult to design and it reflects primarily on the selection of incorrect but acceptable solutions. It is considered as the best form of knowledge tests. It is recommended particularly in cases when a whole test is to encompass the same type of test assignments. For instance:

The basic casting techniques are:	
a. Casting in sand	*c. Induction casting*
b. Electric-arc casting	*d. Casting in metal casts*

Arranging and comparing assignments – the student is required to arrange or match one or two data chains in a certain way. Such types of assignments are highly economical and a large number of facts may be examined within a single assignment. The disadvantage is that such tests are difficult to design.

Example of comparing test assignment:

In front of each measuring unit (on the left side) write down a number expressing the value (on the right side) that is measured by the measuring unit:
____ Volt *1. Electricity intensity*
____ Ampere *2. Electrical resistance*
____ Watt *3. Voltage*

Example of arranging test assignment:

The elements – conductors of electrical energy/electricity are stated in this assignment. Use ordinal numerals, from 1 to 5, to mark their conductivity ranking from the highest level – 1, to the lowest – 5.
__steel __aluminium __wood __copper __silver

The reliability of various types of test assignments has been studied - the extent of reliability of: alternative type tests, multiple-choice tests and arranging and comparing tests. According to certain studies, alternative type tests are the least reliable (reliability coefficient 0,31). The reason for this lies in the high possibility of guessing correct answers, and consequently the test reliability is lessened. In the case of multiple-choice tests, the possibility of random guessing is considerably reduced and the reliability coefficient is 0,64. Arranging and comparing tests have the highest reliability coefficient - 0,69.

Types of Knowledge Tests by Purpose/ Function:

In accordance with their purpose/function knowledge tests are classified into:

- **Normative** (traditional) tests aimed at determining individual differences in student achievements (they are not implemented in determining the efficiency of the relevant teaching method);
- **Criteria-based** knowledge tests enable the determination of the contents and the extent of adopted knowledge by students in the framework of a certain school subject.

In the case when the normative achievement test is applied, where test assignments are selected on the basis of normal distribution principles – from the most simple to the most complex ones in equal ranks; then – through implementation of assessment principle - student achievements are sorted out into equal ranks. In the case of applying the criteria-based achievement test, it is not reasonable to base a school grade on the results of this test. If the teacher mostly chooses assignments based on elementary knowledge that most of students should adopt, this test cannot be used for assessment, but

primarily for monitoring of teaching effects.[8] Predominant use of quantitative criteria in assessing student achievements in tests and assignments should be avoided; student achievements should not be assessed primarily on the basis of the quantity of correct information, but on the basis of the extent of the student's autonomy and the complexity of the demonstrated knowledge.

Both types of test, normative and criteria-based, serve to examine the knowledge, but their purposes are not the same. The assignments' forms are the same for both types of test.

Annex nº 5: Comparison of normative and criteria-based knowledge tests

The basic differences between normative and criteria-based knowledge tests should serve as an indicator for the teacher on how to determine the limits of the students' outcomes and grades in the test:

- Through normative tests the quantity of the student's adopted knowledge is examined, and through criteria-based tests the contents of the student's knowledge.
- Normative knowledge tests are based on the psychology of individual differences and psychometric principles. Criteria-based knowledge tests measure the objectives that are achieved by the students and to what extent.
- In the case of normative tests, after first having designed the test and pilot testing it is possible to develop the norms. In the case of criteria-based tests teaching objectives and performance criteria have to be set before the test is designed and used.
- Achievement measures in normative tests are relative, and in criteria-based tests they are absolute.
- The differences in the perception and examination of the metric characteristics of normative and criteria-based test are obvious.
- Discrimination which can appear in the normative tests is examined through item analysis, where a comparison is carried out for each assignment (item) of the student´s performance at the test - the best and the worst results. The discrimination is better, if the difference in results between the above mentioned groups of students is larger. In the case of criteria-based tests the most discriminative assignments are the ones that students did not manage to do before the teaching of relevant subject matter, and then after the teaching on the relevant subject matter they are done by all students.
- In implementation of normative tests it is assumed that students' knowledge can be expressed in the form of a "normal line". The assignments done by all students are eliminated, as well as the ones that were not done at all, due to the fact that such assignments have no discriminative value. In criteria-based tests a normal distribution of results is not assumed. The initial assumption is that most of students will achieve the educational objectives, i.e. be able to do assignments at the test with success.
- In normative knowledge tests, the validity can be examined in two modes: by comparing test results with teacher's grade and so-called "contents validity" where the contents of the knowledge test is compared with the contents of the school subject. In criteria-based tests only the contents validity is examined, that is, it is examined to what extent test assignments cover the whole subject matter and are compatible with the educational objectives.
- In both normative and criteria-based knowledge tests, the results are always quantitatively expressed. The only difference is that the results of criteria-based tests are expressed as a percentage of the adopted knowledge.

[8] Teachers often set the limit at 50% of the required knowledge for the first passing grade ("satisfactory" grade- "2"), without prior determination as to whether at least half of the existing assignments from the repertory of basic knowledge is at a reproductive level. If half of the assignments derive from the repertory of basic knowledge, then the test is not normative, so the assessment based on such a test is not justified.
If a teacher formulates and sorts out the assignments evenly, ranging from the basic and the most simple to the most complex ones, and he/she defines the limit of knowledge for grade «2» («satisfactory») as 50% of the overall required knowledge, then the grade does not meet fundamental metric requirements, and the assessment does not reflect all knowledge levels.

Individual differences in knowledge between students are determined through **normative** knowledge tests; the effectiveness of the implementation of a certain teaching procedure cannot be determined.

Criteria-based knowledge tests enable determining the contents and the extent of adopted knowledge by the students in the framework of a certain school subject. A precondition of designing such tests are previously formulated educational objectives or relevant teaching programme objectives. The level of knowledge to be adopted has to be determined in the objectives and various taxonomies of educational objectives are implemented (Bloom's taxonomy is most frequently used).

Finally, it is important to note that normative and criteria-based knowledge tests are not mutually exclusive and that the adequacy of their application depends on the objective of the selection.

Determining the assessment criteria and ranges on the basis of knowledge tests depends on the objectives and outcomes of the teaching and learning process on the one hand, and the type of implemented test, on the other hand.

In the case when the normative achievement test is applied, where test assignments are selected on the basis of normal distribution principles– from the most simple to the most complex ones in equal ranks; then –the student´s achievements are sorted out into equal ranks through the implementation of the assessment principle.

If a criteria-based achievement test is applied, it is disputable to base a school grade on the results of such a test.

The implementation of normative knowledge tests makes teachers and students evaluate knowledge according to social criteria, that is, make comparisons with others. Through application of criteria-based tests the student's results are mutually independent, and their work is directed to achieving certain objective criteria that induce students to compete with themselves.

There are two testing functions in the current educational system:

1. Testing conducted to define the readiness of students and predict further performance.
2. Testing conducted to diagnose individual results and channelling of student progress.

Preparation and Assessment of Test Responses (Answers)

Knowledge tests are the objective instruments of achievement assessment enabling the examination of a rather larger number of students. They require skilful design due to the fact that their application is reasonable only if they meet all the metric characteristics required for tests. However, in practice tests that are not designed skilfully and non-discriminative tests are frequently applied.

Teachers may use already prepared and standardised knowledge tests in practice (they are seldom used in the Serbian educational system) and tests designed by themselves, i.e. "series of assignments of the objective type". The process of knowledge test design is a very complex one and requires special training of the teaching staff, as well as team work between the teachers and professional support staff in school.

Led by the metric characteristics of knowledge tests, the teacher who designs series of objective type assignments determines the measures for evaluation of the accurateness of answers and the number of points - on the basis of outcomes set. It is very important to avoid predominance of quantitative criteria for the evaluation of performance obtained in assignments and in tests. The teacher should not assess the test performance on the basis of the quantity of correct information, but on the basis of the extent of autonomy and complexity of the demonstrated knowledge. The above mentioned classification of grades by intervals is appropriate for the purposes of achievement assessment in knowledge tests! The discrimination of grades is determined by the applied test.

***Annex nº 6: The process of designing knowledge tests (achievement**) is a rather complex procedure, especially in the case of preparing standardised tests, but in the everyday practice of teachers, in the framework of outcome-based education, the following steps are usually taken:*

1. *Define the objective of the testing and outcomes to be measured;*
2. *Determine the module or relevant teaching contents;*
3. *Make the list of ideas for assignments (at least twice more ideas in comparison to final number of assignments included in the test);*
4. *Design test assignments and transform ideas into certain test forms; usage of assignments that belong to types that are close to the objective is recommended;*
5. *Sort assignments into groups – one group consists of all assignments of the same type; give instructions to students on how to do the assignments in each group.*
6. *At the same time, during the design of the test, the teacher develops the key for answers (expected answers) ,as well as the mode of scoring and assessment;*

In determining the number of points the following factors should be taken into account: the complexity of mental processes that the student must activate in order to provide the needed answer, the required autonomy and creativity of students during responding, the required amount of relevant information to be presented/recognised by the student.

7. *Out of all prepared assignments, the ones that enable the achievement of the objective of the test should be included into the final version: if the objective is to test the adoption of basic knowledge, the teacher can shape the test as criteria-based, and then he/she does not assess, just provide an informative feedback; if the objective is assessment, the teacher creates the test according to the normative model – in that case the assignments providing discrimination of grades are included (also the following assignments are included: the assignments that most students are able to do, the assignments done by average students, as well as the ones done only by the best students);*
8. *The teacher designs the test technically and aesthetically, being careful about its explicitness and leaving enough room for students' answers, particularly in the case of essay assignments.*

Student Preparation for Testing

One of the main segments of the testing process is the preparation of students for testing. The students that prepare themselves for testing always have better achievements than the ones that are not prepared. Also, the preparation process reduces the extent of student anxiety, which has several causes:

- A student is not adequately prepared for testing;
- A student is insecure whether he/she is prepared for testing;
- A student is overwhelmed with the quantity of information he / she has to learn;

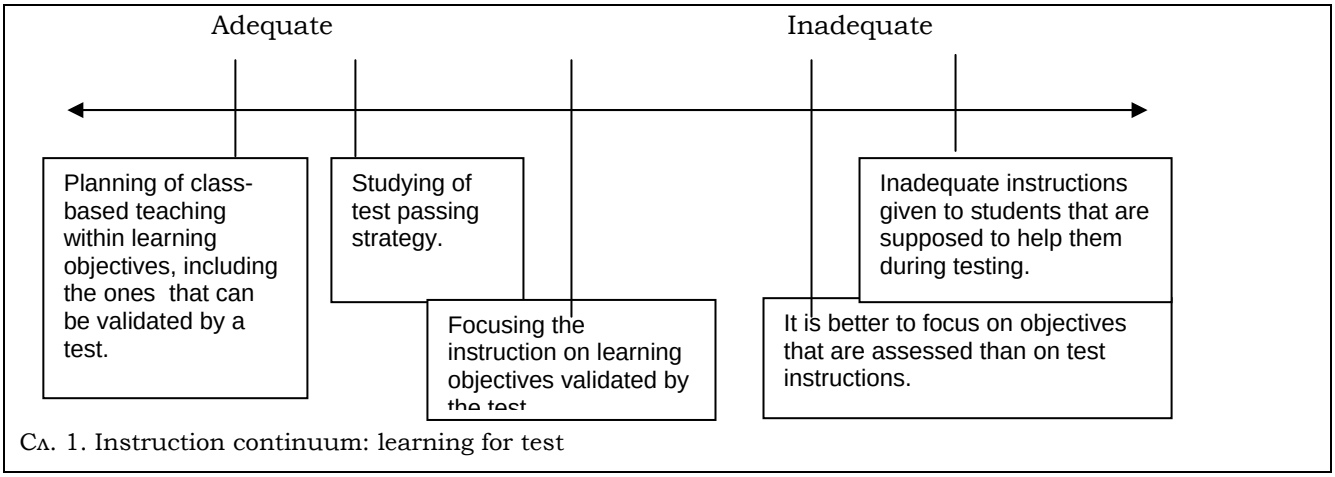
- A student does not fully understand the testing requirements.

The students must master the skills of recognizing demands in test assignments and the skills of competent and concise responding. The students that prepare themselves for testing by practising response strategies (not school subject contents), always have better achievements than unprepared ones. Also, the preparation process reduces the extent of student anxiety.

There are four areas of student preparation for validation of school achievement through tests:

- basic preparation – learning of contents;
- material preparation – organising of tools needed for testing;
- physical preparation – adequate nutrition and rest before the testing;
- psychological preparation – creating learning attitudes and inducing motivation, asking questions aimed at checking the level of knowledge etc.

One of the pedagogical interventions, that depend on the implementation of knowledge tests aimed at assessing and monitoring student progress, and pedagogical practice as well, is the intensification of activities and the teaching process for test purposes. The attitudes concerning the effects of teaching for testing and their reasonableness are mostly opposed. The critics and promoters of this type of teaching agree that teaching for testing shall be treated as a wide range of various pedagogical interventions. At one end of the teaching for testing continuum is the planning of school instruction based on learning tasks, including testing as a measuring form. At the other end of the continuum are the instructions for actual test assignments, or help in actual testing.



Сл. 1. Instruction continuum: learning for test

The attitudes about teaching for testing effects are opposed: on the one side are those who promote the idea that it has negative effects, and on the other side, those who treat this activity as very efficient and formative for the whole teaching and learning process, not only for adoption of the test responsiveness strategy. The teaching for testing itself is not negative; it is negative when the teacher provides the students with answers on concrete questions, and it can be very positive and with a wide transfer value if students adopt strategies of information selection from teaching contents and master skills of test responsiveness.

Alternative Forms of Testing and Assessment

Alternative testing and assessment methods are the following: portfolio assessment (based on selected and representative student works); authentic assessment; practice work assessment; graphic works; experiments; quizzes; projects; written reports and so on.

Portfolio assessment is performed on the basis of carefully represented and selected student works.

Authentic assessment is the method of gathering information on the extent of student comprehension of teaching contents, in a context that reflects realistic situations and induces students to implement their knowledge, gained in the class, in some authentic context.

Assessment of practice work means presenting tasks, projects or studies to students, and then evaluation of results to assess their practical skills.

Graphic works present one of the forms of practical works of students.

Work trials are the engagement of students in the realisation of professional behaviour adopted during instruction. They are carried out under simulated conditions (school conditions etc.) or in authentic working environment conditions (workshops, places for work). The teacher shall monitor the adoption of knowledge and mastering of skills. It is based on application in practice.

How are these different types of assessment evaluated? The quizzes and questions from essays can be graded through one range or result. More complex grades, in the case of projects and written reports, can be assessed through the implementation of alternative procedures for determining results. These procedures can be used for determining levels, and as a help to students in improving their practical work.

Application of Assessment Instruments

When examining procedures are used for assessment, it means that the realisation of outcomes is assessed in the first place, i.e. the final learning effect. In that case, a wide range of assessment instruments may be implemented. Tests with assignments of all types, traditional types of assignments (for instance, mathematics assignments, physics assignments, etc); case studies, all kinds of final examinations, log books and monitoring protocols, verbal examinations, practice.

When monitoring procedures are implemented in assessment, the learning process and the processes of the student's activity during learning and implementation of adopted knowledge are monitored and evaluated. Then the repertory of assessment instruments is very narrow, referring to: logbooks of student activities and protocols for systematic monitoring of students, case studies, exercises, projects, debates, role playing, simulation.

When the procedure of effects validation is implemented in assessment (the evaluation procedure for products of the learning activity), the most appropriate instruments are: traditional types of assignment, case studies, different kinds of examinations, log books etc.

Table nº 10: Assessment Instruments (SAQA, 2000)

Instrument	Monitoring	Product Evaluation	Examination?
Alternative type assignments			Implemented
Assignments /questions/reasoning claims			Implemented
Traditional type assignments (for inst: mathematics assignments)		Implemented	Implemented
Speech tests / speech checks			Implemented
Case studies		Implemented	Implemented
Complementing assignments			Implemented
Different kinds of final examinations		Implemented	Implemented
Log books and monitoring protocols	Implemented	Implemented	Implemented
Student learning books	Implemented	Implemented	Implemented
Matching assignments			Implemented
Multiple choice assignments			Implemented
Verbal questions			Implemented
Personal interviews	Implemented		Implemented
Practical exercises/demonstrations	Implemented	Implemented	
Portfolio	Implemented		Implemented
Projects	Implemented	Implemented	Implemented
Questionnaires		Implemented	Implemented
Questions including limited answers			Implemented
Role playing	Implemented		Implemented
Simulations	Implemented		Implemented
Questions including short answers			Implemented
Structured questions			Implemented

According to Bloom's taxonomy, that presents a solid basis for recognising possible VET outcomes, and in accordance with the educational domain and the level of objectives, assessment instruments are applied in a differentiated way (table nº 11a – cognitive domain, table nº 11b – affective and psychomotor domain).

Table nº 11a: Implementation of assessment instruments on monitoring outcomes in the cognitive domain

Bloom's Taxonomy: Hierarchy of Objectives in Educational Domains (outcomes)		Instruments for outcome realisation assessment in secondary VET – applicability															
		Knowledge tests with various assignments	T3: Multiple choice assignments	T3: Arranging and comparing assignments	T3: Alternative choice assignments	Traditional type assignments	Speech checks – autonomous student presentations	Case studies	Final Examinations	Log books and protocols	Verbal questions	Practical exercise and demonstration of prior learning	Projects	Questionnaires	Role playing	Simulations	Written responses to brief questions	Debates
Cognitive domain		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1.0 Knowledge	1.10 Knowledge of details	+	+	+	+						+			+			+	
	1.20 Knowledge of modes of details' treatment	+	+	+	+						+			+			+	
	1.30 Knowledge of general notions	+	+	+	+						+			+			+	
2.0 Comprehension	2.10 Translating	+	+	+	+	+	+				+						+	
	2.20 Interpreting	+	+	+	+	+	+				+						+	+
	2.30 Extrapolating	+	+	+	+	+	+				+						+	+
3.0 Implementation		+	+	+		+	+	+		+	+	+	+		+	+		+
4. Analysis	4.10 Analytical elements	+	+	+	+													
	4.20 Analytical relations	+	+	+	+	+	+				+							+
	4.30 Analytical organisational principles	+	+	+	+	+	+				+							+
5. Synthesis	5.10 Original and autonomous presenting					+	+				+	+	+					+
	5.20 Planning	+		+		+	+	+			+	+	+			+		
	5.30 System of abstractive relations						+						+					+
6. Evaluation	6.1 Internal criteria	+	+	+	+	+	+				+		+		+		+	+
	6.2 External criteria	+	+	+	+	+	+				+		+		+		+	+

Table nº 11b: Implementation of assessment instruments on outcomes in the affective and psychomotor domain

Bloom's Taxonomy: Hierarchy of Objectives in Educational Domains (outcomes)		Instruments for outcome realisation assessment in secondary VET – applicability																
		Knowledge tests with various assignments	T3: Multiple choice assignments	T3: Arranging and comparing assignments	T3: Alternative choice assignments	Traditional type assignments	Speech checks – autonomous student presentations	Case studies	Final Examinations	Log books and protocols	Verbal questions	Practical exercises and demonstration of prior learing	Projects	Questionnaires	Role playiing	Simulations	Written responses to brief questions	Debates
Affective domain		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1.0 Reception	1.1 Discrimination	+	+	+	+	+	+	+		+	+				+	+	+	
	1.2 Willingness to respond						+	+				+	+		+	+		
	1.3 Intentional attention						+	+		+	+	+	+		+	+		
2.0 responding	2.1 Passive responding						+	+		+	+	+			+	+		+
	2.2 Willing responding.						+	+		+		+	+		+	+		+
	2.3 Responding with pleasure						+	+		+		+			+	+		+
3.0 valuation	3.1 Value adoption	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+
	3.2 Preferring values						+	+			+			+			+	+
	3.3 Identification with values							+		+						+		+
4.0 organisation	4.1 Conceptualisation of values	+					+				+		+	+			+	+
	4.2 Arranging system of values			+	+			+		+		+				+		+
5.0 characterisation	5.1 General focus							+		+								+
	5.2 Life philosophy							+		+								+
Psychomotor domain		+					+	+		+		+	+		+	+		+
1. Reflexive movements								+		+								
2. Basic movements								+		+		+	+		+	+		
3. Observation abilities		+					+	+		+					+	+		
4. Physical abilities								+				+				+		

5. Motor skills							+				+				+		
6. Non-verbal communication						+	+		+		+			+	+		+
The + is placed to mark when a certain testing and assessment mode is particularly appropriate for relevant competence level.																	

Difficulties in Assessment

Perfection in the field of measuring of human characteristics and achievements is not possible. Nor will physical measures reach the level of perfection. The traditional belief that upgrading and modifying procedures will result in a perfect measuring process is wrong.

The general limitations of measuring a process are the same as in the case of measuring pedagogical phenomena, and the efforts are made in the fields of psychology and pedagogy to reduce them through the implementation of methodology. The first step in the process of increasing assessment objectivity is the recognition of factors having impact on this process, and the next step is lessening the effects of negative factors.

The factors that influence the shaping of a school grade are:

- Student knowledge, skills and achievements;
- Systematic modifying factors that reduce the objectivity of the assessment: certain periods during the school year (more strict assessment requirements at the end of the first semester in comparison to the requirements at the end of the school year); class or subject teaching (in class teaching the emphasis is put on student personality, too, whilst in school subject teaching it is put on student achievement);
- Non-systematic modifying factors reducing the assessment objectivity: subjective factors related to the student (the mood, anxiety, intellectual and other abilities, working habits, speech skills, the gender, special features, such as neatness, etc.); subjective factors related to teacher (the gender, the mood, abilities, pedagogical competence, programme competence etc.); objective factors (time of the day, spatial arrangement , etc).

Sources of mistakes made during the processes of estimation and assessment are:

- Halo-effect and the effect of the first impression (on the basis of noticing a certain student feature the teacher makes a general impression of the student and draws further conclusions);
- Constant mistake (types: personal equation, central tendency, extreme estimations);
- Logical mistake;
- Context mistake («quality of the class in general» and so on.);
- Disfunctional assessment (use of a grade as disciplinary measure);
- Reduced assessment scale (a teacher does not use all the grades for assessment, just a part of the scale);
- Unclearly defined measuring subject and non-defined measuring requirement.

Annex nº 7: Selected Sources of Mistakes in Evaluation and Assessment (Andrilovic,1988; Andrilovic and Cudina, 1988; Pavlovic-Babic, 2004)

1. The effect of the first impression **(halo-effect)** is the mistake in evaluation based on unreasonable generalisation and tendency to estimate specific features according to the first impression of the person. The general impression is usually built on the first impression that is based on scarce information, and sometimes on a single predominant characteristic. The logical

mistake lies behind this kind of mistake, i.e. a wrong assumption on connection of some characteristics. In order to reduce the impact of the halo-effect it is necessary to increase the awareness of evaluators on the presence of this most influential mistake, and precisely define evaluation criteria.

2. Constant mistake present constant tendency of providing students with similar grades. Elementary forms of such mistakes are:

- personal equation **(tendency of assessor to be predominantly strict or tolerant)**;
- central tendency (tendency of assessor to grade students with average grades without sufficient differentiation and noticing individual distinctions);
- preferring extreme grades in the grading scale (tendency of assessor to **choose very high and very low grades in grading scale**, avoiding the average ones).

3. Logical mistake is a wrong assumption that some of characteristics are connected, hence that one of them means similar status of others ; such mistake is the consequence of outset.

4. Assessment as a disciplinary measure – the punishment: There are teachers who use grades as a means to keep discipline in the class.

5. Reduction of grading scale.

6. Insecurity of teachers in determining the subject of assessment is a problem that both students and teachers cope with: some teachers insist on the scope (quantity) of teaching contents to be adopted by students, not on determining which teaching objectives are achieved through learning.

Learning as a part of the instruction process encompasses mastering a set of skills, procedures and terminology; student assessment is focussed on testing whether the students managed to adopt/master them. The most frequent testing mode of adoption of teaching contents is examining the extent of recalling information from the memory. Traditional tests and knowledge tests, as one of testing modes, usually test the knowledge and skills independently of a particular problem, there is no testing of the students' comprehension of key notions, ability to integrate knowledge in resolving of practical problems.

7. The teachers' insecurity in developing assessment criteria – it is particularly articulated in the implementation of written tests and determination of the level of knowledge to be demonstrated. Should the student who responded correctly on 50% of questions, or 20%, be graded with a satisfactory grade (2)? Teachers have different criteria even when assessing the same stuff that results in the classification into strict and tolerant teachers.

8. During assessment all teachers do not **assess** knowledge quantity and quality **in the same way**. Many of them take into account the engagement of students, his/her interest for the school subject, intellect and so on.

9. The **quality of the class** to which the student belongs is also an influential factor, so a teacher has different assessment criteria in more qualitative and less qualitative classes.

10. **Fear and tremor** can affect the behaviour and answers of students.

11. Traditional attitude: a grade represents the measuring unit of student achievement for a certain period − instead of treating assessment as a continuous monitoring activity of student progress.

In spite of that, a school grade formally and factually represents the only recognised indicator of student learning outcomes. Though present in the instruction and school operation, mistakes made during processes of estimation and assessment can be reduced. Due to the fact that in the assessment process a teacher is at the same time a measurer and a measuring tool, making mistakes should be reduced through facing them and being aware of their presence, as well as through the selection of more objective assessment methods. The basis for reduction of assessment mistakes is the evaluator's knowledge of the presence of such mistakes, modes of their manifestations and their causes, that is the **awareness** and the **caution.** The reduction of

mistakes is ensured through the engagement of several evaluators, their practising, and design of precise and operational evaluation scales.

Required Grade Characteristics

Characteristics of the grade meeting the requirements of proposed procedures and the function of the instruction process are: objectivity, discrimination (differentiation of all levels of student achievements), validity, reliability, promptness, regularity, informativity, instructivity, explicitness, transparency.

Annex nº 8: Preparation and teacher training for assessment procedures in secondary outcome-based VET

Special training of vocational secondary school teachers on outcome-based assessment is in accordance with the strategic documents on VET strategy in the Republic of Serbia. This sequential process necessarily begins with the development of skills needed for determining objectives and outcomes; the next step is training on assessment process involving the stage devoted to designing of future outcomes and further instruction on the basis of current assessment indicators. (See in detail the documents on strategy).

III Part

Assessment

In VET Education

Frequently Asked Questions and Answers

Frequently Asked Questions on Assessment

Question 1: Does every monitoring and tracking of student's achievement represent assessment at the same time?

A teacher is testing, assessing and validating a student's achievements, but those are different activities.

Testing represents a systematic collection of data on how and to what extent students and teachers achieve expected results and realise educational objectives. It can be carried out in verbal form, written form, by observing psycho-motoric actions and in some other ways. In principle, the results of testing are not to be assessed.

Assessment is a qualitative analysis aimed at determining the level of realisation of certain objectives. It represents distribution of answers into qualitative categories, and then specifying their quantitative value (grade).

Validating represents determining the level of educational objectives realisation taking into consideration conditions in which the results are achieved.

Evaluation is a pedagogic process of monitoring, measuring and validating of effects and processes in education. It comprises the previous processes and is wider than they are.

Question 2: How does assessment influence the teaching process?

Two approaches are differentiated: formative (processing) and summative (final) according to how and to what extent the results of testing, assessment and validation can influence the educational process. Formative assessment is carried out during the teaching process and it modifies the mere teaching. Summative assessment is realised at the end of particular segments and it establishes the levels of final achievement.

Question 3: Why do we assess, or, what are assessment objectives?

The primary objective of assessment is to upgrade learning. The secondary objectives are:

- To provide students individually with information on whether they have achieved determined outcomes, how they have acquired a module and where difficulties in the learning process are;
- To give instruction to the teacher on how and to what extent students achieved what is expected, and to what degree and in what way they have acquired the contents of the module;

- To provide teachers with diagnostic information on difficulties that students encounter in learning and to suggest additional activities that should be introduced in order to improve teaching and learning.
- To provide teachers with information on how students perceive and react to realised contents and structure of the module;
- To continuously align teaching with teaching objectives / outcomes.

Assessment functions:
- In relation to students: informative, instructive / developing, motivational, evaluative function.
- In relation to teaching: informative, analytic, evaluative, corrective-innovative function.

Question 4: Since assessment is a complex process, what is it determined by?

Assessment dimensions are:

1. **What do we assess – CONTENTS:** concepts of skills, application, attitudes and choices.
2. **PURPOSE of assessment:** What is it going to be used for?
3. **Who will execute the assessment – ACTORS OF ASSESSMENT:** a student, other students – members of a work group or a teacher.
4. **METHOD of assessment (ways and procedures of assessment):** quiz, report, group or individual projects, written works, drawings, test……
5. Undertaken **ACTIVITY AND FEEDBACK** that is given to students. This is the most important component of assessment process which establishes a link between assessment and improvement of the student's learning.

Question 5: Which principles should govern the process of assessment?

The basic conventional **assessment principles** are:
1. Assessment is planned as an integrative part of the lessons.
2. It comprises all actors and activities in teaching and learning.
3. It is an important professional skill of a teacher.
4. It gives an answer to the question: How do students learn?
5. It enables the individualisation of the teaching process.
6. It gives direction to the student's progress.
7. It motivates students to learn.
8. It stirs emotions and the students' self-esteem.
9. It introduces students and other actors in the lessons to the learning objectives and criteria for assessment of the learning outcomes.
10. It influences development of student' self-assessment abilities.
11. It comprises the whole scope of students' achievements.

Question 6: Should the assessment be carried out periodically or continually?

Assessment, teaching and learning are processes integrated in each other. They ensure that all educational activities are focused on learning outcomes. Assessment is not the final product of teaching and learning, but a constant process that provide students and teachers with feedback on the implementation and the possibility of realisation of teaching and learning. The objectives and functions of the assessment process determine it as a process that follow the student's progress and help the student to make progress. In order to fulfil this task, a teacher assesses the student's achievement and the mere process of learning continually and from lesson to lesson.

Question 7: What should a teacher do to implement adequately a model of continual assessment?

Steps of continual assessment process implemented by a teacher:

1. Get to know in details the established objectives, expected effects / outcomes of module and ensure that they are understood;
2. Plan the assessment;
3. Inform the students about the requirements and ensure that they understand their role and responsibility in the process of assessment;
4. Shape and design the assessment by selecting appropriate methods, instruments and materials;
5. Carry out assessment which also involves collecting of data;
6. Make judgement and secure feedback to students;
7. Fulfil administrative requirements;
8. Evaluate the process of assessment.

Question 8: How does a teacher plan assessment?

1) He / she makes an overview (list) of expected effects (outcomes) that need to be assessed;
2) He / she determines the number and types of procedures and techniques he / she is going to use;
3) Determines the assessment criteria;
4) Describes how the results are used in teaching;
5) Determines dates and deadlines;
6) Prepares the scheme of notifying results;
7) Envisages the procedures of evaluation and assessment according to student's feedback, and
8) Determines the assessment details to which he / she is going to introduce the students.

Question 9: Are criteria of assessment the same for all objectives and programme activities and all assessment instruments?

Establishing assessment criteria encompasses defining the level and quality of knowledge and skills that the student acquires in the teaching and learning process. Established objectives and outcomes of the teaching and learning determine objectives and procedures of assessment. The grade should not primarily be defined by the quantity of information (avoid quantitative assessment criteria), but by the ability of the student to use relevant knowledge /skills on his own (independently), or whether he/she needs help to use that knowledge.

Assessment criteria are not a unique and universal category since they are determined by both contents that are assessed and an applied technique – assessment procedure. Criteria applied for procedures that determine the quantity of the acquired programme activities are not identical to criteria applied for procedures that determine the qualitative dimension of the acquired programme contents although they are similar and comparable. Assessment criteria also depend on the contents of assessment (whether information and knowledge that can be verbally articulated are assessed or features that teaching should create, or skills?). Among available taxonomies is Blum's (see page 34).

If tests of knowledge that more often measure the quantity of information are applied, then the grade intervals are quantitatively determined. With standardised tests of knowledge (model of normal distribution) intervals are already determined by the process of standardisation and the teacher just applies norms. When the teacher creates knowledge tests (normative, continuum of tasks) then the equal intervals are set up for school grades. When the teacher assesses verbal answers and individual student's activities, he / she then uses qualitative measures and dimensions of assessment that show the level of selection and integration of acquired contents.

Question 10: How to distinguish the levels of successful learning when verbal testing is applied?

SOLO Taxonomy of Assessment	
Levels	Description
Pre-structural – analogous to "unsatisfactory" grade - 1	• The student states unimportant information and provides answers that make no sense. • The student simply says: «I do not know», repeats the question or quotes irrelevant facts. • The student mentions only the first (not necessarily important) aspect that he/she recalls.
Mono-structural	• The student's response (answer) is focused on a single aspect. • All the responses may be equally accurate, but also mutually inconsistent. • The student is able to consider contents with comprehension, due to the fact that he is partly acquainted with the scope of contents; but he/she is not able to apply or transfer knowledge and its meaning to new contents or situations.
Multi-structural	• Separated, important facts. • The student draws conclusions on the basis of observing many aspects, but these aspects are not connected, resulting in inconsistent responses. • Two responses at this level may provide the same quantity of information, but there is no linkage, hence different conclusions are drawn.
Relational	• Putting together important facts. • The responses are based on real experiences and they are inconsistent from time to time. • The student's response provides a comprehensive concept based on explaining various separated facts, characteristic for a multi-structural type of answer, but he/she sticks to previously adopted notions and contents during the instruction process.
Generalised abstraction level (expanded abstraction) – analogous to "excellent" grade – 5	• The student is able to make generalised judgements and extend generalisations far beyond the limits of contents delivered by the teacher. • Ability to make hypotheses. • The student is able to: make selection of facts, integrate all relevant facts and their mutual relations; modify them and present them as abstract theoretical structures; this level enables deduction and usage of information that was not originally involved; therefore, the student is able to offer alternatives, consider solutions independently, even without drawing a final conclusion.

Question 11: How to assess a student's achievement when quantitative measures of what has been learned are applied?

It is possible to determine a student's achievement measured by certain techniques within the frame of achievement intervals. Intervals based on percentage are most often applied. They are convenient for assessment just if measuring instruments (tests, checking and other assignments) are created in accordance with the metric requirements of measuring instruments.

In order that the next intervals give discriminative grades it is necessary that they are equal, and that each interval is equal to one grade; any reduction in scope reduces the discriminative feature of a scale. The precondition for application of this scale is that measuring

instruments of achievement are properly composed and encompass tasks from the simplest to the most complex in appropriate proportion.

<table>
<tr><th colspan="4">Intervals of Outcome Realisation (Adequate for Assessment)</th></tr>
<tr><th colspan="2">Range</th><th>Description</th><th>Achievements in Knowledge Tests</th></tr>
<tr><td colspan="2">0 - 20%</td><td>The absence of information or the lack of linkage between information.</td><td>A student does not know the answers/or performs only the most simple reproductive tasks that do not require further engagement</td></tr>
<tr><td colspan="2">21% - 40%</td><td>Approach to knowledge and/or theoretic discussion without analysis and implementation.</td><td>A student responds to simple reproductive tasks and tasks requiring a basic level of engagement and interpretation.</td></tr>
<tr><td colspan="2">41% - 60%</td><td>In order to obtain more than 40% a student shall demonstrate the ability to analyse at least a single relevant model, theory or principle from the teaching contents. He/she should identify key elements and emphasise their importance, offer alternatives and recommend an adequate solution.</td><td>A student knows almost all answers, that are kind of reproductive, but he is also able to make links between contents and compare them. He/she should demonstrate the ability to resolve rather simple assignments.</td></tr>
<tr><td colspan="2">61% - 80%</td><td>In order to master more than 60%, a student shall explain the implementation of a model, theory or principle from the learning manual and course materials, in an integrative way.</td><td>A student is able to perform tasks referring to the following processes: implementation, analysis and synthesis, as well as deductive thinking.</td></tr>
<tr><td rowspan="2">81% - 100%</td><td>80%+</td><td>It is expected that a student is able to demonstrate implementation of models, theories and principles, as well as to compare models and theories, including critical analysis.</td><td rowspan="2">A student is able to perform tasks related to: implementation, analysis, synthesis; also, he is able to valuate and estimate contents (i.e. evaluate according to internal and external criteria) – therefore, he/she is able to conduct critical analysis and suggest solutions.</td></tr>
<tr><td>90%+</td><td>A student is able to outline models, criticisms and analyses even beyond the framework of planned activities.</td></tr>
</table>

Question 12: How to assess professional skills, motoric actions, complex work behaviour?

The teacher can assess skills, actions, complex work behaviour by determining the level of independence of the student during the performance:

- The student realises the activity led by the teacher's instructions;
- The student realises the activity prompted by occasional teacher suggestions;
- The students realises the activity only according to an example;
- The student realises the activity on the teacher's initiative and the rest is done independently;
- The student realises the activity completely independently.

Question 13: Are the final grades the arithmetic mean of achieved grades?

Characteristics of a grade that fulfils the requirements of proposed procedures and functions of the teaching process are: objectivity, sensitivity (differentiating all levels of the

student's achievement), suitability, reliability, timeliness, regularity, informative, instructive, obvious, analytical, public….

Apart from these characteristics that depict all school grades, the final grades should characterise a composite outcome as well. The final grades should reflect the different student achievements measured by different assessment techniques. The relation between individual grades and the final grade reflects basic assessment functions when it is the result of continual tracking of the student's progress.

The final grade must not exceed the frame limitation of the lowest and highest grade that a student got but it can be the highest grade that he/she got.

Question 14: Is questioning of students a basic method of testing and assessment?

When a teacher tests and assesses a student's achievement, he / she uses several methods and procedures:

- **Observes the student's behaviour:** observes and tracks the student's learning activities, as well as activities of application of what has been learned (validation of the process) – observes how a student performs a work activity, motoric skill…..;
- **Validates the products of learning** (validation of effects) – assesses products, projects, drawings, models and so on;
- **Examines:** asks questions or gives tasks for a student to answer.

All these activities can be the basis for **student self-assessment.** Self-assessment is an important segment of assessment because it contributes to the formation of criteria, the recognition of situational requirements and gives direction to the acquisition of a repertory of behaviour which satisfies the criteria pattern.

The examination of students can be verbal or in written form:

Verbal examination forms:

- Individual;
- Group discussion.

Written examination forms:

- essays on proposed subjects;
- series of questions and/or assignments (revision tests, written assignments and so on);
- tests (standardised tests or "series of problems of objective type").

Question 15: What are knowledge tests?

The test is a measuring instrument consisting of a series of assignments or problems that are systematically selected, through which the abilities, the personality development and the knowledge of individuals are objectively examined.

Standardised knowledge tests (so called real tests) can be used in teaching and non-standardised knowledge tests, which are known as series of objective type assignments. Teachers most often use series of objective type assignments created by themselves.

The fundamental functions of knowledge tests (achievements) in the teaching and learning process are:

- ***Control function*** *– determines the extent of implementation of the objective, the level of student achievement, knowledge quantity and quality;*
- ***Instructive function*** *– focuses student learning to possible situations in future, supports development of learning strategies - including full comprehension - and the skills of selecting important points and their arranging into a form of hierarchical structure.*

Question 16: Is a simple question an appropriate test assignment at the same time?

Test assignment and the simple question are two different notions.. Knowledge tests (and test assignments) are classified by the form of assignment:

- **Reproduction tests** – open type tests requiring the student's active search for an answer to the question, its reproduction and writing down; subtypes are essay tests and supplementing tests;
- **Recognition tests** – close type tests offering more options so that the student should select the correct one; subtypes are double-choice tests, multiple-choice tests, arranging and comparing assignments.

Question 17: Can every test be used for regular school assessment?

In accordance with their purpose/function knowledge tests are classified into:

- **Normative** (traditional) tests aimed at determining individual differences in student achievements (they are not implemented to determine the efficiency of the teaching method in question);
- **Criteria-based** knowledge tests enable the determination of the contents and the extent of adopted knowledge by students in the framework of a specific school subject.

If a normative achievement test is applied, where test assignments are selected on the basis of normal distribution principles– from the most simple to the most complex ones in equal ranks; then – through implementation of the assessment principle - student achievements are sorted out into equal ranks. If a criteria-based achievement test is applied, it is not reasonable to base a school grade on the results of such a test. If the teacher mostly chooses assignments based on elementary knowledge that most of the students should adopt, such a test cannot be used for assessment, but primarily for the monitoring of teaching effects. Predominance of quantitative criteria in assessing student achievements in tests and assignments should be avoided; student achievements should not be primarily assessed on the basis of quantity of correct information, but on the basis of the extent of student's autonomy and complexity of demonstrated knowledge.

Question 18: How to prepare the achievement test in the school?

Knowledge tests are objective instruments of achievement assessment enabling the examination of a rather larger number of students. They require skilful design due to the fact that their application is reasonable only if they meet all metric characteristics required for tests. However, in practice not so skilfully designed tests and non-discriminative tests are frequently applied.

Teachers may use already prepared and standardised knowledge tests in practice (they are seldom used in the Serbian educational system) and tests designed by themselves, i.e. “series of assignments of objective type”. The process of knowledge test design is a very complex one which requires special training of the teaching staff, as well as team work between the teachers and the professional support staff in the school.

Question 19: Is it necessary that students have experience with knowledge tests and get prepared for testing so that grades would be reliable?

Students should master the skills of recognizing the demands in test assignments and the skills of skilled and concise responding. The students that prepare themselves for testing by practising responding strategies (not school subject contents), always have better achievements than unprepared ones. Also, the preparation process reduces the extent of student anxiety.

There are four areas of student preparation for validation of school achievement through tests:

- basic preparation – learning of contents;
- material preparation – organising of tools needed for testing;
- physical preparation – adequate nutrition and rest before the testing;
- psychological preparation – creating learning attitudes and inducing motivation, asking questions aimed at checking the level of knowledge etc.

Question 20: Are there any other alternative methods of assessment?

Alternative testing and assessment methods are the following: portfolio assessment (based on selected and representative student works); authentic assessment; practice work assessment; graphic works; experiments; quiz; projects; written reports and so on.

Question 21: What is a portfolio technique?

A portfolio consists of selected student's works that demonstrate his / her achievement, progress, difficulties and they should be selected to show the student's strongest learning side within that subject. The shaping of a representative works collection (portfolio) is an activity performed by a student guided by the criteria determined by a teacher together with the students. It involves the elements of self-assessment since the student evaluates and selects works, but the final assessor is a teacher.

Question 22: How to avoid drawbacks and difficulties in the assessment process?

General limitations of the measuring process are the same as in the case of measuring pedagogical phenomena, and the efforts are made in the fields of psychology and pedagogy to reduce them through the implementation of a methodology. The first step in the process of increasing assessment objectivity is the recognition of factors that have an impact on this process, and the next step is to reduce the effects of negative factors.

The factors that influence the shaping of a school grade are:

- Student knowledge, skills, achievements;
- Systematic modifying factors which reduce the objectivity of the assessment: certain periods during the school year (more strict assessment requirements at the end of the first semester in comparison to the requirements at the end of school year); class or subject teaching (in class teaching the emphasis is put on student personality, too, whilst in school subject teaching it is put on student achievement);

- Non-systematic modifying factors which reduce the objectivity of the assessment objectivity: subjective factors related to the student (the mood, anxiety, intellectual and other abilities, working habits, speech skills, gender, special features such as neatness, etc.); subjective factors related to the teacher (the gender, the mood, abilities, pedagogical competence, programme competence etc.); objective factors (time of the day, spatial arrangement , etc).

Sources of mistakes made during processes of estimation and assessment are:

- Halo-effect and the effect of the first impression (on the basis of noticing a certain student feature the teacher has a general impression of the student and draws further conclusions);
- Constant mistake (types: personal equation, central tendency, extreme estimations);
- Logical mistake;
- Context mistake («quality of the class in general» and so on.);
- Dysfunctional assessment (use of a grade as disciplinary measure);
- Reduced assessment scale (a teacher does not use all the grades for assessment, just a part of the scale);
- Not clearly defined measuring subject and non-defined measuring requirement.
- Traditional opinion that grade is a measure of achievement at one moment and not a continual activity of tracking the students' progress.

In spite of that, a school grade represents formally and factually the only recognised indicator of student learning outcomes. Though present in the instruction and school operation, mistakes made during processes of estimation and assessment can be reduced. Due to the fact that in the assessment process a teacher is at the same time a measurer and a measuring tool, making mistakes should be reduced through facing them and being aware of their presence, as well as through the selection of more objective assessment methods.

The basic condition for adequate assessment, whose function is to continually monitor a student and encourage his / her growth and development, is to clearly determine the mere subject of measuring: the objectives of the teaching and learning process should be set up and operationalised up to the level of expected effects which are, at the same time, criteria of the student's success.

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