

# Reflection Report

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## 1. CBC, CBE, and CBA as a System

CBC is a curriculum focused on real life skills, e.g., a training module on ecology, where students learn to analyze eco-problems through projects. CBE is a process in which learners achieve these objectives at an individual pace, through practice, e.g., group studies and simulations in Biology classes. CBA is an assessment that measures the ability to apply knowledge in real-world situations, e.g., presentation of a project on solving environmental problems, then assessment with the criteria described in the rubrics. CBC sets objectives ("be able to conduct field research"), CBE implements them through active methods (workshops), CBA verifies outcomes through authentic tasks (observation of field work). Their correlation is critical: if learning methods (CBEs) do not meet the CBC objectives or the assessment (CBA) does not reflect real competencies, the learning system becomes invalid. Teachers modeled an assignment on the topic "Environmental Problems." The task included a research mini-project: identifying a problem in the region, collecting data, analyzing the causes, developing solutions. The assessment was by a pre-prepared rubric, which reflected key criteria: scientific validity, the level of cooperation, and quality of feedback. We focused on the validity of the assessment, the observed behavior and correlation of tasks with the objectives and levels of Bloom's taxonomy. Teachers prepared practice-oriented tasks, increased methodological competence in creating rubrics. Formative assessment has become a tool for learning and development, not just control. Some had difficulties distinguishing between the tasks levels. There were questions: how to describe the boundaries between the levels, how to

make the assessment reliable and uniform? I realized that competence learning is not a set of specific methods, but a system that requires methodological consistency: from the formulation of objectives to assessment tools. It is important to provide teachers not only with knowledge about CBA, but also with conditions for practice: modeling, sampling, and analysis. The feedback based on transparent criteria contributes to the growth of both students and teachers

## 2. Curriculum Development and Learning Goals

For Biology teachers, I conducted a lesson on competency-based assessment. In the context of CBC, qualitative SMART learning objectives are formulated as observable actions that reflect using knowledge in real situations. E.g.: "To prepare a lesson where students analyze connections in ecosystems using modeling methods and case studies." The objective corresponds to Bloom's taxonomy and focuses on the observed behavior. Learning activities - in correlation with the objective: teachers created interactive models of ecosystems, discussed real cases (the consequences of species extinction) and designed parts of lessons. Active learning, including role-playing, and panel discussions, allowed to develop teachers' practical competencies in the context of CBC. A lesson was on the topic "Food Chains." Successful items: high involvement: the use of digital tools for modeling ecosystems aroused keen interest of participants; clarity of rubrics: teachers noted that the criteria helped to structure the work and minimize subjectivity. Growth zones: some teachers experienced difficulties with going from a lecture format to active training. To improve, a reflection stage after each task to consolidate new approaches is needed. Validity of tasks: in one of the cases there was no connection with local environmental problems, that reduced the relevance for teachers from the southern regions of Kostanay region. It is worth improving the coherence between objectives and tasks: not all tasks were aimed at applying knowledge in real situations, reducing constructive validity. It is planned to use a test matrix for a certain correspondence between the objective and the task. The effectiveness of learning directly depends on the clear formulation of competency goals, use of active and experienced learning methods and well-thought-out assessment tools. I plan to include more examples from the regional context and expand the stages of practical skill development.

## 3. Assessment Quality: Validity, Reliability, and Fairness

During preparing formative assessment for topics within the course "Ecosystems", I realized that a score is not measuring the result, but a tool for supporting and developing students. I developed a test on the topic "Ecosystems," aimed at assessing competencies while analyzing the structure of ecosystems and their dynamics, used tasks aimed at testing the ability to use

digital tools to analyze biological data. At the planning stage, a test matrix was developed that ensured the correlation between objectives, levels of Bloom taxonomy, and types of tasks. Most of the tasks were correlated with learning objectives (application level: "Offer measures to restore the disturbed ecosystem"). Some questions were invalid, as they checked the general erudition ("Name the largest biome of Kazakhstan") instead of analysis skills. Tasks were presented in various formats (visual cases, oral analysis), it took into account the diversity of teachers (fairness). The principles of cultural neutrality and inclusiveness were also taken into account. The lack of time for teachers with limited access to digital resources created unequal conditions. Working at the test deepened my understanding of CBA principles. Bloom's taxonomy helped to structure questions by level (from "analyze" to "create"), avoiding skewing towards memorization. The test matrix provided a balance between theory and applying, which increased the validity. The feedback system was successful: teachers received recommendations for improvement, and not just the final score. What to improve is pre-testing assignments to identify potential problems early. Creating a valid, reliable, and fair evaluation system requires a systematic approach: clear objectives, different tasks, individual needs of students. Competence assessment is a tool for diagnosis and development.

## 4. Grading and Standard Setting

Scoring while assessing should not be just a technical process, but part of a strategy aimed at developing competencies. In the context of CBE, the focus is not only on the final result, but also on observed behaviors that reflect developing particular skills. Significant were the concepts of criterion-based interpretation, which focus on achieving learning objectives, and not on comparison with others, and the validity of scores that ensures the results' corresponding to the declared competencies. Important was the distinction between absolute and relative methods of setting standards. I developed a final test for the module on assessing methodological competencies. Rubrics with clear criteria ("compliance with the educational standards," "use of active methods") ensured transparency and coherence with the lesson objectives. Standardization of scores by rubrics worked well, which reduced subjectivity. Participants noted the clarity of outcomes. Shortcomings were: Weak adaptability to variations in test complexity (only an absolute method was used, which limited flexibility, adaptation to tasks complexity). Limited validity due to lack of SEM analysis to account for error. To improve, I plan to introduce a combined approach: a preliminary threshold score (60-70%) with subsequent adjustment after analyzing the test statistics (when unexpectedly low average score). This will increase fairness and flexibility. It is difficult to assess "critical thinking" without clearly formulated indicators. I plan to develop behavioral descriptors for doing all levels and types of tasks. Rubrics with level descriptors ("satisfactory," "good") were used, which strengthened the correlation with learning objectives. The lack of test validation through pilot

testing reduced reliability. I will add a stage of qualitative analysis of tasks to minimize mistakes. Building a transparent and fair assessment system requires constant analysis of coherence of objectives, methods, clarification of criteria and active participation of all participants. Assessment becomes part of a competent specialist's progressing.

## 5. Use of Rubrics

In the course of practice and analysis I realized its significance also as a tool for formation and regulation of the learning process. Rubrics, as structured assessment tools, provide correlations with learning objectives, reduce subjectivity and increase transparency of assessment. They include three key components: criteria, levels of doing, and descriptors, making it possible to clearly define the observed behavior. E.g., preparing a rubric for evaluating mini-projects on the topic "Environmental problems of the region." The rubric included clear indicators of observed behavior: argumentation of an environmental problem, use of scientific terminology, structuring of the research and reflection. Thanks to this, teachers understood what competencies are developing, how they will be assessed. The correlation between objectives, activities and evaluation criteria strengthened the validity of the process. The task involved identifying and analyzing topical environmental problems in the region. Criteria included: scientific accuracy of data, report structure, problem-solving creativity. The levels ("beginning" "proficientl," "Advanced") were accompanied by descriptors, for example: "Advanced level: the work contains statistical analysis of data, links to authoritative sources and offers innovative solutions." Teachers noted that the presence of a rubric increases motivation, shows outcomes and help to plan actions. I was good: - introduction of rubrics both as an assessment tool, and a means of professional growth. It helped to structure the feedback, making it specific ( "Add a comparison with global environmental problems to go to the" Advanced "level"). But Insufficient approbation of the rubric led to the uncertainty of some descriptors. In some situations, the criteria turned out to be too general, which reduced the discriminative nature of the assessment. The professional use of rubrics requires methodological accuracy, preliminary approbation, and constant adaptation.

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