Reflection Report

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1. CBC, CBE, and CBA as a System

CBC (Competency-Based Curriculum) defines what students need to learn, focusing not only on acquiring knowledge and skills but also on applying them in real-life situations. CBE (Competency-Based Education) organizes how students learn, allowing them to progress at their own pace. Students move forward only after mastering certain competencies through practical work. CBA (Competency-Based Assessment) evaluates how well students apply what they've learned, focusing on real tasks rather than memorization. In short: CBC outlines learning objectives. CBE plans the learning process. CBA assesses practical application. Combined, they build a productive, meaningful education system. Example from My Experience: "Ways to Save Energy at Home" CBC: Students learned about energy types and conservation methods. CBE: They investigated energy use at home, measuring lighting and appliances, and prepared reports. CBA: Assessment involved both written reports and practical recommendations for saving energy. This project was successful because it connected theory with daily life. Students engaged actively, and the assessment valued practical application. Another Example: "Calculating Energy Consumption" Students calculated household energy use from electricity bills. Applied theoretical knowledge to real data. Measured appliance power use with instruments. Developed practical, measurable conservation tips. Enhanced analytical, problem-solving, and critical thinking skills. This project was effective because it directly aligned with learning goals and provided students with real-world experience. Conclusion: Through these projects, I realized CBC, CBE, and CBA are closely connected systems aimed

at achieving clear, practical learning outcomes. Student activities and assessments should always reflect these goals to ensure valuable, competency-based education.

2. Curriculum Development and Learning Goals

To develop high-quality learning objectives in line with the Competency-Based Curriculum (CBC), I begin by clearly defining what students should be able to do. These objectives must be specific, measurable, and action-oriented. For example, instead of stating a vague goal like "Obtaining an image using a lens," I specify it more precisely: "Tracing the path of rays through a thin lens and describing the image formed." This ensures students understand exactly what they need to accomplish. In lesson planning, my primary goal is to enhance students' research and analytical skills. I encourage them to independently sketch diagrams using the properties of three rays and determine the positions of the object and its image. To support this, I use interactive tools such as the PhET simulation (https://phet.colorado.edu/). This platform provides a hands-on experience, allowing students to visualize concepts and connect theoretical knowledge to real-world situations. When planning assessments, I avoid relying solely on traditional tests. Instead, I incorporate various assessment types common in CBC, such as projects, practical tasks, and reflection activities. For example, in a physics lab titled "Determining the Work and Power of Electric Current," the learning objective was for students to determine the cost of electrical energy. Students calculated the power consumption of household devices, estimated their daily energy usage, and proposed energy-saving strategies. The assessment rubric evaluated the accuracy of their calculations, the quality of their recommendations, and the clarity of their explanations. However, I noticed some students struggled with time calculations, highlighting the need to provide sample calculations in future lessons. Additionally, I realized I did not fully explain the assessment criteria at the beginning of the lesson. In the future, I will ensure these criteria are clearly communicated using the rubric. Through this experience, I've learned that for effective teaching in a competency-based curriculum, objectives must be clear, action-oriented, and connected to real-life contexts, while assessments should focus on observable and measurable behaviors.

3. Assessment Quality: Validity, Reliability, and Fairness

There are three key principles in educational assessment: reliability, validity, and fairness. When creating a test, we must consider the importance and role of each principle. If a teacher-created test is reliable, the outcome will also be fair, helping us understand what the students have learned and what still needs to be taught. In competency-based learning, the goal is not only to check what students remember, but also to understand what they can

actually do. I designed the task in connection with the learning objectives using Bloom's taxonomy of cognitive levels. Example: The learning objective is "To draw the path of a ray in a convex lens and describe the image." In this lesson, I gave students a task to draw the path of rays through a convex lens and to describe the image's location, type, and size. This task is valid, because it directly aligns with the learning objective—meaning that the student can apply theoretical knowledge in practice by drawing the ray's path through the lens. There is also a possibility for lower validity if the task only asks something like "What kind of image will be formed?", since that would assess only recall rather than practical skills. To ensure fairness, I used a predefined rubric: Assessment criteria: • Correctly drew the ray path (1 point) • Indicated the image location (1 point) • Described the image type (1 point) • Accurately showed the image size (1 point) For some students who struggle with diagramming, https://www.vascak.cz I provided additional support and gave them simulations to work with. My goal here is to consider each student's individual needs and support them accordingly. $P = 0.65$, which indicates that the task has a moderate level of difficulty and helps to assess the students' potential. The assessment was conducted using clear criteria, and students' individual characteristics and learning styles were taken into account. I believe this assessment is valid, reliable, and fair.

4. Grading and Standard Setting

In my experience, assessment is based on learning objectives and is carried out using specific descriptors and rubrics. At the beginning of the lesson, I explain to students what they need to learn, what tasks to wait , and how they will be assessed. For example, on the topic "Drawing a ray path through a thin lens and describing an image," I assess the student's work based on criteria such as correctly drawing the ray direction, determining the location of the image, and describing its type. For example, I give students a task to draw rays and assess them using the following descriptors: • Was the direction of the rays drawn correctly? • Was the location and type of the image determined correctly? • Was the work graphically accurate? The student receives a specific score for each action. This shows why the student received such score. I assess according to a pre-prepared rubric, all students are assessed using the same criteria – this ensures the principle of fairness. The assessment results are provided with feedback, so the student can clearly see where he or she struggled, made a mistake, and did not understand. What would I improve as a teacher? 1. Some students do not understand the assessment criteria and do not know why they scored low. Therefore, at the beginning of the lesson, I analyze the rubric together and explain to students with examples what exactly is being assessed. For example, I remind them to review the work on the simulator again before drawing the diagram. 2. After the assessment, I ask students to give a report on their work. This reinforces competency-based learning. 3. I give students who have difficulty drawing a ray

step-by-step instructions and have them work on it so that they can demonstrate their knowledge in more detail. This is an important step that strengthens fairness.

5. Use of Rubrics

In general, rubrics are used to assess students' work. They help clarify and make assessment criteria transparent, which ensures fair and objective evaluation. Rubrics assist in standardizing the assessment process. Teachers assess each student's work based on the same set of criteria, which increases the fairness and consistency of the evaluation. Additionally, rubrics help students understand the main requirements of a task. They show students what they need to do to improve their work. For example, let's take the assessment of the laboratory work "Assembling an Electric Circuit and Measuring the Current in Different Parts of the Circuit." In this laboratory task, students assemble an electric circuit and measure both current and voltage. The criteria in the rubric can include the following: assembled the circuit correctly, assembled the circuit entirely according to the instructions, made only one error while assembling, made several errors but the circuit still works, and failed to assemble the circuit or the circuit does not work. However, too many criteria can overwhelm both students and teachers, making the assessment process more complicated. Therefore, the criteria and performance levels in the rubric should be clear, limited in number, understandable for students, and directly aligned with the competencies being assessed. I have realized that rubrics greatly facilitate the assessment process and provide effective feedback to students. For rubrics to be effective, a teacher should consider the following: 1. The language used in the rubric should be simple and understandable. 2. The rubric should be concise, specific, and measurable. 3. The rubric should be shared with students in advance. If a rubric is applied purposefully and correctly, it can become a powerful tool for improving students' knowledge and skills. I can confidently say that rubrics are essential for fair and meaningful assessment in education.

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