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SELF-ASSESSMENT USING THE CONSIDER ALL FACTORS METHOD IN TEACHING BIOLOGY TO STUDENTS

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ABSTRACT

This article highlights the importance of using the "Consider All Factors" method in the effective organization of biology lessons and explores its potential for application in the student self-assessment process. Through this method, students not only actively participate in the learning process but also learn to independently analyze their level of knowledge and identify their strengths and weaknesses. The article outlines the main stages of the method, ways to implement it during lessons, and its role in developing students' self-assessment skills, supported by examples and practical recommendations.

Keywords: Biology education, self-assessment, interactive method, student engagement, critical thinking, creative thinking.

АННОТАЦИЯ

В данной статье раскрывается значение использования метода «Учитывай все факторы» при эффективной организации уроков биологии, а также возможности его применения в процессе самооценки среди студентов. С помощью этого метода студенты не только активно участвуют в учебном процессе, но и учатся самостоятельно анализировать уровень своих знаний,

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определять свои сильные и слабые стороны. В статье представлены основные этапы метода, способы его применения на занятиях, а также его роль в формировании навыков самооценки у студентов с примерами и практическими рекомендациями.

Ключевые слова: биологическое образование, самооценка, интерактивный метод, активность студентов, критическое мышление, креативное мышление.

INTRODUCTION

In general, enhancing the effectiveness of the teaching process requires the careful selection of instructional tools, methods, and forms that are appropriately aligned with the structure and objectives of classroom activities. Their compatibility with learners' needs and interests is of particular importance. Furthermore, systematic analysis and self-reflection, along with the evaluation of learning outcomes, play a crucial role in ensuring the overall quality and efficiency of the educational process [1].

In the organization of biology instruction, the application of interactive methods and modern educational technologies is of paramount importance. These approaches enhance students' comprehension of subject matter and contribute to the development of their independent and critical thinking skills. The integration of student-centered methods and innovative pedagogical technologies in biology classes facilitates the consolidation of prior knowledge, supports the acquisition of new information, and promotes the advancement of cognitive competencies.

Through the implementation of interactive methods, students engage in collaborative learning processes, exchange ideas, participate in group activities, and learn to apply their knowledge in practical contexts. The significance of incorporating interactive methods and educational technologies into the teaching process can be illustrated by the following aspects:

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- they promote the active involvement of students and strengthen their existing knowledge in biology lessons;
- they facilitate the assimilation of new information and the development of analytical and thinking skills;
- they encourage peer interaction, collaborative work, and the practical application of acquired knowledge [3].

Interactive methods ensure students' active participation and effectively engage them in the learning process. Through these approaches, learners are not limited to passively receiving information; rather, they are provided with opportunities to apply knowledge in practice, analyze concepts, participate in discussions, and develop reasoned solutions to academic problems.

In the context of contemporary education, increasing student engagement and fostering their critical thinking and independent analytical skills represent pressing pedagogical challenges. In teaching biology, it is essential not only to transmit traditional subject knowledge but also to shape students as active participants in the educational process. From this perspective, the use of interactive methods—particularly the "Consider All Factors" method—acquires significant importance. This method encourages students to become more actively involved during lessons, to explore the given topic in greater depth, and to articulate their ideas in a well-reasoned and substantiated manner. Most importantly, it enables learners to independently assess their own level of knowledge and understanding.

LITERATURE REVIEW AND METHODS

The "Consider All Factors" method represents a learning strategy grounded in critical and systematic thinking. This approach teaches students to analyze problems from multiple perspectives, examine all cause-and-effect relationships, and take all relevant factors into account when making decisions. In the context of biology education, this method proves particularly useful for analyzing

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complex biological processes, such as topics on "Ecological Problems," "Heredity," and "Evolution."

The main stages of the method include:

1. Identifying the problem;
2. Listing all factors related to the problem;
3. Analyzing each factor;
4. Determining the interconnections between factors;
5. Drawing conclusions and proposing solutions;
6. Evaluating and refining one's own reasoning.

The role of the method in developing self-assessment:

One of the key strengths of the "Consider All Factors" method is that it encourages students not only to memorize information but also to analyze and evaluate it. During lessons, students are tasked with:

- explaining their decisions;
- answering analytical questions;
- supporting their opinions with evidence;
- and ultimately assessing their own knowledge.

This process fosters competencies such as independence, responsibility, and personal development. Students gain insight into their strengths and weaknesses and strive to improve based on this understanding.

As previously noted, the "Consider All Factors" method serves to direct the learner's attention to specific elements, with the intended purpose of enhancing cognitive development, expanding imagination, and enriching critical thinking. The method's effectiveness increases when it is applied with clear objectives. Conversely, if students are reluctant to express their ideas openly, the method's application will not yield the desired results [4].

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During the learning process, it is advisable to compile a list of factors that facilitate effective mastery of the topic by addressing the following questions:
1. Which factors were taken into account in the process of mastering the topic?
2. Which factors were not considered in the process of mastering the topic?
3. What additional factors could be included in the list?
4. Which other aspects of the issue should be given attention? [5]

DISCUSSION AND RESULTS

The "Consider All Factors" method contributes significantly to enhancing students' creativity. Creativity (from Latin, English "create" – to create, "creative" – inventive, imaginative) refers to an individual's capacity to generate new ideas and is considered an independent component of talent, encompassing the ability for creative thinking.

Creative thinking can be defined as:

1. the development of students' abilities and skills to approach the organization of the educational process in a creative manner and to resolve existing problems positively;
2. fostering students' capacity for independent and constructive engagement with learning materials, promoting new and innovative ideas in completing tasks, and gradually developing the foundations of professional training while considering the characteristics of creative development at various age stages [2].

In contemporary pedagogy, various methods are used to enhance the effectiveness of the educational process, activate students' participation, and develop their independent thinking skills. Among these, the "Consider All Factors" (CAF) method holds a prominent place. The essence of this method lies in considering all existing and potential factors when seeking solutions to problems, rather than focusing on one or a few, and in analyzing them systematically.

The connection between this method and creativity is inherent, as creative thinking itself involves considering multiple perspectives, thinking beyond

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conventional frameworks, identifying new relationships, and proposing unconventional solutions. The CAF method provides a conducive environment to cultivate and develop these skills.

The positive effects of the CAF method on creative thinking include:

1. Developing the ability to analyze problems comprehensively: Students are encouraged to consider not only textbook information but also real-life, social, and ecological factors, thereby broadening the scope of their thinking.

2. Encouraging the discovery of unconventional connections and ideas: For instance, in biology lessons, students studying plant physiology who analyze laboratory data alongside climate, soil, water resources, and technological factors gain opportunities to develop new, creative theories or projects.

3. Promoting critical and reflective thinking: Evaluating the impact of each factor and understanding their interconnections allows students to justify their ideas more thoroughly and seek innovative solutions.

4. Stimulating independent learning and inquiry: When applying the CAF method, students extend their knowledge beyond the classroom, actively seeking new information, which is essential for fostering creative approaches.

Through the CAF method, students are able to:

- compare various possibilities;
- select the most relevant ones;
- generate new ideas from them;
- and propose unconventional solutions.

This method influences not only knowledge acquisition but also higher-order cognitive activities such as creation, analysis, research, and project development. Knowledge is formed in any learning process and deepened through independent inquiry.

Moreover, the CAF method's link to creativity provides students with opportunities to develop new ideas and projects. A student trained to analyze comprehensively during lessons can initiate creative endeavors such as unique

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scientific observations, small experiments, ecological projects, or campaigns promoting a healthy lifestyle.

Therefore, the role of the "Consider All Factors" method in developing students' creative thinking deserves particular attention. This method not only involves analyzing problems under the teacher's guidance but also encourages students to conduct independent research, reason critically, justify their perspectives, and cultivate a creative approach. As a result, the learning process transforms into a deeply understood, life-connected, and creativity-oriented knowledge space.

CONCLUSION

In conclusion, it is important to emphasize that enhancing students' personal engagement, fostering independent thinking, critical analysis, and creative approaches represents one of the priority directions in modern pedagogy. In particular, across disciplines, and especially in biology, studying various factors in their interconnections develops not only students' knowledge but also their culture of thinking. In this context, the "Consider All Factors" (CAF) method holds special significance. This method teaches a comprehensive approach to problem-solving by analyzing all existing and potential factors.

The main pedagogical advantage of the CAF method lies in activating students' existing knowledge, promoting deep understanding of problems, and encouraging broad, reflective thinking. Such an approach supports the development of students' creative thinking skills. Creativity is defined as the ability to perceive problems from new perspectives, propose unconventional solutions, and generate new ideas based on existing knowledge. Therefore, the CAF method, which encourages comprehensive analysis, directly supports the process of creative thinking.

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