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RESEARCH ARTICLE OPEN ACCESS

Using Interactive Methods in Completing Problem-Based Practical Tasks in The Chapter "Ecosystem" Of Biology with Interdisciplinary Integration

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ABSTRACT

The article describes the methods and ways of using interactive methods in the interdisciplinary complex implementation of problematic practical tasks in the section "Ecosystem" of biology. A system aimed at developing a project for the interdisciplinary complex implementation of problematic practical tasks in the section "Ecosystem" has also been developed.

Keywords: Problem, practical task, level, plan, phenomenon, process, education, upbringing, goal, activity, system, experience, project, stage, task, interdisciplinary, business games.

INTRODUCTION

The issue of selecting appropriate interactive methods for interdisciplinary integration of problem-based practical tasks in the "Ecosystem" section of biology is often not sufficiently understood. The effectiveness of any interactive method is not determined merely by its conventional naming, but rather by its relevance to the content of the interdisciplinary problem-based practical task and its alignment with the capabilities of the students. The most suitable interactive methods enable the positive resolution of the assigned problem-based practical task within the designated timeframe.

When planning to implement problem-based practical tasks related to the "Ecosystem" while integrating interdisciplinary approaches and selecting non-traditional methods, the teacher should take the following steps:

– Familiarize themselves with guidelines for integrating problem-based practical tasks across disciplines and clearly define the goals and objectives of the implementation;

– The main requirements for implementing problem-based practical tasks through interdisciplinary integration are as follows: when carrying out problem-based practical tasks with interdisciplinary integration, students need to familiarize themselves with the key concepts, phenomena, processes, laws, regulations, and theories. They should understand what issues they can resolve and clearly define the expected outcomes from implementing problem-based practical tasks through interdisciplinary integration in advance;

– Familiarize yourself with the curriculum and, if necessary, make adjustments to it, describing the problem-based practical tasks that will be carried out through interdisciplinary integration;

– Allocate sufficient time for each problem-based practical task to be carried out through interdisciplinary integration, utilizing the interdisciplinary connections outlined in the curriculum, and plan the content and objectives of these interdisciplinary integrated problem-based practical tasks;

– Choosing optimal innovative technologies and interactive methods for the implementation of practical tasks through interdisciplinary integration;

– Organizing the execution of problem-based practical tasks by students both in small groups and individually, that is, selecting a harmonious combination of organizational forms for interdisciplinary integration;

– Supporting the chosen option during the lesson process and making necessary adjustments to the methods and forms of executing problem-based practical tasks through interdisciplinary integration.

Educational and creative activity is reflected in the student's ability to design the process of solving problematic practical tasks related to 'Ecosystems' through interdisciplinary integration. In the pedagogical experiment organized to carry out the research work, special attention should be paid to the development of the student's theoretical knowledge, practical skills, competencies, and abilities during the design of the process of solving problematic practical tasks through interdisciplinary integration.

The following system of practical tasks aimed at developing a project for interdisciplinary integration in solving problematic practical tasks related to "Ecosystems" has been established:

1. Familiarization with the curriculum, textbooks, educational-methodical manuals, and the general description of the class pupils.

2. Defining the main objectives of interdisciplinary integration in solving problematic practical tasks within the pupul's educational and creative activity: setting educational, developmental, and formative goals and objectives.

3. Properly and accurately arranging the main stages of interdisciplinary integration in solving problematic practical tasks in the pupil's educational and creative activity in a clear and consistent sequence.

4. Identifying the key elements within the content of each stage of interdisciplinary integration in solving problematic practical tasks in the pupil's educational and creative activity.

5. Selecting interactive methods and innovative technologies and tools for interdisciplinary integration in solving problematic practical tasks for each stage of the pupil's educational and creative activity.

6. Choosing the leading forms of collective, small group, and individual work for each stage of interdisciplinary integration in solving problematic practical tasks within the pupil's educational and creative activity.

7. Selecting interdisciplinary integrated problematic practical tasks for students who are self-directed learners and possess strong preparedness during the process of the pupil's educational and creative activity.

8. Defining the volume and content of homework in accordance with time norms for the relevant class students.

In the implementation of this system of practical tasks, some students have struggled to sequentially and consistently place the main stages of interdisciplinary integration when performing certain problematic practical tasks. Others have highlighted difficulties in identifying the key aspects of interdisciplinary integration at each stage of solving problematic practical tasks. Additionally, some have faced challenges in selecting innovative technologies and interactive methods or in choosing differentiated problematic practical tasks for advanced learners. For this reason, a training session was organized during the pedagogical experiment-testing process on the principles of optimal selection of methods and technologies for interdisciplinary integration of problematic practical tasks within experimental groups. A methodological guide was developed for the respondents during this training.

One of the necessary aspects of improving the student's skills in interdisciplinary integration of problematic practical tasks on the "Ecosystem" is the analysis of his own educational and creative activity in the process of integrating problematic practical tasks. In the process of pedagogical experimentation, it was found that as a result of the student's own analysis of his own creative activity,

he optimally solves certain tasks. For example, suppose that during the lesson a student did not have an effective approach to selecting a problematic practical task in an interdisciplinary integration manner, then the student, having analyzed himself and identified this shortcoming, tries to complete the next problematic practical task in an interdisciplinary integration manner. At the same time, he thinks out the measures that should be applied in the next problematic practical task in an interdisciplinary integration manner in order to compensate for the shortcoming identified due to the unsuccessfully selected problematic practical task in an interdisciplinary integration manner.

It is advisable to encourage students who perform well in interdisciplinary integration of problematic practical assignments on the topic of "Ecosystem". In some cases, students encounter some difficulties in performing problematic practical assignments using problem-research methods. This is because some students do not have the skills to analyze didactic or role-playing games, educational discussions, and debates when performing problematic practical assignments in an interdisciplinary manner.

Three important functions are performed in the process of interdisciplinary integration of problematic practical tasks during the lesson. These are: educational, developmental, and formative functions. The use of interactive methods during the implementation of interdisciplinary integration of problematic practical tasks greatly aids in conducting the lesson. Directly guiding students through mutual influence, applying interactive methods, and integrating problematic practical tasks across subjects form the basis of this approach, where the teacher encourages independent research rather than merely providing knowledge.

One of the main requirements for the interdisciplinary integration of problematic practical tasks is to effectively link the methods used for this integration with one another. Based on this, enhancing the effectiveness of interdisciplinary integration of problematic practical tasks involves resolving all didactic functions (tasks) within the lesson itself, ensuring that the assignments given for homework logically continue the theoretical knowledge acquired by the students during the lesson. In this regard, when integrating problematic practical tasks interdisciplinary, the teacher must be aware of the following:

– The content and essence of interactive methods in the interdisciplinary integration of problematic practical tasks;

– The place and role of interactive methods in achieving the objectives of interdisciplinary integration of problematic practical tasks;

– Principles for applying interactive methods through the use of interdisciplinary integration in solving problematic practical tasks;

– The use of business games in the execution of problematic practical tasks;

– The introduction of unconventional methods in the interdisciplinary integration of problematic practical tasks;

– Forms, means, and ways to organize and ensure students' creative and educational activities in the interdisciplinary integration of problematic practical tasks;

– Ways and opportunities to identify students' independent thinking and skills in solving interdisciplinary integrated problematic practical tasks.

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