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RESEARCH ARTICLE

Main Criteria for The Professional Orientation of Students in Teaching Natural Sciences

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Abstract

This article analyzes the main criteria for the professional orientation of students in the process of teaching natural sciences. In particular, issues of identifying students' interests and abilities, involving them in practical activities, ensuring interdisciplinary integration, and forming professional competencies based on modern pedagogical technologies are highlighted. It also demonstrates effective methods for developing students' independent thinking, problem-solving, and a conscious approach to career choice. The results of the study serve to improve vocational guidance in the teaching of natural sciences.

KEYWORDS

Natural sciences, vocational guidance, professional competence, student interest, abilities, pedagogical technologies, interdisciplinary integration, practical activity, independent thinking, problem situation, career choice, educational process, innovative approach, methods and techniques.

INTRODUCTION

Teaching natural sciences plays an important role in guiding students toward future careers in the modern education system. Due to the rapid development of society, science, and technology, the demand for highly qualified specialists is steadily increasing. Therefore, it has become a crucial task of the school education process to guide students toward their future professions by taking into account their interests, abilities, and aspirations. In particular, natural sciences such as biology, chemistry, and physics provide wide opportunities in this regard.

Career guidance in the process of teaching natural sciences is carried out by increasing students' interest in subjects, encouraging independent thinking, and connecting learning with real-life situations. The use of interactive teaching methods, organization of laboratory work, and conducting practical experiments not only strengthen students' knowledge but also help introduce them to various professions. For example, in biology lessons, students can learn about professions such as doctors, ecologists, and geneticists; in chemistry lessons, about pharmacists, technologists, and laboratory specialists; and in physics lessons, about engineers, energy specialists, and programmers. This helps form students' understanding of different careers.

Taking into account students' individual characteristics is essential in career guidance. Since each student has different

interests, abilities, and levels of knowledge, it is necessary to provide guidance based on an individual approach. At the same time, encouraging independent research activities, involving students in project work, and directing them toward scientific research positively influence the development of professional interests.

It is also important to expand students' knowledge about different professions during the career guidance process. For this purpose, organizing meetings with professionals, arranging excursions to industrial enterprises, and providing information about modern careers are effective. This allows students to better understand the essence of professions, their role, and their importance in society.Determining the effectiveness of vocational guidance in teaching natural sciences is carried out based on specific criteria. A criterion is an indicator that allows for the evaluation of the quality and effectiveness of a process. In grades 5-6, the criteria for vocational guidance are determined taking into account age characteristics.

The main criteria are listed below.

1. Motivational criterion

This criterion reflects the level of student interest in natural sciences and related professions.

Indicators:

• active participation in the lesson process;

• interest in experience and projects; asking questions about professions; striving for independent research.

• Cognitive (cognitive) criterion

A student's initial knowledge of natural sciences and related professions is determined by this criterion.

Indicators:

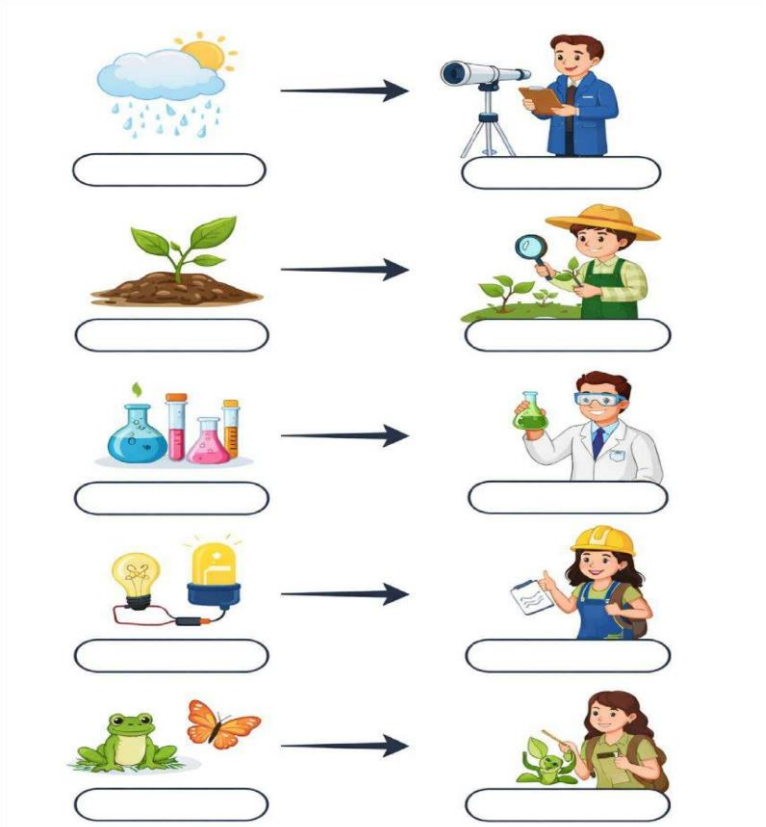
- understanding the connection between science and the profession;

- explain the functions of specific professions;

- correct execution of the practical task.

For example, if a 6th-grade student can explain that a meteorologist observes and analyzes the weather, this is an example of a cognitive criterion.

"DETERMINING PROFESSIONS BY PICTURE"



2. Practical (operational) criterion

This criterion represents the student's practical skills.

Indicators:

• the ability to conduct experiments;

• recording the observation results;

• creating a simple project;

• ability to work in a group.

For example, analyzing a soil sample or preparing a mini-project is an example of an activity-related criterion.

2. Reflexive criterion

The level of a student's awareness of their interests and abilities is evaluated using this criterion.

Indicators:

• To be able to answer the question "Which subject do I like?";

• to be able to state their strengths;

• expressing an opinion about the future profession.

This criterion indicates the stage of initial professional self-awareness in grades 5-6.

3. Social-communicative criterion

In the process of vocational guidance, it is also important for the student to work in a team and exchange ideas.

Indicators:

• active participation in group tasks;

• making a presentation;

• justify their opinion.

For example, participation in the presentation of an environmental project is a practical manifestation of this criterion.

Common Criteria-Based Assessment System

When assessing the effectiveness of vocational guidance, the following levels are identified:

Low level — interest is weak, knowledge of the profession is superficial.

Intermediate level - interest is present, performs practical tasks.

High level — actively participates, conducts independent research, and expresses a conscious attitude toward the profession.

The effectiveness of vocational guidance in teaching natural sciences is evaluated based on motivational, cognitive, practical, reflexive, and socio-communicative criteria. These criteria allow for the determination of students' professional interests, level of knowledge, and practical skills. Especially in grades 5-6, these criteria are of great importance in forming initial professional perceptions.

In general, the process of teaching natural sciences is an effective pedagogical tool for the professional orientation of students. Organizing the lesson process based on modern approaches and evaluating it through specific criteria plays an important role in shaping students' initial professional perceptions, developing their interests, and preparing them for a conscious choice of a future profession.

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