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THE CONCEPTUAL ANALYSIS OF TASKS USED IN INTERNATIONAL EVALUATION RESEARCH

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ABSTRACT

In the article, the conceptual analysis of assignments used in international assessment studies, their comparative analysis with existing educational assignments, as well as the content of assignments in the case of natural sciences are analyzed.

KEY WORDS: ***international assessment studies, natural sciences, academic assignments, literacy.***

INTRODUCTION

Tasks used in international evaluation studies have been the object of many scientific and practical programs. Tasks of international assessment studies are being integrated into the content of the national education system of the participating countries and are recognized as an educational goal [6, 3]. In addition, the implementation of tasks of the level of complexity of the program tasks is determined in the form of necessary knowledge, skills, qualifications and competencies directly related to the content of educational standards, curriculum and programs.

RESEARCH METHODS

In the educational process, the introduction of tasks similar to these tasks is considered as a necessary condition for the formation of competences related to the main basis and subjects. Assignments of international evaluation studies are developed by testologists of three international institutes of the international consortium. After that, the opinions of the national experts of the countries participating in the program are studied and appropriate changes are made. In addition, each participating country will supplement the tasks of this program with tasks and questionnaires in order to implement them at the national level.

RESULTS AND DISCUSSIONS

In general, international evaluation research assignments require the following basic and subject-related competencies and their components: reading scientific texts; interpretation of graphic, pictorial, sketch assignments; drawing conclusions from data; creating mental models; justification of theses, creation of hypotheses and comparison of opposites; purposeful verbalization of problems, taking a position and evaluating facts. Tasks used in international assessment studies focus on the application of student knowledge, mutual integration of interdisciplinary knowledge, decision-making skills, self-assessment, and error detection. Tasks used in research are not limited to a specific topic of study. Also, the assignments test the student's literacy at the time of the assessment program, not the learning process. Assignments are developed in relation to society, environment, natural phenomena, engineering and technology, human development, health, global and daily life, situations, situations, information and problems related to modern sciences. Examples include current issues such as global climate change, epidemics, digitization, etc., in the context of assignments. In the PISA international assessment study, in addition to the basic competencies, students' technological competencies, financial literacy, creative thinking, and "learning in the digital world" (2025) competencies are evaluated in different years.

International evaluation research assignments consist of a number of units. Each part of tasks in turn contains up to 4 tasks (Items). Part tasks are related to each other in terms of content and structure and complement each other. A picture, table, or graph in one assignment will be relevant to all part assignments and tasks. Contextual information is provided when tasks are posted, and this information is shared across all subtasks. Partial assignments require all aspects of the assignment as much as possible, including guessing, probabilistic, visualizing, reacting, deciding, summarizing, analyzing, and making recommendations. There are 5 different types of tasks in the partial assignments. In particular, they are as follows: tasks with a number of correct answers; assignments with one correct answer; short answer assignments; two closed-form assignments; includes multiple choice tasks [7, 266].

The effective organization of training sessions depends on the professional approach of the teacher, the selection of assignments in accordance with the educational

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goals, didactic justification and didactic tools that guide the educational goals. Assignments serve as a didactic tool that serves the formation and development of subject-related and basic competencies specified in the state educational standard. The teacher should achieve adaptability and completeness of the learning process through tasks. Tasks used in the educational process are divided into training and control tasks. Educational tasks are created for the purpose of learning a new topic independently or in class. Students will be able to share and compare learning assignments, discuss problem solving methods, and compare solutions. Educational tasks are used to form the student's ability to use the methods indicated in advance. In the textbooks, the tasks are assigned according to the level of complexity. Completion of tasks of a high level of complexity determines that the student has mastered the subject well. The individual literacy of the student is evaluated through control assignments. In most cases, control assignments consist of a combination of several educational assignments and include several assignments related to the topics covered at a certain time. Cross-topic assignments are rare in these assignments and mostly consist of subject assignments. Students often solve these types of assignments during end-of-term or grade-by-grade tests.

The main purpose of the tasks used in the educational process is to consolidate the acquired knowledge, to repeat it, to support it in different situations, to evaluate the acquired knowledge. Most assignments are one-step assignments that consist of explaining a question or term and performing an action. The analysis of educational and control assignments shows that many assignments do not serve as a sufficient tool for the formation of the student's basic and subject competencies. In practice, assignments are edited as questions and developed only in accordance with the mastered topic. Educational tasks serve as an indicator that determines the achievement of the goal of the lesson. Learning and control tasks determine the possibility of checking the achievement of learning outcomes. Control tasks require the student to accept the tasks as a test process, not a learning process, and the student's current level of knowledge is determined.

The tasks used in the educational process differ from the tasks of international evaluation studies in the following aspects:

1. Knowledge of a certain subject is systematically taught in training sessions, and topics are organized from simple to complex. This sequence ensures that students get systematic knowledge, the first topic and the second topic are organically connected. Tasks are also formed according to this principle. The lack of this systematicity is expressed in the student's general idea of science and certain sections of science at the end of this section or chapter.

2. In addition to systematization, great attention is paid to knowledge, questions, and terms related to exams and tests. These topics, terms, and assignments similar to exam papers are reviewed as often as possible.

3. Reinforcement assignments are also given as homework. A student's complete and quality completion of all assignments given by the teacher is a condition for a good grade.

4. Students are rarely encouraged to engage in independent research related to practice, daily life, or global life, and assignments that develop student creativity and research competencies. The reason why such tasks are not given is that the final solution is not always reached, they are not directly related to the lesson topics, and the educational process is organized based on a strict plan, which does not allow using such tasks. In practice, it is rarely observed that the teacher uses assignments that are not related to the textbook and the given topic. Today's educational activities are "focused on memorizing and retaining information, which hinders the development of critical thinking, independent information search and analysis skills, and other skills"[5]. In most cases, students are not given a full, complex task, but parts of this complex task or "part tasks" in educational activities. In most cases, assignments are used only to assess students.

Recent research on pedagogy suggests that the expansion of international assessment research has increased the focus on tasks used in the learning process. One of the educational strategies of the countries participating in the evaluation program is the wide implementation of tasks similar to the tasks used in international assessment studies in the educational process and thereby forming the basic competencies of students, and several scientific studies are being conducted on the tasks.

Below we will analyze the tasks on the example of natural sciences. In international assessment studies, literacy in natural sciences is described as "being able to apply knowledge of natural sciences in practice, understand problems of natural sciences, develop conclusions using scientific resources, understand decisions about nature and changes in nature caused by the human factor" [7, 266] we can say. If we analyze this description, science literacy is indirectly examined in relation to everyday life, various socio-economic and political issues in society. The student is required to think independently, make independent decisions and evaluate his own results.

To create confidence in students to study the environment, to observe and analyze processes and phenomena in nature, to be able to use tools, tools, and methods in the study of natural phenomena correctly, to be able to express terms, concepts, laws, quantities with mathematical formulas, achievements in the field of science, their development of students' scientific worldviews through practical implementation, respect for the creators of science and technology in the correct use of the achievements of science and technology for humanity in the future, careful preservation of spiritual and cultural heritage, and education of elements of universal culture in them.

In natural sciences, tasks are used in most cases in the repetition and examination phases of training [4,9]. Assignments are mostly used to assess students. Evaluation is seen as a tool for the teacher to motivate students to be active. At the same time, R. Duit [3,23] analyzed the tasks in physics textbooks and came to the following conclusion: "The tasks in physics textbooks consist of repetitive formal tasks and this is 90%. Tasks related to everyday life are rare. Such assignments

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usually allow students to observe daily life, connect with the knowledge they are learning in the classroom, and help develop their problem-solving competence. Tasks with several answers are rarely found in physics textbooks." On the basis of this analysis of the scientist, it is possible to conclude as follows: In the physics class, it is intended for students to deal with the algorithm for solving certain tasks and to repeat this algorithm by memorization. In some cases, more complex assignments require students to solve or modify a formula or equation. Being able to work on these types of tasks does not mean that students have fully understood the content of the subject. Due to this, students' interest in science decreases. For students, science is seen as an abstract, rare science in life. If the tasks assigned to the students are connected to the information they have seen, known, and encountered in practice, they will increase their motivation to understand the importance of science and learn it. According to N. Sheker and J. Gerdes, "constantly repetitive tasks included in the scheme provide the opportunity to apply the learned knowledge in a limited amount" [9,61]. Furthermore, these researchers conclude that "students learn to solve tasks, but rarely learn to solve problems." Judging from the above-mentioned points, the function of tasks given in educational sessions requires the change of students' attitude towards problem solving.

It is desirable that tasks should be at the center of educational activities in natural sciences. This means that most of the students are taught in the training sessions not to complete assignments, but to teach them as a tool, a resource that can be used in practice. Also, the teacher should develop and use assignments that should not only direct the student to the correct solution, but should also make the student think through this assignment and provide a different approach to the assignment. When developing these types of assignments, it is appropriate to develop assignments based on the example of the area where the students live and know well.

Observations show that a student who is unable to complete a specific task tries to solve it using sample tasks. Tasks in this case can be used in the educational process, especially in mathematics, when working on formulas or solving equations. In the sciences of natural direction, the assignments should cover more information, it is necessary to extract the necessary information from a large amount of this information and to complete the assignment using the appropriate formula. This develops students' independent research skills.

Another important factor in the development of the "assignment tradition" is the development of students' independent explanation skills [5, 9]. In the tasks, it should be assumed that the information presented to the students is not ready-made, but that they find information by independent search, repetition and comparison with other tasks. Tasks should become more complex depending on the progress of the educational process.

According to H. Gudjons [4,13], knowledge becomes systematized by performing increasingly complex tasks. By performing the tasks related to its application in practice, it is integrated with other knowledge and becomes connected to the basic knowledge. Also, the teacher should explain the new topic and give the students the opportunity to solve tasks related to this topic independently and present their solutions. In this case, the teacher evaluates the "current state" and "potential state" of the student. The teacher pays attention to methodological aspects in explaining the topic and tries to explain the most important parts of the topic in detail, taking into account the "current situation" of the students [10, 11]. Dealing effectively with student errors is one of the most overlooked aspects of task design. And error solutions are the main motivation to solve tasks with continuous and persistent errors in mind. Students should not be afraid of making mistakes while solving the task, but should be encouraged to come to the final correct solution through mistakes. P. Heuslur and G. Lind stated this situation in their scientific program that "whoever knows what kind of error occurs, knows what the right solution will be" [5, 10]. From the pedagogical point of view, the elimination of mistakes is not accepted as a necessary or unavoidable solution, but it should be seen that it is possible to learn from and through mistakes [8, 21].

From the point of view of didactics of science, it is recommended to explain the errors on the basis of tasks corresponding to this error. For example, a task worked on in a certain group or by an individual student is purposefully made wrong, and this wrong solution is critically discussed in the training session. It is one of the tasks of the teacher to form and systematically develop students' opinions on identifying mistakes and why they are mistakes. Through this, students' competencies of critical thinking and finding constructive solutions are formed.

In the development and improvement of tasks, special attention is paid to the development of multi-solution tasks in the following years. Solving tasks in natural sciences involves an approach based on one or several laws. For example, in physics, problems related to mechanics can be worked through the law of conservation of energy or the law of balance of motion. It is a simple and elegant way to explain the solution of the problem in one way. This is also a less time-consuming way for the teacher. It does not develop students' ability to find alternative solutions to a given task when limited tools, resources, or information are available. It encourages students to think narrowly and not to solve tasks with only one solution and not to look for other solutions [5, 4]. In particular, the use of constructive tasks in the educational process is becoming more popular. Through these tasks, students design a specific product, item or structure.

CONCLUSION

The educational policies, educational processes, educational and regulatory documents, and the content of education of the countries that have achieved high results in international evaluation studies have begun to be thoroughly studied by other countries. In particular, the results achieved in the programs of Singapore, Hong Kong, Canada, Finland, and Japan are becoming the program object of many pedagogical researches. The program tasks, in turn, started the tradition of "task development" [6, 2] in the participating countries. The concept of "assignment tradition" means

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purposeful and acceptable use of assignments in educational training [2,105]. According to C. Aufshnayter, "systematic application of tasks in educational training has a decisive influence on the optimal educational process".

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