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GROUP FORM OF ORGANIZATION OF INDEPENDENT WORK OF DISABLED STUDENTS

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Abstract

Social and economic changes taking place in society focus on the problem of the formation of an active, creative personality. In the development of a person capable of self-development and self-realization the following qualities are of great importance as the ability to independently learn, find the necessary information, apply the gained knowledge into practice, and make decisions independently. The article considers the methodological features of group training as one of the forms of organizing the independent work of students with disabilities in the process of studying mathematics on the example of studying the course "Probability theory and mathematical statistics".In the course of the research, didactic materials for classes and lectures and methodological recommendations for their use were developed. The theoretical basis of the study was the theory of individualization and differentiation of education of students with disabilities. On the basis of questionnaires of students and teachers, on the comparison of the volumes of studied educational material in classes, on the number of certified students, it was established that the use of a group form of work for students with health limitations allows increasing their communication, independence, contributes to the development of memory, thinking, speech, and as a result, improves the grades of students with disabilities.

Keywords: Inclusive education, group independent work

1. Introduction

Inclusive education is currently paid considerable attention to. Teachers, methodologists, scientists are increasingly interested in the issue of high-quality organization of the education process for children with disabilities. The most effective is the organization of independent training with a differentiated and individualized approach in the training of students with disabilities (Matantseva, 2017; Molina et al., 2016; Morodenko & Gileva 2019; Seregina, 2018). The definition of differentiation in various sources is interpreted differently, in our research we will see it as a training system in which each student masters a certain minimum of general education training. This training is common and provides the possibility of adaptation in constantly changing living conditions. Each student is entitled and guaranteed to give priority to those areas, which correspond to his inclinations most (Dorofeev et al., 1990). To differentiate training, many forms of organization of the educational process are used: groups for joint training are formed, classes and groups within classes, taking into account individual specialization.Children are taught according to individual curricula and programs.Individual work on creative tasks is carried out. Differentiation can be manifested in two main types: level differentiation and content differentiation (Zorina, 2018). Both types of differentiation can be used while working with students with disabilities.

2. Problem Statement

The research is aimed at finding methods and techniques for organizing group independent work of students with disabilities when teaching mathematical disciplines, at adapting available didactic materials to the characteristics of students with disabilities.

Students with various health disorders may have low cognitive activity, reduced attention, increased fatigue, are often shy, not independent, afraid, not sociable. According to psychologists and teachers, the main goal of teaching students with disabilities in a mass educational institution of the secondary vocational school is the development and self-realization, mastering the curriculum, developing the most important social skills, professional training (Gavrilchik et al., 2020; Martynova, 2016).

While planning work in groups with students with disabilities, the teacher should set educational, instructional and corrective-developmental tasks, according to the following principles:

- balancing academic knowledge and social skills;
- acceptance and consideration of differences in the individual identity of students;
- creation and maintenance of an atmosphere of acceptance, tolerance, cooperation in the group;
- adaptability of educational process, teaching and learningmaterials;
- use of different forms, methods of training;
- implementation of active approach in training and education (work in couples, groups, collective work).

3. Research Questions

The following questions should be answered in the course of the research.

- Does group work affect the improvement of the quality of education of students with disabilities in organizing independent work?
- What types of group work are most effective when working with students with disabilities?
- How to prepare didactic materials qualitatively for organizing group independent work on the discipline "Probability theory and mathematical statistics" of students with disabilities?
- What criteria should one use to assess the knowledge, abilities and skills obtained by students during independent work?

4.   Purpose of the Study

The purpose of the study is to search for practices and methods of organizing group independent work of students with disabilities when studying the discipline "Probability theory and mathematical statistics" in a secondary special educational institution and to develop didactic materials for organization of group independent work of students with disabilities.

5.   Research Methods

The study was carried out on the basis of the Kurgan pedagogical college, in the second-year groups, where there are students with disabilities studying "Information Systems","Applied Informatics",during the course "Probability theory and mathematical statistics". The experiment consisted of several stages. At the first stage the scientific, educational, and methodical literature on the organizations of group independent work of students with disabilities, the educational standard, working programs for the studied discipline is studied and analyzed, the relevance of this problem is revealed. At this stage, the work was carried out aimed at finding methodological ways of teaching students with disabilities, theoretical materials were identified and systematized, reference and teaching didactic materials were selected.

At the second stage of the experiment, the developed materials were tested at lectures and practical classes in control and experimental groups.

At the final stage, the results of pilot work were summed up, conclusions were drawn and methodological recommendations were developed on the problem of research.

5.1.   Theoretical and practical aspects of organizing group independent work with students with disabilities

The concept of group work, the purpose and main tasks of such work are described in many methodological and scientific publications (Konnerup, 2018; Lukerianova, 2017; Morodenko & Gileva 2019; Seregina, 2018; Zorina, 2018). Under a group form of work, we mean such a form of organizing educational and recognition activities in class, which involves the functioning of different small groups working on both general and specific tasks of a teacher (Selevko, 1998).

The purpose of group work is to individualize the independence of students, increase cognitive activity, create a positive emotional and psychological climate. As the experience of school and college teachers shows, the use of group work in for children with disabilities has a number of difficulties. One of them is the process of forming training groups. Analysis of the literature has shown that there is no single

approach to dividing students into groups. In the process of studying mathematics among the main criteria for dividing students into groups, the following can be taken into account:

- mathematical abilities of students;
- education alopportunities of students;
- level of knowledge of the subject;
- emotional compatibility of trainees;
- types of health disorders.

5.2. Methodological aspects of organizing independent work with students with disabilities

Using the theoretical background for the application of group forms of study, having analyzed the program of the course under study, the content of textbooks and methodological manuals, having found out the educational opportunities of students, we developed a technological map for studying the entire course "Probability theory and mathematical statistics" and individual topics of the course. The map reflects the goals and objectives of studying the course, a possible combination of forms of student activity, stages of classes and types of group work. In our experiment, we successfully used a group form of training organization at lectures and practical classes on the formation of skills and abilities for solving problems, in classes on revision, when conducting tests.

When organizing a lecture using group forms of training, we took into account the following factors:

- the presentation of the teaching material in the textbook and manuals;
- the possibility of dividing the educational material into parts that can be studied independently;
- the need for preliminary preparation of students to work in groups;
- clear formulation of tasks in the group and work algorithm of each participant in the group.

Considering the volume of educational material, as well as the characteristics of the types of group work, we came to the conclusion that at lectures work in static pairs can be organized to revise the theoretical questions of the previous lecture. Such work can also be carried out in the form of testing, or guessing a crossword, or a mathematical dictation, followed by checking it with the help of ready-made answers by students themselves. When creating pairs, we took into account the relationship between students in the group, using the sociometric method.

Students with disabilities worked in heterogeneous pairs according to clear instructions. At the same time, each of the students acted as both a teacher and a student. Let us give an example of using a group form of work at the lesson of general revision of the probability theory section "Random events". The main purpose of this lesson was to revise and summarize the theoretical material of the section, reinforce the abilities and skills of solving problems, and prepare students for control work. We identified the main questions for revision: classical, statistical and geometric probability definitions; probability addition and multiplication theorems, full probability formula, Bayes'theorem; repetition of tests and approximate formulas of probability theory. At the practical lesson, we used link and cooperative-group forms of work. Students worked in groups with different levels of training. In the group a volunteer was chosen, who helped

the teacher in organizing the work and put assessments in a special card. The lesson was conducted according to plan: revision of theory, solving problems, checking homework, reflection.

Here is a description of the course of one of the classes. The lesson was conducted according to plan: revision of the theory, solving problems, checking homework, reflection. At the first stage, the theoretical material was repeated. For assessment each student was prepared a card containing tasks with gaps, tasks to choose the right answer, tasks of free presentation. Examples of such tasks are tasks of the following type.

- Select the correct formulas to count the number of combinations of *n* elements by *m*:

$$a)\, C_n^m = \frac{m!}{(m-n)!} \quad b)\, C_n^m = \frac{n!}{m!(m-n)!} \quad c)\, C_n^m = \frac{n!}{(m-n)!}$$

$$d)\, C_n^m = \frac{(n-m+1)(n-m+2)..(n-1)n}{m!}$$

- Formulate the probability addition theorem of two joint events orally.
- Fill in the gaps: "The probability of an event is called the ratio of the number... results,... this event is one of... the results of the experience in which this event may appear".

Students independently checked the completed task by exchanging cards in pairs, atthesametimethey discussed issues, analyzederrors, argued.

At the second stage, tasks were solved on the topic "Classical and geometric definition of probability". Each student in the group pulled out a card with a task, decided it and explained his decision to the students in his group. Other students of the group could offer their solutions, could provide assistance to a friend. When all the tasks in the groups were completed, the teacher checked the completed tasks, during which students answered the questions of the teacher, found out the difficulties in completing the tasks, discussed solutions, chose the most rational ones.

To reinforce the skills and abilities of solving problems on the topic "Probability addition and multiplication theorems. The formula of full probability" students were asked to make up and solve problems on this topic in dependently, check the decisions received and correct the mistakes made. Below ther are examples of didactic materials.

1. Events A, B and C and their probabilities P (A) = 0.6, P (B) = 0.78, P (C) = 0.97 are given. Give examples of tasks to find the probability that: a) only one of the events will occur; b) only two events will occur; c) all events will occur; d) all events will not occur. Solve the made up tasks.
2. In the reading room there are 7 textbooks on probability theory, of which three have a binding. The librarian took two textbooks at random. Find the probability that both textbooks will be bound. Specify the correct solution for thet ask.

- Event A is that both textbooks will be bound. Event A_1 is that the first textbook taken will be in binding. Event A_2 is that the second textbook taken will be in binding. $A = A_1 \cdot A_2$, $P(A) = P(A_1 \cdot A_2) = P(A_1) \cdot P(A_2)$, asEvents A_1 and A_2 areindependent. $P(A) = \dfrac{3}{7} \cdot \dfrac{2}{7} = \dfrac{6}{49} \approx 0.12$.

- Event A is that both textbooks will be bound. Event A_1 is that the first textbook taken will be in binding. Event A_2 is that the second textbook taken will be in binding. $A = A_1 \cdot A_2$, $P(A) = P(A_1 \cdot A_2) = (A_1) \cdot P(A_2/A_1)$, asEvents A_1 and A_2 aredependent. $P(A) = \dfrac{3}{7} \cdot \dfrac{2}{6} = \dfrac{1}{7} \approx 0.14$. ·

To repeat the methods of solving problems on the topic "Repetition of tests. Approximate formulas of probability theory" was proposed a test with match making tasks.

At the last third stage, homework was checked, and students were also invited to do homework in groups. Each group received a task on one of the topics in the section. In class, each group presented its own solutions, members of other groups recorded proposed solutions and could propose their own ones. In group children solved tasks, at the same time students discussed tasks, asked each other questions. Each student received an assessment at the end of the class for his work, evaluating himself according to the criteria proposed by the teacher. Finally, the student's work was assessed after the group members discussed the contribution of each of its participants.

Summing up the lesson, the teacher clarified what useful things students learned during the lesson, what difficulties arose in completing tasks, what helped to overcome these difficulties.

6.   Findings

Experimental work was carried out in the natural conditions of study at a teacher training college, where students with disabilities studied together with almost healthy students. The experiment took place for two semesters, the results of the questionnaire of teachers and students, as well as the analysis of educational documentation showed the following results: students with disabilities became more sociable, their vocabulary increased, mathematical speech became more literate, academic performance increased compared to the control group. Thus, we can state that with the periodic inclusion of a group form of work in the educational process, the volume of tasks completed in practical classes increases, student activity increases, which allows assessing the work of more students and their results achieved during the work.

7.   Conclusion

The use of a group form of training children with disabilities, combined with traditional forms, contributes to more effective teaching. With competently organized group work, students with disabilities feel significant, useful, they learn to respect the work of others, listen toand understand the rest of the group. In the course of group work, students receive assistance from fellow students and a teacher if necessary. During the study, it was found that the use of a group form of work for students with disabilities allows increasing their sociability, independence, contributes to the development of memory, thinking, speech, which ultimately improves the quality of performance of students with disabilities.

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