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TEAMWORK AS A HIGHLY EFFECTIVE APPROACH TO TEACHING MAJORS IN HIGHER EDUCATION

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Abstract

This work is dedicated to the pedagogical problem. This article presents an algorithm for arranging students' teamwork in such majors as "Mechanics" and "General Physics Workshop". Freshmen who are engaged in teamwork adapt more easily to a new social and educational environment. Also, teamwork increases the effectiveness of learning. The basic forms of working with students of technical specialties are shown. The problems of student learning and possible ways to solve them are considered. The course and the material and technical base allow every student to have his or her individual manual for the laboratory work. every student has to work with every groupmate irrespective of whether there is fondness or not. Psychologically, this helps develop tolerance and the ability to work with any partner. Students with the initially low or average level of knowledge need to be engaged in teamwork. Learning difficulties can hinder adaptation. Consequently, students experience confusion, self-doubt, and lack of self-esteem.

Keywords: Educational environment, effectiveness of learning, freshmen, higher education, teamwork, teaching majors.

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1. Introduction

In terms of the competency building approach, the development of the student's communicative competency is one of the major aims of the teamwork. The communicative competency also includes interaction with partners, self-development, self-determination, and self-education. This is the development of the core competencies. Educators single out the following innovative approaches to the educational process: modeling, project creating, active and interactive forms of student work, workshops, training, etc. (Zamolotskikh, 2009).

2. Problem Statement

The economic upturn in the country can be ensured by the technological development and technology implementation in the production processes. This requires the engineering graduates to possess comprehensive knowledge and expertise in their field. That is why the 'perspective approach' to education is relevant. It implies that a student acquires basic knowledge as well as useful information-seeking skills in the field of expertise. This ensures a more comprehensive approach to learning general engineering and professional disciplines that are the 'core' of the professional higher education.

On the other hand, it is only possible to provide more hours of economic and humanities subjects by reducing hours of majors. Thus, the conflict of interest arises. One of the possible solutions is to increase the effectiveness of pedagogical technologies. This implies developing teaching methodologies that under the time constraints will help preserve the best traditions in Russian education based on comprehensive training.

3. Research Questions

There are some peculiarities in teaching "Mechanics" and "General Physics Workshop" since they are taught when students are adapting to the new environment (first year, first semester). Students' standby capabilities are accountable for successful adaptation. Also, the ability to overcome obstacles and in-group communication play an important role in the adaptation process (Berezin, 1988). The faster and easier the student adapts to the new environment, the sooner he or she will be able to realize their full potential.

4. Purpose of the Study

We suppose that after enrollment and first exams students tend to change their view on their profession. Also, their self-evaluation changes as well. That is when the support of family and friends becomes crucial. Not only is the support important, but also maintaining friendly relationships within the study group. Moreover, character traits (perseverance, ability not to give in to sadness, ability to overcome difficulties, and ability to digest a great amount of information) play an important role in successful adaptation. If the initial adaptation is successful and the student easily engages in the learning process, then the student begins to acquire professional skills. Y. K. Babanskiy describes adaptation as a sequential completion of three stages. These stages are breaking school stereotypes and forming the new

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ones (1-3 semesters), accumulative stage (4-6 semesters), and the final stage (7-10 semesters) (as cited in Izvolskaya, 2010; Pogorelko & Iliyin, 2010; Yesenbekova & Dustalieva, 2018).

5. Research Methods

The first-year students usually confront the following identified difficulties: the significantly greater amount of workload; new challenging disciplines; in-group communication difficulties; a new system of communication with professors (Izvolskaya, 2010).

There are three groups of factors that affect adaptation. They are social, psychological, and pedagogical groups of factors. Pedagogical factors include a professor's teaching skills, environment organization, material and technical base, and communication with coursemates (Arkhipova, 2007; Smirnov & Zhivaev, 2008; Zinchenko & Meshcheryakov, 2007).

Some authors suggest other methodologies for conducting research on students' adaptation. For example, one methodology which is similar to the school one suggests that students' observations (the analysis of the homework: home assignment checks, oral check of the home assignment, and the overall performance dynamics) should be reviewed according to seven factors. These factors are the learning activity, successful learning of the suggested material, behavior in the class, behavior during the break, relationships with classmates (coursemates), communication with the teacher (professor), and emotions.

Implementation of this methodology to higher education could not be justified due to a different performance assessment and students' age group. Control activities have different time frames and are less frequent. Consequently, it is possible to obtain research results at the end of the semester or the end of the course. Usually, in this case, it is already too late to help students to adapt.

6. Findings

Nowadays, learning process primarily aims at the development of general skills, skills for individual search and processing of information. Thus, there is a shift from the 'education for life' to a 'lifelong education' (Arkhipova, 2007; Pogorelko & Iliyin, 2010). Thus, the classical blocks such as "Lectures", "Workshops", and "Laboratory sessions" tend to be ineffective. The main disadvantage of a 'classical' lecture is a lack of students' activity and a lack of feedback from the professor. These days, new types of lectures have emerged. For example, lecture-discussion, lecture-visualization, etc. In teaching practice, these types of lectures are believed to be suitable for senior students. The modern teaching practice shows that freshmen enjoy the "Lecture-Discussion" and "Workshop-Discussion" types (Kolmogorova, 2008; Badanina, 2009).

The "Lecture-Workshops" combination seems to be quite beneficial. Its peculiarity is in supporting the theoretical material with algorithmic examples of its implementation. This helps process new information. In this way, students do not passively listen but are actively engaged in the studying process.

The "Mechanics" course is peculiar since, during the first weeks, students refresh the school material with few new elements. This helps improve group work since all members are familiar with the

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information. It is also possible to observe the group and define their level of knowledge and communication skills.

In this work, we used the following algorithm to divide students into teams:

1. During the introductory lecture, it is possible to refresh the school material on Physics with the group in the "Lecture-Conversation" style. If the initial level (also, according to the results of the Unified State Exam) is high or average, one or two introductory lectures will be enough (2-4 hours). If the initial level is low, the number of lectures should be increased (6-8 hours). In this case, it is necessary to approach each group individually.

2. During the first workshop, it is possible to offer standard algorithmic tasks and analyze the level of knowledge in the group. It can also be useful to carry out "entrance control" through solving mathematical problems.

3. The next combined "Lecture-Workshop" lesson should include challenging tasks that imply trying to find a creative solution rather than following the algorithm. At this stage, the professor should observe the group paying attention to the reaction and discussion as well as help the students find the necessary direction.

4. Further, it is possible to offer "modular" group tasks.

The first two steps may take 1-4 weeks since classes are not held daily. By this time, students will have gone through the initial social and psychological adaptation to the new environment. Students start to know each other better and divide into smaller groups (2-4 people). These groups are based on fondness. Furthermore, these groups can be divided into two categories: "lead and follow" and "equal similar abilities with a different initial level of expertise". In one class, there are both as well as several "individualists".

In "lead and follow" groups, teamwork can help the "lead" enhance the level of knowledge while the "follow" can improve their knowledge through communication with a person who is good at the certain subject. The professor also plays a significant role by encouraging the "lead" and providing the "follow" with an additional explanation of the material.

In the groups of "equals", it is necessary to offer tasks of different complexity so that students do not face insurmountable difficulties. Individual approach to each team seems to be the most suitable. In this case, the professor gives hints, guides, provides additional explanation, but avoids giving the solution to the task.

"Individualist" students can be also divided into the following categories:

1. Students with a high level of knowledge and high self-esteem. To them, it is important to offer increased complexity tasks. It is better to avoid engaging them in teamwork. If the communication level is sufficient, they are likely to join a group of "equals" later.

2. Students with a low level of knowledge and low self-esteem. These students fear critics from others. They need more attention and tasks that they can handle so that they improve their knowledge step by step.

3. Students with a low level of knowledge and high self-esteem. In this case, the professor and psychologist should provide students with their help.

For the introverts, teamwork is stressful so it is better to offer them individual tasks. Thus, they are more likely to attain success.

Special attention should be paid to organizing teamwork in teaching "General Physics Workshop". It aims to teach former students how to carry out experimental studies. Working with laboratory equipment helps acquire knowledge for measuring and processing information as well as comparing and contrasting the obtained results with theoretical. The course and the material and technical base allow every student to have his or her individual manual for the laboratory work. Still, the laboratory work should be done by two students since it is easier to work with the laboratory equipment in pairs. Thus, there is a temporary group with a common goal (to carry out an experiment, collect and analyze the results). Furthermore, the pairs change every lesson. In this way, every student has to work with every groupmate irrespective of whether there is fondness or not. Psychologically, this helps develop tolerance and the ability to work with any partner.

Observing the lesson, the professor can get an insight into communication patterns between group members. This helps in organizing the learning process and choosing techniques for lectures and workshops. Since "Mechanics" and "General Physics Workshop" have the same theoretical base, having the same professor teaching them can be an advantage. In this way, it helps make the lessons more effective through establishing more close contact with groups.

7. Conclusion

In the "Mechanics" course, in groups with the initially high level of knowledge, students join into groups slowly or they simply do not. This can be due to the desire to compete with peers. Usually, these students do assignments on their own during the first two years.

When seniors choose their specialization, they have to communicate with people with similar scientific interests and problems (a scientific school). In this case, adaptation to a new environment should be researched further.

Usually, students with the initially low or average level of knowledge need to be engaged in teamwork. In this case, learning difficulties can hinder adaptation. Consequently, students experience confusion, self-doubt, and lack of self-esteem. Many students start to feel disappointed about their choice of program and want to change it or apply to another university. In this case, it is crucial to feel support.

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