

METHODS FOR CONDUCTING A COURSE PROJECT ON MACHINE PARTS

**Asror Nazarov, Shuxrat Sharipov, Rustam Yusupov, Sodik Mustapaqulov⁴, Xomid
Jamanqulov**

Karshi Engineering Economical Institute, Karshi, Uzbekistan.

Abstract: The course project is considered as an integral part of the learning process and it performs three inseparable functions: didactic, developmental and educational. The pedagogical, ie didactic function is manifested in the formation of skills and abilities of students to comprehensively solve professional problems in future innovative engineering activities, the ability to apply knowledge. Developmental function - develops in students the creative potential for the successful implementation of future innovative engineering activities, as well as the ability of the future engineer to think, spatial imagination and design, analysis and synthesis of machine parts. The upbringing function forms a culture of intellectual work, the ability to work in a team, in various positions, including leadership positions, to independently make responsible decisions and defend them based on arguments and facts.

Keyword: innovation, course project, aggregation, fan, technology, drive unit, education.

INTRODUCTION

The task of training specialists for the professional activity of innovative engineering can be solved on the basis of modern methodological approaches and teaching methods recently achieved on the basis of general vocational education. This is done in a visual and effective way, especially in the course of the course project on the subject "Machine Details".

Prospective engineers will contribute to the development of the following skills in future design activities:

- formation of skills in determining the operating parameters and productivity of technological machines and equipment;
- develops the ability to apply in practice modern paradigms and methodologies, instrumental and computational tools in accordance with the specialization of training[1].

The course project strengthens, systematizes, summarizes the knowledge gained by students during lectures, laboratories and practical classes, and forms skills, competencies and necessary competencies that can be used to solve professional problems in a future innovative engineering career. Completion of the course project is one of the main and compulsory forms of education of general professional disciplines, it forms creative technical thinking in students, fosters a culture of intellectual labor, teaches independent work. It is the activity that is a key element of the creative approach in the implementation of the course project.

This is the science of "Machine Details" - a science of comprehensive analysis, synthesis and general laws of design of machine mechanisms, as it allows you to creatively apply knowledge in solving unknown problems.

It is known that the course project is considered as an integral part of the learning process and it performs three inseparable functions: didactic, developmental and educational.

MATERIALS AND METHODS

The pedagogical, ie didactic function is reflected in the formation of students' skills and abilities to comprehensively solve professional problems in future innovative engineering activities, the ability to apply knowledge.

The developmental function develops in students the creative potential for the successful implementation of future innovative engineering activities, as well as the future engineer's technical thinking, spatial imagination and ability to design, analyze and synthesize machine parts.

The nurturing function forms a culture of intellectual labor, the ability to work in a team, in various positions, including leadership positions, to make responsible decisions independently and to defend it on the basis of arguments and facts[3].

In our research, we developed a methodology for the implementation of the course project on the subject "Machine Details" using the aggregation-design method based on the integration of engineering methods from the engineering method and design methods from educational methods and using innovative educational technologies "Fan" technology.

Fan technology is a complex and multidisciplinary technology focused on the study of problematic topics.

The essence of the technology is that it provides information simultaneously on different areas of the subject. For example, pros and cons, advantages and disadvantages, advantages and disadvantages are identified.

This interactive technology allows students to successfully develop their critical, analytical and clear logical thinking, as well as to concisely express and defend their ideas and opinions in writing and orally.

“Fan” technology focuses on the active work of small groups, each participant, and the group as a whole, discussing certain areas of the overall theme.

“Fan”technology at different stages of the study of the subject:

- in the beginning - the free activation of their knowledge;
- in the process of studying the topic - a deep understanding and comprehension of its basics;
- in the final stage - can be used in the regulation of the acquired knowledge.

Basic concepts encountered in “Fan” technology:

An aspect (point of view) examines an object, an event, a concept.

Advantage - an advantage, a privilege in comparison with something.

Virtue is a positive quality.

Defect - imperfection, non-compliance with the rules, criteria.

Conclusion - to come to a conclusion from a certain idea, from evidence to logical rules.

In addition to education, “Fan” technology is educational in nature:

- teamwork skills;
- the ability to discuss problems, situations from different perspectives;
- the ability to find compromise decisions;
- respecting the opinions of others;
- politeness;
- creative approach to work;
- activity;
 - it also allows the formation of qualities such as the ability to focus on a problem [4, p. 45.].

Aggregation - is one of the methods of systematic analysis in engineering, in which the problem is solved by transforming small parts into a whole, ie from a piece to a whole. The result of aggregation is also called aggregation. The use of the aggregation method in the implementation of the course project is a more complex process of designing complex equipment, drives, conveyors.

RESULT AND DISCUSSION

In order to simplify the design process, it is done by dividing the drives into several details, creating separate structural calculations and design drawings of each detail, and then combining the individual parts into a single whole. This allows students to complete the course project perfectly, quickly and easily, shaping their creativity, ingenuity skills by making changes to the design of non-standard details.

We have selected the most effective “Fan” educational technology in the application of the aggregation-design method. We have seen that when students complete a course project, their mastery rate increases if they do it in a team rather than individually.

According to “Fan” technology, depending on the number of students in the group, they are divided into several subgroups and separate sections of the course project assignment into small groups. In addition to completing the course project individually, students conduct research on a selected topic in small groups.

In addition to completing the course project individually, students work in small groups as a team. At the end of the semester, before the defense of the course project, each small group makes a presentation on the results of the assignment. Presentation materials will be discussed with the participation of group students. Students who actively participate are encouraged. Each section to be completed in the course project assignment is divided into groups[2].

For example, let the group be tasked to complete a project on “Designing a belt conveyor drive with a two-stage cylindrical gear reducer”. Effective use of scientific, educational, teaching aids, modern

programs of information technology, advanced foreign experience is required for the implementation of the course project.

The interdisciplinary approach is used in the design process, as it requires not only knowledge of the theory of machines and mechanisms, but also knowledge of natural sciences, general and special sciences, as well as professional knowledge of the operation of designed machines. In addition, it is problem-oriented because students are presented with a complex problem in designing, analyzing, and synthesizing a real machine[5].

Project implementation is also based on independent analysis and synthesis using personal experience. It is necessary to take a stratified approach to the distribution of tasks among students, depending on their level of complexity[6].

CONCLUSION

Thus, a well-organized course project on the subject of "Machine Details" helps to systematize theoretical knowledge, use it in practice in future engineering and innovative activities, develop their creative abilities, increase their creative potential by activating the cognitive activity of students in the complex solution of professional problems.

Creative potential means invention in science and art. Creative potential is a rare quality that is unique to gifted individuals, and sometimes even ordinary people make remarkable discoveries. Creative potential is also the ability to see innovation in simple things.

REFERENCES

1. Kutergin V.A. - Engineering activities from a constructive point of view. - Izhevsk: Uralsk. RAS, Institute of Applied Mechanics, 2007 - 531 pp.
2. Nazarov A.A. Improving the methodology of preparing students for innovative engineering careers / Doctor of Philosophy (PhD) dissertation on pedagogical sciences / - Karshi. 2020.-138 p.
3. Nazarov A.A. Technology of course project implementation in general professional subjects // Teacher and continuous education. Scientific-methodical journal. "Nokis." 2019. № 6. b. 89-92.
4. Ishmuhammedov R., Abduqodirov A., Pardaev A. "Innovative technologies in education" (practical recommendations for teachers of educational institutions). Talent Fund of the President of the Republic of Uzbekistan. - Tashkent, -2008.-180 p.
5. Nazarov A.A. Fundamental research general professional process disciplines on the basis of general scientific disciplines. European Journal of Research and Reflection in Educational Sciences (ISSN 2056-5852) Vol.7 No. 1, 2019 -p. -38-40
6. Nazarov A.A. "Machine parts" as the foundation of the special disciplines of future careers of engineers. Innovative projects and programs in psychology, pedagogy and education. International scientific and practical conference. Sterlitamak, Russian Federation International Research Agency. 2019, 67-69 p.