Abstract - The research of the attitude towards the project teaching was conducted among students (N = 140). With the help of this analysis it is possible to determine in which way the project form of teaching helps to students in mastering the teaching content. The project teaching conducted at the Electrotechnical School is based on the correlation between various subjects, encouraging students to attain a higher level of knowledge, motivating them for research by providing practical examples, having clearly defined rules and steps to be developed.

After completing their project tasks, the students presented their results in front of the class. They are asked to study additional content on the Internet and thus use the computer for positive and useful purposes. Afterwards, students gave their views and opinions about project tasks. We found that they reacted positively to the project tasks, and that they preferred to work in smaller groups (up to 3 students) or independently.

Keywords - project, teaching, research, student outcomes, competences, presentation, evaluation, teamwork, vocational teaching

I. INTRODUCTION

The main motivation for conducting an anonymous survey was the evaluation of the work done so far and the finding of new teaching methods with the aim of improving students' competences. After the project tasks were completed, the students answered questions related to them.

What did we ask students by an anonymous poll?

The anonymous survey contained four main groups of questions related to:

- adoption of the outcomes - how writing project tasks affects the adoption of outcomes and teaching content
- motivation - are the project tasks motivating students and how they affect interpersonal relationships
- structure of the project task - whether the project tasks were clearly defined, whether the students responded to the manner in which they were set and whether they were of adequate weight and complexity
- team work - are they preferring to create project assignments independently or in a group

The students responded to each question by an estimate of 1 to 5. Scale description:
- 1 - I do not agree
- 2 - mostly disagree
- 3 - I do not know
- 4 - mostly agree
- 5 - I completely agree

II. PROJECT ASSIGNMENTS

Project assignments were designed in such a way that they linked textbook lessons to practical examples. For the quality of project work, students should invest extra effort, and the scope of the task was such that it was necessary to work in multiple stages. Some tasks were designed to work in a team and some independently.

The students answered the questions after they had made several project assignments in the subject of Algorithms and Programming and from Computer Networks.

Each project task contains clearly defined guidelines to which it is to be made, the date and time of submission and the means of submission.

A. An example of project assignments from Algorithms and Programming

Project assignment - security on the Internet (each student works independently)

The aim of this project task is to protect student safety on the Internet and social networks. The task was to write a program that will let students know how secure are their passwords used for social networks. The students wrote the code in the programming language C (correlation between programming and civic education).

B. Example of Project Tasks from Computer Networks

Project assignment - development of project documentation (team work)

The team of computer network specialists should prepare the project documentation for the computer network of the organization "3. c. LLC" which consists of
the following organizational units: research, procurement, production, sales, human resources, finance and accounting. The aim of the project task is to produce documentation that should include:

- The IP address of the device
- Logical scheme and network simulation in Packet Tracer
- Device arrangement in the program
- Prices of devices and equipment for such a network

III. Research Results

A. Adoption of the outcome

In this category we asked students did the project tasks encourage their ingenuity, and did they help them in achieving a higher level of knowledge. The results are presented in Figure 1, which shows that most students (61 %) believe that by designing the project tasks they gained a higher level of knowledge (33 % answered with 4, 28 % answered with 5).

When asked if project topics were previously covered by class lessons, they responded as is shown in Figure 2. The results showed that the pupils applied the teaching materials they met on the course in project assignments (38 % answered with 4, 44 % answered with 5).

B. Motivation

Asked how project tasks affect motivation to master new teaching contents, the students responded as shown in Figure 3. Students agreed with the statement that project tasks motivate students to work and learn (only 28 % disagreed, and answered with 1 or 2).

When asked whether students think that project tasks encourage mutual communication between students, the evaluation was as shown in Figure 4. The evaluation is very positive and it shows how these types of tasks achieve a higher level of communication and pupils develop ways of adopting civic education concepts (e.g. co-operation, accountability for task accuracy and compliance with deadlines).

C. Structure of project assignment

On the assertion that the project tasks were clearly defined and that the instructions were accurate enough to answer the questions asked by the students, the results are shown in Figure 5. Students overwhelmingly agreed that the project tasks were clearly defined - 77 % answered with 4 or 5.
On the question whether the evaluation of project tasks was clearly defined and whether the grades the students had clearly described their efforts, the students responded as shown in Figure 6.

![Student assessment that their work is evaluated according to clearly defined rules](image)

Figure 6. Student assessment that their work is evaluated according to clearly defined rules

On the complexity of the project tasks, the students said that the projects were of adequate complexity, giving feedback on how all the tasks were done (Figure 7).

![Student assessment of the claim that the project tasks were of adequate complexity](image)

Figure 7. Student assessment of the claim that the project tasks were of adequate complexity

These questions were set up to enable the teacher to evaluate “what combination of teaching methods should be applied and whether these methods meet student learning abilities, learning conditions and available resources to support the learning process” [1][2].

D. Team work

In this set of questions we wanted to find out from the students whether they prefer more individual work or group work. The results are shown in Figures 8.a, 8.b and 8.c.

![I like to design the project tasks independently](image)

Figure 8.a. I like to design the project tasks independently

From Figure 8.a it can be concluded that most students (54%) prefer to work individually and do not necessarily like working in a team.

![I like to design project tasks in a group of 2-3 students](image)

Figure 8.b. I like to design project tasks in a group of 2-3 students

From Figure 8.b it can be seen that the majority of students (61%) agrees the ratio of 2-3 pupils per team is optimal.

![I like to design project tasks in a group of 4-5 students](image)

Figure 8.c. I like to design project tasks in a group of 4-5 students

Through this questionnaire the students expressed the attitude that they do not like when a larger number of students make a group that needs to create a project assignment.

IV. CONCLUSION

As a result of this research, it was shown that students achieve higher levels of competence by writing project assignments. The results of the testing and the checking of the knowledge after the project tasks are better and the average grade rating is higher by 20% with no negative scores.

After making a project assignment, the students feel more satisfied, and the process of designing the project raises students’ motivation for learning. The topics that students deal with are from everyday life and are closely related to practice. Apart from a higher level of achievement, students also have good competencies in interpersonal relationships. This result is also linked to clearly defined project tasks motivating students. When designing some types of project tasks, students prefer to work in a maximum of three-member teams, while they prefer to work independently when solving individual tasks.
With these surveys, we wanted to emphasize that the main subjects in the teaching process are students and teachers [3] and we wanted to achieve communication that will teach us how to feel when learning new teaching contents through project teaching methods and thus help to master new teaching content.

Project teaching on the basis of these results shows positive results for students, which is a positive feedback, and this type of teaching should be applied as far as possible in computer-related subjects.

REFERENCES

