

IMPLEMENTATION OF FREE LEARNING POLICY-INDEPENDENT CAMPUS PROGRAMS ON MASTERING COURSE THEORY OF FOUNDATION DESIGN**Nila Prasetyo Artiwi, Telly Rosdiyani**

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E-mail: prasetyonila2@gmail.com**ABSTRACT**

Minister of Education and Culture Regulation No. 3 of 2020, entitles students to 3 semesters of study outside their study program. Through the Free Learning Policy - Independent Campus program, students have wide opportunity to be able to choose the learning method and place they want which is believed to be able to enrich and increase their insight and competence in the real world according to their passion and aspirations. The "Free Learning, Independent Campus" policy was initiated by the Minister of Education and Culture which includes 1) opening of new study programs, 2) higher education accreditation system, 3) freedom to become State universities with legal status, and 4) the right to study three semesters outside the study program. In planning a foundation structure, calculations must be included regarding the bearing capacity of the soil, soil stability, bearing capacity of the foundation and stability of the foundation, all of which are based on empirical and mathematical calculations. This research was conducted to analyze the level of student mastery of the Foundation Design course. With primary data collection in the form of questionnaires distributed to students of Civil Engineering, Banten Jaya University semester 7 (seven). One of the results of the research shows that students who take part in the apprenticeship program / practical work in projects with foundation work, but have not mastered the theory, most of them cannot plan and design the structure of the foundation (45 people = 84, 91%).

Keywords: bearing capacity; foundation design; independent campus; practical work; empirical calculations.

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INTRODUCTION

Indonesia's sustainable development must be supported by human resources who have creativity and innovation. Strong resources are expected to be generated from higher education institutions that prepare their graduates to become skilled, flexible and tough personnel. The Free Learning Policy - Independent Campus launched by the Minister of Education and Culture is a framework to prepare students to become strong scholars, relevant to the needs of the times, and ready to become leaders with a high national spirit (Nizam, 2020).

Minister of Education and Culture Regulation No. 3 of 2020, entitles students to 3 semesters of study outside their study program. Through the Free Learning Policy - Independent Campus program, students have ample opportunity to be able to choose the learning method and place they want which is believed to be able to enrich and increase their knowledge and competence in the real world according to their passions and aspirations. The policy of "Free Learning, Independent Campus" was initiated by the Minister of Education and Culture which includes 1) opening of new study programs, 2) higher education accreditation system, 3) freedom to become State universities with legal status, and 4) the right to study three semesters outside the study program. These four fundamental policies provide great hope for private tertiary institutions to develop and have national and international competitiveness (But still there must be a frame, limiting the form of this learning activity, at least 8 (eight) learning programs have been prepared in the form of: internships in Industry, students building villages, teaching in schools, student exchanges, research in research institutes, entrepreneurship development, independent projects, and humanitarian projects. The objective of the Free Learning - Independent Campus policy, the program "the right to study for

three semesters outside the study program" is to increase the competence of graduates, both soft skills and hard skills, so that they are more ready and relevant to the needs of the times, prepare graduates as future leaders of a superior nation and have a personality. Experiential learning programs with flexible pathways are expected to facilitate students to develop their potential according to their passions and talents. Cooperation between the Ministry of Education and Culture (Kemdikbud) and various stakeholders has been carried out, to support this program. For example, a Memorandum of Understanding with the Ministry of State Owned Enterprises (BUMN) regarding the Certified Student Apprenticeship Program (PMMB) which students can take for 1 to 2 semesters. Until now, there are 118 BUMN that are members of the Indonesian Human Capital Forum, not including other companies that have collaborated with the Ministry of Education and Culture and international companies in Japan, South Korea, Taiwan, and several other countries.

Any changes in the learning system of Free Learning – Independent Campus will certainly have a big impact on course management. Several things that can be indicative of a problem include adjustments in the number of credits (Semester Credit Units), adjustment of learning outcomes in the form of mastery of subjects that are converted into hours of activity, students who are already working, by choosing learning activities in the form of internships / work practices, The student will leave studying in the Study Program, while the student has not yet mastered the theory of Foundation Design, for example the one in semester 6 (six) in the Unbaja Civil Engineering Study Program. This will cause problems in learning outcomes, so that in the end there are no graduates who have quality and competence, who are able to design and plan the foundation structure of a building. as well as taking an apprenticeship program / practical work for 2 semesters at the place of work.

In planning a foundation structure, calculations must be included regarding the bearing capacity of the soil, soil stability, bearing capacity of the foundation and stability of the foundation, all of which are based on empirical and mathematical calculations. For internships / practical work, students will get field knowledge, technical work, but planning calculations must follow theoretical lectures.

Based on these conditions, this study was conducted to analyze the level of student mastery of the Foundation Design course in the Civil Engineering Study Program of the University of Banten Jaya prior to the existence of the Free Learning Policy program - Independent Campus by forecasting / predicting the implementation of this program. The formulation of the problem in this study is how much student mastery of the Foundation Design course.

Free Learning Policy – Independent Campus

The form of learning activities is in accordance with Minister of Education and Culture Regulation (Permendikbud) No.3 of 2020, Article 15 (1) can be done inside the Study Program and outside the Study Program, as shown in Figure 1 below. Lecturers as activators are the main pillars that must be built, have a professional and innovative spirit in serving students to grow and succeed. Lecturers must also be able to direct and motivate students to be able to learn independently. The appointment of lecturers as student guides in practical work must be in accordance with their scientific competences. In addition, Lecturers must also be able to face changes that will be difficult and full of challenges and inconveniences, as well as situations where we are consolidating policies.

Foundation concrete is an important part of the building structure and road building. With the strength of a strong concrete foundation structure, it will ensure that the building on it will be sturdy and can live longer (Eri.S.H, Rulhendri.R, 2013); (Rigi.M, 2019); (Marwahyudi.M, 2020). Foundation concrete, including the subgrade from the foundation, greatly affects the quality of the concrete itself. Good quality concrete will produce high quality concrete so that construction is very concerned and calculated carefully, a good calculation will produce good quality concrete as well. So it can be said that the foundation concrete is very important to pay attention to so as not to damage the construction, especially not to allow the foundation to rust and collapse (Marwahyudi.M, 2019); (Mubarak.M, et.al, 2020); (Syaiful.S, Lasmana.L, 2020); (Syaiful.S, 2020); (Triyanto, et.al, 2019).

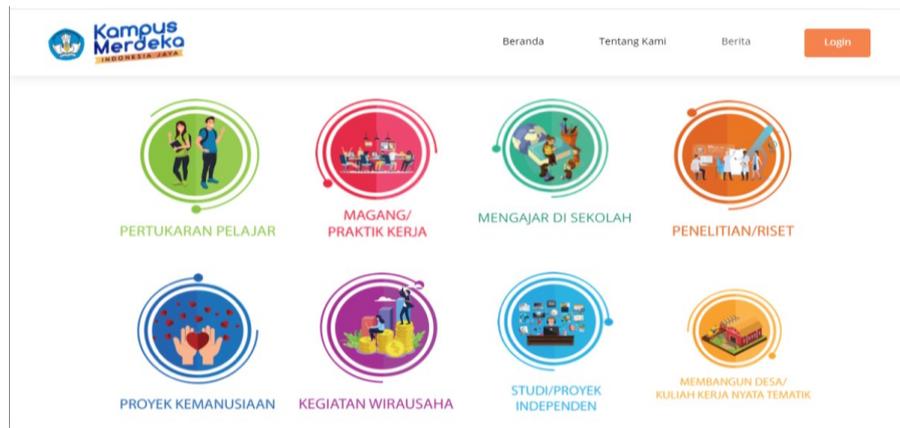


Figure 1. Scheme of Free Learning Policy Program Forms - Independent Campus Source : Minister of Education and Culture, Directorate General of Higher Education

Minister of Education and Culture Regulation (Permendikbud) Number 3 of 2020 Article 15 (2) Forms of Learning outside the Program consist of: a. Learning in other study programs at the same university; b. Learning in the same Study Program at different universities; c. Learning in other study programs at different universities; and D. Learning in non-tertiary institutions.

Minister of Education and Culture Regulation (Permendikbud) Number 3 of 2020 Article 18 (3) Facilities by Higher Education in the Learning process as referred to in paragraph (1) letter b are as follows: a. at least 4 (four) semesters and no longer than 11 (eleven) semesters are Learning in the Study Program; b. 1 (one) semester or the equivalent of 20 (twenty) semester credit units is Learning outside the Study Program at the same tertiary institution; and c. A maximum of 2 (two) semesters or the equivalent of 40 (forty) semester credit units constitutes: 1. Learning in the same Study Program at different tertiary institutions; 2. Learning in different study programs at different universities; and / or 3. Learning outside of higher education. One alternative to dividing semesters in this learning program can be seen in Figure 2 below:



Figure 2. Free Campus Learning Map Source : Minister of Education and Culture, Directorate General of Higher Education

In semesters 1, 2, and 3 students carry out learning in the original study program for general compulsory courses and study programs. In semester 4, students can choose to study outside their original study program, but still in one university. Furthermore, in semester 5 and 6 (2 semesters - which is equivalent to 40 credits), students can choose to study outside the tertiary institution, in the field of work they are interested in, but which is related to their study program. Here, the conversion of courses will be carried out which must be careful, carried out by the Supervising Lecturers. The benefits of being free to study for 3 (three) semesters outside the study program are expected to

provide learning experiences outside the study program and additional learning outcomes (competencies).

Foundation Design

Simultaneously with the implementation of the Free Learning Policy - Free Campus program, there will be changes in the lecture system that has been running so far in the Civil Engineering Study Program. The Foundation Design course as a course that contains the basics of calculation and the concept of building a civil infrastructure must be well mastered by students. Sturdy or not the structure of a building depends on the condition of the foundation structure. Of course, the foundation must be planned carefully and thoroughly, in accordance with the foundation planning guidelines and have the required safety factor (safety factor), because this is related to the safety of building users and the surrounding environment. In this lecture, students were given an explanation of the types of foundations and data analysis techniques for soil characteristics for building foundation designs and techniques for building foundations in the field.. The General Instructional Objectives of the Foundation Design course are, after completing this course, students are expected to be able to make a study of foundation designs, both shallow foundations and deep foundations based on soil characteristics data and building plan designs.

The foundation is one of the constructions of a building that is located at the bottom of a construction, the foundation has an important role in a building, where the foundation bears all the construction burdens of the upper part of the soil layer at the bottom.. he resulting soil stresses except at the ground surface are in addition to the loads already present in the soil mass from its own weight, (HS, Sardjono,1988). The types of foundations are: 1. Shallow foundation (tread foundation and continuous foundation), 2. Deep foundation (pile foundation and pile foundation) - Bouwless, 1993.

Striving for foundation planning meets 4 criteria: a. Efficient in cost b. Effective in structure weight c. Optimal implementation time and method d. Efficient in building operation and maintenance. This needs to be considered in order to obtain an effective and accountable building design from a 'CQT' perspective (Cost, Quality and Time). The foundation structure design process requires a fairly complete analysis, including the condition / type of superstructure, work loads on the structure, the profile of the soil layer where the building / structure is located and the possibility of settlement. Some steps that need to be taken in a foundation structure design process: 1. Determination of Plan Load 2. Soil Investigation 3. Selection of Foundation Types 4. Determination of Foundation Dimensions 5. Construction Stage (Indonesian National Standard, SNI-1991).

To be able to plan a foundation structure properly, an engineer should understand the basics of soil mechanics. From the quantities in soil mechanics, it can be calculated the bearing capacity of the soil which is the basis for a foundation element. (Terzaghi 1943) was the first to provide a comprehensive theory of the ultimate soil bearing capacity for shallow foundations. Some of the equations that are often used to calculate the bearing capacity of the soil in shallow foundations are:

1. For the foundation lane / continuous , $q_u = c'N_c + qN_q + \frac{1}{2} gBN_g \bullet$
2. For a square foundation, $q_u = 1,3c'N_c + qN_q + 0,4gBN_g \bullet$
3. For a circular foundation, $q_u = 1,3c'N_c + qN_q + 0,3gBN_g$ (SNI-T-15-03)

Investigation of underground conditions is a requirement for the design of building structural foundations. Not carrying out land investigations which usually ranges from 0.5 to 1 percent of the total cost, and then finding out that the foundation must be changed is a wrong economic consideration, almost no major projects are carried out without consideration of land investigations, therefore soil investigations are very important for know the type of soil which can later determine the type of foundation used. Field Test : Standard Penetration Test (Dynamic test), Cone Penetration Test (sondir), laboratory Tes (Bowless JE. 1993) .



Figure 3. Examples of wells foundations



Figure 4. Examples of pile foundations

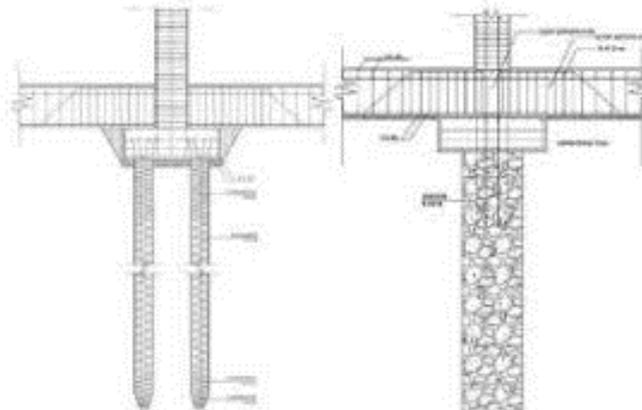


Figure 5. Pieces of Pile and Well Foundation structures

Example question :

Plan a rectangular foundation that must carry a dead load of 1100 kN and a live load of 500 kN. Column size is 400×400 mm². The foundation width is limited to 2.00 m. The permit stress is 265 kN / m². The effect of landfill is neglected in this example, while the quality of the concrete $f / c = 25$ MPa and the quality of the reinforcing steel $f y = 400$ MPa

Figure 6. Example of foundation design problems

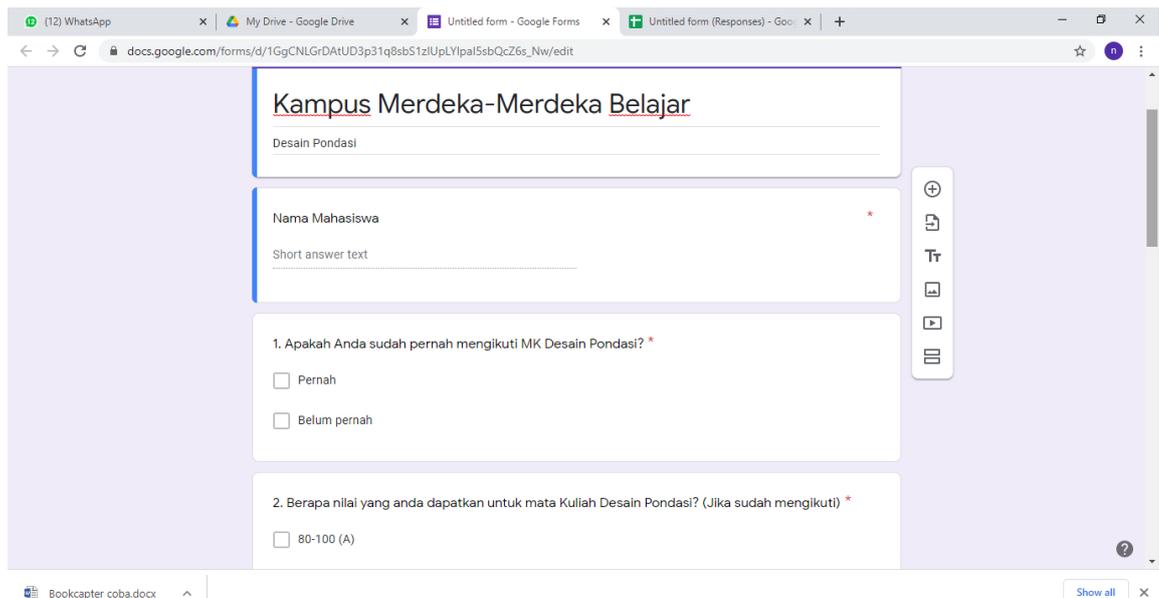
The explanation above is some of the material that must be mastered by students when passing the Foundation Design course, both theory, calculation, planning design and implementation techniques in the field.

RESEARCH METHODS

This research uses an electronic survey method, with primary data collection in the form of questionnaires distributed to 7 (seventh) semester of the Civil Engineering students of Banten Jaya University, conducted in February 2021. Secondary data is in the form of literature references, and data analysis uses quantitative descriptive

RESULT AND DISCUSSION

From the results of the questionnaire survey, the number of students in the 7th semester of the Civil Engineering Study Program at Banten Jaya University was 70 people, participating in the questionnaire as many as 53 people. Of these, the answers to the questions can be seen in the following table:



The image shows a screenshot of a Google Form titled "Kampus Merdeka-Merdeka Belajar". The form is displayed in a web browser window. The form content includes:

- A title: "Kampus Merdeka-Merdeka Belajar"
- A subtitle: "Desain Pondasi"
- A text input field: "Nama Mahasiswa"
- A question: "1. Apakah Anda sudah pernah mengikuti MK Desain Pondasi? *"
 - Radio button: "Pernah"
 - Radio button: "Belum pernah"
- A question: "2. Berapa nilai yang anda dapatkan untuk mata Kuliah Desain Pondasi? (Jika sudah mengikuti) *"
 - Radio button: "80-100 (A)"

Figure 7. Questionnaire format with Google form Source : Survey, 2021

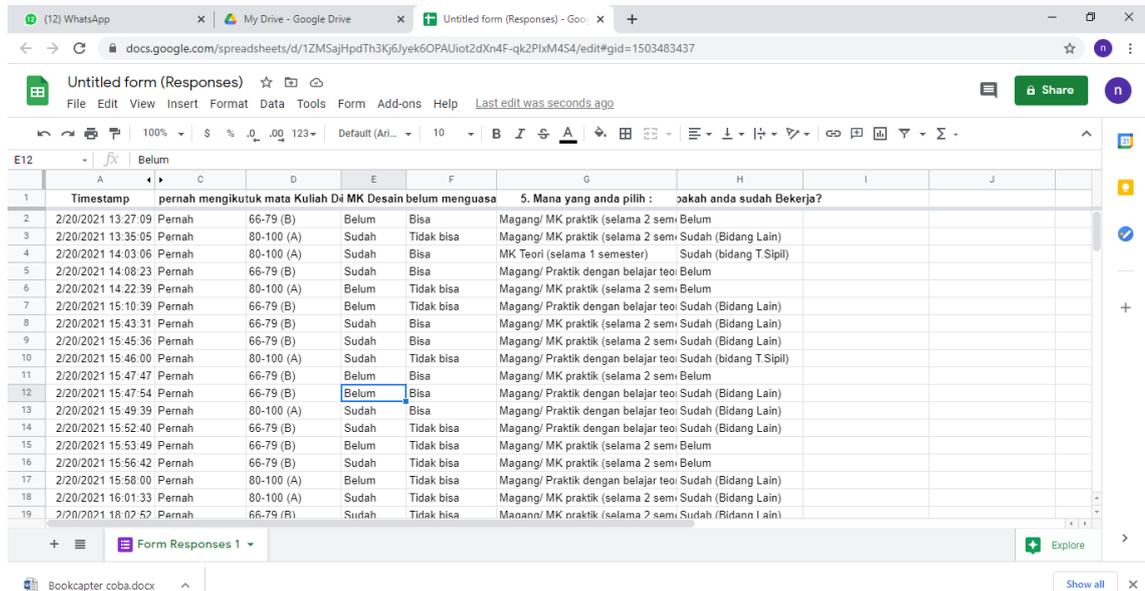


Figure 8. Questionnaire Response Table with Google Form Source : Survey, 2021

Table 1. Questionnaire Results

TABEL HASIL KUISIONER KM - MB - DESAIN PONDASI				
NO.	Pertanyaan		Jumlah	Prosentase (%)
1	Apakah Anda sudah pernah mengikuti MK Desain Pondasi?	Sudah	53	100,00
		Belum		
2	Berapa nilai yang anda dapatkan untuk mata Kuliah Desain Pondasi? (Jika sudah mengikuti)	A	19	35,85
		B	28	52,83
		C	5	9,43
		D	1	1,89
		E	0	
3	Apakah anda sudah memahami / menguasai MK Desain Pondasi? (Bagi yang mendapat nilai A dan B)	A, Sudah	14	26,42
		A, Belum	5	9,43
		B, Sudah	22	41,51
		B, Belum	6	11,32
4	Menurut anda, jika mengikuti Kerja Praktik di proyek yang ada pekerjaan pondasi, tetapi belum menguasai teori, apakah ketika lulus anda akan bisa merencanakan dan mendisain struktur pondasi?	Bisa	8	15,09
		Tidak Bisa	45	84,91
5	Mana yg anda pilih :	a. MK Teori (selama 1 semester)	1	1,89
		b. Magang/ MK praktik (selama 2 semester)	31	58,49
		c. Magang/ Praktik dengan belajar teori secara mandiri (selama 2 semester)	21	39,62
6	Apakah anda sudah Bekerja?	a. Sudah (Bidang Teknik Sipil)	12	22,64
		b. Sudah (bd. Lain)	15	28,30
		c. Belum	26	49,06

Source : Analysis, 2021

From the results of the analysis, with the number of 7th semester students, only 53 students took the questionnaire as samples, all of whom had taken the Foundation Design course (100%). Of these, those who get an A grade are 19 people, a B grade is 28 people, a C grade is 5 people, a D = 1 person, and an E = 0. Students who get A and B grades answer that they have understood / mastered the course Foundation design as many as 36 people (67.93%), who do not understand / master as many as 11 people (20.75%). These results indicate that this can be an indication that even though students have taken and passed the Foundation Design MK, there is still the possibility that they have not yet understood / mastered the subject, because in the assessment, there are often many factors that become indicators of graduation, not just being able to understand or be able to answer questions. during exams, for example activeness during lectures, and the presence of these students which are included in the assessment indicators. This can be used as material for evaluation and consideration, if the Free Learning Policy - Independent Campus , students do not take theoretical courses, but directly take internships / practical work, maybe in the implementation of technical work in the field the student can carry out, but when asked to plan calculation designs the foundation structure of the student will experience difficulties, because they have never received a theoretical course, which is indeed full of formulas, so that it can have an impact on the results of incorrect planning calculations, and in the end they are wrong in planning, wrong in determining the use of budgets and work results. unsafe for users, may endanger safety. This is the most fatal impact, because it relates to human life.

Students who answered that if they took practical work on a project with foundation work, but had not mastered theory, would be able to plan and design the foundation structure as many as 8 people (15.09%) and answered that they could not be 45 people (84, 91%). This means, more than 50% of students still need to continue to take foundation design theory courses, then take part in an internship / practical work. The correlation with the Free Learning policy- Independent Campus program, if the 6th semester student (six) chooses to take part in an internship / practical work in the field of Civil Engineering by converting the values of Foundation Design theory, it needs to be considered carefully and carefully, so that it does not happen, the student after taking the internship / practical work for 2 semesters, apparently unable to plan and design the structure of the foundation.

As many as 1 (1.89%) students choose to take theoretical courses (1.89%), 31 students (58.49%) choose to take internships / practical work courses for 2 (two) semesters, and those who choose to follow Apprenticeship courses / practical work for 2 (two) semesters by learning theory independently are as many as 21 people (39.62%). This shows that students are more interested in taking part in an apprenticeship / practical work program than just learning theory, this is in line with the policy of the Free Learning - Independent Campus, which wants students to be free to determine their desire to choose learning methods, but still be able to gain knowledge, anywhere. It is also seen that students' interest in learning theory and independently has a smaller percentage compared to the choice of apprenticeship / practical work programs.

From 53 students, 12 people have worked in the Civil Engineering field (22.64%), 15 in other fields (28.30%) and 26 people (49.06%) have not worked. Although the percentage is still below 50%, students who work in the field of Civil Engineering (have not yet graduated), the hope is that all graduates of the Civil Engineering Study Program at the University of Banten Jaya will work according to their competences in the field of Civil Engineering. For this reason, the provision of theoretical knowledge and knowledge during an internship / work practice will be needed in the real world of work after students graduate from college. The ability to plan and design foundation structures, as well as carry out work in the field technically is the desired achievement in studying the Foundation Design Course, where a Civil Engineering Bachelor must be able to work managerial and of course as an engineer, supervisor, qualified and professional engineer

CONCLUSION

From the results of this study, the conclusions that can be drawn are: Students who graduate take the Foundation Design Course (theory) with grades A and B (36 people = 67.93%), have not been

able to understand or master the Foundation Design course. This means that the ability to plan and design the foundation structure after graduating from college is still not reliable. Students who take part in the apprenticeship program / practical work in projects with foundation work, but have not mastered theory, most of them cannot plan and design the structure of the foundation (45 people = 84, 91%). Students are more interested in participating in an apprenticeship / practical work program than just learning theory (31 people = 58.49%).

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