

# EDUCATION FOR PRACTICE: RESULTS OF THE ANALYSIS OF ATTITUDES OF STUDENTS AND EMPLOYERS ON THE IMPORTANCE OF INTERNSHIP IN HIGHER EDUCATION INSTITUTIONS IN ENGINEERING

S. Tišma<sup>1</sup>, S. Kalambura<sup>2</sup>, H. Meaški<sup>3</sup>, K. Horvatinčić<sup>1</sup>, A. Farkaš<sup>1</sup>, A. Ruk<sup>1</sup>

<sup>1</sup> *Institute for Development and International Relations (CROATIA)*

<sup>2</sup> *University of Applied Science Velika Gorica (CROATIA)*

<sup>3</sup> *University of Zagreb, Faculty of Geotechnical Engineering (CROATIA)*

## VIRTUAL PRESENTATION

### Abstract

Internship is an integral part of a professional course at higher education institutions, which is directed to a practical test of acquired theoretical knowledge. The term of internship also refers to the acquisition of knowledge and skills through work-based learning where the role of work-based learning is twofold. On the one hand, it enables students to deepen and expand the knowledge acquired through other forms of learning and, at the same time, testing that knowledge within the working environment. On the other hand, that experience prepares students for a world of work enabling acquisition and development of new competencies, and increasing opportunities for a successful job finding. The internship experience is important for the receivers of students, i.e. potential future employers who gain insight into knowledge and skills of students-future employees, and can point out to additional needs for further development of professional courses in accordance with the needs of work.

This Paper presents the results of the analysis of the attitudes of students, knowledge and their experiences acquired through internship as well as the impressions of employers on the level of students' knowledge at the Faculty of Geotechnical Engineering of the University of Zagreb. The research was conducted in the 2019 /2020 period using the survey method with the students of the final year (the fifth year of their study) just before their entering the labour market. The employers were in partnership for many years, which ensured the continuity of the analysis and the basis for conclusions on the progress made in organization and quality of internship year in year out as well as recommendations for future positive shifts.

The results indicate that the topic has not been explored enough, that the approaches in organization differ from country to country, and that there is not comprehensive professional and scientific literature on this topic. There is no unique legislative framework regarding the organization and conducting of internship (work placement) in the Republic of Croatia, but these issues are regulated by internal rulebooks from institution to institution. The attitudes of both students and employers change recently. Employers increasingly insist on strengthening practical knowledge and skills of the students for quality practice performing while students strive to establish adequate communication, possibilities of independent work within the framework of the internship and participation in the team work.

**Keywords:** higher education, internship, work placement, engineering, labour market, economic development

## 1 INTRODUCTION

According to the projections on future trends in the labour market in the Republic of Croatia, there is a clear need for trained experts in the field of environmental engineering. Such research has been conducted in recent years in the European Union in connection with experts preparing to work on new technologies and innovations. For example, Paci, Lalle and Chiacchio (2013) analysed the intensity of initiatives in the area of higher education and training that are important enablers for a new trend for innovation. In the paper, they analysed trends for innovation highlighting higher education and training

as an important pillar for change and university - industry collaborations are key pillar of this respective change for a responsible future. European standards and guidelines for quality assurance in higher education (2015) also state cooperation with the economy and raising the level of competencies of teachers to prepare and encourage students to strengthen skills for independent work. A research on practical courses in higher education was conducted in Croatia during 2017 (Ministry of Science and Education, 2017), which proposes a stronger connection between entrepreneurs and universities and strengthening the quality of internships. Also, the Study Strategy - SuZG for the period 2014-2025 (2013) envisages the improvement of studies based on learning outcomes, their harmonization with the competencies required for the labour market and strengthening existing STEM study programs in accordance with scientific, economic and general social changes. At the same time, it envisages improvement in the management of students' careers (including the development of internships), improvement of their own skills and acquisition of new competencies necessary for successful integration in the labour market. Easier integration of students into the labour market is one of the priorities of the Strategy of Education, Science and Technology of the Republic of Croatia (2014) in terms of achieving changes in the system of higher education and science as a prerequisite for increasing the employability of graduates

Internship is an integral part of the study program aimed at the practical verification of acquired theoretical knowledge. The term internship also refers to the acquisition of knowledge and skills through work-based learning, where the role of learning through work is twofold. On the one hand, it enables students to deepen and expand the knowledge acquired in other forms of teaching and at the same time test this knowledge in the work environment. On the other hand, this experience prepares students for the world of work, enabling the acquisition and development of new competencies and increasing the chances of successfully finding employment (Ministry of Science and Education, 2017).

Student internships in the Republic of Croatia are not regulated by legal acts, but universities and polytechnics regulate them with their Ordinances. At the Faculty of Geotechnical Engineering, University of Zagreb, students' internships are regulated by the Ordinance on internship at the graduate university study of the Faculty of Geotechnical Engineering, according to which internship is mandatory and an integral part of teaching at the university graduate study on Environmental Engineering, which consists of Geoenvironmental Engineering module, Environmental Management module, and Water Management module. Internship serves graduate students to supplement their theoretical knowledge with practical knowledge, as well as to prepare a diploma thesis and enables them to more successfully realize the study program and engage in professional work.

Internship at the Faculty of Geotechnical Engineering, University of Zagreb is conducted in the IV. semester of graduate study and lasts 160 hours. The obligation of the graduate student is to perform internship with one or more natural or legal persons for a period of 20 working days, and the tasks performed by the student must be related to the field of Environmental Engineering depending on the enrolled module.

The Faculty of Geotechnical Engineering organises internships of its' students. Heads of practical courses appointed by the Faculty Council before the beginning of each academic year are responsible for the planning and organization of internships. Heads of practical courses are responsible to the Vice Dean for teaching and quality management, and their responsibilities include: establishing a list of natural and legal persons with whom students perform internship; development of a plan for performing internship for the current academic year; referral of students to student internships; keeping records of completed internship; evaluation of the Internship Diary; and compiling an annual report on completed internships and submitting a report to the Vice Dean for Teaching and Quality Management. The Head of the practical course proposes an internship program for each student in agreement with the mentor. The content of the program should derive from the content and character of the professional subjects of study and the activities of the natural or legal person with whom the internship is performed.

## **2 METHODOLOGY**

The results of the research of the attitudes of students and employers on the importance of internship in higher education institutions in engineering presented in this article are based on the desk analysis and data analysis further backed up with qualitative methods. Desk analysis included an in-depth review of the relevant policy documents and scientific literature (books, articles) as well as available Internet

sources. The survey was conducted in October 2020 on a sample of 35 employers and 35 students who attended an internship in the academic year 2019/2020. After completing the internship, students and employers filled out a questionnaire on satisfaction with the internship. The questionnaire for employers on their satisfaction with students on internship consists of 10 questions and is divided into two parts. In the first part of the questionnaire, which consists of 8 questions, employers rate satisfaction with certain segments of internship on a scale of 1-5. The segments that employers evaluate are: Student's ability for internship, Student's motivation for work, Theoretical knowledge of a student needed to perform the internship, Practical knowledge and skills of a student needed to perform the internship, Student's independence at work, Student's work in a team, Student's desire for further training and Satisfaction with the role of the Faculty of Geotechnical Engineering in the organization of internship. The second part of the questionnaire refers to additional comments of the employer on the student's work on internship, i.e. what the employer liked and did not like in the student's work, as well as suggestions for improving the internship.

The questionnaire for students on their satisfaction with the internship consists of 10 questions and is divided into two parts. In the first part of the questionnaire, which consists of 8 questions, students rate their satisfaction with individual segments of internship on a scale of 1-5. The segments that students evaluate are: The quality of the organization of internship by the employer, Conditions for work and performance of internship, Appropriateness of student's internship in relation to the study program, Appropriateness of communication with students, Possibility of independent work within internship, Participation in teamwork, Satisfaction with mentors and the role of the Faculty of Geotechnical Engineering in the organization of internship, as well as improving the same.

The results of the survey were statistically processed and the findings are presented in this paper. The conclusions present key guidelines for decision makers regarding strengthening practical knowledge and skills of students for quality practice performing and rising ability in communication, possibilities of independent work within the framework of the internship and participation in the team work.

### **3 RESULTS**

#### **3.1 Analysis of internship from the point of view of employers**

Survey on the satisfaction with students on internship in the academic year 2019/ 2020 was completed by 35 employers who have long-term cooperation with the Faculty of Geotechnical Engineering in Varaždin, Croatia. The ability of students for internship was rated excellent by 22 employers (62.9%) and very good by 13 employers. 94.3% of employers consider the motivation for student work to be excellent, while only two employers rated it as very good. The theoretical knowledge of the student required for the student internship was rated excellent by 24 employers (68.5%), very good by 10 and good by one employer. 57.1% of employers consider the practical knowledge and skills needed to perform internship to be excellent, and 42.9% very good. Student's independence in work was rated excellent by 24 employers (68.5%) and very good by 11 employers. Most employers, 33 out of 35 (94.2%) rated the work of the student in the team as excellent, one employer as very good, and one could not assess. Students' desire for further training was assessed in the same way as team work, 33 employers considered it excellent, 1 very good, and 1 could not assess.

88.6% of employers are extremely satisfied with the role of the Faculty of Geotechnical Engineering in the organization of internships, while 4 of them are satisfied with the same. The results of the survey on the satisfaction with students on internship in the academic year 2019/ 2020 are shown in Fig. 1.

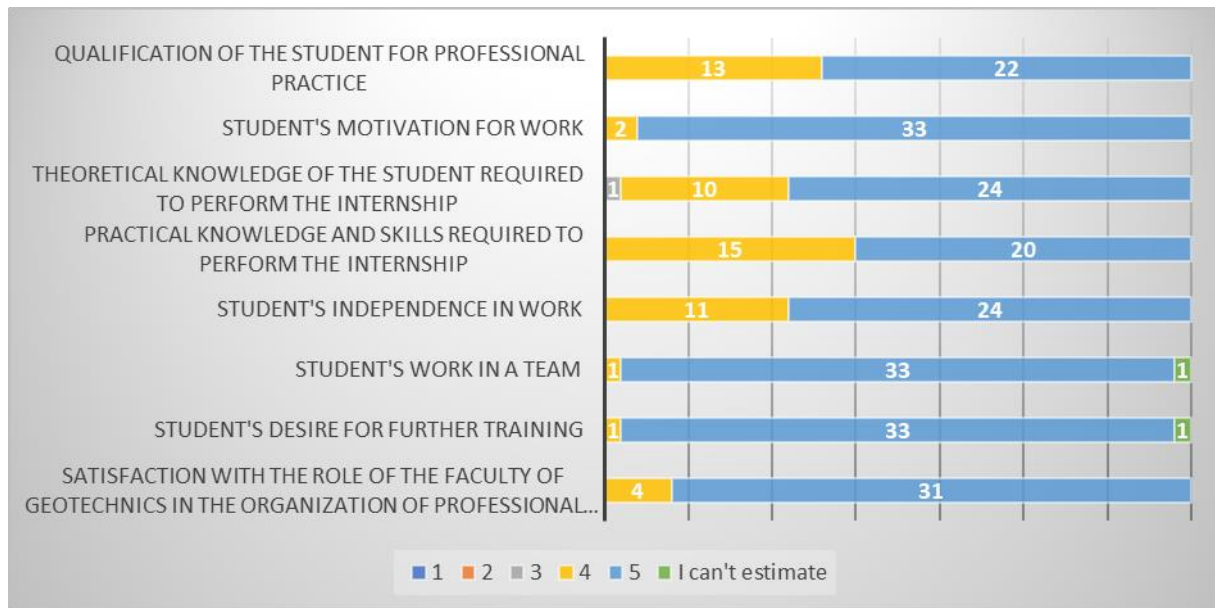


Figure 1. Results of the survey on the satisfaction of employers with the work of students on internship in the academic year 2019/2020

When asked what they liked most about the work of students, most employers answered the desire to work, learn and improve (20%), business communication (17.1%), motivation (17.1%), interest (14.3%) and readiness to learn and work (11.4%). In addition, employers praised the commitment, meticulousness, independence, propensity for teamwork, punctuality, seriousness, practicality, attitude to work, fulfilment of work tasks, self-initiative, responsibility, dedication, dexterity, innovation, approach and diligence of students.

The proposal to improve the internship came from an employer who believes that in the scope of internship a student should work on specific jobs in order to prepare him/her for the labour market.

### 3.2 Analysis of internship from the point of view of students

Analysis of internship from the point of view of students for the academic year 2019/ 2020 was made on a sample of 35 students. The majority of students, 28 out of 35 (80%) rated the organization of internship by the employer as excellent, 6 students considered it very good and 1 student good. 34 students rated the conditions for work on internship as excellent, and only one student as good. The adequacy of internship with regard to the study program was also assessed as excellent by most students, 29 of them representing 82.9%, while 6 students considered it very good. 28 out of 35 students, or 80%, rated the adequacy of communication with the student as excellent, 6 students considered it very good and one good. The possibility of independent work within internship was assessed as excellent by 62.9% of students, very good by 25.7% of students and good by 11.4%. 24 out of 35 students (68.6%) rated the participation in teamwork as excellent, while 28.6% of students rated the same as very good. One student felt that participating in teamwork within the student internship was good. The vast majority of students, 32 out of 35 (91.4%) rated their mentor as excellent, while two students rated him/her as very good and one as good. Satisfaction with the role of the Faculty of Geotechnical Engineering in the organization of internship was rated excellent by 26 students (74.3%), very good by 7 students (5%), while two students think that it is good. The results of the survey on students' satisfaction with internship in the academic year 2019/ 2020 are shown in Fig. 2.

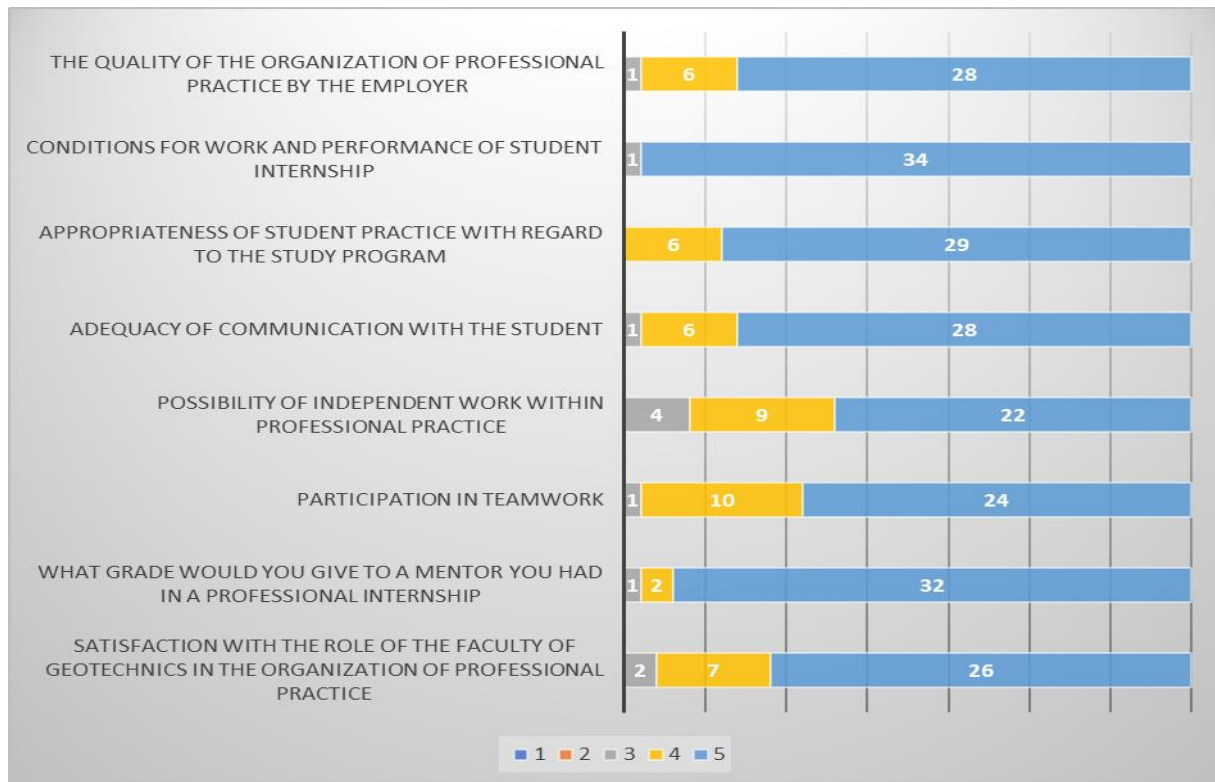


Figure 2. Results of the survey on students' satisfaction with internship in the academic year 2019/2020

When asked what they particularly liked about student internships, most students answered the commitment and friendliness of mentors (25.7%) and the kindness, communication and friendliness of mentors and employees (22.9%). In addition, students praised teamwork, the possibility of independent work, experience gained before graduation, the possibility of training, conditions for internship, pleasant working atmosphere, work organization, equipment, the opportunity to expand knowledge, job dynamism, excellent cooperation and mentors' and employees' desire for teaching.

In the academic year 2019/ 2020 the students did not like the fact that there was no possibility for field work due to the Corona virus pandemic.

One student cited as a recommendation for improving internships the signing of a Cooperation Agreement with several companies in the City of Zagreb.

## 4 CONCLUSIONS

Internship is an integral part of the study program aimed at the practical verification of acquired theoretical knowledge. The term internship also refers to the acquisition of knowledge and skills through work-based learning, where the role of learning through work is twofold.

As part of the graduate study at the Faculty of Geotechnical Engineering, University of Zagreb, students must complete an internship lasting 160 working hours (20 working days) with one or more employers with whom the Faculty has signed a Cooperation Agreement.

In general, employers are quite satisfied with students on internship, especially with the motivation of students to work and the desire for further training. Very high marks were also given by the employers to the work of students in the team and they are very satisfied with the role of the Faculty of Geotechnical Engineering in the organization of internships.

What is noticeable in the analysis of the average grade of individual areas by academic years is that employers are less and less satisfied with students' ability to perform internship, as well as with the theoretical and practical knowledge and skills that students have to perform internship.

Nevertheless, many employers praise the motivation, desire to learn, improve and work of students, the level of communication and business communication with students as well as their approach to work.

In general, students are satisfied with the internship performed within the graduate study of the Faculty of Geotechnical Engineering, University of Zagreb - the average grade in all segments that students rated is above 4.5. The segments that students rated the highest are the mentor they had in the internship and the conditions for work on internship, while they are least satisfied with the role of the Faculty of Geotechnical Engineering in the organization of internships.

In the analysis of internship by academic years, it is noticeable that students are increasingly satisfied with the quality of organization of internship by the employer, working conditions and performance of internship and the adequacy of internship with regard to the study program. The increase in ratings in these areas can be linked to the growing number of signed Cooperation Agreements with various companies.

On the other hand, the decline in students' satisfaction over the years is visible in the adequacy of communication with a student, in the possibility of independent work within internship and participation in teamwork. Nevertheless, the average rating of these segments is still high.

Based on the attitudes of students and employers, recommendations for improving internship programme in university studies and on the example of the Faculty of Geotechnical Engineering, University of Zagreb include further increasing the number of companies that accept students, which obviously affects the better quality of student practice and greater student satisfaction with internship. Also, the recommendation is that the Faculty should be more involved in internships, as well as better organization and greater engagement of the Heads of practical courses.

The recommendations for improving internship programmes by students are better communication between the Faculty and the company. It would be much easier for companies and students if companies had information about students in advance, especially about the topic of the thesis and the area of student's interest in order to prepare assignments in time and in accordance with the student's interests, but also prevent the arrival of students who will not benefit from internships precisely in that company.

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