



The Impact of Apprenticeships on Skill Acquisition among Students of Civil Engineering Program in Indonesia

Panji Padma Negara¹, Suprpto², Arik Triarso³, Siti Talitha Rachma⁴, F. X. Maradona Manteiro⁵, Lisa Triratna Damayanti⁶, Alifya Amalya Putri⁷

Surabaya State University, Ketintang Street, Gayungan, Surabaya, East Java, Indonesian
suprpto@unesa.ac.id

Abstract. This research explores how apprenticeships affect skill acquisition for civil engineering students in Indonesia. We use qualitative research methods to understand how these practical experiences help students learn and develop their skills. Our study is based on Situated Learning Theory, which explains how learning happens best in real-life contexts. Situated Learning Theory includes several key ideas. Contextualized Learning means learning occurs in the actual environment where the skills will be used, making it more relevant and practical. Social Interaction refers to how students learn through interacting with others, such as mentors and peers, during their apprenticeships. Authentic Activities involve engaging in real tasks and problems that professionals face, which helps students gain hands-on experience. Learning as Participation highlights that students learn by being actively involved in the work and the community of practice. In our research, we look at how these aspects of Situated Learning Theory apply to apprenticeships. We focus on how students learn in real-world settings, how their interactions with others support their learning, and how working on genuine tasks helps them acquire new skills. By studying these elements, we aim to show how apprenticeships play a crucial role in helping civil engineering students gain practical experience and improve their skills. This research highlights the benefits of learning in context and through active participation during vocational apprenticeships.

Keywords: vocational apprenticeship, civil engineering, skill acquisition, professional growth

1. Introduction

1.1. Background and Research Problem

Skills are important in the development of human resources in preparing themselves for a better future [1]. Skills and education, especially learning activities, have been studied as closely related [2] [3]. Some of the previous studies on student skills in Indonesia addressed skill enhancement through training activities held on campus [4] [5] [6] [7]. In contrast to these previous studies, this study discusses improving student skills through activities held outside the campus, which are referred to as

internships. Internships are generally held in an office or workplace that is directly related to a particular field of expertise or profession. On the other hand, internships are also a topic that has been widely researched in Indonesia. Some of the previous research on internships focused on the issue of work readiness as a result of internships [8] [9]. Our research seeks to contribute to previous research that has discussed the outcomes of internship activities but has not focused on outcomes in the form of skill enhancement.

1.2. Research Aim Related to Theoretical Review

This study aims to investigate the acquisition and development of practical skills among students involved in apprenticeship program.

1.3. Literature Review

To achieve the research aim, this study is grounded in Situated Learning Theory. This theory encompasses several critical elements to consider, including Contextualized Learning, Social Interaction, Authentic Activities, Learning as Participation. Learning is most impactful when it occurs in environments where the skills are actually utilized, facilitating a connection between theoretical knowledge and practical application [10, 11]. Peers interaction fosters a richer learning experience by allowing students to exchange insights and collaborate on projects, thereby enhancing their comprehension and abilities [12]. The relevance of education increases as learners engage in tasks that mirror real-life situations and makes it easier to apply theoretical concepts [13]. Participation in community practices allows individuals to acquire essential skills and knowledge, emphasizing the social nature of learning [14]. Contextual learning promotes deeper understanding by situating knowledge within its practical use, making learning experiences more meaningful [15]. Collaborating with others not only enriches the learning process but also helps individuals develop essential problem-solving skills [16]. Authentic tasks enable learners to bridge the divide between theory and practice, providing opportunities to engage with the material in a significant way [17]. Active participation in social contexts facilitates learners to gain insights and skills from experienced community members [18].

2. Method

2.1. Research Design

This research involves with qualitative methods, with narrative examination serving as the essential method to investigate and coherent personal experiences. The principal objective of qualitative methods is to explore complex human behaviors and social phenomena through detailed, non-numeric data, while narrative examination focuses exactly on how people recount their understandings to deliver perceptions into their private and social settings [19] [20].

2.2. Research Participant

Informants for this investigate are designated based on purposeful principles associated with the study's aims. In employing purposive sampling, investigators intentionally select participants who are likely to provide meaningful and comprehensive information that directly addresses the research queries, thereby enhancing the overall value and significance of the study's discoveries [21].

2.3. Data Collection

This research employs interview, particularly semi-structured interview. Interviews are a fundamental qualitative research tool used to obtain comprehensive and circumstantial evidence from participants through interactive dialogue, with semi-structured interviews offering a structured approach with flexibility, allowing researchers to explore specific topics while being open to new themes that may arise [22] [23].

2.4. Data Analysis

This study is a qualitative study that uses a qualitative descriptive analysis method. This method of analysis is carried out by examining and categorizing data based on its main characteristics, until the researcher has a concise but still clear and detailed picture [24] [25].

3. Result and Discussion

During the internship period, students get a valuable opportunity to jump directly into the world of work, especially in the field of Quality Control. Despite having no previous internship experience, the placement of students in this department provides a very valuable experience. The tasks that students perform, such as structural inspection, checklist creation, and material testing, have opened students' insights into the importance of quality control in construction projects. This internship experience is also a place for students to apply the knowledge they have gained during lectures. Many of the subjects that students learnt, such as project management, structural analysis, and OHS, turned out to be very relevant and useful in daily work.

Students can see firsthand how the theories taught in class are applied in practice in the field. Overall, the internship in the Quality Control department has given students a very valuable experience. Students not only gained technical knowledge about construction, but also soft skills such as teamwork, problem solving, and decision making. This experience has prepared students to face challenges in the real world of work and become a competent professional in the construction field.

‘The internship experience at the construction project has provided valuable opportunities for students to directly apply the theories obtained during lectures. Lecture materials that were previously only conceptually understood, now become more real and relevant after being exposed to actual work situations in the field. Thus, students are able to build a more comprehensive understanding of the knowledge

learnt.

One concrete example is the application of land measurement science that students learn during lectures. The practicum of land measurement that has been carried out with classmates turns out to be very useful when students join the surveyor team in construction projects. The skills gained from the practicum allow students to actively contribute to field survey activities and deeply understand the importance of measurement accuracy in construction projects.'

'During the inspection of structural works, collaboration is the key to success. Collaboration between students from other campuses in the Quality Control section is very helpful in speeding up the process of finding defects in large buildings. By dividing tasks and working in teams, students can cover a wider area in a shorter time. In addition, collaboration also allows students to share knowledge and experience with each other, so that they can find more effective solutions in overcoming various problems that arise in the field.

A part from the inspection process, collaboration is also very important in closing defects. Especially when facing defect lists that are not equipped with enough information about the location or type of damage. By working together, students can help each other to find the necessary information and ensure that all defects are properly addressed. This internship experience taught students that in a large and complex construction project, teamwork is absolutely necessary to achieve optimal results. Many tasks cannot be completed individually, such as mapping progress on a large building or taking measurements that require high accuracy.

'The experience of collaborating with colleagues has given students a deeper understanding of the importance of teamwork. Through interactions with people from different backgrounds, students learnt how to communicate effectively, respect different opinions, and work together to achieve a common goal. The process of adapting to a new work environment is also an important part of this experience, teaching students to be more flexible and open to change.

In addition to improving sociability and adaptability, collaboration has also been shown to improve work efficiency. By dividing tasks and helping each other, work can be completed more quickly and accurately. The process of correcting each other's mistakes is also an important part of teamwork, as it allows each team member to learn from mistakes and improve the overall quality of work.'

'The process of developing competence and skills is a continuous thing. Through this internship opportunity, students continue to strive to improve their abilities. One effective way is by actively interacting with field supervisors. The supervisor acts as a mentor who provides direction, input, and valuable practical knowledge.

In addition to interacting with supervisors, sharing knowledge and experiences with colleagues is also key to self-development. By exchanging information and ideas, students can learn from each other, find solutions to problems faced, and expand their professional network. This mutual learning process not only improves the quality of work, but also strengthens relationships between colleagues.

'The experience of collaborating with colleagues for 5 months has given students a deeper understanding of the importance of communication and teamwork. The open and honest discussions that we often have have been key in solving various problems that arise. Exchanging ideas and different perspectives not only enriches knowledge, but also strengthens relationships between team members. By giving each other

advice and input, we were able to find more innovative and effective solutions to each challenge faced. This shows that success in completing a task does not only depend on individual ability, but also on the team's ability to work together harmoniously.

Through the intense discussion process, students realised that each team member has unique skills and perspectives. By complementing each other, we can create a strong synergy and achieve optimal results. In addition, the discussion experience has also improved students' ability to effectively communicate ideas, listen openly to others' opinions, and convince others of an idea. These skills are not only useful in the context of work, but also in everyday life. Students believe that this valuable experience will be a very useful provision for students in facing future challenges.

'The experience of working on the task of calculating the needs of castings, wiremesh, and others in a short time has provided a real picture of the dynamics of work in the construction world. The time pressure requires students to work efficiently and effectively. This task has trained students to be able to think quickly, make the right decisions, and complete the work according to the specified deadline. In addition to training technical skills, this assignment also provides an opportunity to adapt to the work culture in the construction world. By working on practical tasks, students can understand how various elements in a construction project are interrelated and dependent on each other. This experience also helps students to appreciate the importance of teamwork and good coordination in completing a project.

Overall, the experience of working on the material requirement calculation task has been a very valuable provision for students to enter the construction world. Through this task, students have developed various relevant skills, such as analytical ability, problem solving, and time management. In addition, students have also gained a deeper understanding of the dynamics of work in the field and the importance of working professionally to produce maximum work results.

'This internship experience has provided students with many valuable lessons that cannot be obtained in the campus environment. Through the various tasks given, especially challenging new tasks, students are encouraged to continue learning and developing themselves. These challenges have encouraged students to think critically, find solutions, and hone their skills. In addition, the internship experience has also given students high motivation to continue learning and developing. By applying the knowledge that students have learnt in college in the real world of work, students feel more motivated to deepen their knowledge and skills. This experience has also opened students' eyes to the vast world of work and the opportunities that await in the future.

The internship experience, which is full of tasks, including some that are classified as difficult, has become a valuable stepping stone in preparing to enter the world of work. The challenges faced during the internship are not just tasks that must be completed, but also a golden opportunity to hone various competencies relevant to the field of study. From analytical and problem-solving skills, to time management skills and adaptation to a new work environment, everything can be honed through these tasks. As such, internships have become a kind of workplace simulation that allows students to test their abilities and identify areas for improvement.

Moreover, the challenging tasks during the internship have also built mental toughness. When faced with complex tasks and tight deadlines, students are trained

not to give up easily and keep trying to find solutions. The ability to cope with pressure and work under pressure is a very important skill in the dynamic and competitive world of work. Thus, the internship experience has provided students with invaluable provisions to face the various challenges they will face in the future, both in the context of education and career.

The internship experience has opened students' eyes to the importance of constantly learning from professionals in the field. By interacting directly with them, students can directly observe how they work, solve problems, and adopt a professional work culture. The willingness to accept tasks from mentors, even those outside their comfort zone, has been key in the students' learning process. Through feedback and evaluation provided by mentors, students can identify areas for improvement and develop themselves more effectively.

A proactive approach in seeking information has also been one of the keys to success during the internship. By actively asking questions, looking for references, and discussing with colleagues, students can obtain relevant information needed to complete the assigned tasks. In addition, an open attitude towards input and criticism from others is also very helpful in improving the quality of work. Through this internship experience, students realise that learning does not only occur in the classroom, but can also occur in a real work environment.

During the internship period, students observed consistency in the roles, contributions, activeness, and participation that students have given. Both at the beginning and the end of the internship period, students' commitment to give their best in every task assigned never changed. Even when faced with the most challenging situations, the spirit to find solutions and solve problems remains burning. The ability to complete the assigned tasks, both independently and in collaboration with group members, has given them great satisfaction. It shows that students are able to work effectively under pressure and make meaningful contributions to the success of the team.

Through this internship experience, students are increasingly confident in their ability to contribute actively in a team. Consistency in work and high dedication have been the keys to students' success in completing various assigned tasks. In addition, this experience has also honed students' ability to solve problems, think critically, and work together with others. Thus, students feel that they have grown as individuals who are more independent, responsible, and ready to face challenges in the future.

The internship experience has given students a deeper understanding of the importance of team collaboration. Working together with colleagues from various backgrounds has taught students how to respect different opinions, communicate ideas effectively, and reach mutual agreements. In addition, students also learnt about the importance of compliance with standards and regulations in the company. This fosters awareness of the importance of quality and integrity at work. One of the other valuable lessons learnt by students is how to make the right decisions in solving problems. Through various situations encountered during the internship, students are trained to think critically, analyse existing information, and choose the best solution.

In addition, students also realise the importance of doing good documentation of every activity carried out, especially when working in the field. Complete and accurate documentation is not only useful for performance evaluation, but can also be a reference for future work. Overall, this internship experience has contributed

significantly to the development of students, both in terms of hard skills and soft skills. The skills acquired by students during the internship will be very useful in facing the increasingly complex and competitive world of work.

4. Conclusion

- Students perform tasks/work during internships on projects that have provided opportunities to apply/implement knowledge from lecture materials
- Students feel that the practical experience gained from the internship process has helped to understand a concept/theory that has been learned in class
- Students collaborate/work together with group members or with other people in the internship project to solve a problem/challenge in the internship project
- Collaborative activities have contributed to your learning process
- Students feel that your social interaction/association with practitioners/experts/professionals in the internship project has influenced the development of student skills as prospective professionals in the field of civil engineering
- Students feel that feedback from group members and from supervisors in the internship project has helped gain new skills during the internship
- There are certain tasks/work that are most impressive to students during the internship, which are considered as experiences that are relevant to the goal of building a professional career
- Activities during the internship (i.e., activities that you do as if you were already a professional) have increased your motivation to learn
- Tasks/work during the internship are valuable experiences that contribute to students' readiness to face professional challenges in the future
- Social interaction/association with practitioners/professionals during the internship has taught students about the norms and values that apply in the world of practice/professionalism in the field of Civil Engineering
- Students play a role/contribute/are active/participative as someone in an internship group (as a member of the internship group) dynamically, from the beginning of the internship to the end of the internship
- While students participate in internship activities, there are impressions regarding the atmosphere/context/conditions of the world of Civil Engineering.

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