



The Role of Mentorship during Vocational Apprenticeships among Students of Civil Engineering Program in Indonesia

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Abstract. This research explores how mentorship influences the learning and development of civil engineering students during their vocational apprenticeships in Indonesia. Using qualitative research methods, we investigate the impact of mentor support on students' professional growth. Our study is informed by Zone of Proximal Development (ZPD) theory, which sheds light on how learners advance with the help of others. ZPD theory includes several important concepts. Scaffolding describes the way mentors provide structured support to help students tackle tasks that are beyond their current abilities. Social Interaction and Learning Dynamics involve the interactions between students and mentors, where learning occurs through dialogue and shared experiences. Mediation of Cultural Tools and Practices refers to how mentors use their knowledge, tools, and methods to guide students in their learning process. In this study, we examine how these aspects of the ZPD theory play out in the context of apprenticeships. We focus on how mentors offer essential support, engage in meaningful interactions with students, and introduce them to practical tools and techniques. By analyzing these factors, we aim to highlight how mentorship enhances students' ability to learn and succeed in their apprenticeships. This research underscores the critical role of mentors in helping civil engineering students bridge the gap between theoretical knowledge and practical application.

Keywords: vocational apprenticeship, civil engineering, mentorship, professional growth

1. Introduction

1.1. Background

Internship can be defined as a structured training program that integrates practical work experience with classroom learning materials, allowing participants to acquire skills and knowledge [1]. The internship process includes several things, namely clear goal setting between the employer and the intern, a combination of theoretical and practical learning, regular assessments, mentoring, increasing task complexity, and ending with certification to improve the employability of the participants [2].

Research topics related to internship activities have been raised in many previous studies in Indonesia. Several previous studies discussed the influence/impact of internship experience on student competence [3] [4]. Several other previous studies discussed the influence/impact of internship experience on work readiness [5] [6]. Based on a brief discussion of several previous studies, it can be seen that these previous studies tend to focus on the impact, or influence, or output of internship activities on academic life and also on the potential for professional career development of students. Unlike several previous studies, this study focuses on the internship process itself, not on the impact or influence. This research that focuses on the internship process specifically talks about the issue of mentorship as one of the things that happens during the internship. Mentorship is a relationship in which an experienced individual provides guidance, support, and advice to a less experienced person to help them develop personally and professionally [7].

1.2. Research Aim Related to Theoretical Review

The aim of this study is to assess mentorship within the ZPD facilitates learning and skill advancement.

2. Literature Review

To reach the research aim, this study relies on Zone of Proximal Development (ZPD). It consists discussion on scaffolding, social interaction and learning dynamics, mediation of cultural tools and practices. Vygotsky posits that people learn most effectively within a Zone of Proximal Development, where they can perform tasks with the assistance of a more knowledgeable partner, highlighting the fundamental role of collaboration in cognitive development [8]. Scaffolding, that provides support which is incrementally withdrawn as learners develop more independence and competence, is critical to foster self-efficacy and deeper understanding in learning/studying [9]. Learning is a social process, as interactions with peers and educators provide stimulation for learners to surpass their current cognitive abilities, thus facilitating development [10]. Learners can interrelate their existing knowledge and new concepts by engaging in cooperative tasks and discussions [11]. Such demonstrates how social dynamics play a crucial role in enhancing educational outcomes and personal growth [11]. Cultural tools, such as language, symbols, and technological resources, are beneficial to shape cognitive processes and ability to navigate learning environments, thus, enriches educational experience within the ZPD [12]. Learning through cultural practices influences cognitive development as well as shows interconnectedness between social context and individual understanding [13]. Such emphasizes the importance of community and culture in the learning process [13]. The mentorship process can be analyzed through the Zone of Proximal Development (ZPD), where mentors assess the skills of students to identify their tasks, providing targeted support and scaffolding for those tasks, gradually encouraging independence as students gain competence, continuously adjusting the level of assistance based on their progress, and building confidence through task completion, ultimately facilitating personal and professional growth.

3. Method of the Study

3.1. Research Design

Qualitative methods are essential to this study, definitely engaging narrative review to examine and understand individual accounts. Qualitative study methods are intensive on understanding multifaceted social phenomena through comprehensive and often subjective data, whereas narrative inquiry midpoints on the designed scrutiny of personal stories to gain a deeper understanding of individual experiences and standpoints [14] [15].

3.2. Research Participant

This research integrates informants selected purposely to meet accurate conditions. This sampling technique contains choosing persons who have precise qualities or experiences applicable to the research objectives, thereby confirming that the sample is collected of those who can contribute the most valuable standpoints and understandings into the study [16].

3.3. Data Collection

This research employs interview, particularly semi-structured interview. Interviews in qualitative research involve a method of direct engagement with participants to excerpt rich, comprehensive evidence, and semi-structured interviews are categorized by their use of a flexible interview guide that enables examination of detailed themes while permitting scope for the participant to present new subjects [17] [18].

3.4. Data Analysis

This study uses a qualitative descriptive analysis method. Descriptive analysis focuses on the activity of summarizing data by grouping it into thematic categories that describe content and observe patterns, thus providing a clear and easy-to-understand summary of the main characteristics of the data [19].

4. Result and Discussion

During the internship on the construction project, students receive assistance from various parties, including site engineers, surveyors, and field supervisors. Students will be explained about the conditions of the project area and the technical implementation of the tasks to be carried out. Students are also taught how to operate the Theodolite to determine coordinate points. From the surveyor, students learn about the use of tools in the field and how to operate them. The field supervisor teaches the importance of communication with workers and understanding project specifications based on shop drawings. Guidance from mentors is very helpful for students in understanding work methods and solving new case studies encountered in the field. If there is a method that they want to learn more about, students can discuss it with the

staff of the project method and schedule. Mentorship by mentors in the field is very necessary during an internship. The assistance of field mentors provides new knowledge to solve even difficult challenges.

Inappropriate or ineffective support by mentors can occur because of the large number of students in their section. Thus, it is possible for students to be less concentrated on the learning stage. In addition, other ineffectiveness occurs due to excessively long working hours and lack of adequate facilities in the project. The ineffectiveness of excessively long working hours requires students to adapt. Especially in the professional world of work.

Through regular interaction with the field supervisor during the internship, students successfully improve their oral and written communication skills, as well as their skills in making presentations and project reports. The hands-on experience in the field improves students' ability to analyze and solve technical problems, track project progress, and make improvements. The supervisor sets clear goals and provides valuable guidance and insights that cannot be obtained from textbooks. They also provide opportunities for building professional networks. During the internship, students gain many new experiences, such as the use of surveyor tools, effective communication, and weekly progress monitoring in the field, as well as the use of Revit in the office. These experiences bring changes to students' mindsets and show the practical differences with lecture theory, as well as increase knowledge through additional tasks given by the field supervisor.

On the construction project, the field supervisor held a session after the lunch break to answer questions from the interns about various aspects of the project, from construction techniques to project management. The supervisor patiently explained each question using real examples from the project. The supervisor was also open to discussions about various things, not only related to civil engineering but also other topics that brought the interns closer together. Having a supervisor who was relatively similar and open-minded was very beneficial, because the supervisor was happy to respond to questions from all interns and supported good interactions between them.

Students regularly have weekly mentoring sessions with their field supervisors to discuss field issues, present activity reports, and receive constructive feedback. Supervisors also conduct specialized training on civil engineering software and new methods, and facilitate the exchange of knowledge and criticism between interns. At the beginning of the internship, the supervisor introduces the participants to each other, explains the objectives and structure of the project, and opens a Q&A session for clarification of information. While in the field, students often discuss problems that occur and decisions made. In addition to routine tasks, students are also faced with impromptu assignments and quizzes that test their knowledge on topics such as formwork and scaffolding. During this process, students have many opportunities to learn and share knowledge with their colleagues.

Internships make students face various technical challenges, such as finding structural errors during checklists in the field without knowing how to fix them. To

solve complex problems, it is therefore necessary to consult with more experienced field supervisors. Internship discussions often focus on project constraints, work methods, material quality, and project progress. Students can directly ask supervisors or direct workers about the steps taken when there are problems, considerations in decision making on the project, and the possible impacts of those decisions.

The internship experience provided a significant difference in social interactions compared to everyday life. The internship environment is very professional, with formal communication and clear roles, while everyday life is more relaxed and informal. In the internship project, I met individuals of various ages and backgrounds, providing new perspectives, different from the usual everyday interactions with peers. The internship environment also has clear and measurable goals, and offers more structured learning and development opportunities through mentoring and feedback. In addition, the norms and work ethics in the project, such as discipline and proper dress, are different from the flexibility of ordinary social life. Internships also provide opportunities to build professional networks that are important for the future. One of the challenges experienced was adapting to the local language.

The challenges during the internship were the high time pressure and complexity of the project, which made it difficult to complete the task on time. This made students learn to set priorities and manage their time better. Guidance from seniors in the field was very helpful in dealing with these difficulties, allowing students to develop better. In addition, the work environment demanded high professionalism and ethics when interacting with stakeholders, superiors, or clients, which was different from everyday social interactions which were more relaxed. The internship project involved intensive teamwork, where collaboration and coordination were essential to achieving goals. Working hours that applied until Saturday were also something new that was initially surprising, but over time students got used to the work pattern.

5. Conclusion

- Mentoring from the field supervisor helps students overcome challenges or tasks that initially felt difficult during the internship
- Students feel a mismatch or ineffectiveness between support from the field supervisor and field conditions
- The mentoring process during the internship has affected students' ability to learn new knowledge and apply new skills
- The field supervisor on the project directly opens himself to questions and answers/responds to questions from interns
- The field supervisor on the project facilitates/encourages discussions/questions and answers/sharing of knowledge among interns
- Students may ask questions to the field supervisor on the project
- Students feel a difference between the social environment in everyday life and the social environment on the project
- Students face challenges in terms of adjusting to the internship

- The supervisor on the project has helped students adjust to the new social environment
- The mentoring process/interaction with the supervisor has influenced students' views and understanding of certain social norms in the field of civil engineering
- Social and cultural issues affect students' learning experiences during the internship

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References

- [1] L. Friedman, "Apprenticeship: A Key to Workforce Development," *Harvard Education Press*, 2021.
- [2] T. Nguyen, "Evolving Apprenticeships: Adapting to Modern Workforce Needs," *International Journal of Training Research*, vol. XX, no. 1, pp. 75-89, 2022.
- [3] D. D. & R. D. R. Lutfia, "Analisis Internship bagi peningkatan kompetensi mahasiswa," *Jurnal Ilmiah Manajemen Kesatuan*, vol. VIII, no. 3, pp. 199-204, 2020.
- [4] I. R. A. & R. J. Pratiwi, "Pengaruh Implementasi Merdeka Belajar Kampus Merdeka Magang Terhadap Kompetensi Mahasiswa Jurusan Ilmu Administrasi Fakultas Ilmu Sosial dan Politik Universitas Sam Ratulangi," *Jurnal Administrasi Publik*, vol. IX, no. 1, 2023.
- [5] E. N. & A. M. Astuti, "Pengaruh Efikasi Diri, Motivasi Kerja, dan Pengalaman Magang Terhadap Kesiapan Kerja Mahasiswa FEBI IAIN Ponorogo," *Niqosiya: Journal of Economics and Business Research*, vol. IV, no. 01, pp. 33-48, 2024.
- [6] A. S. Gohae, "Pengalaman magang, minat kerja dan pengaruhnya terhadap kesiapan kerja mahasiswa akuntansi," *Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA)*, vol. IV, no. 3, pp. 1954-1964, 2020.
- [7] M. C. & K. K. E. Higgins, "Reconceptualizing Mentoring at Work: A Developmental Perspective," *Journal of Career Development*, vol. XLVII, no. 5, pp. 581-596, 2020.
- [8] H. Daniels, "Vygotsky and Pedagogy," *Routledge*, 2016.
- [9] P. Gibbons, "Scaffolding Language, Scaffolding Learning," *Heinemann*, 2014.

- [10] L. J. R. N. M. M. & M. N. Yee, "Learning through Play in early childhood: A systematic review," *International Journal of Academic Research in Progressive Education and Development*, vol. XI, no. 4, 2022.
- [11] S. Ghavifekr, "Collaborative Learning: A Key to Enhance Student's Social Interaction Skill," *MOJES: Malaysian Online Journal of Educational Sciences*, vol. VIII, no. 4, pp. 9-21, 2020.
- [12] W. M. Roth, "Reading activity, consciousness, personality dialectically: Cultural-historical activity theory and the centrality of society," *Mind, Culture, and Activity*, vol. XXI, no. 1, pp. 4-20, 2014.
- [13] B. Rogoff, "Learning together: children and adults in a school," *Community. Oxford University Press*, 2001.
- [14] J. Mason, *Qualitative Researching* (3rd ed.), Sage Publications, 2018.
- [15] D. E. Polkinghorne, *Narrative Knowing and the Human Sciences*, State University of New York Press, 1988.
- [16] N. K. & L. Y. S. (. Denzin, *The SAGE Handbook of Qualitative Research* (5th ed.), Sage Publications, 2018.
- [17] U. Flick, *An Introduction to Qualitative Research* (6th ed.), Sage Publications, 2018.
- [18] I. E. Seidman, *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences* (4th ed.), Teachers College Press, 2013.
- [19] D. Silverman, *Qualitative research* (4th ed.), Sage Publications, 2016.
- [20] A. M. I. Mustari, "Pengaruh pengalaman magang dan minat kerja terhadap kesiapan kerja (studi pada mahasiswa fakultas ekonomi dan bisnis universitas brawijaya)," *Jurnal Ilmiah Mahasiswa FEB*, vol. IX, no. 2, 2021.

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