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Industrial Training: Challenges among Students in Construction Industry

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Abstract: Industrial training is structured learning off -campus and gives students the opportunity to gain experience in a professional field before they step into the real world of work. This study was conducted to find out the extent of the challenges faced by students during industrial training in terms of knowledge, skills, and work ethic. This study was conducted in a survey using a quantitative approach. Research applied the survey research design based using quantitative approach. A set of instruments developed based on literature analysis. The variables investigate are knowledge and skills in terms of challenges among student during industrial training period. The respondents from students in program related with Civil Engineering and Building Construction are involved to response the survey. There are 208 students from three faculties involved in this research. The findings of the study show that the challenges of students in terms of knowledge, skills and work ethic are at a high level, and there are differences between the three faculties in terms of knowledge, skills, and work ethics. As conclusion, students undergoing industrial training in Construction Industry are capable to apply knowledge and skills within the training period.

Keywords: Industrial Training, Challenges, Knowledges, Work Ethic

1. Introduction

Industrial training is structured learning off-campus and gives students the opportunity to gain experience in a professional field before they step into the world of work. Industrial training is a process to enhance experience and be able to apply knowledge according to their competence. (Mediawati et al., 2020). The industry has advised the educational institutions to apply the necessary skills in order to operate effectively and efficiently while in the industry (Francis & Alagas, 2017). In addition, according to him, industrial training can give students an experience that is not possible to convey through theory classes. Industrial training is also known as work -based learning which has become one of the major educational strategies in the world (Hasan, Tuan Mohd Yasin, & Mohd Yunus, 2015). The main purpose of industrial training implemented is to apply practical knowledge in real work situations (Hasanefendic, Heitor, & Horta, 2016). Industrial training is a platform for students to integrate theoretical knowledge with the reality of real work as well as practice the knowledge gained (Mat Yusof

& Mohiddin, 2018). According to him, industrial training programs can create positive values between students and employers. At the same time, industrial training will be useless because students do not get proper training while conducting industrial training (Hasanefendic, Heitor & Horta, 2016). From another angle, this industrial training program can provide opportunities for students to explore the changes and developments of technology more comprehensively than the atmosphere on campus. Therefore, industrial training can also provide an opportunity for students to understand in more depth about various aspects of management and communication skills between employers and employees (Mat Yusof & Mohiddin, 2018).

1.1 Research Background

Industrial training is implemented to provide knowledge of the challenges faced by students while undergoing industrial training and exposure to students with real situations while working and expand their knowledge and skills. In addition, industrial training can increase knowledge according to the efficiency of the programs implemented (Mediawati et al., 2020). Therefore, to increase the effectiveness of industrial training, the university needs to strengthen the relationship between the industry to produce skilled graduates (Mat Yusof & Mohiddin, 2018). This is because, the industry needs to play a role by providing wider opportunities for students to improve their existing skills. Moreover, the effectiveness of industrial training conducted by students will not be achieved if no actual evaluation is done (Hasanefendic, Heitor, & Horta, 2016). The need to study the effectiveness of industrial training needs to be implemented to determine the analysis on industrial training to be made more systematically and extensively as there are industries that often cause problems rather than problem solving (Mat Piah & Haron, 2018). From another perspective, to be competitive in the job market students need to have competencies and skills in performing jobs (Muhammad Jamil, Othman, Abdul Rahman, Mohamed, & Zainuddin, 2016). Students need to have a high level of knowledge and be positive to face the challenges of the real world of work in the future.

Furthermore, in producing productive graduates, industrial training programs can help students in increasing the level of student reliability to become a professional later (Mat Yusof & Mohiddin, 2018). This is because, Priansa (2017) has stated that competence is the ability of employees to do a job in terms of efficiency, maturity, experience, effectiveness, and responsibility will result in success in the training. Technical skills in a training are required to adapt in the proper use of equipment with the scope of work offered by the industry and at the same time, industrial training is very focused on industrial engineering practice and the actual knowledge required in the industry. However, there are still industries that do not provide the actual scope of work and skills needed by students during training. This causes there is a bad perception and industrial training programs do not give a positive impact to students (Mat Yusof & Mohiddin, 2018). In addition, there are also challenges in the construction industry. As can be seen from the study, Turner, Oyekan, Stergioulas and Griffin (2021) stated, the productivity rate in the construction sector is still among the lowest in the industry. Therefore, the need for training and learning to improve the skills of construction workers is highly encouraged (Johari & Neeraj Jha, 2020).

1.2 Objectives

The objectives of this study are to
1. To identify challenges from the aspect of knowledge in construction.
2. To identify challenges in terms of skills in construction.
3. To identify challenges from the aspect of work ethic in construction
4. To identify the different challenges faced by students of each faculty

2. Methodology

The implementation of this study focuses on the scope of challenges faced by students in the field of construction while undergoing industrial training. This methodological approach aims to achieve the stated objectives of the study. This study was conducted using specific methods to obtain information from respondents who participated in the study. As a result, an appropriate methodological approach can help ensure the authenticity and accuracy of the findings.

2.1 Research Design

Research applied the survey research design based using quantitative approach. A set of instruments developed based on literature analysis. The variables investigate are knowledge and skills in terms of challenges among student during industrial training period. The respondents from students in program related with Civil Engineering and Building Construction are involved to response the survey. There are 208 students from three faculties in UTHM involve in this research. The selection of respondents' criteria is those who are experienced in industrial training based on Bachelor Degree Program. The numbers of population and samples shows in Table 1.

Table 1: Population and sample

Faculty	Population (person)	Sample (person)
Faculty A	75	65
Faculty B	320	175
Faculty C	46	40
Total	441	280

2.2 Research Procedure

In formulating of research problem statement, researcher conduct in literature analysis and initial stage survey among students who are undergoing industrial training. The research methodology is based on outline of how research concept needs to be conducted. The techniques used will analyze the information in the research topic. Research methods are the strategies, processes or techniques utilized in the collection of data or evidence for analysis to uncover new information or create better understanding of a topic. The research focus on quantitative approach and questionnaire as data information collected. Random sampling technique applied to identify the respondents. The validity of the instrument is important for checking the structure, aspects of language and the way sentences are arranged. The purpose of validity is to identify the level of competence and challenges encountered while undergoing industrial training. Therefore, to obtain the validity of the instrument, the researcher will prepare questionnaire items from previous studies or question items constructed by the researcher for the purpose of review by three experts consisting of lecturers in related field. Before the actual study is conducted, the researcher needs to obtain the reliability of the questionnaire form conducted. Data were collected and analyzed using SPSS to determine Cronbach's alpha values. Cronbach's alpha values were used to obtain validity and reliability values for the analyzed variables. The alpha values analyzed within range of $0.8 < \alpha < 0.9$ and referred by Griethuijsen et al. (2014).

2.3 Research Instrument

For quantitative studies, the researcher may employ various methods, including questionnaires. Additionally, before conducting research, the researcher must determine research instruments. The questionnaire method is used in this study, and the instrument is derived from respondents' responses to a face-to-face questionnaire and an online survey. The questionnaires will be developed under the variables mentioned in conceptual framework.

3. Results and Discussion

This chapter describes the analysis of data and research results obtained through the process of feedback submitted by respondents through a questionnaire that has been prepared. The obtained data were analyzed to obtain the values of frequency, percentage, and mean and deviation of standard scores and ANOVA tests. The main purpose of this data analysis is to identify the challenges faced by industrial training students in the field of construction.

3.1 Demographics of Respondents

Respondents involved in this study were Industrial Training students from there faculties which are program offered in bachelor's degree Program related to Civil Engineering and Building Construction. Demographic information is required to determine gender, faculty, and duration of industrial training. The analysis for this information is described one by one in the following sub-chapters.

Based on the results of descriptive analysis, the number of male respondents was 138 people (49.3%) while for female respondents it was 142 people (50.7%). Furthermore, most of the trainees are from the Faculty B which is 175 respondents (62.5%) while the A Faculty has 65 respondents (23.2%). In addition, a total of 40 respondents (14.3%) from Faculty C. Finally, the industrial training period of students is for 1-3 months for a total of 240 respondents (85%) and a total of 40 respondents (15%) for a period of 4-6 months.

3.2 Challenges from the aspect of knowledge in construction

A total of 9 items were developed to assess the challenges from the knowledge aspect in construction. Based on table 2, the highest mean value is for item B1 related to the search for sufficient information about the operations of the company that will undergo industrial training. with a mean value of 4.56 and a standard deviation of 0.552. While item B3 has the second highest mean value is 4.50, and the standard deviation is 0.522. It concerns knowledge of safety and health operations during construction sites. Furthermore, from Table 2, there are students who are less knowledgeable in conducting testing of building materials before use in the project for item B8, with the lowest mean value with a mean value of 4.33, the standard deviation is 0.661. However, it is still at a high level.

Table 2: Challenges from the aspect of knowledge in construction

No	Statement	Mean Score	Standard Deviation
B1	I have enough information about the operations of the company that I will undergo industrial training.	4.56	0.552
B2	I am clear with every scope of work on the construction site in line with my field of study.	4.43	0.544
B3	I understand safety and health operations while on a construction site.	4.50	0.522
B4	I was able to interpret the building materials used in accordance with the standards referenced.	4.45	0.533
B5	I got company information about the industry training needs in their place.	4.46	0.573
B6	I was able to apply theoretical knowledge in the classroom for use during industrial training.	4.46	0.526
B7	I have complete information on the scope of duties of each worker on the construction site.	4.44	0.558
B8	I can run a test of building materials before use in a project.	4.33	0.661
B9	I am able to operate high -tech machines on construction sites.	4.37	0.620
	Average score mean	4.441	0.396

3.3 Challenges from the aspect of skills in construction

A total of 9 items were developed to assess the challenges from the aspect of skills in construction. Based on the results of the analysis as in Table 3.2, has shown a high perception of the challenges from the aspect of skills in construction. With reference to table 3, the highest mean value is for item C6 which is related to skills in reading each drawing while at the construction site with a mean value of 4.46 and standard deviation of 0.526. While item C1 has the second highest mean value is 4.44, and the standard deviation is 0.602. It is related to skills in using engineering software such as AutoCAD properly during industrial training. Furthermore, from Table 4.5, there are students who are less skilled in applying engineering software such as Esteem, Mesh and others during industrial training properly, with the lowest mean value with a mean value of 4.27 standard deviation is 0.764.

Table 3: Challenges from the aspect of skills in construction

No	Statement	Mean Score	Standard Deviation
C1	I was able to use engineering software like AutoCad properly during industrial training.	4.44	0.602
C2	I was able to perform machine operations on construction sites without expert supervision.	4.33	0.698
C3	I was able to apply management skills on projects assigned to me.	4.39	0.582
C4	I was able to make early plans about the assignments given to me.	4.39	0.556
C5	I use my communication skills properly to give instructions to workers on construction sites.	4.41	0.521
C6	I am adept at reading every drawing while on a construction site.	4.46	0.526
C7	I was able to apply engineering software like Esteem, prota, Mesh etc during industrial training properly.	4.27	0.764
C8	I was able to plan the traffic flow work at the construction site to facilitate the delivery of construction supplies.	4.31	0.649
C9	I am adept at making every calculation required while industrial training is conducted.	4.32	0.607
	Average score mean	4.359	0.455

3.4 Challenges from the aspect of work ethic in construction

Table 4: Challenges from the aspect of work ethic in construction

No	Statement	Mean Score	Standard Deviation
D1	I am committed in performing the tasks of each assigned task.	4.52	0.528
D2	I was able to complete the assignments given by the supervisor in the allotted time.	4.41	0.541
D3	I present myself to the construction site earlier than the scheduled time to maintain discipline in the workplace.	4.46	0.534
D4	I am able to work to resolve conflicts found in group assignments.	4.40	0.572
D5	I was able to identify the conflicts that existed in group assignments.	4.44	0.571
D6	I was able to maintain a good relationship between supervisors and colleagues.	4.44	0.552
D7	I am more willing to work after reading assignments and getting work done.	4.41	0.549
D8	I make sure to be under the supervision of a supervisor before starting the operation of a machine on a construction site.	4.37	0.519
D9	I am professional in carrying out tasks while on a construction site.	4.39	0.537
D10	I am tolerant in communication by giving accurate information to clients.	4.38	0.522
D11	I use my time completely to learn something new before starting a job.	4.40	0.525
D12	I use my time completely to learn something new before starting a job.	4.38	0.508

Average score mean	4.417	0.410

A total of 12 items were constructed to assess the challenges from the aspect of work ethic in construction. With reference to table 3.3, the highest mean value is for item D1 which is related to committed in performing the task of each task given with a mean value of 4.52 and standard deviation of 0.528. While, item D3 has the second highest mean value is 4.46, and the standard deviation is 0.534. It is related to attendance to the construction site earlier than the scheduled time to maintain discipline in the workplace. Furthermore, from table 4, there are students who are not under the supervision of a supervisor before starting the operation of a machine at the construction site., With the lowest mean value with a mean value of 4.37 standard deviation is 0.519.

3.5 Analysis of the differences between the challenges faced by students of each faculty

Based on Table 5, it is found that there is a significant difference in the challenge from the aspect of knowledge in construction (p> 0.05). Meanwhile, from the aspect of skills in construction there was also a significant difference (p <0.05). Challenges from the aspect of work ethic also showed significant differences (p <0.05). This indicates that students from the three faculties have different challenges in the field of construction while undergoing industrial training.

Table 5: Differences between the challenges faced by student for each faculty

Statement	Faculty	Mean Score	Standard Deviation	p
Challenges from the aspect of knowledge in construction.	A	4.270	0.431	
	B	4.530	0.366	.000
	C	4.327	0.341	
Challenges from the aspect of skills in construction.	A	4.099	0.512	.000
	B	4.488	0.395	
	C	4.222	0.379	
Challenges from the aspect of work ethic in construction.	A	4.25	0.505	.000
	B	4.501	0.365	
	C	4.302	0.325	

4. Conclusion

In conclusion, the researcher obtained the results of cooperation provided by the parties involved especially the management of the institution, industrial training students; the results of the study concluded that industrial training students from all faculties had challenges while undergoing industrial training. The challenges of knowledge and skills available during industrial training must be in line with the knowledge experienced through program of study with three or four years at the university. Insufficient critical knowledge and skills will contribute to negligence, errors, and waste in performing this industry training. Therefore, everyone must play a role in ensuring that industrial training runs smoothly. Therefore, the importance of mastering the skills and knowledge acquired during the study should be emphasized for students to be better prepared to face challenges while undergoing industrial training.

Acknowledgement

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