

Analysis of Job Competency Requirements in the Construction Services Industry for Vocational High School of Construction and Property Engineering Expertise Programs

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The purpose of this study is to find job competency requirements in the construction services industry for graduates of Construction and Property Engineering (TKP) Vocational Schools in Malang City. The development of the construction service industry is currently very rapid, marked by infrastructure development in various regions in Indonesia, so that it requires a lot of workers in the construction sector. The existence of a large number of labour needs provides good opportunities for graduates of the Vocational School in the Construction and Property Engineering expertise program. Graduates from TKP have opportunities that are very diverse, ranging from image interpreters, estimators, surveyors, admins and so forth. However, many graduates do not meet the work requirements of industrial construction services. The importance of this research is to synchronise the competency needs in the DU/DI construction services with the formation of competencies in schools, through learning activities in schools. This research is a survey with

a quantitative approach. Data collection techniques using questionnaires were then analysed using a descriptive statistical method. The findings of this research can be used by Vocational Schools in preparing their students through vocational subjects and field experiences that are able to provide insights which are in line with developments in the field today.

Keywords: Job Competency, Construction Services, Construction and Property Engineering

Introduction

The Industrial Revolution 4.0 is characterised by digitalisation, where competition is needed for innovation and expertise, that brings changes in human life and has a great influence on the world of work. Strengthening Human Resources through the millennial generation that is innovative, productive and competitive in various business sectors and industries, is very necessary. In addition, the enthusiasm for individuals to continuously improve their personal competencies, both soft skills and hard skills, is needed to produce creative, innovative and responsive breakthroughs for all changes. Efforts to improve it, in the Republic of Indonesia era 4.0 require revitalisation from various sectors not only in the world of education, but in all sectors, one of which is the construction service industry.

The construction service industry has an important and strategic role in infrastructure development such as roads and bridges, dams, housing and settlements, railway lines, airports and information and telecommunications, which are the government's priorities at this time. Infrastructure development is a national priority because it will be a lever for economic growth at the local, regional and national scale, that can improve people's welfare. The success of infrastructure development is one of the keys to have a high quality workforce.

The construction service industry broadly consists of carrying out activities in the field, along with stakeholders such as contractors, consultants, material suppliers, plant suppliers, transport suppliers and labour [1]. Construction activities include planning, preparation, manufacturing, installation, inspection, demolition and repair of buildings. Construction activities are carried

out by construction companies, which include contractor companies and construction consulting companies.

The development of the construction service industry is currently very rapid, marked by infrastructure development in various regions in Indonesia, so that it requires a lot of workers in the construction sector. But it still has not been matched by an increase in the competence of the construction workforce [2]. This can be seen from the number of experts in the field of construction which is still far below the need. The need for construction experts currently reaches 700,000 people, but the available experts only reach the range of 195,000, meaning that the expert labor supply is only fulfilled by 28% [3].

The existence of a large number of labour needs provides good opportunities for graduates in the Construction and Property Engineering expertise program Vocational School. TKP expertise competencies are not only related to building planning, related to documents consisting of planning drawings such as DPIB graduates [4]. TKP graduates have opportunities that are very diverse ranging from image interpreters, estimators, surveyors, admins and so forth. However, many graduates do not meet the work requirements of industrial construction services.

The results of previous studies also explained that a few Vocational Schools still do not link and match the world of work in providing learning experiences to students, both from the selection of teaching materials, learning resources, activities and practical equipment used [5]. Supported by Hanafi in his research explaining that the trigger of the problem of the inability of vocational graduates is: (1) lack of information about work in their field, (2) having experience in the field more interested in industry, and (3) skills possessed by TKP graduates don't meet industry needs [6]. This is in line with the research conducted by Almira, which revealed that the low absorption of graduates was due to the reluctance of the industry to employ TKP Vocational graduates, because of the incompatibility of competencies available to those needed by the construction service industry [1].

Competence is an ability that a person has including knowledge, skills, and attitudes and other individual factors that can make someone do work. Job competency is the work ability of each individual which includes specific aspects of knowledge, accountability, and work attitudes that are applied to realise required performance standards in the workplace [7]. In line with the opinion of Ramadhan et al, who explained that job competency is the work ability of each individual, which includes aspects of knowledge, skills, and work attitudes, that are in accordance with the standards set in the Business World/ Industrial World (DU/DI) [8]. The ability possessed by someone is used to carry out tasks that are needed in the workforce [1]. So, job competence is a work ability that a person has including knowledge, skills, and attitudes and other individual factors that can make someone do work as evidenced by a certificate of expertise.

Based on the above explanation, researchers are interested in finding job competencies requirement in the Construction Services Industry for Vocational High School graduates in Construction and Property Engineering Expertise Programs. The importance of this study is (1) to synchronise the competency requirements in DU/DI construction services with the formation of competencies in schools, through learning activities in schools and (2) to increase the absorption of graduates into the workforce to contribute indirectly to reduce the Open Unemployment Rate.

Methods

This research is a survey with a quantitative approach. The survey was conducted on 10 construction service companies in Malang City randomly, consisting of contractor and construction consulting companies. Data collection techniques used questionnaires. Data obtained from the results of the study will be analysed using descriptive statistical analysis.

Results and Discussion

The results of data analysis of the types of job competencies that can be filled by graduates of the Vocational School in Construction and Property Engineering Expertise Program are presented in Figure 1.1 and Figure 1.2.

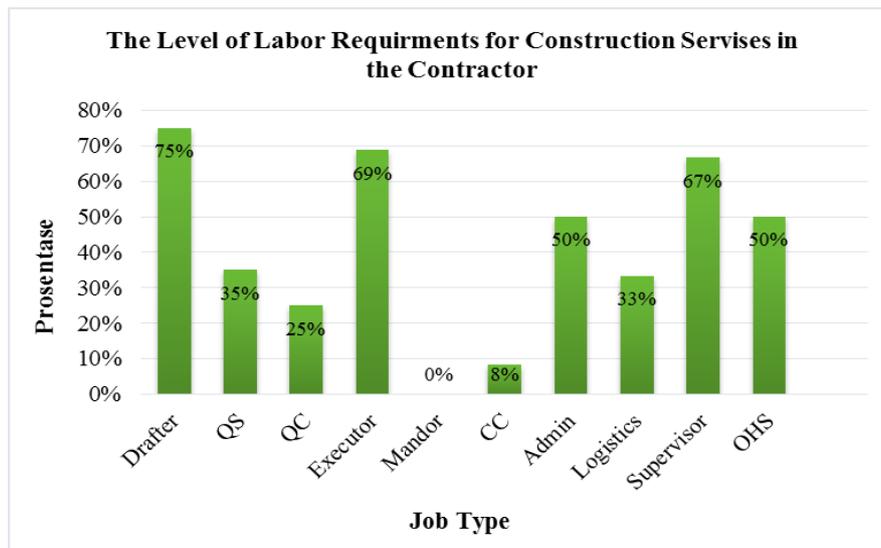


Figure 1.1 Graph of Job Type in the Contractors Company

Referring to Figure 1.1, the types of work for vocational school graduates in the high percentage of the TKP expertise program are drafter, executor, supervisor, technical admin, and OHS. Whereas the types of jobs with low percentage include quantity surveyors (QS) or estimators, quality control (QC), cost control (CC), and logistics. The type of work that has a high percentage gives a good opportunity for TKP Vocational School graduates to fill. TKP Vocational graduates who can fill the type of work that is in DU/DI must meet the required competencies.

The competency of the research results required by the construction service industry in the field of implementation for high-percentage TKP vocational graduates is as follows: (1) drafter must have the competence to be able to draw shop drawings and as build drawings, (2) implementers must have the competence to be able to carry out work accordingly with work programs, calculating work volume and making daily reports, (3) supervisors must have the competence to be able to oversee the activities of workers, make schedules and work plans, (4) engineering admin must have the competence to be able to entry data, document, attend, report weekly or monthly, and make travel documents, and (5) OHS teams must have related competencies regarding construction OSH such as the use of APD, work safety signs and so on. Almira explained that the type of work in the construction service industry that can be occupied by

graduates of the Building Engineering Vocational School is a drafter, and an estimator in the executor and supervisor [1].

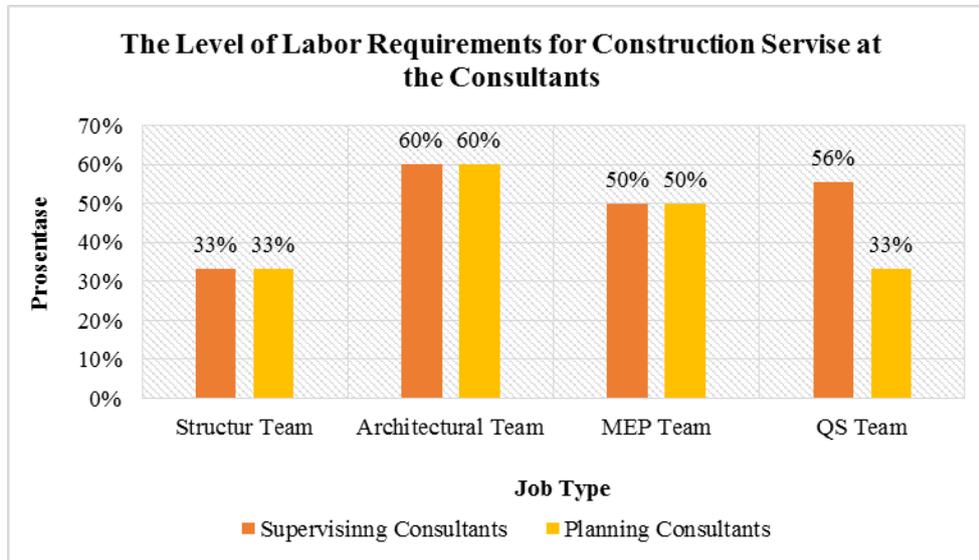


Figure 1.2 Graph of Job Type in Consultants Construction

Based on Figure 1.2 the types of work for vocational school graduates in the high percentage of the TKP expertise program are the architecture team and the QS team, while for the low-percentage type of work include the structure team and the MEP team. Furthermore, for the type of work in the field of planning, consultants have a high percentage of the architectural team only, while the types of jobs with low percentages include the structural team, the MEP team and the QS team.

The competencies that must be possessed by TKP Vocational graduates to be able to fill jobs in the supervisory field are as follows; (1) the architectural team is checking work drawings with the owner's request, mastering drawing applications (Auto CAD, Google Sketcup, etc), checking material according to SPEK, knowledge of materials and materials, checking image volume calculations with the field and checking the results of work in the field, and (2) the MEP team which is able to check the material according to SPEK, must have knowledge of MEP materials and other materials, check the calculation of image volume in the field, and check the results of work in the field. While the competencies that must be possessed by TKP Vocational School graduates to be able to enter the type of work in the field of planning

consultants are as follows: the architecture team is able to draw images according to the owner's request, able to make 3D images, master drawing applications (Auto CAD, Google Sketcup, etc), able to create RAB, master the calculation application and understand OSH at work.

The work competencies needed in the construction service industry in Malang are not much different from the work competency requirements in other cities. This is evidenced by the results of research from Ramadhan explaining that the work competencies needed by DU/DI for Building Engineering Vocational School graduates in DKI Jakarta include: (1) making drawings/ shop drawings, (2) making final drawings/ as draw drawings, (3) making drawings on building construction and non-construction constructions, (4) mastering drawing software, (5) mastering structural calculation software, (6) calculating material requirements, (7) calculating volume, (8) calculating RAB, (9) having discipline and (10) being communicative. The work competency described above, as a whole, covers the field of executor, consultant planner and supervisor consultant [8].

Supported by Almira's research, it was shown that the knowledge competencies of graduates of the Stone Concrete Engineering Vocational School needed in small to large scale companies in East Java included (1) understanding of concrete aggregate quality, (2) managing construction work in the field, such as making material management schedules, personnel work, equipment and time of construction work up to work reporting, (3) understanding of slump testing procedures, material use and concrete construction work, and (4) understanding of concrete construction work and work management. Whereas the skills competency of TBB Vocational High School graduates needed in small to large scale companies include: (1) drawing, (2) preparation work, (3) finishing work, (4) calculation of volume (5) implementation of structural work, installation of scaffolding, and (6) calculation and implementation of construction work. Then for the competency attitudes of TBB Vocational graduates needed are (1) graduates who are responsible, (2) have a good cooperative relationship, (3) complete of assignments on time, either directly or gradually, (4) be consistent with what is done and (5) are able to solve problems both individually and in groups [1].

In line with the results of Oro's research, the competency profile of TKP Vocational students needed by construction services is as follows: (1) aspects of knowledge are shallow foundation technical specifications, shallow foundation pair profile work, concrete casting preparation, fresh concrete pouring and concrete casting factors; (2) skill aspects are factors reading foundation work drawings, concrete casting work and concrete reinforcement installation; and (3) attitude aspects are factors for shallow foundation pair preparation work, foundation pair work, casting preparation work and concrete reinforcement factors [9].

The competencies described above must be possessed by TKP Vocational School graduates to be able to fill the workforce needs according to the type of work at DU/DI. If competency has been mastered by students, then the work in the field will easily be resolved because it is competent in the field. Competent or not, someone can be seen from the competencies they have, because competency is everything that is owned by someone in the form of knowledge, skills and internal factors of other individuals to be able to carry out tasks or a job needed in the world of work [1].

Conclusion

Based on the results of the research and discussion described above, it can be summarised as follows: *Firstly*, the work competency needs in the construction service industry for TKP Vocational graduates in the implementing field include (a) being able to make soft drawing and build drawings, (b) able to make 3D images, (c) master image software (Auto CAD, 3D Max, Google Sketcup, etc), (d) able to calculate volume (RAB), (e) able to make RABP, (f) make time schedule, (g) knowledge about materials and materials and (h) understanding K3 at work. *Secondly*, the work competency requirements in the construction service industry for TKP Vocational School graduates in the supervisory consulting field include, (a) being able to check work drawings in the field, (b) mastering image software (Auto CAD, 3D Max, Google Sketcup, etc), (c) able to check image volume calculations in the field, (d) be able to check the results of work in the field, (e) be able to check material according to SPEK, and (f) have knowledge of materials and understand OSH in the workplace. *Thirdly*, the work competency requirements in the construction service industry for TKP Vocational School graduates in the field of planning consultants include, (a) being able to draw images according to the owner's



request, (b) mastering 2D and 3D drawing software, and (c) being able to make RAB and understanding OSH in place work.

Recommendation

Vocational schools should prepare their students through vocational subjects and field experience that are able to provide insights that are in line with developments in the field today and are able to accommodate the competencies needed in the world of work.

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