The Role of Universities in Engineer Certification as Quality Assurance of Engineers Professionalism

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Engineers professionalism in Indonesia is regulated in the Act of the Republic of Indonesia Number 11 of 2014 on engineering. Act 11, 2014 aimed at preventing errors and emissions engineering practices that could harm the public, securing investment and development budgets, developing engineering and technological innovation as well as equalizing the qualifications and competence of Indonesian engineers with engineers from other countries. So it will advance the engineering profession in order to spearhead the development and global competitiveness for the progress and welfare of the Indonesian people. The development of innovation and value creation is based on a mechanism of cooperation universities, industry and government (triple helix). This study aims to examine the role of universities in the engineering profession, particularly in engineer certification, which certification as a means of quality assurance for the professionalism of an engineer. Regulation of engineer certification refers to Act 11, 2014. The study was conducted refers to a methodology which covers the main activities of the literature study, data collection, data analysis, and formulation of conclusions.

Results of the study show that, universities acts forming the basis of competence engineer by education degree program. Also plays a role in the engineering profession program, which is a program of universities after the degree program to form the engineering competence.

Keywords: engineer certification; universities

1. INTRODUCTION

One of the most important tasks the engineer is to ensure the safety of the people who will receive the impact of the products that he designed. All of the code of ethics of the professional engineering organizations stressed the importance of safety in the task of engineers. [1].

Engineers are the main components in engineering services. Engineers are required to have the competence to do the job in a professional manner so that activities that do can improve the quality of life and himself. The products produced by the engineer must be accountable, materially, morally and legally. So that the services in the field of engineering is done in a professional, responsible, professional ethics. have legal certainty in providing protection for engineers and engineering users. It required legislation governing professionalism. Special to the engineering profession has been issued Act 11, 2014 on Engineering. The study analyzed the 11 Act, 2014 to regulate the certification engineers. Certification function as quality assurance for the professionalism of an engineer. The certification process is based on a mechanism of cooperation by universities, industry and government (triple helix). [2]. The scope of the study focuses on the role of universities in the certification engineers, limited to engineering practice in the field of Construction Services

2. LITERATURE REVIEW
2.1 Engineer Professionalism

Engineer Professionalism is a person of high educational background and or have the ability and explore and master the application of knowledge, science, technology, art and or specific areas. In the field of construction services expertise is in the field of
construction workers who have a certificate for construction planners, construction supervisors and the contractor as proof of professional competence and ability of working expertise in the field of construction services according to scientific disciplines and/or specific expertise [3]. Engineer professionalism implies that one holds paramount the safety, health, and welfare of the public. The process of certification is the decisive career step that raises a technically trained person to the engineer professionalism with all of the implicit responsibilities that go with the authority to make critical decisions affecting the public. Every state has its own specific requirements for certification as a professional engineer [4].

2.2 Registration Process and Certification
Registration process and certification of construction services are effort to have construction service business class based on classification is classify the business based on area and sub area of works, and qualification is classification of business based on grade of competence and capability [5]. Basically, certification is a proof of acknowledgement in determining classification and qualification of competence and capability in construction service sector. In personal form or in the form of company a proof of acknowledgement of personal competence and capability of professional skills in construction services sector according to specific field of study and skill as well as expertise.

2.3 Professional Certification
Efforts to improve the quality of competence and professionalism of experts can be done through certification serves as a quality assurance system [6]. Professionalism of Indonesian engineer stipulated in the Act 11, 2014. This Act also regulate the professional engineer certification, the organization of the working license to service standards.

Certification is part of the requirements that must be possessed by workforce who will work in the corporate world of construction services in a professional manner. Labor certification, in an effort to meet the quality demands professional workforce, which is needed by the business / industry locally, nationally and internationally. [7] Implementation of certification experts construction services should have the firmness of rules regarding competency standards can ensure the competence or quality construction workforce. [8]

Someone to obtain an engineer's degree can be obtained through four sources, namely: [9]
1. Higher Technical Education Graduates who hold a Bachelor of Engineering (Sarjana Teknik -ST),
2. Higher Technical Education Graduates who hold a Bachelor of Engineering (Sarjana Teknik -ST) with experience working in engineering
3. Higher Technical Education Graduates who hold a Bachelor of non-Engineering (non Sarjana Teknik - non ST),
4. Recognition of prior learning (RPL)

Institutional framework certification according to Act 11, 2014 involves the Board of Engineers Indonesia, Higher Education (universities) that organizer Profession Engineers Program, Professional Certification Agency as organizers Competency Test, and The Institution of Engineers Indonesia (PID) [10].

3. METHODOLOGY
Research methodology is a scientific way has been used to achieve data with certain aims. Academic way means that the activities are based on scientific methods [11]. These scientific methods are combination of rational and empirical approaches [12]. Rational approach gives a coherent and logic paradigm, while empirical approach gives a frame work of empiric in ensuring a truth.

This study is a descriptive and qualitative research, carried out through the stages of literature study and data collection include professional competence assurance system, profession license, qualification assurance systems engineering profession.

4. ANALYSES AND DISCUSSIONS
The implementation of professional certification in terms of the five (5) aspects : [13]
1. Accreditation of Universities Program
2. Engineers Professional Program
3. Registration Engineers
4. Professional Engineers
5. Continuing Professional Development

4.1 Accreditation of Universities Program
To be an engineer shall meet the qualification standards from the Department of Higher Education agreed by the Minister and the Board of Engineers, so that the Universities program must first be accredited.

Board of Engineers has a duty to ensure that the quality of the courses may be equipped with a Engineers Professional Program achieve minimum standards comparable with the global practice. The purpose of accreditation is to ensure that graduates of the course meets the minimum academic requirements for registration as a competency.

4.2 Engineers Professional Program
Engineers Professional Program is a program of universities after the degree program to form the engineering competence. [14] Bachelor of higher education programs need to be equipped with the education profession to establish engineering competence through the Engineers Professional Program. Profession program lasts for one year, carried out by the Universities Program that has been accredited by an accreditation body formed by the Board of Engineers dimensional profession. Someone who had graduated from universities that have accredited, can immediately follow the professional education program as a continuation of higher education programs.
Engineers Professional Program can also be organized through Continuing Professional Development mechanisms in the form of work experience under the supervision of a minimum of 2 years. This Continuing Professional Development can be done for university graduates who have not been accredited, or for a long time accredited university graduates who do not follow professional education program but have enough work experience so that they can directly apply his experience. Work experience should be acquired for at least one year in Indonesia with the type of work experience include: [15]

a. During a period of not less than 12 months (in aggregate) in the design office.

b. During a period of not less than 12 months (in aggregate) under the supervision of the work at the project site or location of an investigation.

c. At the end of work experience, submit written evidence in the form of a portfolio, including details and descriptions of work experience to PII.

Someone who has met the Standards Engineers Professional Program, either through professional programs and through the mechanism of recognition of learning the past, as well as pass Engineers Professional Program entitled to a certificate of professional engineers and registered by PII, thus earned the title professional engineer (Ir.). Listed in front of his name.

4.3 Registration Engineers

Every engineer who will perform the engineering practice in Indonesia must have the Engineers Registration Certificate, obtained after having Engineer Certificate of Competency. Certificate of Competence Engineering obtained after graduating Competency Test conducted professional certification agency [10].

Competency test was conducted to test the applicant's ability to apply knowledge and experience in the practice of engineering, and knowledge of setting and regulating the practice of engineering for the profession in question. Requirements for the competency test is a graduate of the Engineers Professional Program.

4.4 Professional Engineers

To be able to practice the profession with social responsibility, one can enroll a Professional Engineer to PII. To register a Professional Engineer, someone must first pass of Competency Test conducted specifically for candidates for Professional Engineers. The requirement to take the exam is to have a work experience for a minimum of 4 years starting from obtaining Engineers Registration Certificate. [15] Work experience is evidenced by submitting written evidence in the form of a portfolio, which consists of details and descriptions of work experience. PII carry out the registration for and on behalf of or under the coordination of the Board of Engineers. Competency Test conducted by professional certification institution that is USTK transferred to the Board of Engineers of LPJK coordination. Engineers Board formed a committee to formulate the contents and establish policies Competency Test System for Professional Engineers.

4.5 Continuing Professional Development

After receiving Engineers Registration Certificate, the license must be renewed every 5 years in order to continue the practice of engineering. Before you can renew the license, one of the requirements that must be taken is to complete an average of 50 hours Continuing Professional Development per year for 5 years. Board of Engineers make a committee that handles Continuing Professional Development and establish Continuing Professional Development Standards. Challenges to be faced is the absence of regulations governing the Continuing Professional Development.

5. CONCLUSION

Results of the study the role of universities in the engineering profession, particularly in engineer certification, such as:

1. Certification as a means of quality assurance for the professionalism of an engineer
2. Universities acts forming the basis of competence engineer by education degree program.
3. Universities plays a role in the engineering profession program, which is a program of universities after the degree program to form the engineering competence.

4. Referring to the best practice, the registration of experts should be the responsibility of the Board of Engineers. PII only carry out administrative functions that implement the registration for and on behalf of or under the coordination of the Board of Engineers.

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REFERENCES


