CHALLENGES CONFRONTING THE PROFESSIONAL PERSONALITY OF THE CIVIL ENGINEER IN SUDAN

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مُسْـتَخْـلَـص

صناعة التشييد تعتبر من المهن الهامة من حيث مخرجاتها ومنتجاتها ويأتي دور المهندس المدني كلاعب أساسي في مكونات هذه الصناعة.
حتى يقوم المهندس المدني بدوره كاملاً لا بد أن تكون لديه مهارات وصفات مهنية تمكنه من أداء المهام الموكلة إليه.
اهتمت هذه الورقة بالتحديات التي تواجه الشخصية المهنية للمهندس المدني في السودان وذلك من خلال الملاحظات حول جوانب القصور في الممارسة المهنية. اعتمدت الورقة على إطار نظري في المجال وتم جمع بيانات من واقع الممارسة حول تلك التحديات وبعد تحليلها وتفسير النتائج خلصت الورقة إلى أن الشخصية المهنية للمهندس المدني في السودان تواجه العديد من التحديات من حيث نقص المهارات والمعرفة واقترحت بعض الحلول كتوصيات للتقليل من أثر تلك التحديات وجوانب القصور فيما يتعلق بالمناهج التعليمية و التدريب و التدرج المهني و الوظيفي.

ABSTRACT

The construction industry is considered as one of the important industries regarding their outputs and products. The civil engineer in this industry plays key roles as a team leader. In order to achieve his/her duties the civil engineer should have some professional skills & characteristics to enable doing his/her jobs.
This paper addressed the challenges confronting the professional personality of the civil engineer in Sudan regarding the observations about shortcomings in performance.
A theoretical frame was established in the mentioned topic and data was compiled using a formal questionnaire. The paper proved that the professional personality of the civil engineer in Sudan suffers lack in skills and knowledge where some recommendations were issued regarding educational syllabus, training and professional degrees in order to mitigate the impact of such shortcomings.

Keywords: *Skills, Characteristics, Challenges, Professional Personality,*

1 Introduction

Civil engineering as an area within engineering sciences is considered to be of paramount importance, in particular in the developing countries. The reasons behind this classification stem from the continuous demand for the services and products created by this profession.

In Sudan, the influence of civil engineering represented in the construction industry is so clear and could be observed when studying previous growth of the domestic product profile. The share of construction industry in the GDP in the year 2016 was reported as 4.8% compared to 3.2 in the year 2008 while most of other economic sectors showed a decrease in the average (domestic authorities); this constitutes a real indication of the importance of this industry.

The concern of civil engineering could be observed clearly when talking about infrastructure projects, real estate investments and superstructure projects. The progress of countries is measured against the existence of such projects which reflects the actual development of economic prosperity and people's well-being.

Because of the strategic roles performed by this industry, developed countries always exert efforts to encourage the industry to boom.

Human resource is one of the key resources serving the industry where team work policy is dominating the system of operations. The civil engineer plays pivotal roles in managing and administrating situations throughout the whole project lifecycle. The success of the civil engineer in such missions, as a main project leader in most situations, requires possession of particular characteristics to strengthen his/her personality.

The term Personality is referred to individual differences in characteristic patterns of thinking, feeling and behaving. The study of personality focuses on personality traits are distinguishing qualities or characteristics that are the embodiment of an individual's. They are your habitual patterns of behavior, temperament and emotion (Tom Denham, 2014).

Two broad areas which are the understanding of individual differences in particular personality characteristics, such as sociability or irritability and the understanding of how various parts of a person come together as a whole.

Skills are the learned capacity to carry out specific tasks. They are competences or talents to do things. These proficiencies can include critical thinking, manual, negotiation, outdoor, presentation, or technological. Typically, skills are special abilities that are acquirable through training and experience.

The building block of successful career development is comprised of four components: skills, values, interests and personality traits.

This paper addresses the roles of the civil engineer in Sudan compared with the actual capabilities and skills commonly exist in his/her professional personality.

2 Objectives

1. Assess the findings of a previous study stating that the performance and competitively of the local engineer is only 55% of the international standards (Ajban, 2012).

2. To identify areas of deficiency aiming to establish a reform plan for local modeling.

3 Scope

The paper emphasizes the current situation of civil engineering in Sudan and the carrier of civil engineers in the light of the changing environment and continuously developing technologies. The future requirements and expectations that could form the targeted personality of the civil engineer are considered vital.

4 The Main Question

Regarding the scope of the research and observations from local practice the following questions are usually arisen: -

1. Is the professional personality of the civil engineer in Sudan suffering any deficiencies compared to other international carriers?

2. Is the problem stems from educational and knowledge issues?

3. Are there any reasons other than technical circumstances being behind these deficiencies?

4. Are the available training programs considered to be adequate to bridge gaps and professional deficiencies?

5. Is the character and personality of the local engineer enables him/her to play the assumed roles and responsibilities?

6. Is it essential for the engineer to have other skills?

5 Methodology

To achieve the objectives of this paper, assessment shall be conducted by elaborating the roles of civil engineer and the potential challenges in the numerously changing

environment focusing on skills and capabilities that form the personality of the civil Engineer. The following methodology was adopted:

1. A theoretical framework from relevant references was prepared where key terms of the topic were thorghouly defined and discussed. Data was compiled from the field of construction industry in

Sudan, where, a formal questionnaire was adopted as a research tool.

2. The population of this study comprises the group of civil engineers registered at the Sudanese Engineering Council, where a systematic random sample was selected to give their responses.
3. The data was analyzed using SPSS soft program and the results were discussed and interpreted.

6 Theoretical Review

6.1 Related disciplines:

As the work of civil engineers is a function of the economic, political, and social environment that affects infrastructure and development decisions, professional engineers require an ability to make intellectual judgments that encompass human, societal, and technical values. Societal concerns need to be reflected in the deliverables of civil engineering practice, which include infrastructure that are underpinnings of human civilization. Burrell and Devkota (2012) discussed the professional development for civil engineers and the role of humanities and social sciences (H&SS) in a civil engineer's education and professional development.

(Nguyen 1998) stated that the most essential generic attributes of an engineer include technical knowledge and skills. Learning other areas of knowledge is secondary to the requirement to produce engineering graduates with technical competency, analytical capability and critical thinking skills. Yet most undergraduate civil engineering programs allow a few H&SS courses to be taken as electives. Incorporation of humanities and sciences in an engineering curriculum helps in developing communication, analytical and leadership skills, and in generating concern for society and the environment (Ahuja 2014).

Economics is the social science concerned with the processes that govern the production, distribution, and consumption of goods and services in an exchange economy. Bennett (2005) claims that engineering solutions are dependent upon market forces and market prices, and therefore states that engineers must learn economics, especially micro-economics which is about the determination of market value and the setting of prices. (Soodet al, 2012) considers courses in finance and economics as enabling effective participation in society.

One of the important aspects of the civil engineer's knowledge is the legal aspects such as knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules and the democratic political process.

6.2 Skills required for Civil Engineer:

From the international records of the construction industry the following skills are essential to possessed by the engineer:

A. Reading & Comprehension.

B. Critical Thinking.

C. Writing & Speaking

D. Monitoring & Coordination

E. Active Learning.

F. Judgment and Decision Making.

G. Negotiation & Instructing.

H. Management of Personnel Resources - Motivating, developing, and directing people.

I. Persuasion.

6.3 Important Styles and Personality:

The civil engineer must have a convincing and influential personality, So as to assist in the implementation of the project strategy among employees and customers. There are many styles considered to be helpful to enhance the civil engineer to build a model personality such as:

A. Dependability.

B. Cooperation & Initiation.

C. Leadership & Integrity.

D. Innovation & Attention to Details.

E. Analytical Thinking.

F. Adaptability/Flexibility.

G. Persistence.

H. Stress Tolerance.

I. Self-Control & Independence.

J. Achievement/Effort.

K. Social Orientation & Concern for Others

7 Data Compilation

Primary data was compiled using a questionnaire as a tool.

7.1 Design of the questionnaire

The questionnaire was designed to deliver data related to the raised questions and problem. The configuration of the document covered the key disciplines related to civil engineering activities namely, fiscal, administrative & legal issues. The skills and capabilities of the local civil engineer were always checked throughout the questionnaire sections.

7.2 Distribution of the questionnaire

The population of this study comprises the group of civil engineers working in the different fields such as construction or consultancy in both public and private sectors.

A sample of 80 engineers was selected in a systematic random way in a manner to represent the population. The

returned copies were 69 and which constitutes 86% of the sample.

8 Data Analysis and Interpretation of Results

Having the data collected by the questionnaire, analysis was performed using SPSS software program and the following discussion and interpretation was conducted:

Both, public & private sectors were represented in this study although the dominant of the samples being from the private sector. All disciplines and departments of civil engineering were represented in this study.

When asking the audiences about their annual income, the feedback was astonishing as about Missing number here???% refused to answer and 80% 0f them have salaries not more than 9000 SDG per month which could not make them work in full hearts.

In asking two correlated questions concerning their residence and locations of works, most of them are suffering problems of transportation, time management and financial difficulties. Transportation issues constitute real problems to the employees as 43% depend on public transportation while only 45% have their own means of transportation.

Registration of members at the Engineering Council is always an issue under discussion as most of the engineers have no strong intentions to do so for different reasons. 74% are registered as graduated engineers which is the first threshold of the profession. This necessitates an overall revision of measures dealing with time limits, experience and other desired skills.

When asking the audience about training programs that they had attended throughout their carrier, about 75% answered by having about 6 courses. The key question is about the nature and topics of these courses and their relativeness to the engineer scope of work. Professional revision is needed where a suggestion of establishing a center for training and qualifying civil engineers with well-defined roles might assist in mitigating negative impacts.

The turnover rate of labors is a symptom of poor work environment in both public & private sectors. More than 90% of the samples have previous engagement in about 6 entities before getting their current jobs. This situation is considered as a negative factor where more efforts are needed to put things in order.

In order to work efficiently, the engineer should have some logistic requirements such as technical tools which should be facilitated by the entity, 50% of the samples declare that these requirements are sometimes available being the cause of deficiencies in achieving good results.

57.1% of the samples believe that they are not fully delegated to do their works without intervention of top management and their direct managers. This situation is absolutely odd and reflects the lack of administrative knowledge among entities. This should be revised and corrected in order to support trust and self-dependence within employees.

57.6% of the audience, unfortunately, stated that no scientific references or laboratory methods are followed in performing works in their entities; this evidence interprets the current state of the profession deterioration.

When asking about the documentation of tests records, 60% of the audience answered by always which constitutes a good sign of development. from an overall point of view the remaining 40% is not minor enough to be omitted so it important to deal with problems concerning the documentation process..

The use of computer programs is very essential in engineering works. The awareness and skills of which should be taken as an important measure when evaluating engineers. The percentage of those insured their usage of computer programs in their engineering works is 74% .it is good indication but the ambition should be raised to establish full electronic construction industry.

71.4% agree that they are involved in estimating and budgeting works which is good to extend knowledge abut other disciplines.

The engineering syllabus in Sudan conservatively deals with subjects other than engineering and technical issues e.g. administration, finance and legal aspects. The importance of these disciplines will be discovered latter in practice. The engineer has a key pole in the tendering process, when asking about this .the feedback is only 42.9% are always involved in this process. This result reflects the gap need to be bridge in this area.

45.7% are always involved in financial negotiations with customers and labors. Regarding negotiations in contracting process only 31.4% assume they have good skills. Negotiation skills are so important to be considered in the engineer carrier.

When asking about intentions in learning about fiscal, administrative and legal issues 79.4% insure their have high intentions to learn. Construction industry in Sudan does not assist its stakeholders to achieve their professional intentions because of many considerations so it is critical to let things go as usual. Intensive policies and legislations should be established to help civil engineers to have knowledge in such areas.

Self-confidence is as a backbone for the engineer, without having this characteristic he/she cannot be able to confront any risks or pitfalls. Self-confidence has strong link with skills regarding cooperation with others

When asking about this issue the responses of the audiences reflect contradicting indicators where 17.6% answered that they take their decisions without referring to the managers and 84.9% stated by eventual interventions while 97% recognized their use of expert's advices.

One of the chronic problems facing engineers is when they are managed by non-technical persons where communicative environment might not be eligible to perform technical works safely, 43.8% of the samples suffer such problem.

Consequences of legal issues now a day have strong impacts on project management in terms of conflicts and disputes between the project parties. Asking about negotiation skills in contract forming and selection only 31.4% declare their ability to perform such tasks.it is very important to encourage training on these skills.

Reading skills are the road to positive thinking. Foreign, besides, tongue languages in both writing and speaking are very important to the engineer to work perfectly.

Unfortunately, only 28.6% believe that they are good in English language regarding correspondences and contract writing.48.6% are active in gaining different types of knowledge. The skills concerning reports writing and taking meetings' minuets are important only 42.9% of the audiences have such skills.

Listening skills and tact in speech are essential to be acquired by the engineer. The percentages of having such skills are 81.8% and 65.7% respectively.

Problem solving skills are of high priority in reforming the overall situation. Engineering projects are always faced by complicated challenges and problems which need expert engineers to solve or mitigate their impact.48.6% of the samples stated that they have high ability to solve such situation. More attention should be performed to qualify engineers in this area.

9 Conclusion

The study proved that professional personality of the civil engineer in Sudan is suffering of many deficiencies regarding to their poor skills in many important areas of their carriers. This problem is basically stems from the nature of the education and training programs which need to be revised to suit current and future requirements.

10 Recommendations

The basic recommendations are as follows:

1. Review of the admission system for engineering colleges by adding more professional skills measures in the light of the academic weighting.

2. Replacing the current university's requirements subjects by others in management, economy, law and other relative topics.

3. The current subjects regarding university's requirements are to be considered in the early pre-university education stages such as primary schools.

4. Review existing training methods by accredited experts and apply mandatory training systems.

5. Methods of awarding professional degrees and certificates by engineering entities should be revised to include measures reflecting the physical capabilities, skills and tacit knowledge of the engineer.

6. Establishment of a national training center for engineers caring for theoretical and practical issues and to be responsible for issuing certificates and accreditations.

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