



Application of “TQM” and “TSM” in UAE Construction Safety Management

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Outline

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- Problem statement
- Research Methodology
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Introduction

- It is not uncommon for construction companies to underestimate the need of a safety plan prior to starting a project
- Planning is critical for construction safety and setting a goal as proactive approach
- TQM is a management philosophy and its goal is to align an organization's product and service quality with customer satisfaction through proper planning
- TSM; on the other hand; aims to prevent accidents or near misses by planning for safety and providing clear lines for responsibilities
- TSM and TQM are very similar; as the focus on TSM result in several benefits; chief amongst them being the lower cost of services and a better understanding about TSM utilization

Problem statement

- Numerous hazards at a construction site; failures of tower cranes; scaffolding and temporary formwork result in the highest number of deaths and injuries.
- Many bodies involved; failures often result in consultants; contractors; engineers and site managers incriminating each other without anyone taking full responsibility for the issue.

Research Methodology

- The survey in this research was designed based on questions covering the Deming's fourteen points on (TQM) and Peterson's theory on (TSM) concept
- The information gathered from these points helped define the targeted respondents' objectives and goals of the study
- Implementing some of the Deming's fourteen points augments the quality of the work environment and provides a safer work area in any construction projects

Research Methodology

- Results include rating average; standard deviation and coefficient of variance. The survey has 7 questions designed to show rating scale of 5 (strongly agree); 4 (agree); 3 (neither agree nor disagree); 2 (disagree) and 1 (strongly disagree)
- Coefficient of Variance = Standard Deviation/Rating Average
- The questionnaire was distributed to more than 100 engineers in different positions. A Total of 61 responses were received

Results and Discussion

- Other respondents were from 10 project managers (16.4%); 8 consultants (13.1%); 7 engineers from Oil and gas industry (11.5%); 6 safety engineers (9.8%); and 5 contractors (8.2%). Finally; there were 3 “other” responses (4.9%) from other positions in the construction field.
- The first question asked in the survey was to specify the position of the respondents. As illustrated in the Figure 2; the most respondents were from 11 project engineers (18%) and 11 site engineers (18%).

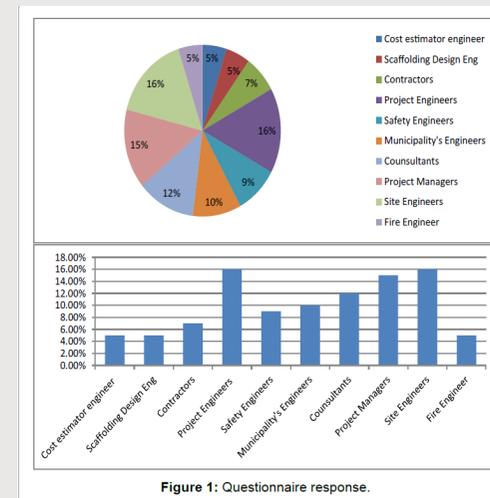


Figure 1: Questionnaire response.

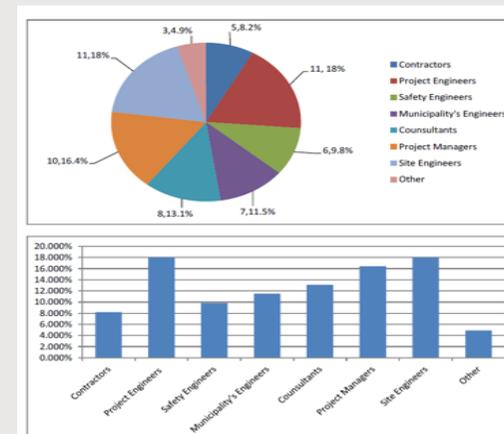
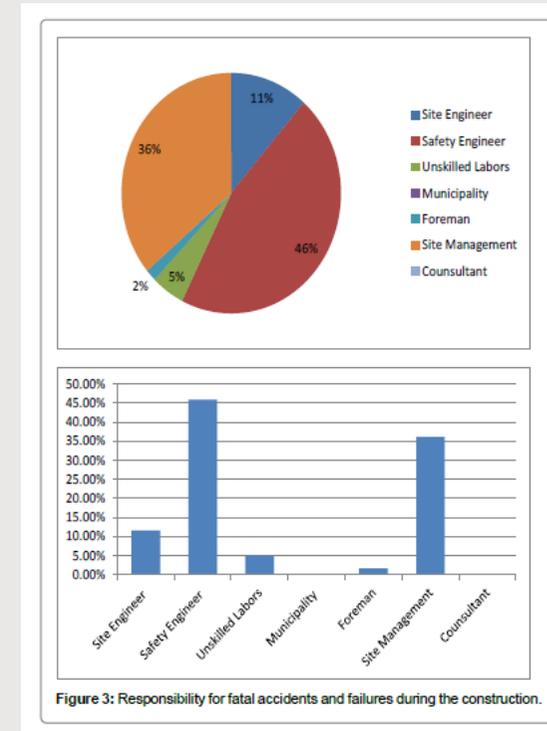


Figure 2: Position of respondents.

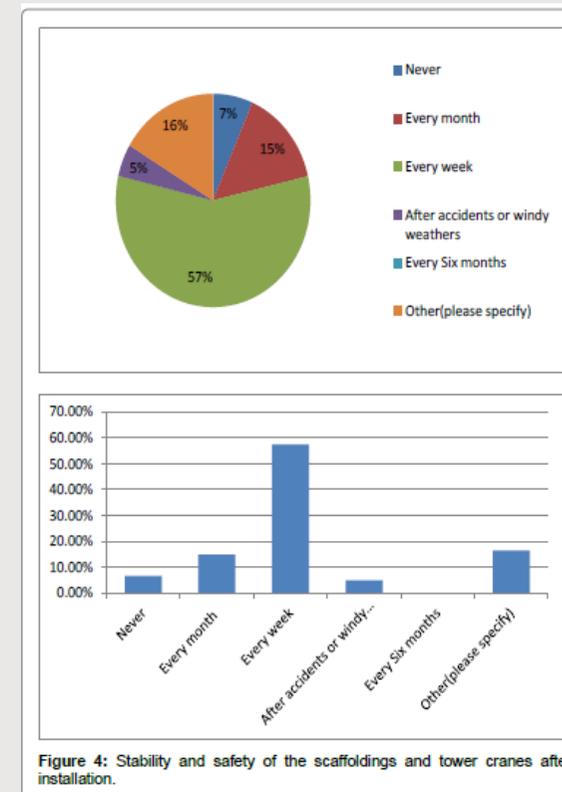
Results and Discussion

- The second question pertained to the responsibility for fatal accidents and failures during the construction stage. Figure 3 illustrates how 28 respondents (45.9%) admitted that the safety engineer is responsible for fatal accident and failures. 22 respondents (36.1%) opined that the site management is responsible. 7 respondents (11.5%) said that the site engineer is responsible. 3 respondents (4.9%) believed that unskilled labor are responsible. Finally; only one respondent (1.6%) said that the foreman is responsible for any fatal accidents on site.



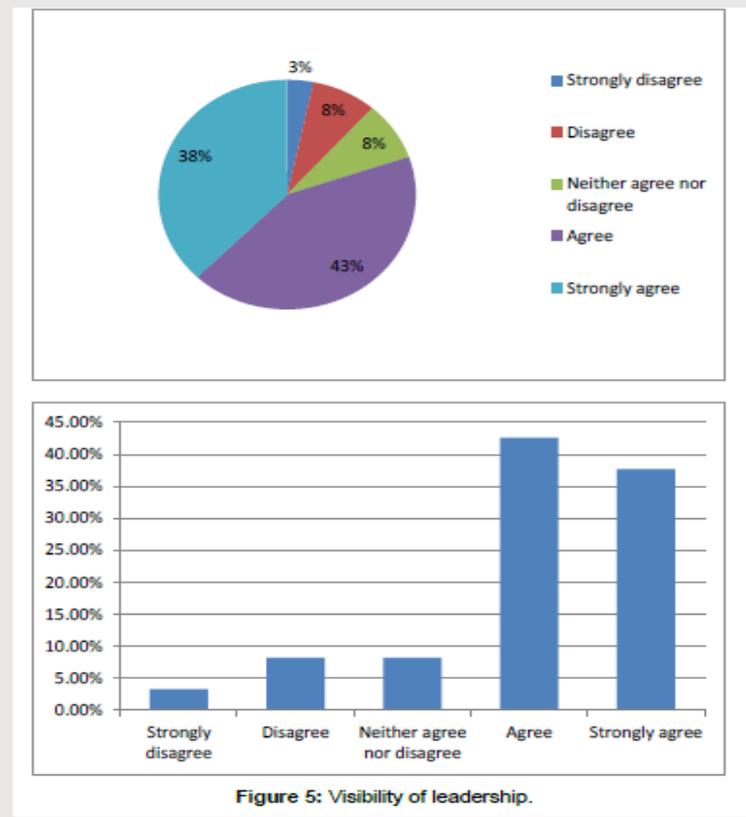
Results and Discussion

- The third question of the survey pertains to inspecting the stability and safety of the scaffoldings and tower cranes after installation. As illustrated in Figure 4; 57.4% of the respondents check the stability of the scaffolds and tower cranes every week; 14.8% check every month; 6.6% never check; and 4.9% check it only after accidents



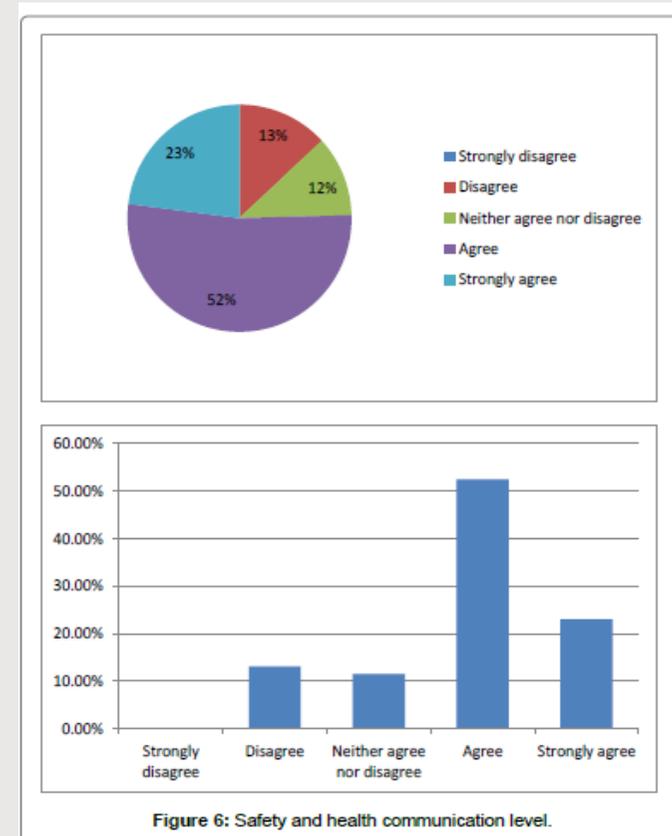
Results and Discussion

- Peterson's first point was covered in the fourth question where it asks about the visibility of leadership in the construction activities that help to promote safety culture between employees and contractors in the construction site. It is evident from Figure 5 that 26 respondents (42.6%) agree; 23 respondents (37.7%) strongly agree; while 5 respondents (8.2%) disagree; 2 respondents (3.3%) strongly disagree and lastly; 5 respondents (8.2%) neither agree nor disagree. The rating average for this question is 4.03; with most respondents agreeing that visibility and activity of leadership in different activities in their sites results in a safer work environment. Standard deviation was calculated to be 1.048 with a coefficient of variance of 0.260.



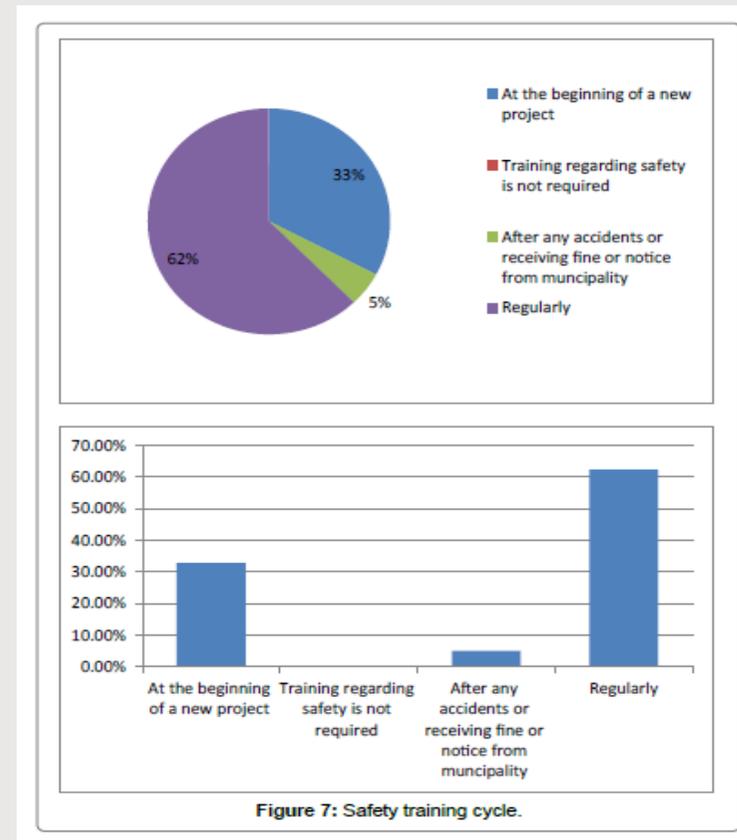
Results and Discussion

- The fifth question is about the safety and health communication level between the management and end-users in the organization. This question refers to Peterson's fourth point; which holds that communication about safety and health between management and workers should occur regularly. As can be discerned from Figure 6; 32 respondents (52.5%) agree; 14 respondents (23%) strongly agree; 8 respondents (13.1%) disagree; while 7 respondents (11.5%) neither agree nor disagree. Interestingly; none of the respondents strongly disagree. The rating average for this question is 3.85; which means that almost of the respondents agree that communication about safety and health between management and workers is carried out regularly in their organizations. Standard deviation was calculated as 0.928 with the coefficient of variance being 0.241.



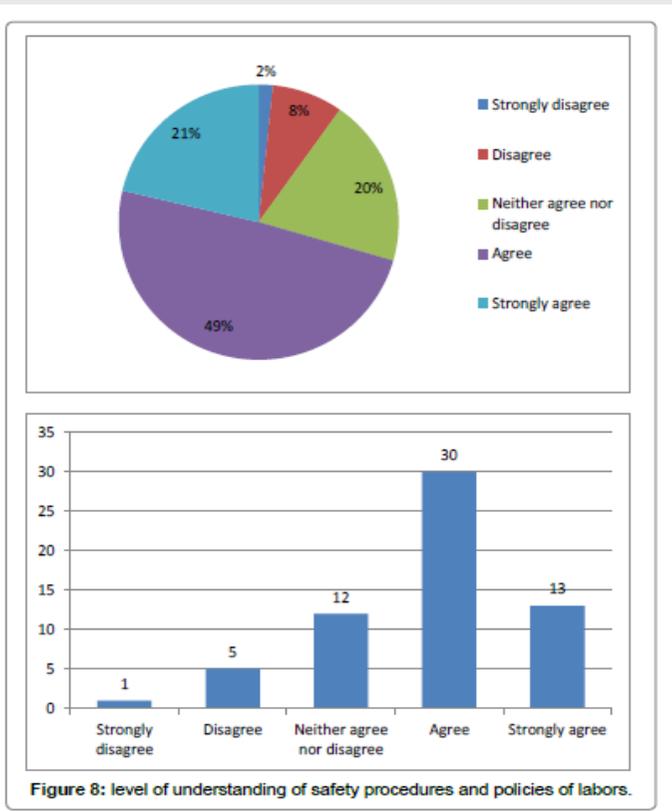
Results and Discussion

- The relationship between safety performance and professional competence was covered in Deming's sixth and Peterson's seventh point; respectively; maintaining that construction related accidents often occur due to a lack of frequent safety training. This leads to a decline in the competence level of labors' professional skills. As can be seen in Figure 7; 62.3% of respondents train their labor regularly; 32.8% do so at the beginning of a project; and finally 4.9% do it only after an accident or incurring municipality fines.



Results and Discussion

- Lastly; question 7 explored the level of understanding of safety procedures and policies of the end-users in the construction site. In general; management should make sure that the labors possess a clear and thorough understanding of the required safety and health policies according to Peterson's ninth point. From Figure 8; it is evident that 30 respondents (49.2%) agree; 13 respondents (21.3%) strongly agree; 12 respondents (19.7%) neither agree nor disagree; 5 respondents (8.2%) disagree; and finally only 1 respondent (1.6%) strongly disagreed. The rating average for this question is 3.80; meaning that almost all respondents acknowledge explaining safety and health policies to all labor so as to avoid fatal accidents and injuries. Standard deviation was calculated to be 0.928; with a coefficient of variance of 0.244.



Conclusion

- Based on this study; it can be argued that virtually all personnel avoid responsibility for accidents and failures; opting instead to blame others
- Engineers try to blame each other and none of them will accept that it was his/her mistake. As such; there should be a clear statement identifying the responsibility of all engineers/managers involved in the project
- In addition; this would make the work site safer because accountability makes the staff thorough and responsible when undertaking an assigned task
- A major point according to Peterson's theory on Total Safety Management (TSM) is to provide and use Personal Protective Equipment (PPE).
- Results of the survey reveal that most of the respondents who filled the survey were implementing all safety and health procedures to avoid accidents.



THANK YOU