

# A review on safety practitioners' competency profiles from the employers' perspective

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**Abstract.** To ensure fewer accidents and injuries to workers on construction sites, it is essential to review the recruitment practices, job duties and relevant study areas of safety practitioners, named as safety officers in Hong Kong. Therefore, the current study aims to assess the current recruitment requirements, job duties and study areas relevant to junior safety practitioners in different organizations to possibly review and improve the curriculum for the Environmental and Occupational Safety and Health programmes. A questionnaire was designed and distributed to senior personnel in organizations recruiting safety practitioners for the development, implementation and maintenance of a safety management system in their companies. A total of 36 companies participated in the study, and the data were analysed using score frequency and mean score. The results reveal the followings: (1) A recruitment requirement of organizations for safety-related posts is a degree in occupational health and safety or a certificate and/or diploma in occupational health and safety. (2) The most common junior safety officers' job duties include conducting safety inspections in the workplace; preparing a safety inspection reports; assisting in safety training and education programmes; and assisting in executing a safety management system and audits. (3) The most relevant taught subjects to junior safety officers' job duties include "Occupational Safety and Health Legislation", "Safety Management and Audit" and "Construction Safety". Based on the outcome of the study, various recommendations are available for policy makers and educational institutions.

**Keywords:** Employers, Occupational health and safety, competency, recruitment.

## INTRODUCTION

The twenty-first century has witnessed great advancement in scientific and technological capabilities to cope with the increasing complexities in the construction sector (Gann and Salter, 2000). This situation exposes construction workers, professionals and technicians to various job-related hazards while working on construction sites without appropriate equipment and working support (Leung *et al.*, 2016; Konijn *et al.*, 2018). However, there has been a decline in accident rates and occupational injuries in the construction industry in Hong Kong from 28% in 1994 to 11% in 2015 (Lingard and Rowlinson, 1997; Legislative

Council Secretariat, 2017). The reduction in the number of accidents on construction sites has been attributed to a self-regulatory approach for developing, implementing and maintaining safety management systems as well as a framework for safety performance evaluation (Aksorn and Hadikusumo, 2008; Ng *et al.*, 2005). Despite the downward trend in the number of fatalities on construction sites, the construction industry still accounted for the second most occupational injuries in Hong Kong in 2015 (Legislative Council Secretariat, 2017).

To sustain the downward trend in casualties of

construction accidents and possibly improve the safety performance of construction projects, there is a need to employ the services of safety officers (Lu *et al.*, 2016). Therefore, the Hong Kong Polytechnic University proposed a BSc (Hons) in Environmental and Occupational Safety and Health (EOSH) programme in 2005. This programme aims to train competent graduates in two contemporary areas (i.e., environmental health, and occupational safety and health) to meet the demand of the industry, respond to the impact of increasing occupational safety and health problems as well as environmental legislation on the working environment of organizations in Hong Kong (Yiu and Tsang, 2018). Similar to other occupational safety and health programmes, this EOSH programme ensures that graduates can fulfil the academic requirements for registration as registered safety officers and environmental officers in Hong Kong; and membership requirements from the Institute of Occupational Safety and Health in the United Kingdom. Most graduates are also engaged in a variety of career opportunities in the public sector, construction companies, non-governmental organizations, and private agencies in Hong Kong.

The quality, competitiveness and professional competence of the EOSH programme should be a top priority for it to remain pivotal in the dynamic challenges of safety in the industry (Tracey *et al.*, 1995; Duijm *et al.*, 2008). This goal requires consistent review of the EOSH programmes to meet up with the demands of organizational needs and the construction industry at large. With this consideration, it is essential to constantly benchmark the EOSH programme to meet the uniqueness of professional needs and recommend possible revision to its content to ensure professional competence and relevance of EOSH graduates. The current research thus seeks to assess the recruitment requirements, job duties and study areas relevant to junior safety officers by organizations to possibly review and improve the curriculum for the EOSH programme.

### **Recruitment requirements of junior safety officers**

The first decision in recruitment involves paying close attention to the skills, key attributes and competencies required for the specific context and anticipated role of the employees (Bebbington *et al.*, 2017). To ensure that qualified professionals with the right skills and competencies become part of the company, organizations set diverse criteria and make considerations depending on the objectives, goals and priorities of the establishment. Safety is a major concern because of the great losses to individuals, organizations and society arising from fatalities and injuries (Zou and Zhang, 2009); therefore, competent individuals are required to handle the safety affairs of the organization. Junior safety officers engage in supporting the administration and enforcement

of the safety acts and occupation health and safety regulation, facilitating and evaluating safety awareness programmes, and fostering the vision, mission and values of the organization (Daly, 2015). Consequently, there is the need for excellent written and verbal communication skills in the languages used in the city (e.g., Cantonese and English in Hong Kong).

However, for safety officers to be employed by organizations, they must possess certain academic/educational requirements. For instance, a degree/diploma qualification with six months previous construction experience as well as proficiency in completing site inspections and audits are required from junior safety officer job applicants in Dublin, South Africa (Brightpath Recruitment, 2018). In the United Kingdom, those aspiring to become safety officers are expected to have an award in health and safety in the workplace, a certificate in occupational safety and health, a national general certificate in occupational health and safety, and a qualification approved by the Institute of Occupational Safety and Health (Hotcourses Limited, 2018). A recognized certificate, diploma or higher diploma in occupation health and safety or a recognized certificate in construction safety is required from safety officers in Hong Kong (Hong Kong e-Legislation, 2004). However, some technical universities have health and safety engineering as part of their engineering and management courses with graduate students possessing the academic knowledge for specific expertise in the classroom and practical skills during internships with companies (Wybo and Wassenhove, 2016).

### **Relevant subject areas for job duties of junior safety officers**

Construction safety is a vital study area because of the high risk and number of injuries and fatalities in the industry in recent years (Famakin and Fawehinmi, 2012). The process of ensuring construction safety requires extensive training and safety awareness, efficient safety regulations and legislation, and supportive top management (Awwad *et al.*, 2016; Famakin *et al.*, 2020). To effectively handle the job duties required of junior safety officers, relevant subject areas are essential for enhancing their knowledge. Yiu and Tsang (2018) identified 15 important occupational safety and health subject areas by benchmarking all existing occupational safety and health academic programmes. These subject areas include (1) accident prevention and analysis, (2) construction safety, (3) ergonomics and human factors, (4) epidemiology, (5) fire safety management and legislation, (6) health and safety economics, (7) human health risk management, (8) occupational health and hygiene, (9) occupational safety and health legislation; (10) pathophysiology, (11) psychology and human performance, (12) mathematics for occupational safety

and health, (13) safety management and audit, (14) safety technology, and (15) toxicology. Out of these 15 occupational safety and health subject areas, 'construction safety', 'occupational safety and health legislation', 'safety management and audit', 'safety technology', 'accident prevention and analysis', and 'mathematics for occupational safety and health' are subject areas included in the current EOSH programme. These subjects were found important for EOSH graduates for effective handling safety and health issues in the workplace and highly relevant to the needs and registered safety officers' professional standards (Occupational Safety and Health Training Centre 2012).

## RESEARCH METHODOLOGY

To evaluate the market needs of EOSH graduates, a questionnaire survey was designed and distributed to companies expected to recruit safety practitioners in their workplace. The aim of the survey was to collect information about the safety requirements and job-related duties of safety practitioners in Hong Kong. The questionnaire was designed in three sections: (1) background information of the company; (2) recruitment practice and requirements of the company; and (3) relevance of job duties and subjects taught for needs of the workplace. 12 recruitment requirements as well as 10 job duties were identified, while 15 subject areas of occupational safety and health (OSH) were also adopted in this study. In the preliminary question section, the respondents were requested to indicate whether they offer safety-related jobs or recruit junior safety posts in their company. If the answer to either of the two questions was negative (i.e., no safety-related jobs or do not recruit junior safety posts), the responding company was not expected to continue answering the questions. However, if the respondents reported a positive response to either of the two questions, then they were expected to mark the appropriate recruitment requirements and job duties applicable to their organization, while the subject areas of OSH were measured using a Likert scale score ranging from 1 (highly related) to 5 (totally unrelated).

Before the distribution of the questionnaires, companies that could possibly recruit safety practitioners for the development, implementation and maintenance of a safety management system in the workplace were identified. The criteria for the inclusion of the company for participating in the study include: (1) organizations with twenty (20) or more employees expected to employ one full-time safety supervisor and (2) organizations with 100 or more employees expected to recruit one safety officer. In total, 72 companies were identified that fit the criteria for participation in the study. A questionnaire survey was sent to the senior personnel in these selected organizations for responding to the questions. 36 companies returned the completed survey, representing

50% of the study population. Of the 36 companies, 2.8% of the respondents had between 20 and 50 employees; 11.1% had between 100 and 199 employees; and 86.1% had 200 or more employees in their organization. In addition, 97.2% of the respondents offer safety-related jobs, while one of the companies (2.8%) did not have any project and did not recruit any safety personnel or junior safety practitioners. The company was, therefore, excluded from any further analysis to be conducted. For the number of safety-related jobs in the responding companies, 31.4% recruited between 1 and 5 safety personnel; 14.3% recruited between 6 and 10 safety personnel; 11.4% recruited between 11 and 20 safety personnel; 14.3% recruited between 21 and 30 safety personnel; and 28.6% recruited more than 30 safety personnel. Of the 35 companies recruiting for safety-related jobs, five (14.3%) of them do not recruit junior safety practitioners. Therefore, the remaining 30 responding companies were used for further analysis required in achieving the objectives of the study.

The data were analysed using the Statistical Package for Social Sciences version 22 software. First, frequency tables were used for representing the recruitment requirements and job duties of junior safety-related posts in the different organization. Second, mean item score was used for rating the relevance of different subject areas in the workplace related to job duties of safety practitioners.

## RESULTS

### Recruitment practice and job duties of safety-related posts

A descriptive analysis was conducted to examine the diverse requirements for recruitment of junior safety-related jobs in different organizations, as well as the job duties of junior safety-related posts in respective organizations. The results show that a degree in occupational health and safety is the highest requirement, which is requested by 70% of the organizations involved in the survey, while 63.3% of the responding organizations would accommodate a certificate/diploma in occupational health and safety. Moreover, familiarity with safety ordinances and regulations (60%), and a valid green card (i.e., a mandatory safety training certificate) (50%) completes the list of recruitment requirements important to the majority of the responding organizations. The results also show that knowledge of ISO 9001 (6.7%), others (i.e., Master's degree with laboratory experience, degree in safety management or construction related subjects, good educational background and keen interest in being a registered safety officer) and a valid Hong Kong driving license, which both rated as 13.3%, are not considered as an important recruitment requirement for junior safety

**Table 1.** Recruitment requirements for junior safety-related posts.

Recruitment requirement	Frequency	Percentage (%)
Degree in Occupational Health & Safety	21	70.0
Certificate/Diploma in Occupational Health & Safety	19	63.3
Familiar with Safety Ordinances and Regulations	18	60.0
Valid Green Card (i.e., Mandatory Safety Training Certificate)	15	50.0
Higher Certificate/Higher Diploma in Engineering/Safety Disciplines	12	40.0
Safety Supervisor Certificate	11	36.7
First Aid Certificate	9	30.0
Knowledge on OHSAS 18001	6	20.0
Certificate of Confined Space Competent Person	5	16.7
Safety Training Certificate (e.g., Train the Trainer Certificate)	5	16.7
Valid Hong Kong Driving License	4	13.3
Knowledge on ISO 9001	2	6.7
Others	4	13.3

**Table 2.** Job duties of junior safety-related posts.

Job duties	Frequency <sup>^</sup>	Percentage (%)
Conduct safety inspections in the workplace	27	90.0
Prepare safety inspection report	27	90.0
Assist in safety training and educational programmes	27	90.0
Assist in executing safety management system and audit	27	90.0
Provide recommendations for safety improvement if necessary	25	83.3
Maintain all site safety-related records and filing	25	83.3
Rectify unsafe conditions and practices	24	80.0
Implement safety measures in the workplace	23	76.7
Conduct accident/incident/injury investigation and prepare analysis reports	23	76.7
Prepare statutory required report (Form 3A)	17	56.7
Others	3	10.0

<sup>^</sup> Higher frequency implies common job duties of junior safety practitioners.

posts (Table 1).

The responding organizations also identified the duties of junior safety-related jobs (refer to Table 2). The results reveal that several duties recurred in 90% of the organizations who responded to this study, including conducting safety inspections in the workplace; preparing a safety inspection report; assisting in safety trainings and educational programmes; and assisting in executing a safety management system and audit. On the other hand, the suggested duties by some responding organizations were the only duties not rated over 50%. The suggested duties (i.e., 'others') include environmental sampling work; display screen equipment (DSE) assessment; manual handling operations (MHO) assessment; safety promotion; and preparation of safety publications.

### Relevance of subject areas for job duties of junior safety officers

Based on the content analysis of the EOSH programmes

offered by various institutions around the world, the study identified fifteen subject areas relating to the job duties of junior safety officers which may be applicable to different organizations in Hong Kong. These subject areas were then rated according to their level of relevance to the duties of junior safety officers by organizations participating in this research. The results show that only four of the subject areas exceeded the midpoint rating in relevance to the job duties of the junior safety officers, including occupational safety and health legislation (Mean = 1.45, Std. = 0.736) and safety management and audit (Mean = 1.48, Std. = 0.574). On the other hand, pathophysiology (Mean = 3.62; Std. = 0.903), epidemiology (Mean = 3.52, Std. = 0.986), health and safety economics (Mean = 3.07, Std. = 1.067) and toxicology (Mean = 3.03, Std. = 0.906) had very low relevance to the job duties of junior safety officers (Table 3). The results indicated legislation and management practices are critical when conducting regular safety inspection and advising safety management practices at

**Table 3.** Relevance of subject areas for job duties.

<b>Subject areas of job duties</b>	<b>Mean<sup>^</sup></b>	<b>Std.</b>	<b>Rank</b>
Occupational Safety and Health Legislation	1.45	0.736	1
Safety Management and Audit	1.48	0.574	2
Construction Safety	1.55	0.870	3
Accident Prevention and Analysis	1.66	0.897	4
Safety Technology	1.83	0.759	5
Occupational Health and Hygiene	2.07	0.842	6
Fire Safety Management and Legislation	2.24	0.830	7
Human Health Risk Management	2.38	1.083	8
Ergonomics and Human Factors	2.72	1.131	9
Psychology and Human Performance	2.86	1.060	10
Mathematics for Occupational Safety & Health	2.86	0.789	11
Toxicology	3.03	0.906	12
Health and Safety Economics	3.07	1.067	13
Epidemiology	3.52	0.986	14
Pathophysiology	3.62	0.903	15

<sup>^</sup> “1” represents highly relevant while “5” represents totally irrelevant.

work.

## DISCUSSION

The requirements for recruitment of junior safety officers were examined in this study, and the results show that a degree, certificate or diploma in occupational health and safety are the most frequent academic qualifications requested by organizations for junior safety officers in Hong Kong (Hong Kong e-Legislation, 2004; Zodpey *et al.*, 2009). Perhaps, the organizations believe that courses in the specific area of interest (i.e., EOSH programmes) will focus on the specific professional knowledge and skills required by the occupational safety and health practitioner compared with a course in mechanical or other engineering fields with limited knowledge on the core of EOSH skills. In fact, the intended learning outcomes in the different courses have diverse skill sets which may not be totally suited for a safety practice. Moreover, a degree in occupation health and safety prepares the graduate with a detailed and foundational knowledge base required to build a successful career as an EOSH practitioner. On the other hand, additional degrees (i.e., a Master's degree), additional certifications (e.g., safety training certificate, first aid certificate) and knowledge of standards, such as OHSAS 18001 and ISO 9001, were not significant requirements from the organizations. Perhaps, the organizations felt that once the graduates possess a good academic qualification which provides the basic knowledge, it becomes easier to train them to fit into the goals and needs of the company. More importantly, they could also provide them with trainings in line with the roles and functions the graduates are expected to

perform within the organization.

The result of the study reveals that all the identified job duties for junior safety officers recurred in many of the organizations involved in the survey. The most common duties include conducting safety inspections in the workplace, preparing a safety inspection report, assisting in safety training and education programmes and assisting in executing a safety management system and audit (Awwad *et al.*, 2016; Loeppke *et al.*, 2015; Lutchman *et al.*, 2016; Zhang *et al.*, 2015). Although the training received by the EOSH graduate within the classroom may not be completely sufficient for a successful career as an environmental safety and health officer or an occupational health and safety officer (Wybo and Wassenhove, 2016), they are expected to have the basic theoretical knowledge from their degree coupled with some practical understanding from internships, which would form the much needed experience to carry out the activities in the different organizations. On the other hand, only few of the organizations involved in this study allowed junior safety officers to engage in environmental sampling work, display screen equipment assessment, manual handling operations management and preparation of safety publications. Perhaps, they felt that the junior officers require additional training and attendance of various continuous professional development activities before they can engage in some advanced duties for the organization. In addition, the organization may also want the junior safety officers to build considerable confidence on the job or work best with minimum supervision before engaging them in experienced activities.

The study reveals that the following subject areas were the most relevant for the job duties required from junior safety officers, including occupational safety and health

legislation, safety management and audit, and construction safety. Subject areas including pathophysiology, epidemiology and health and safety economics were less relevant to the different participating organizations. Occupational safety and health legislation addresses the importance of a safety practitioner at work. A safety practitioner always advises his/her employer in terms of interpreting legal interpretations on occupational safety and health legislation. This helps an employer to devise a practicable safe system of work based on the prescriptive regulatory approach. Safety management and audit are essential for maintaining a safe work environment in workplace since 2000s. Thorough understanding of management practices and auditing principles by safety officers is pivotal to the elimination of work risk and accident prevention (Sabharwal *et al.*, 2015), which contributes to its relevance to organizations employing junior safety officers. On the other hand, construction safety for occupational health and safety officers focuses on the construction workers' work conditions, such as working at height, lifting operation, use of electricity, machinery noise, heat stress at confined space, etc. This study area is a relevant study area for junior safety officers because it provides opportunities to identify cases of construction site injuries arising from unfavourable workplace conditions and resulting in potential injuries and property damage. Moreover, accident prevention and analysis by junior safety officers is pivotal to the key decision of resources management and cost analysis at the managerial and institutional levels. Appropriate descriptive accident analysis can help employers to forecast the direct and indirect cost spent on dealing with injuries and near-miss cases, and ensure considerable benefits from appropriate intervention (Case *et al.*, 2018; Guzman *et al.*, 2015; Rydlewska-Liszowska, 2002).

## RECOMMENDATIONS AND FURTHER RESEARCH

The study investigated the recruitment requirements, job duties and relevance of different study areas for junior safety officers among different organizations in Hong Kong. Practical recommendations are thus suggested for policy makers and educational institutions to ensure that curriculums for junior safety officers conform with the requirements of recruiting organizations. Because recruitment organizations requesting junior safety officers often require a degree or certificate in occupation safety and health, it is essential for educational institutions to consistently monitor the quality, content, competitiveness and professional competence of the EOSH programmes and review where necessary to meet the changing needs of organizations.

The study shows that the major job duties of junior safety related posts include conducting safety inspections in the workplace, preparing a safety inspection report,

assisting in safety training and education programmes and assisting in executing a safety management system and audit. Therefore, the study recommends that courses involving practical sessions could be introduced in the EOSH programme where students would be expected to visit various construction sites during teaching semester. For instance, students could visit some construction companies to familiarize themselves with the procedural approach for conducting safety inspections and writing reports. Students could also engage in training and education activities in their fourth year of study, while also visiting companies to learn about the execution of a safety management system and audits. This engagement would help the students to gain adequate knowledge and experience about safety activities in the organization and help them to easily adapt upon graduation.

The results of this study also identified relevant study areas for junior safety officers, including occupational safety and health legislation, safety management and audit, construction safety, and accident prevention and analysis. It is, therefore, suggested that the intended learning outcomes of courses' studies should focus on these key areas so that the students can effectively function after graduation. The current study investigated the recruitment requirements, job duties and relevance of study areas for junior safety officers using a quantitative approach. Adopting a qualitative study, such as the Delphi study, focus groups and interviews for cross-validation, can be considered in future studies (Hussein, 2009). The proposed methodology will provide more detailed information about the safety-related needs of the various organizations. More importantly, different characteristics of an organization (e.g., size and number of employees and types of construction activity) may influence the requirements, study areas and job duties of safety officers. Hence, further studies can be conducted to investigate the significant differences in the

## CONCLUSIONS

The training received by EOSH graduates during their course of study is foundational to sustaining a construction industry with fewer accidents and injuries to construction workers. Therefore, improving the quality of the EOSH programme is essential. The identification of recruitment requirements, specific job duties and relevant study areas for organizations, which were examined in this study, can influence the content of training of EOSH graduates to ensure that they receive what is required by organizations. A questionnaire survey was distributed to senior personnel in organizations expected to recruit safety practitioners for the development, implementation and maintenance of a safety management system in their workplace. A total of 36 companies participated in the study, and the data were analysed using score frequency and mean score. The results reveal that organizations

require a degree in occupational health and safety or a certificate and/or diploma in occupational health and safety for recruitment of safety-related posts; conducting safety inspections in the workplace, preparing a safety inspection report, assisting in safety training and education programmes and assisting in executing a safety management system and audit are the common duties of junior safety officers. Occupational safety and health legislation, and safety management and audit were considered the most relevant study areas for junior safety officers. The study suggests the integration of students with organization duties by introducing courses involving practical sessions will help them to understand their roles as safety officers in the future.

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