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## Health and Safety Skill Supply on Construction Sites in Tanzania

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**Abstract** The aim of this paper is to present discussions on the construction health and safety skills supply on construction sites in Tanzania. Specifically, the study focuses on the contents and methods for supplying health and safety skills to the casual labourers on construction sites. A mixed approach research type was used and questionnaires were administered to 180 casual labourers and 42 safety officers and gang supervisors on six construction sites. The response rate was 81% equating to 180 fairly filled questionnaires. The results were enhanced through interview with six site managers and observation of site activities. Collected data was analyzed using SPSS version 16.0, Relative Agreement Index (RAI) and content analysis. The findings indicate that health and safety skills are predominantly supplied to construction casual labourers informally through practical experiences, briefing toolbox meetings and informal discussions whereby tacit and explicit knowledge was generated. The study further revealed that only skills on the use of PPE and first aid kit are supplied at medium level, the rest are at the low level. The study concludes that methods for supplying H&S skills on construction have remained largely informal and most of skills supply themes are neglected and as a result it prevailing health and safety skills gaps and shortage among casual labourers. The study recommends that it is necessary to create environment and relevant conditions, methods and tools which would trigger workers' voluntary participation and commitment in those activities related to health and safety management so that can enhance more skill supply.

**Keywords** Construction, Health and Safety, Labourers, Skills Supply

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### Introduction

The nature of construction activities in most developing countries are labour-intensive which create jobs to a wide range of people with majority being less skilled labourers. In Tanzania for example, the construction industry employs 9% of the workforce [1]. Despite the employment advantage, majority of the labourers in construction sites have continued to be exposed to dangerous working conditions which culminate to high rates of accidents and ill-health problems. Such a phenomenon, to a great extent causes permanent disabilities and severe injuries and even death which later diminish the industry's workforce. Casual labourers are more vulnerable to the safety risk situation as they are employed on a temporary basis (often daily) without any proper contractual agreement [2-3]. The study done by Okoye *et al.* [3] reveals that the more the industry tries to substitute its permanent labour force with casual workers the more vulnerable the industry will be in terms of safety because people's behaviours are influenced by their perceptions and environment.

The Tanzania Employment and Labour Relations Act 2004 [4] defines a casual worker as a worker who is engaged to work temporarily for a period not exceeding six (6) months, and whose remuneration is calculated on a daily basis. It has been observed that this type of employment in the Tanzania construction industry has increased over the decade [5]. This calls for special attention on how to improve their working situation specifically the health and safe working environment. Researches [6-8] corroborate that there is a positive



relationship between health and safety skills of a person and safety performance on construction sites. Thus there is a high chance of getting accident in environment where skills on health and safety are limited. For example the study done by De Silva *et al.* in Sri Lanka found that lack of health and safety skills and unqualified officers causes unexpected accidents in the construction industry. On the other hand, Akinwale & Olusanya [9] argue that awareness on possible risk factors and knowledge on how to reduce these risk factors among workers will enhance site safety. Additionally, in their model, accent safety knowledge as proximal factors that have a positive relationship with workers safety behaviour. In the same line of thinking, Hinze *et al.* [10] conducted research on 57 projects in USA and they found that higher safety performance was attained with safety training. Based on the aforementioned assertions, there is clear evidence in the literature that health and safety skills seem to be plausible condition for safety performance on construction sites. This implies that safety skills are important in changing worker's safety attitude and behaviours.

Health and safety skills supply to the casual labours on construction sites is the issue which needs attention. In some countries the supply of health and safety skills to the labours on construction sites is compulsory. Some regulations have implicitly indicated on how health and safety skills and its contents should be supplied (the Construction Design and Management Regulations (CDM) of 2015; the South African Construction Regulation of 2014 and the Swedish Work Environment Act of 2009). In Tanzania also the Occupational health and safety Act 2003 [11] require workers to be informed and educated on health and safety risks on site and the way to control them. While health and safety skills supply is a legal requirement, there is little evidence on how it has been supplied on construction sites. This paper therefore unveils the practice of health and safety skills supply to workers on construction sites in Tanzania. Specifically, the paper addresses the contents/theme and the methods used for supplying health and safety skills to the casual labourers on construction sites.

### 1.1. The Concept of Skills and Skills Supply

A skill is a multi-facet concept and its definition varies depending on the context and different ideological positions. For example, skills have been associated with ability to perform a certain tasks at a certain level of competence [12]. Thus the main focus is the ability to do rather than underlying competence or mental representation [13]. In some cases, skills are associated with a qualification and its acquisition through formal education and training [14]. On the other hand, skills are defined as social attributes, general education, training, qualifications and technical skills. Other definition of skills focused on knowledge gained from the skills and some time it is used interchangeable [15]. These varied perspectives of skills suggest that skills can mean different things to different people. Nevertheless, what emerge from different definitions is that, the phenomenon of skills is underlying three components. These components include the 'ability' of the labour force, the 'task', which is the action to be performed and 'output' a representative measure of the work done. Therefore, for the purpose of this study, skill is defined as 'ability of labourers to perform a certain task by considering health and safety issues.

Presently, there are various attempts to categorise skills in different forms. Generally, skills has been classified as soft and hard skills Masumeh [16], formal and informal skills, transferable and non-transferable skills, and implicitly and explicitly [15]. According to Masumeh [16] hard skills are skills acquired through performing technical procedures or practical tasks that are typically easy to observe, quantify, and measure. In other word hard skills can be found in textbooks, procedures, instructions, programmes and databases. On the other hand, soft skills are interpersonal skills that have been acquired through internalised experience, automated skills and internalised cultural which is embedded into practice [17]. However, both hard and soft skills are interwoven and work simultaneous as they complement each other. This assertion is also found in Nakata & Takeuchi (1991) work when they discussed on explicitly and implicitly knowledge. They acknowledge that knowledge always contains a certain tacit and personal component. Nonaka & Takeuchi (1991) explain that explicit knowledge is gained through formal system, programme and structure, whereas implicit knowledge is describe any kind of learning which does not take place within, or follow from a formally organised learning programme event. Informal learning happens throughout people's lives in a highly personalized manner based on their particular needs, interests, and past experiences. What is important from the nature of skills is that there is no



clear demarcation of whether skills is formal or informal, hard or soft, explicit or implicit both type of skills however they supplement each other.

### 1.2. Health and safety skills

Health and safety skills is basically attached to the impartation of knowledge and understanding on the health and safety issues that are required in the working environment, working tools, machines, working stations and the workers [9]. However, safety skills has been viewed as collective competency which involves practice, an emerging property of a social-technical system, the result of a collective process that involves people, interaction, technologies as well as social relations [18]. In this view, one needs to understand hazards in the surrounding, how to prevent, to assess and to control and hazard from its occurrence based on the environment and the work context. In order to effectively manage safety at workplaces both explicit and implicit skills are required [18]. For example, explicit skills involve accident records, theories, safety regulations and guidelines while and tacit may involve safety engineer's experience, occupational hazard recognition, perceptual and cognitive skills. Similarly, implicit skills are measured as ability to effectively communicate with workforce on understanding of safety and the importance of working safe [19]. Hard skills are measured as abilities to identify what is safe and unsafe, manage risks, appropriately plan work activities, as well as to apply safe work principles to novel situations [20].

A different level of stakeholders in construction requires different skills of health and safety. Ridely [21] has established the content of the health and safety training for labourers in themes such as typical construction hazards and how these are controlled, standards methods of working safety and site rules, legal requirements and liabilities, working at height, manual handling, fire prevention, work equipment and ergonomic hazards. Generally, workers on construction sites are required to have skills on common accidents and dangerous occurrences and how to report an accident [19]. On the same view site supervisors are required to have more health and safety skills since they are the custody of safety on construction sites. They need skills on risk assessment/ method statement, safety regulations, specific site health and safety that challenge supervision on a daily basis, how to provide effective toolbox talks, and, supervision of occupational health and behavioural safety. In addition, management team need skills on recent changes in accepted working practice, management of occupational health, risk associated in electricity, excavations, working at height, scaffolding, demolition and confined space. Dingsdag *et al.* [19] point out that team management need more soft skills as they required having ability to effectively communicate with employees. Likewise, the ability to gain greater audience understanding of the message by listening to and integrating others' perspectives was seen as vital for positive safety culture. For the purpose of this paper only content/theme for casual labour are discussed.

### 1.3. Methods of Supply Health and Safety Skills

Various researchers have discussed different methods for supply of health and safety skills in construction [18, 20, 22]. Generally skills can be supplied into either formal/systematic or informal approaches. Formal and systematic approaches are regarded as those methods which are structured and planned and this has been ranged from license or certificate courses, accredited and approved courses, short courses and vocational and professional courses. These formal training can be provided by employer organizations, union, the health and safety organization, college and universities or private occupational health and safety consultants/trainers [18]. Informal approach is regarded as unstructured methods which people acquired skills. This can be informal briefing, Narratives (storytelling), observing and through interactions. Chang *et al.* [22] points that individual continuously obtains, combine, modify and use knowledge through their everyday cooperation and interaction. Similarly Aase & Nybø [23] state that people learn safety rules faster when those rules are presented in the form of stories than in formal training or through instructions. According to Hislop [24], when informal groups of people who have a particular activity in common and as a consequence have some common values, knowledge, and a sense of community identity shared and transfer skills from one another. While formal approach have been criticized that does not usually take into account local culture of the workplace [26], there has been predominate ways of health and safety skills supply [20]. Similar studies also found that companies can transfer safety knowledge through workers orientation, toolbox talks, and training sessions among others



[26]. Moreover, informal approaches such as storytelling, interaction as the skills supply methods have received little attention. This being the case, the debate of whether formal or informal approaches should be used in health and safety skills supply in the construction sites, it will depend on the level and responsibility of the individual worker on the site. For example Podgórski [25] argues that the newly employed workers on construction sites learn better to recognise hazards and to behave according to certain rules through observing, listening, talking, feeling and acting than through formal training methods. Accordingly, informal learning can be achieved through apprenticeship, whereby experienced supervisors or safety officers indicate hazards and risks at work and how to avoid them. The aforementioned argument indicates the potentiality of gang supervisors using this approach as they are always guiding their workers. The study done by Phoya [8] found that gang supervisors and safety offices were the key persons to trained health and safety knowledge on construction sites in Tanzania. Nevertheless, the trainers were required to attain formal training in order to acquire skills on how to train others at workplaces. Therefore the combinations of the two approaches are essential for effective health and safety skills supply on construction sites.

## 2. Methods

The study adopted a mixed approach combining qualitative and quantitative research. Six large on-going construction projects in Dar es Salaam were purposely selected. To get potential cases a preliminary survey was carried out to map out potential large construction sites in Dar es Salaam. Construction projects are registered by the Contractors' Registration Board (CRB) based in Dar es Salaam. A list and physical addresses of on-going construction sites in Dar es Salaam was obtained from CRB and several projects were selected based on the criteria established by the researchers. These criteria include large construction sites which have concurrent /multiple activities in progress and with labours working in different trades. A total of 180 casual labours were selected from six sites approximate 30 labours from each site. Casual labours were selected using stratified sampling since the group was not homogenous (Kumar, 2011). Casual labours were categorised in different trades such as concrete, masonry, plasters, plumbers, floor and ceiling finishes. The stratification allowed the combination of different trades to be included in the study. Also the total of 42 gang supervisors and safety offices were purposely selected 7 from each site. The major data collection tool included survey of literature, and questionnaires, interview and non-participatory observations.

Questionnaires were self-administered by research assistants. Out of 222 questionnaires distributed, 180 were fairly filled and returned equating to 81%. The first part of questionnaire was based on profile of the respondents such as age, education and experience. The second part of questionnaire covered methods for health and safety skills supply and themes of H&S skills supplied. Twenty two themes of health and safety skills were identified from literature and were assessed using 5-point likert scale in term of level of skills in which workers possess in each theme as follows: very high, high, moderate, little and very little (on 5 to 1 point scale). The collected data was analysed using Statistical Package for Social Sciences (SPSS), content analysis and Relative Agreement Index (formula (1)), the formula is used to rank the level of health and safety skills possessed in each theme.

*Relative Agreement Index (RAI) (%) =  $\sum a (n/N) * 100/5$  .....(1)*

Where; *a* is the constant expressing weighting given to each response (ranges from 1 for very little up to 5 for very high), *n* is the frequency of the responses, and *N* is total number of responses (180). The Relative Agreement index for all themes were calculated. Relative Agreement Index (RAI) comparison table was used to rank the results by taking into account the average scores and the RAI as follows:

**Table 1:** Relative Agreement Percentage (RAI)

Average Mean Score	RAI (%)	Ranking
4.0 to 5.0	80 to 100	High (H)
3.0 to 4.0	60 to 80	Medium (M)
1.0 to 3.0	20 to 60	Low (L)

## 3. Results

### 3.1. Respondents' profile

Respondents' ages ranged between 20 and 45 years where the majority (63%) fell within the range of 25 years to 35 years, indicating that majority were youth. This study shows that, since most activities on construction



sites in Tanzania are largely done manually, therefore one needs to be physically strong, and so they are not activities that older men would want to do. Majority of the workers (72%) had only primary education and 75% of the respondents have practical experience of more than five years.

### 3.2. Methods for supply of health and safety skills

Figure 1 presents methods through which respondents acquired health and safety knowledge and skills.

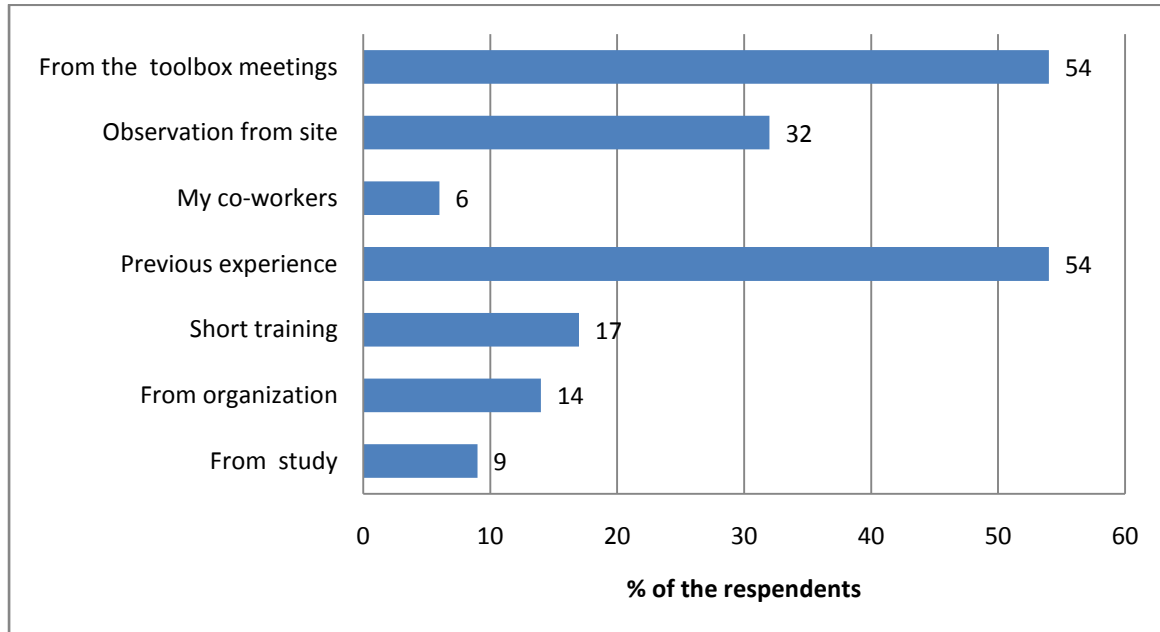


Figure 1: Health and safety skills supply on construction sites

Results indicate the large proportional of the respondents (54%) acquired health and safety skills through practical experiences and informal briefing in toolbox meetings and 35% through observations.

### 3.3. The nature of health and safety skills supplied on construction sites

Table 2 indicates the 22 health and safety skills themes extracted from literature and the extent to which they are supplied to the workers on construction sites.

Table 2: Health and safety themes supplied to labourers on construction sites

S/N	Health and safety skills themes	N	Mean score	RAI (%)	Rank
1	skills on the use of PPE	180	3.11	62.20	1
2	skills on first Aid	180	3.08	61.60	2
3	skills on site rules and hazards on the site	180	2.99	59.80	3
4	Guiding machine and test	180	2.95	59.00	4
5	Work in safe manner as proper safe routes and use equipment safely	180	2.88	57.60	5
6	Prevention of flammable liquid hazards	180	2.80	55.80	6
7	Prevention from communicable diseases in the site	180	2.79	54.80	7
8	skills on proper use of equipment	180	2.74	54.60	8
9	skills on working safe at height	180	2.73	53.20	9
10	skills on electrical hazards	180	2.66	52.20	10
11	change work to affect safety	180	2.61	51.80	11
12	Skills on risk identification	181	2.59	51.40	12
13	skills on toxic substance and prevention	180	2.57	50.80	13
14	Risk communication skills	181	2.54	50.20	14
15	skills on injury prevention	180	2.51	50.00	15
16	skills on control falling object	180	2.50	49.20	16



17	procedure for reporting accident	180	2.46	49.20	17
18	informing workers on company policy	180	2.46	46.80	18
19	Skills on risk assessment	180	2.34	46.80	19
20	Mechanical hazards	181	2.34	42.40	20
21	skills on fire and emergency procedure	180	2.12	37.20	21
22	Skills on preventing ergonomic risk such as proper manual handling, bending, posture	180	1.91	34.80	22

Results indicate that health and safety skills themes are supplied at low level with relative index factor scores ranging from of 60% to 20%. This implies that most of the themes of health and safety skills were not adequately supplied on construction sites. Only two health and safety themes scored RAI above 60% indicating that they were moderately supplied. These themes include skills on proper use of personal protective equipment (PPE) and skills on first aid provision.

### 3.4. Years of experience and themes of construction health and safety skills supply

Table 3 presents the influence of respondents' years of experience on the supply of health and safety skills themes.

**Table 3:** Years of experience and skills on H&S themes to labourers on construction sites

Health and safety skills level	Level of experience	N	Mean	Std. Dev.	Sig.
skills on the use of PPE	≤ 5 years	50	2.32	1.236	
	> 5 years	130	2.43	1.275	.779
skills on accident prevention	≤ 5 years	50	1.48	.931	
	> 5 years	130	1.63	.952	.190
skills on injury prevention	≤ 5 years	50	1.46	.734	
	> 5 years	130	1.68	1.014	.012
skills on emergency situation	≤ 5 years	50	1.72	.948	
	> 5 years	130	1.91	.565	.000
skills on working safe at height	≤ 5 years	50	1.64	.525	
	> 5 years	130	2.58	.544	.321
skills on preventing ergonomic risk	≤ 5 years	50	1.76	.744	
	> 5 years	130	1.73	.923	.144
skills on fire protection	≤ 5 years	50	1.66	.626	
	> 5 years	130	3.40	1.434	.000
skills on first Aid	≤ 5 years	50	2.04	.968	
	> 5 years	130	3.30	1.487	.000
Skills on risk identification	≤ 5 years	50	2.72	.834	
	> 5 years	130	3.75	1.125	.000
Skills on risk assessment	≤ 5 years	50	3.40	.639	
	> 5 years	130	4.03	.907	.000
skills on proper use of equipment	≤ 5 years	50	2.36	.898	
	> 5 years	130	2.93	.980	.002
skills on electrical hazards	≤ 5 years	50	2.90	1.147	
	> 5 years	120	2.49	.722	.000
skills on control falling object	≤ 5 years	50	2.52	1.282	
	> 5 years	120	2.03	1.148	.001
skills on toxic	≤ 5 years	50	2.46	.503	
	> 5 years	120	2.55	.516	.616
Mechanical hazards	≤ 5 years	50	2.66	.593	
	> 5 years	120	3.10	.438	.000
Prevention of flammable liquids hazard	≤ 5 years	50	2.70	.839	
	> 5 years	130	2.80	.826	.714
Guiding machine and test	≤ 5 years	50	3.54	.706	
	> 5 years	130	2.63	1.115	.000
Prevention from communicable diseases in the site	≤ 5 years	50	2.92	.274	
	> 5 years	120	2.65	.479	.000



informing workers on company policy	≤ 5 years	50	2.90	1.147	
	> 5 years	130	2.42	.602	.000
procedure for reporting accident	≤ 5 years	50	2.52	1.282	
	> 5 years	120	1.94	.964	.000
change work to affect safety	≤ 5 years	50	2.46	.503	
	> 5 years	120	2.62	.638	.041
Risk communication skills	≤ 5 years	50	2.68	.587	
	> 5 years	120	3.11	.445	.000
skills on site rules and hazards on the site	≤ 5 years	50	2.76	.847	
	> 5 years	120	2.78	.832	.796
Work in safe manner as proper safe routes and use equipment safely	≤ 5 years	50	3.52	.707	
	> 5 years	120	2.73	1.159	.782

Results indicate that there is significant relationship between the practical experience of the employee and majority of themes of safety skills supply on construction sites. By and large, respondents with experience of more than 5 years possess more H&S skills than those with less than 5 years. Themes with no significant difference include: skills on use of PPE, skills on accident prevention, skills on working safe at height, skills on preventing ergonomic risks, skills on toxic, skills on prevention flammable liquids hazard, skills on site hazards and work safe manner. This implies that the supply of health and safety skills of the aforementioned themes is through practical experience of the employee.

#### **Interviews**

The interviews were carried out face-to-face. Labourer highlighted issue related to experience and toolbox meetings as the common method to acquire health and safety skills in construction sites. One of the respondents emphasizing the importance of practical experience said

*“Before I came here, I was working in a construction project in a mining area. In mining I learnt a lot regarding health and safety issues. I learnt how to identify hazard, how to assess risk and how to control risk. This experience I have, I shared it with my fellow while we are working in a certain task”<sup>1</sup>.*

The aforementioned quotation underscores the practical experience as one of the methods for acquiring and supplying of health and safety skills among workers on construction sites.

#### **Observations**

Through observation to some of the health and safety issues discussed at the informal toolbox meetings in one of the sites; it was revealed that workers were instructed about health and safety risks on construction sites and the importance of wearing appropriate Personal Protective Equipment (PPE) according to their task and to take care of the PPE. They were also reminded on procedure of reporting accidents or incidents. The finding from observation corroborates the findings from survey as the proper use of PPE as the main theme supplies to the employees in the construction sites. It was further observed that, there was a mentorship where arrangements of experience worker work with non- experienced worker. This was observed in masonry, steel fixtures and scaffolding groups. This kind of arrangement can influence health and safety skills transfer if the supervisor has the substantial health and safety skills.

#### **4. Discussions**

The present study reveals that H&S skills on construction sites are largely supplied informally whereby practical experience and informal briefing in toolbox meetings were dominant methods. This finding support the works of Gherardi & Nicolini [18], Aase & Nybø [23], Chang *et al.* [22] and Podgórski, [25] which collectively agree on the use informal methods in imparting H&S skills. Practical experience is based on practice-based epistemology which considers practice as the generative source of tactic knowledge. Tactic knowledge is acquired through socialization, interaction, participation in performing certain activity. On the other hand

<sup>1</sup>Researcher discusses with one of the respondents in one of the labourers on construction sites. On 20<sup>th</sup> June 2016



informal briefings and discussions were necessary to supplement explicit knowledge. As commented by Podgórski, [25] that explicitly knowledge is acquired through procedures and instructions.

Among H& S skills themes assessed it was determined that skills on proper use of personal protective equipment (PPE) and skills on first aid provision were supplied on average and the rest of the skills were on low level. However, comparing themes on the low level, skills on site rules and hazards on the site, guiding machine and test, work in safe manner as proper safe routes and use equipment safely and prevention of flammable liquid hazards were fairly supplied on site. The themes were supplied through practical experience and instructions whereby both hard and soft skills were acquired. This confirms the works of Masumeh [16] and Hildreth *et al.* [17] that hard skills are skills acquired through performing technical procedures or practical tasks while soft skills are acquired through internalised experience, automated skills and internalised cultural which is embedded into practice.

This study also reveals significant different of the skill supplied through listed themes and years of practical experience of the workers. This underscores that practical experience of the employees is necessary when designing health and safety training in workplaces. However not all health and safety skills can be supplied through practical experience, rather other methods such as formal training, formal and informal briefing is required in order to have a positive impact.

## 5. Conclusions

The results of the current study contribute important empirical on how health and safety skills are supplied in construction sites. The study provides an insight on the available themes for health and safety skills and methods in which these skills are supplied in construction sites. The study revealed that only skills on the use of PPE and first aid kit are supplied at medium level while the rest themes are supplied at the low level. This implies that most of skills supply themes are neglected and as upshot it prevailing health and safety skills gaps among casual labourers in construction sites. The two skill themes are largely supplied informally through practical experience and briefing meetings whereby both tactic and explicit knowledge were important. The study concludes that health and safety skills supplied in construction site require combination of tactic and explicit knowledge, hard and soft skills, formal and informal methods. Nevertheless while practical based approach is dominant method for skills supplied, the study recommend that it is necessary to create environment and relevant conditions, methods and tools which would trigger workers' voluntary participation and commitment in those activities related to health and safety management

The implication of this study may help academicians, professionals organizations, firms and institutions in their attempts to bridge these skills gaps and shortages as well as methods used for supply of health and safety skills in construction sectors.

## Reference

- [1]. The United Republic of Tanzania. (2015). *National Budget 2014/2015*, Ministry of Finance., Dar es Salaam. Government printer
- [2]. Wells, J.S., & Jason, A. (2010). Employment relationships and organizing strategies in the informal construction sector. *African Studies Quarterly*, 11(2&3), (Spring), 107–124.
- [3]. Okoye, P.U, Okolie, K.C & Aderibigbe, Y.W. (2014). Correlation of Casualization Mechanism and Construction Workers Safety Behaviour International Journal of Engineering and Innovative Technology (IJEIT) Volume 3, Issue 9, March 2014.
- [4]. The United Republic of Tanzania. (2004). *Employment and Labour Relation Act 2004*. Dar es salaam. Govenment printer
- [5]. Jason, A. (2008) Organizing informal workers in the urban economy: The case of the construction industry in Dar es Salaam, Tanzania. *Habitat International* 32, 192–202. : ILO
- [6]. Priyadarshani, K., Karunasena. G and Jayasuriya, S. (2013). Construction Safety Assessment Framework for Developing Countries: A Case Study of Sri Lanka *Journal of Construction in Developing Countries*, 18(1), 33–51, 2013.





- [7]. Musonda, I. (2012) Construction Health and Safety (H&S) Performance Improvement. A Client-Centred Model. *PhD thesis*, University of Johannesburg
- [8]. Phoya, S. (2012). Health and Safety Risk Management in Construction Sites in Tanzania: The Practise of Risk Assessment, Communication and Control; *Licentiate Thesis*; Gothernburg, Chalmers University of Technology.
- [9]. Akinwale, A. A., & Olusanya, O. A. (2015). Implications of Occupational Health and Safety Intelligence in Nigeria. *The Journal of Global Health Care Systems*, 6(1), 1-13
- [10]. Hinze, J., Hallowell, M., & Baud, K. (2013). Construction-safety best practices and relationships to safety performance. *Journal of Construction Engineering and Management*, 139(10), 23-28.
- [11]. The United Republic of Tanzania. (2003). *Occupational Health and Safety Act 2003*. Dar es salaam. Govenment printer.
- [12]. Frogner, M. L. (2002). Labor market trends: Skills shortages. Special feature (pp. 17-27). Office for National [7] Gherardi, S., Nicolini, D. (2002). Learning the trade: A culture of safety in practice. *Organisation*, 9 (2), 191–223.
- [13]. Vanpatten, B., & Benati, A. G. (2010). Key terms in second language acquisition. New York: Continuum International Publishing Group
- [14]. Bosworth, D. L. and Dutton, P.A. (1990). Skills Shortage: An Overview *International Journal of Manpower*, Vol. 11, 54-57.
- [15]. Nonaka I, Takeuchi H. The knowledge-creating company: how Japanese companies create the dynamics of innovation. New York, NY, USA: Oxford University Press; 1995.
- [16]. Masumeh T, (2014) Skills Acquisition Theory and Its Important Concepts in SLA *Journal of Theory and Practice in Language Studies*, Vol. 4, No. 9, pp. 1971-1976
- [17]. Hildreth P, Wright P, Kimble C. (1999). Knowledge management: are we missing something? In: 4<sup>th</sup> UKAIS Conference. London, UK: McGraw Hill; . p. 347–56
- [18]. Gherardi, S., Nicolini, D. (2000). To transfer is to transform: The circulation of safety knowledge. *Organisation*, 7 (2), 329–348.
- [19]. Dingsdag, D. P., Biggs, H. C., Sheahan, V. L. and Cipolla, D. J. (2006), A Construction Safety Competency Framework: Improving OH & S Performance by Creating and Maintaining a Safety Culture. CRC for Construction Innovation, Brisbane, Qld
- [20]. Järvis, M., Virovere, A, and Tint, P. (2016). Formal Safety versus Real Safety: Quantitative and Qualitative Approaches to Safety Culture – Evidence from Estonia Proceedings of the Latvian Academy Of Sciences, 70 (5) 269–277.
- [21]. Ridley, J. (2008), *Health and Safety in Brief* 4<sup>th</sup> Edition, Elsevier Ltd UK.
- [22]. Chang, S.-W., Huang, H.-C., Chiang, C.-Y., Hsu, C.-P., Chang, C.-C. (2011). Social capital and knowledge sharing: Effects on patient safety. *J. Adv. Nursing*, 68 (8), 1793–1803.
- [23]. Aase K, Nybø G. (2002): Organizational knowledge in high-risk industries: what are the alternatives to model-based learning approaches? In: Third European Conference on Organizational Knowledge, Learning and Capabilities OKLC 2002.
- [24]. Hislop, D. (2005). Knowledge Management in Organisations: A Critical Introduction. Oxford University Press, Oxford. 310 pp (at p. 71).
- [25]. Podgórski, D. (2010). The Use of Tacit Knowledge in Occupational Safety and Health Management Systems. *International Journal of Occupational Safety and Ergonomics (JOSE)* 2010, Vol. 16, No. 3, 283–310.
- [26]. Hallowell, R.M., (2012). Safety knowledge management in American construction organizations. *Journal Management Engineering*, 282, 203–211.

