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OSH 21ST CENTURY SKILLS IN A VUCA ENVIRONMENT

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Abstract

Today, businesses are operating in a VUCA environment. In the VUCA environment, Occupational Safety and Health (OSH) skills are essential for a business's viability and sustainability since they safeguard personnel, ensure legal compliance and standards conformance, reduce operational costs, foster productivity, elevate reputation, and exhibit social responsibility. In a VUCA environment, the risk management process acts as a pillar for business viability and sustainability. With effective risk management, businesses can use it to proactively detect and reduce risks, improve adaptation and resilience, guarantee business continuity, make better decisions, and instill confidence among stakeholders. Businesses may negotiate uncertainty, grasp opportunities, and put themselves in a position for long-term success by managing risks properly. Effective risk assessors are essential to the success of risk management because they provide accurate and trustworthy assessments of potential risks. Hence, through this study, it investigates the criticality of OSH risk assessor skills in functioning in the VUCA environment; and identifies the pedagogical preferences for effective risk assessor program. A quantitative research approach is employed for this study, utilising a three (3) parts survey comprising 25 items. The study involved fifty (50) OSH practitioners as the respondents. The Relative Importance Index (RII) results for OSH risk assessor skills in a VUCA environment, assessed on a ten-point Likert scale, are as follows: applied knowledge of the subject matter (0.88), communication skills (0.87); attention to detail (0.87); risk control techniques (0.87); ethical consideration (0.87); risk assessment methodologies (0.86); analytical thinking (0.85); critical thinking (0.85); data analysis (0.84) and adaptability (0.84). Next, respondents conveyed their preferences regarding pedagogical approaches using a ten-point Likert scale. The Relative Importance Index (RII) scores for these approaches are as follows: problem-based learning (0.83); authentic assessment (0.82); inquiry-based learning (0.81); collaborative learning (0.81); technology integration (0.81); experiential learning (0.81); cultivating creativity and innovation (0.81); project-based learning (0.80); multidisciplinary and interdisciplinary approaches (0.80) and metacognitive strategies (0.79).This study contributes to the design of the OSH risk assessor programme for assisting industries in operating in the VUCA environment by helping them to understand the vision, develop situational awareness, make complex situations clear, and generate hypotheses to address potential risks, all of which lead to more informed decision-making, increased resilience, and efficient resource use.

Keywords: VUCA, OSH risk assessor, OSH skills, pedagogical strategies

1 INTRODUCTION

Occupational Safety and Health Master Plan 2021–2025 (OSHMP25) was unveiled on October 13, 2021 with an emphasis on instilling the values of Inclusive OSH—togetherness and commitment to further enhance the OSH system in Malaysia in order to achieve preventative culture (New occupational safety and health master plan, 2021). Strategic Thrust Number Three (3) of the OSHMP 25, titled "Promoting OSH Education and Research" via Program 2, emphasizes the significance of OSH personnel demonstrating a strong sense of professionalism in the planning, management, execution, and evaluation of OSH initiatives (Department of Occupational Safety and Health, n.d.). Consequently, the OSH Risk Assessor is a critical OSH competency that needs to be developed. This development process demands a number of carefully planned, excellent, and effective OSH training and educational initiatives. Indeed, the significance of OSH risk assessors cannot be overstated, especially in light of the existing Occupational Safety and Health Act (OSHA) 1994 and the recent introduction of the OSH (Amendment) Act 2022. Section 18B (1) of the OSH (Amendment) Act 2022 mandates that every employer, self-employed individual, or principal must conduct a comprehensive risk assessment concerning safety and health risks that may impact anyone within their workplace. In order to effectively assist employers in making decisions about OSH concerns inside the business and promote a culture of prevention, OSH risk assessors should have the necessary competence.

Navigating OSH concerns within a volatile, uncertainty, complex, and ambiguous environment presents a formidable challenge. OSH risk management emerges as a crucial and important process, guiding employers in making informed decisions that pave the way for a preventive culture while ensuring steadfast compliance. Indeed, failure to adequately manage OSH risks may result in workplace accidents, occupational illnesses, or fatalities. Nonetheless, making errors in judgment or overlooking risks can, in the gravest of circumstances, lead to catastrophic outcomes. (Department of Occupational Safety and Health, 2020). As a result, it becomes clear that the skills of qualified OSH risk assessors are required for OSH risk management of the highest standard. Competency is the attribute or state of possessing the knowledge, discretion, strength, or ability required for a specific task or regard (Zulkefli & Zulkifli, 2022). They added that proficiency in the role of an assessor is of paramount importance, given the pivotal nature of judgment and assessment. Likewise, Rantala *et al.* (2022), mentioned that the outcomes of the OHS risk assessment may be impacted by the risk assessor's individual knowledge, experience, talents, skills, qualities, beliefs, attitudes,

understanding, and behaviors. Additionally, based on the results of their research, they concluded that the most crucial risk assessment abilities for OHS experts were the ability to comprehend and manage the entirety of safety practices as well as the meaning, concepts, and criteria of risk assessment as well as the related workplace safety legislation. Therefore, the purpose of this preliminary study is to investigates the criticality of OSH risk assessor skills in functioning in the VUCA environment for Malaysia.

Pedagogy is crucial for ensuring an effective learning process. It serves as the cornerstone upon which educational experiences are constructed and is essential to how knowledge and skills are taught to learners. It is defined as the science and art of teaching practice, and is influenced by complex learning theories and principles (Bhowmik *et al.*, 2013). Drawing from the research conducted by De Gagne *et al.* (2021), their findings underscore the importance of grounding pedagogy with high-quality, pragmatic, real-world knowledge and skills that empower students to realise their full potential. Additionally, the role of technology is highlighted as a valuable tool to enhance and serve pedagogy effectively. Furthermore, Endroyo *et al.* (2015) study came to the conclusion that an industry-focused OSH learning model with four (4) essential components is required to achieve effective results in terms of knowledge, skills, and attitudes necessary for safe work in the construction industry, namely: (a) material, containing OSH basic theory and its application in industry, (b) learning/training method that uses Competency Based Learning, Cooperative Learning, and Contextual Learning, (c) tool/equipment to learn the skills, and adequate media as well as maximum utilisation of the environment, (d) learning/training evaluation in the form of portfolio. This study emphasis the value of a comprehensive strategy for safety education in the construction industry. Hence, this the purpose of this preliminary study is to identify the pedagogical preferences essential for the development of an effective OSH risk assessor programme tailored to the specific needs of industries in Malaysia.

2 METHODOLOGY

This preliminary study used quantitative research methods, utilising online survey techniques to gather data. It uses logical thinking, numerical analysis, and preserves objectivity in its operations (Mohajan, 2020). This study adopted purposive sampling. Etikan *et al.* (2016) highlighted the selection of purposive sampling, emphasising that this approach involves choosing respondents with specific characteristics aligned to the study's objectives. The researchers used these three (3) criteria to make sure sample selection was homogeneous: (i) Respondents had OSH education ranging from certificates to doctorates (ii) Respondents were

either OSH competent persons or OSH practitioners; and (iii) Respondents had at least a year of experience as OSH risk assessors. The Situated Learning Theory (SLT) as illustrates in Figure 1 was developed by Jean Lave and Etienne Wenger in the late 1980s and it has been adopted in this study. SLT is well known for having strong connections to the fields of sociocultural and social cognition research. It emphasizes the crucial importance of learning in authentic, real-world settings and circumstances as an educational framework. Indeed, SLT is gaining ground in the fields of workplace and adult education, and it has significant implications for OSH. This method emphasises the importance of real-world social contexts for learning and offers students a great chance to broaden their knowledge as well as experiment with new ways to use it in a variety of contexts. (Mairtin, 2002). It promotes the idea that students learn better in collaborative group settings and when the activities are based on real-life experiences (Dyack, 2020). Because OSH risk management is primarily focused on making educated judgments to successfully manage risks within the complexities of real-world circumstances, it is best applicable in the research of risk management. As a result, Figure 2 illustrates the conceptual framework for this preliminary study.

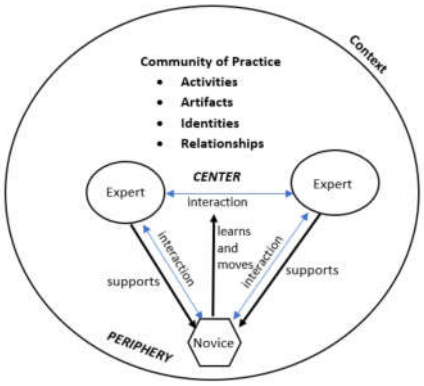

Figure 1. Situated Learning Theory (SLT).

Figure 2. Conceptual framework.

The online survey has been carefully designed to adhere to ISO 31000:2018(E) and the Guidelines for Hazard Identification, Risk Assessment, and Risk Control (Department of Occupational Safety and Health, 2008). A renowned OSH specialist with a Ph.D. in OSH and an astounding 23 years of experience in OSH with 15 years of which were devoted to OSH risk assessment validated the survey items. Fifty (50) OSH practitioners involved in the online survey, and their responses underwent reliability test and descriptive analysis that included calculating frequencies and percentages to establish a demographic profile. Six reliability levels are derived from the Cronbach's Alpha coefficient: excellent (0.90 and above), good (0.80 – 0.89), acceptable (0.70 – 0.79), questionable (0.6 – 0.69), poor (0.5 – 0.59) and unacceptable (less than 0.59) (Mallery & George, 2003). The researchers also agreed with Rooshdi *et al.* (2018) in applying the Relative Importance Index (RII) to gauge the significance of OSH risk assessor knowledge and skills, as well as preferences for the pedagogy. Five importance levels are derived from RII values from high (H) ($0.8 < RI < 1$), high-medium (H–M) ($0.6 < RI < 0.8$), medium (M) ($0.4 < RI < 0.6$), medium-low (M-L) ($0.2 < RI < 0.4$) and low (L) ($0 < RI < 0.2$) (Chen *et al.,*2010).

3 FINDINGS AND DISCUSSION

The findings and discussion for this study are explained in 3.1 – 3.4.

3.1 Reliability analysis

The Cronbach's alpha coefficient, employed to assess the internal consistency of items in the online survey, reveals that both constructs have achieved exceptional reliability, with values exceeding 0.9, as demonstrated in Table 1. This emphasizes the robust internal consistency of the data collected from the online survey.

Table 1. Reliability test results.

Constructs	Cronbach's Alpha	Number of Items
OSH risk assessor skills	0.977	10
Pedagogical approaches	0.984	10

3.2 Demographic profile

Table 2 shows the industry distribution among the respondents. It was observed the majority of the respondents came from the construction industry (28.00%).

Table 2. Industry.

Type of industry	Frequency	Percentage
Manufacturing	10	20.00
Mining & Quarrying	1	2.00
Construction	14	28.00
Utilities	3	6.00
Transport, Storage & Communication	2	4.00
Wholesale & Retail Trades	1	2.00
Finance, Insurance, Real Estate & Business Services	6	12.00
Oil & Gas	2	4.00
Education & Training	2	4.00
Public Services & Statutory Authorities	9	18.00

The results in Table 3 show that a significant portion of respondents, at 46.00%, had a master's degree.

Table 3. Academic qualification.

Academic qualification	Frequency	Percentage
Diploma	7	14.00
Degree	18	36.00
Master	23	46.00
PhD	2	4.00

Majority of the respondents are holding management position as shown in Table 4.

Table4. Job position.

Job position	Frequency	Percentage
Academician	3	6.00
Technical	7	14.00
Management	24	48.00
Medical	5	10.00
Consultant	2	4.00
Competent person	9	18.00

Based on Table 5 and 6, majority of the respondents had 1 – 5 years working experience in OSH and involved in the OSH risk assessment.

Table 5. OSH working experience.

Number of years in OSH	Frequency	Percentage
1 – 5	15	30.00
6 - 10	10	20.00
11 - 15	11	22.00
16 - 20	11	22.00
21 - 25	0	0.00
26 - 30	1	2.00
31 - 35	1	2.00
36 - 40	1	2.00

Table 6. OSH risk management experience.

Number of years involved in OSH risk assessment	Frequency	Percentage
1 – 5	22	44.00
6 - 10	10	20.00
11 - 15	9	18.00
16 - 20	8	16.00
21 - 25	0	0.00
26 - 30	1	2.00

3.3 Level of importance for OSH risk assessor knowledge and skills

The Relative Importance Index (RII) study has been used to determine the importance of OSH risk assessor skills in the dynamic VUCA environment. The criticality of the OSH risk assessor skills is as in Table 7. The table clearly indicates the significance of all the listed OSH risk assessor skills, with each skill scoring RII above 0.8.

Table 7. Ranking of OSH risk assessor skills using RII.

OSH risk assessor skills	Description	RII
Applied knowledge of the subject matter	Familiar with pertinent laws, rules, and best practices.	0.88
Communication skills	Communicate facts effectively and clearly in both oral and written reports.	0.87
Attention to detail	Be meticulous for precise and thorough assessments.	0.87
Risk control techniques	Familiar with various risk management methods and suggest suitable actions to minimise or eliminate risks.	0.87
Ethical consideration	Maintain objectivity, integrity, and confidentiality as per professional ethics throughout the assessment.	0.87

Risk assessment methodologies	Familiar with various risk assessment methodologies and frameworks.	0.86
Analytical thinking	Able to identify, analyse, and make judgments by examining the connections between individual elements.	0.85
Critical thinking	Able to challenge assumptions, evaluate evidence and consider alternative viewpoints.	0.85
Data analysis	Gather and interpret relevant data in the risk assessment.	0.84
Adaptability	Have the capacity to change and adapt to new situations.	0.84

The foremost skills for OSH risk assessors, as shown in Table 7, is their applied knowledge of the subject topic, which received score of 0.88. With this ability, OSH risk assessors can accurately assess risks and interpret pertinent OSH regulatory requirements, assuring full compliance. This finding is perfectly in line with the insights from Rantala *et al.* (2022), which emphasis that the risk assessor's individual knowledge, experience, talents, skills, qualities, beliefs, attitudes, and behaviors can have a significant impact on the results of OHS (Occupational Health and Safety) risk assessments. As we move down the list, we get to communication skills, which are crucial for enabling OSH risk assessors to clearly and precisely explain information, whether through oral presentations or written reports. Effective communication not only raises confidence levels but also greatly aids in better decision-making. Therefore, it goes without saying that OSH risk assessors should be excellent communicators, assuring a high level of clarity in articulating OSH risks and encouraging management to put the best safety measures in place for the wellbeing of employees. The research of Bucata and Rizescu (2017), who emphasize the crucial significance of good workplace communication as a fundamental component impacting an organisation's success or failure, lends support to this finding. The third key skill for an OSH risk assessor is their exceptional attention to detail. This skill is paramount as it guarantees precision and thoroughness in assessments, ultimately leading to the effective management of OSH risks. This perspective resonates with the insights of Chileshe and Kikwasi (2014), who emphasized that a critical obstacle to the adoption and implementation of risk assessment and management practices (RAMP) is a deep understanding of the risk management process.

3.4 Level of preferences of pedagogical approaches for effective risk assessor program

The Relative Importance Index (RII) study has also been used to determine the preferences of of pedagogical approaches for effective risk assessor programme as shown in Table 8. The

table clearly indicates the high level of significance with scoring RII above 0.8 except for project-based learning, multidisciplinary and interdisciplinary approaches and metacognitive strategies with H-M (0.80, 0.80 and 0.79).

Table 8. Ranking of pedagogical approaches for effective risk assessor programme using RII.

Pedagogical approaches	Description	RII
Problem-based learning	Emphasises the needs of the learners and encourages inquiry, critical thinking, and the application of knowledge and skills.	0.83
Authentic assessment	Analyse how well learners comprehend concepts and apply their knowledge in real-world situations.	0.82
Inquiry-based learning	Learners are challenged to use their critical thinking, problem-solving and information literacy abilities as they engage in questioning, investigating, and discovering answers.	0.81
Collaborative learning	Active involvement, teamwork, and the creation of knowledge through group discussions.	0.81
Technology integration	Use of technological resources, platforms, and tools to improve and support teaching and learning.	0.81
Experiential learning	Learning through direct experience and active engagement with the real world.	0.81
Cultivating creativity and innovation	Generation of new ideas, original thinking, and the development of innovative solutions.	0.81
Project-based learning	Engaging in real-world tasks or projects aimed at tackling practical issues or challenges.	0.80
Multidisciplinary and interdisciplinary approaches	Learners draw connections, think critically across disciplines, and use knowledge and abilities from diverse fields to address challenges in the real world.	0.80
Metacognitive strategies	Learners take charge of their own education, keep track of their development, and adjust as necessary.	0.79

Respondents overwhelmingly favored problem-based learning (0.83) as the top choice for incorporation into the OSH risk assessor program, closely followed by authentic assessment (0.82). Notably, both of these pedagogical approaches align seamlessly with the core principles of the Situated Learning Theory (SLT). As emphasized by Mairtin (2002), SLT has garnered substantial recognition in the realm of adult and workplace education, unveiling profound implications for OSH practices. SLT promotes a holistic and socially grounded perspective on learning, effectively challenging conventional classroom-based, decontextualized educational methods. Furthermore, it's worth highlighting that the remaining pedagogical options on the

list also align harmoniously with the principles of SLT, ensuring that learning remains firmly rooted in authentic contexts and thriving communities of practice. These elements collectively constitute the foundational components of a robust OSH risk assessor programme, poised to cultivate highly proficient OSH risk assessors.

4 CONCLUSION

The risk management process serves as a pillar for the survival and vibrancy of enterprises in the VUCA environment. Thus, effective risk assessors are crucial to the success of risk management. Through this preliminary study, we determined the level of importance for OSH risk assessor (1-applied knowledge, 2- Communication skills, 3- Attention to detail, 4- Risk control techniques, 5- Ethical consideration, 6- Risk assessment methodologies, 7- Analytical thinking, 8- Critical thinking, 9- Data analysis and 10- Adaptability). In the effort for designing an effective OSH risk assessor programme, based on the SLT, the level of significant for the pedagogical preferences as follows: 1- Problem-based learning, 2- Authentic assessment, 3- Inquiry-based learning, 4- Collaborative learning, 5- Technology integration, 6- Experiential learning, 7- Cultivating creativity and innovation, 8- Project-based learning, 9- Multidisciplinary and interdisciplinary approaches and 10- Metacognitive strategies.

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