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AWARENESS AMONG THE STUDENTS AT UNIVERSITI UTARA MALAYSIA (UUM) TOWARD CONSTRUCTION ACCIDENTS HAPPENING IN MALAYSIA

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Abstract:

Construction contributes considerably to the country's economic prosperity, despite the high number of fatalities in the construction industry. Occupational accidents in construction industry at 3958 cases in 2020. Compared to other industries, the construction sector has a higher injury rate. The aim is to study the awareness among Universiti Utara Malaysia (UUM) students towards construction accidents happen in Malaysia which focused on students who are taking Bachelor of Technology Management course (MOT). Objective of the study is to analyze the causes and impacts of the construction accidents and analyze the level of awareness of students towards the construction accidents happen in Malaysia. Quantitative method was used which is online questionnaire. 256 respondents have answered the online questionnaire. The finding of the study shows that students are aware of the causes and impacts of the construction accidents. This indicates that students have high awareness on the occupational accidents happen in the construction industry.

Keywords:

Awareness, Students, Construction, Accident, Risks

Introduction

According to Occupational Safety and Health Administration (OSHA), occupational accidents defined as injuries or property damage. According to Hosseinian et al (2012), accidents at the construction industry are unplanned events. These events can include the

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movement of people, objects, or materials that could harm, damage, or even loss of people or property. Construction site accidents have injured, harmed, or even killed workers because it's labour-intensive nature and high-risk manufacturing procedures, the construction industry experiences significant financial loss because of occupational accidents (Yilmaz, 2015). According to Xia et al (2016), among the occupational accidents in the construction industry, falling hazards have the highest rates. Falls hazards are the main factor in serious injuries (48%) and fatalities (30%) in construction accidents. According to the Strait Times (2021), a construction accident at light rail transit (LRT) was reported as one foreign worker died and the other two workers were injured. The fall occurred in Bandar Bukit Tinggi, Selangor's Klang district and was Malaysia's seventh industrial site catastrophe this year, with authorities vowing stricter controls to prevent future accidents. In 2022, there were a total of 148 construction accidents recorded in Malaysia. This was lower compared to the number of construction accidents in the previous year. Overall, occupational accidents in the construction sector have decreased in the last few years (Statista Research Department, 2023).

According to Holt (2001), having a system for managing health and safety that complies with the law is necessary for accident prevention in the construction industry. Although there are severe safety inspections and audits by the Department of Occupational Safety and Health, the number of accidents at building sites is very concerning. The workers in the construction industry must be protected, have a safe working environment and have lesser chances of being involved in accidents. With the proper awareness in the construction industry, it can be minimized the accidents happen. Li et al. (2019) suggested that awareness and knowledge about the accidents in construction industry are important to reduce the number of losses and accidents. Undergraduate students who intend to work in the construction industry should be aware of the causes and impacts of construction accidents and preventive measures to minimize the rate of accidents. The younger workforce faces a greater risk of 25 to 40% of workplace accidents than other workers (Andersson et al, 2014). According to Puerto et al (2015), young workers such as undergraduate students working as interns and fresh graduates are at a greater risk of accidents due to their lack of job experience.

The statistics of accidents show that awareness of construction accidents is important to help students be responsible for safety when working on the construction site. Hence, this study will investigate the awareness of UUM students taking MOT courses about the causes and effects of accidents in the construction site.

Literature Review

Occupational Accidents

According to the Department of Statistics Malaysia (2021), there were 32,674 cases of occupational accidents reported and there were 312 occurrences of occupational fatalities. Services, manufacturing, and construction are the main industries that cause occupational accidents in Malaysia. Construction is the industry with the highest rate of occupational fatalities even though it ranks third in terms of injuries. This industry continues to be the most hazardous rather than exhibiting a long-term stable trend, since it had the highest rate of occupational fatalities in 2020, which was 3.3 times higher than the total national rate (Department of Occupational Safety and Health, 2020).

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Accidents in the Construction Industry

According to Shamsuddin et al (2015), the construction sector considered as high-risk industry because of the high danger of accidents. The construction industry, manufacturing, and agriculture are among the three high-risk industries identified by the Department of Occupational Safety and Health (DOSH). Some key reasons, such as time, cost, and quality, are always prioritized before safety. According to the United States Department of Labor (2018), construction is a high-risk sector that includes a variety of activities that involve building, modifying, and repairing. Construction workers engage in a variety of tasks that could put them in danger of accidents. Accidents include rooftop falls, unprotected machinery, being struck by large machinery, electrocutions, and dust.

Construction Accidents in Malaysia

The statistics on construction-related incidents show that the accident rate in Malaysia is still high, implying that the construction industry is one of the important sectors that requires a massive and rapid reform of current site safety practices. According to a report from the Construction Industry Development Board, the former Chairman of the National Institute of Occupational Safety and Health claimed that Malaysia's Fatal Accident Rate (FAR) was not only 20% higher than that of the United Kingdom but was also 10 times worse than that of the United Kingdom. According to the Department of Occupational Safety and Health (2022), a worker of the construction site in Perak was killed by the machinery. The man was moving an excavator when he was struck by a "mechanical low loader ramp" and died as a result. In Sabah, workers in killed by the building materials. While doing cleaning duties and dumping construction waste into the elevator pit, a subcontractor worker was killed when he was struck by construction debris that fell from the 16th floor. At the LRT3 project construction site in Bandar Bukit Tinggi, Klang, today, steel scaffolding fell, trapping five migrant workers behind the debris. Figure 1 shows the accident that occurred on the Sungai Besi-Ulu Kelang Elevated Expressway (SUKE), this time claiming the lives of three foreign workers.

Figure 1: Accident Occurred on the Sungai Besi-Ulu Kelang Elevated Expressway (SUKE)

Causes of Construction Accidents

According to Ramya et al (2016), accidents can occur on a construction site for various reasons such as poor safety awareness, falling hazards, being struck by machinery,

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electrocution, slips and trips, fire, and natural hazards. Insufficient safety awareness is one of the causes of construction accidents in the construction industry. Poor safety awareness includes a lack of training and awareness of safety hazards and concerns. Lack of training results in inadequate knowledge of hazards and safety, which reflects the management team's ignorance of safety-related concerns.

Impacts of Construction Accidents

The top five impacts of construction accidents are loss of human life, worker demotivation, workplace conflict, productivity loss, and work-progress delays (Ahmed, 2019). Muhamad Zaini et al. (2020) also suggested that work-progress delays and higher construction cost as the impact of construction accidents.

Awareness of Construction Accidents

Awareness is the state or capacity to observe, feel or be conscious of events, or objects (Jati et al, 2012). Accidents are unplanned events that cause damage to property, death and lost productivity. Thus, awareness of construction accidents can be reduced with the right plans, preparations, and actions (Environment Health and Safety, 2018). Employee dedication to supporting safe work conditions is known as awareness. The presence of safety awareness encourages employees to manage hazards in a more positive work environment. Without safety awareness training, workplaces are vulnerable to several risks that could reduce productivity.

Underpinning Theory

Examining how the knowledge of causes and effects of accidents can evaluate the awareness of UUM students. Construction workers' understanding of risks can be improved with situational awareness developed by Endsley (Kim, 2020). The idea of situational awareness was first introduced in the subject of ergonomics, but it has found widespread use in many industries, including construction. Situational awareness is defined as the person's comprehension of "what is going on". It includes three levels: the perception of things in the current situation, comprehension of the current situation, and projection of the possible future situation. The framework of the study is shown in Figure 2.

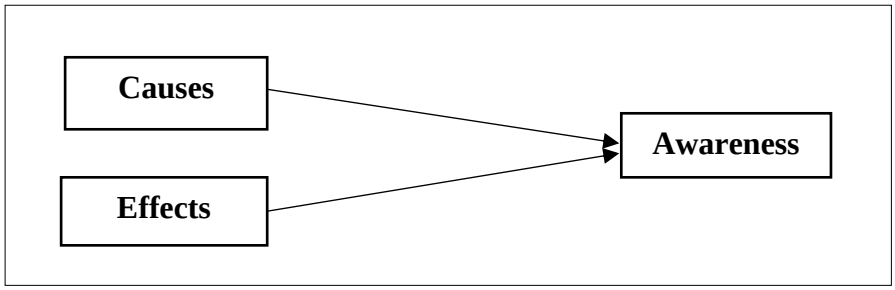

Figure 2: Research Framework

Accidents, events that injure people, damage property and equipment don’t just happen. They are not random acts of fate that occur out of the blue. Rather accidents are the combination of events that come together to create a flow of process where a progression of events leads to a negative outcome, an accident. The need for a theory reflects the difficulties in providing logical and rational explanations as to why certain events, people, and equipment interacted to generate a usually predictable negative outcome. Over the years many academics of the

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safety profession have tried to bring logic to create an understanding of the underlying and contributory factors that collide from a series of events that produce the environment for an injury to occur. A theory is: "systematically organized knowledge applicable in a wide variety of circumstances; especially, a system of assumptions, accepted principles, and rules of procedure devised to analyse, predict, or otherwise explain the nature or behaviour of a specified set of phenomena (Hamid et al., 2019)

Methodology

Data Collection

The researcher used a quantitative method to conduct this study. The quantitative method works by quantifying and analyzing variables to obtain results. Online questionnaires were used as a tool to obtain the primary data of this study. The undergraduate students from the Bachelor of Technology Management course were selected to respond to the online questionnaire through WhatsApp and Telegram. Referring to Krejcie and Morgan (1970) sampling table, 256 respondents were selected using a random sampling technique. The researcher used Krejcie and Morgan's sampling table for an effective method to determine the sample size from the population of Bachelor of Technology Management students. The questionnaire consists of three parts: the respondent's demographic data, the second part of the questionnaire measures UUM students' knowledge of the causes of construction accidents and the third part on the impacts of construction accidents in Malaysia.

Data Analysis

To ensure accuracy, the researcher used The Statistical Package for Social Sciences (SPSS) to examine the respondent's questionnaire responses. A commercially available software package for data management and statistical analysis is called SPSS. Following that, the researcher uses descriptive analysis in this study. This analytical procedure aids researchers in presenting and summarizing an observation. It gives the researcher a conclusion in summarizing the questionnaire's data. Regression analysis was used to identify the relationship between the independent and dependent variables.

Result & Discussion

The Respondent's Demographic Profile

The study collected a total of 256 responses from MOT undergraduate students. The demographic profile of the respondents is represented in Table 1. The results show that 152 (59.4%) of the respondents are female and 104 (40.6%) are male respondents. In addition, most of the respondents are from the category 21-25 years old which is 194 (75.8%). The second higher category is 18-20 years old which is 43 respondents equivalent to (16.5%) and the least is 26-30 years old which is 19 respondents equivalent to (7.4%). Moreover, 22 respondents (8.6%) have work experience in construction sites, meanwhile 234 respondents have no work experience in the construction site.

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Table 1: Demographic Profiles

Item	Category	Frequency	Percentage (%)
Gender	Male	152	59.4
	Female	104	40.6
Age	18-20	43	16.5
	21-25	194	75.8
	26-30	19	7.4
Working experience	Yes	22	8.6
	No	234	91.4
Total		256	100

Awareness Level of the Respondents toward Causes of Construction Accidents

The first part of the analysis is to assess the awareness level of the respondents towards the causes of construction accidents in Malaysia. Respondents must respond to 'yes' or 'no' based on their awareness level. The data is shown in Table 2 and represented in Figure 2.

Table 2: Data of Respondents

Item	Yes	No
Falling hazards	239	17
Slips & trips	202	54
Struck by machinery	233	23
Fire	133	123
Electrocution	230	26
Natural hazards	114	142
Poor awareness on work safety	237	19
Poor awareness on the use of personal protection equipment	239	17

Based on Figure 2, 239 respondents equivalent to 93.4% were said yes to falling hazards and poor awareness of using personal protection equipment as the cause of construction accidents. Besides, 237 respondents (92.6%) chose yes to poor awareness of work safety, followed by 233 respondents (91%) chose yes to being struck by machinery while 231 respondents (90.2%) chose electrocution as the cause of construction accidents. The high percentage indicates that students are aware of the causes of construction accidents. Meanwhile, 142 respondents equal to 55.5% said they are aware of natural hazards as the least cause of construction accidents. Followed by 123 respondents equals 48.1% who said no to fire indicating that they are unaware of fire as the cause of construction accidents.

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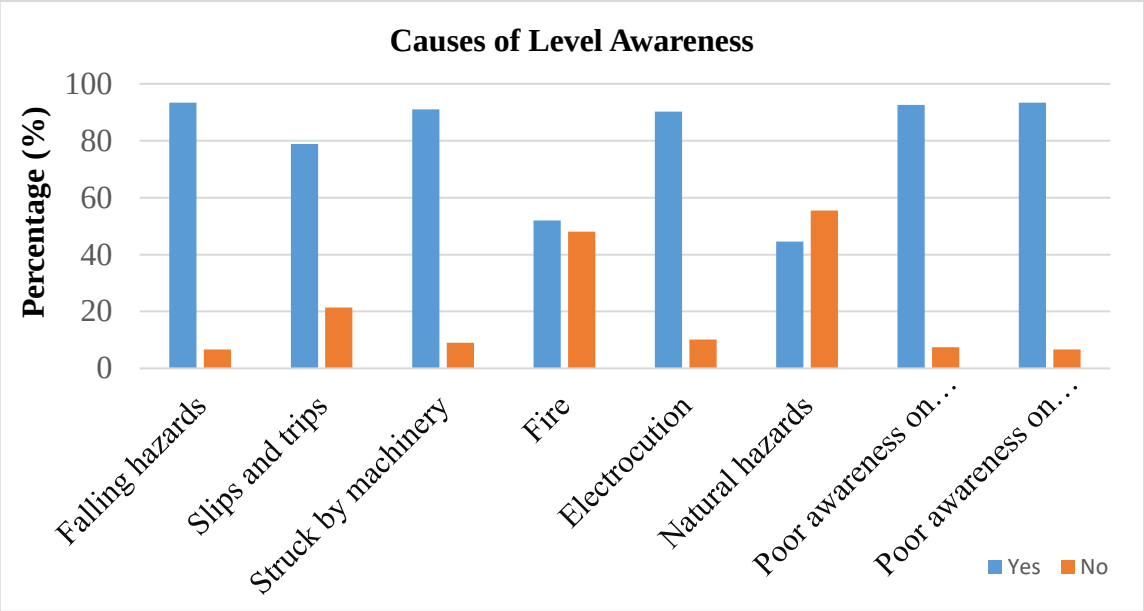

Figure 3: Causes of Construction Accidents

Other Causes of Construction Accidents

Respondents also suggested some causes of construction accidents based on their awareness level. Lack of experience, improper training, old and heavy equipment, manual handling, lower ability to afford technologies for construction activities and carelessness as the causes of construction accidents.

Awareness Level of the Respondents toward Impacts of Construction Accidents

The second part of the analysis is to assess the awareness level of the respondents towards the impacts of construction accidents in Malaysia. Respondents are required to give their response 'yes' or 'no' based on their awareness level. The data is shown in Table 3 and represented in Figure 3.

Table 3: Data of Respondents

Item	Yes	No
Demotivation of workers	227	29
Loss of human life	241	15
Damage to equipment	234	22
Work-progress delays	233	23
Productivity loss	222	37
Higher construction cost	233	26

Based on Figure 4, 241 respondents equivalent to 94.1% said yes to loss of human life as the dominant impact of construction accidents. Meanwhile, 15 respondents equal to 5.86% said no as they were not aware of the impact. Besides, 234 respondents (91.4%) chose yes to damage to equipment as they have awareness of the impact, meanwhile 22 respondents equal to 8.59% said no. Followed by work-progress delays and higher construction costs which shared the same number of respondents (233), equivalent to 91.1%. The high percentage indicates that students are aware of the impacts of construction accidents. Meanwhile, 23

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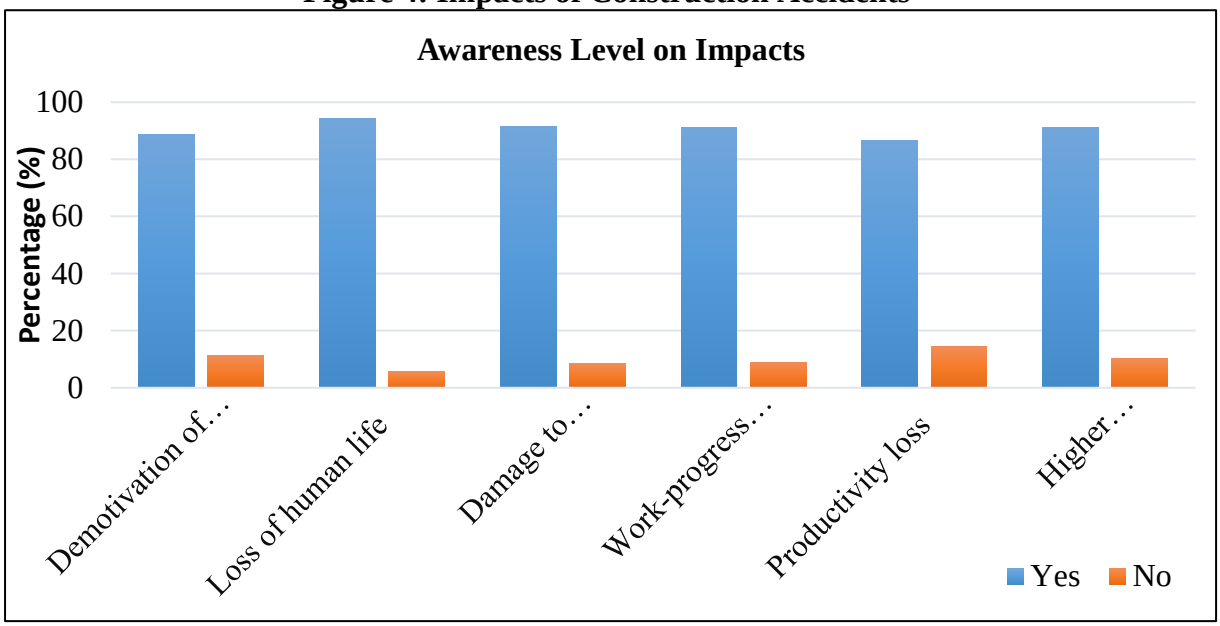
respondents (8.98%) said no to work-progress delays and higher construction costs as they were not aware of the impact.

Figure 4: Impacts of Construction Accidents



Other Impacts of Construction Accidents

Respondents also have suggested other impacts of construction accidents based on their awareness level. Bad reputation, an increase in work pressure, low self-esteem of workers, extra costs for victim's medical treatment, court issues if the accidents are serious, hiring of new workers and suffering of the victim (permanent disability). Based on Figure 5, 245 respondents equivalent to 95.70% said yes as they have a high awareness of construction accidents. Meanwhile, 11 respondents equal to 4.30 % said no as they have less awareness of the construction accidents happening in Malaysia.

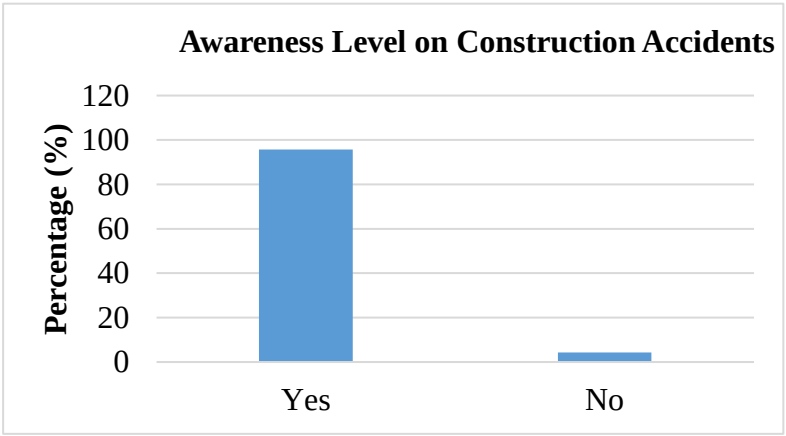


Figure 5: Awareness of Construction Accidents

Descriptive Statistics

According to the statistics, the mean for the cause variable is 4.20, indicating that respondents have a high awareness of causes that lead to construction accidents, whereas the mean for impacts of construction accidents is 4.52. The mean indicates respondents are more aware of

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the impacts of construction accidents. In addition, the standard deviation for causes is 0.481, whereas the impact is 0.614. The low standard deviation indicates that the values are closer to the mean (Andrade, 2020).

Table 4: Descriptive Statistics for All Variables

Variables	Mean	Standard Deviation
Causes of construction accident	4.20	0.481
Impacts of construction accident	4.52	0.614

Reliability Analysis

Reliability analysis was performed, and Cronbach's alpha of each structure was examined. According to Tavakol & Dennick (2005), Cronbach's Alpha greater than 0.7 is treated as a good reflection of the reliability of the internal consistency. The low alpha coefficient indicates that the project has a low measurement contribution to the interest structure. Therefore, variables with a Cronbach's alpha lower than 0.7 are usually eliminated. As shown in Table 5, the value for causes was 0.765, whereas the value for impacts was 0.921. This indicates that the values are acceptable to Cronbach Alpha

Table 5: Cronbach's Alpha Scores for Variables

Variables	Cronbach Alpha
Causes of construction accident	0.765
Impacts of construction accident	0.921

Regression Analysis

The results indicated that $R^2 = 0.142$, meaning that causes and impacts are factors explaining 14.2 % of the variance in F =20.940, p <.001. In this case, causes and impacts with beta values β =0.016, p < 0.012; β = 0.286, p < 0.001. Besides, causes and effects positively influenced undergraduate students' awareness level. According to Ng et al. (2018), the result is' very significant' if the p< is less than 0.5. Table 6 shows the regression analysis results of this study.

Table 6: Regression Analysis

	Unstandardized B	Coefficients St. Error	Standardized Coefficients Beta	T	Sig
Constant	1.246	.116		10.735	<.001
Causes(mean)	.067	.027	.016	2.535	.012
Impacts(mean)	.095	.021	.286	4.545	<.001

For this study, the hypotheses are causes and impacts of construction accidents can help analyze the UUM (MOT) students' awareness and help them be more aware of construction accidents. Based on the results, the entire hypothesis has been achieved as the causes and impacts show a significant relationship between undergraduate students taking MOT courses' awareness level. The significant values are p< 0.012; and p< 0.001. Based on the results, students are more aware of occupational accidents in the construction industry that happen in Malaysia. This shows that awareness among UUM (MOT) students is an important issue that should be taken seriously.

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Conclusion and Recommendation

In summary, this study has proven that the predicted hypothesis has been accepted. Therefore, the findings contributed to the university management encouraging more MOT students to be aware of the construction accidents in Malaysia. Furthermore, this study will help students to know about the causes and impacts of accidents in the construction industry. The researcher recommended that more studies be conducted regarding the awareness of construction accidents to help students be responsible for safety when working on the construction site. This study only focuses on UUM (MOT) students; hence it cannot be generalized to other educational institutions. Therefore, future studies may include other educational institutions in Malaysia.

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