Technology adoption of enhanced manual on fire safety and protection management

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Abstract: The study was conducted at Cebu Technological University Pinamungajan Extension Campus, Cebu, in order to Implement Fire Safety Management Procedure and determine its acceptability and effectiveness of the Technology Adoption of Enhanced Manual on Fire Safety and Protection Management during academic year 2019-2020. The Fire Safety and Protection Management Manual for School Maintenance was evaluated on the acceptability of its Effectiveness, Awareness, Safety and Health. Quasi-experiment method particularly survey research was employed on this study. Questionnaires were given to 10 professors/instructors and 180 students, 30 Faculty, 15 Fire Brigade Personnel, 15 Admin Personnel and 15 Safety Maintenance Personnel in Danao City, Cebu for evaluation. Gathered data were treated using total weighted points, weighted mean, and t-test. Based on the findings and after a careful analysis and interpretation of the study, it is concluded that the Technology Adoption of Enhanced Manual on Fire Safety and Protection Management meets the fire safety standards for school campuses. It was found out that the Technology Adoption of Enhanced Manual on Fire Safety and Protection Management Manual was highly acceptable in terms of acceptability of its Effectiveness, Awareness, Safety and Health. It is recommended that the Fire Safety Management Manual be adopted and practice for safety of the end users.

Keywords: fire safety, management, effectiveness, awareness, Danao city, Cebu

INTRODUCTION

In the United State of America, between 2007 and 2011, the number of fires in educational properties averaged 5,690 per year, according to “Structure Fires in Educational Property,” a September 2011 report by Richard Campbell published by

the National Fire Protection Association (NFPA) (Campbell, 2018). Of those 5,690 fires, 4,060 occurred in nursery, elementary, middle or high schools. So, that means 71 percent of the fires that occur in educational structures occur in pre K-12 schools (DISTRICT, 1974).

The report also notes that 54 percent of the fires that occur in pre K-12 schools occur between 9 a.m. and 3 p.m. nearly half (49 percent) of these fires are set intentionally. About one-third occurred in a restroom. Perhaps surprisingly, just 13 percent of the fires occurred in a cafeteria kitchen or cooking area (Dreier, Mollenkopf, & Swanstrom, 2014). All told, these fires caused 70 injuries - no deaths - and $70 million in property damage. Think about that for a minute. Over the five-year period of 2007 through 2011, there were 20,300 fires and just 70 injuries. That speaks volumes about our ability to detect, suppress and respond to school fires (Garrick, 2015).

Safety assessment technology is the new method in the field of safety management. It made safety management from remedy after the accident to prevention beforehand. So safety management had the function that can control the way of accident. But now these methods of safety assessment more adapt the petroleum and chemical industries, not construction industry. This paper integrates the current safety assessment technologies and puts forwards a new method of safety evaluation of building site, which adapted to the traits of construction. In order to set forth the method, this paper has employed Analytical Hierarchy Process (AHP) and method of Fuzzy Evaluation, which are very mature in management theory. This paper discusses construction safety evaluation plan and concrete applying step of Fuzzy Evaluation. This paper is based on the project of Ministry of Construction P. C. China Study on the safety statute and technology standards of construction, which are undertaken by Tianjin University and Tianjin Construction Group (TCG). During this period, TCG asked us to make another study on the safety evaluation in building site. So we verify the fruits in eight building sites of TCG.

In today’s complex world effective safety management is the cornerstone of managing an economically viable business. The requirement to manage safety effectively extends to all private and public business sectors (Furness & Muckett, 2007). Legal responsibilities for safety performance extend throughout all organizations from the management board to the student on work experience. Every operation within any organization has an impact on the safety not only of those undertaking and managing the work but also of others who may be affected by their work activities. Any product or service provided to anybody must be designed or delivered in such a way as to reduce the risks to the end users to an acceptable level. Therefore it can be seen that safety is inextricably linked with all facets of work. The failure to manage safety adequately all too often results in death or injury, chronic ill

health and damage to property and/or the environment. Such results have a significant impact on the physical and economic wellbeing of society (Howden-Chapman et al., 2017).

Although there is a growing international movement toward the use of performance-based fire safety design, current practice is dominated by prescriptive-based design. In prescriptive-based fire safety design, only those requirements prescribed by appropriate building regulations, installation standards, or approved documents tend to be applied. Because these requirements typically include fire protection measures, such as fire detection and signalling systems, automatic sprinkler systems, fire box, and emergency outlet systems, there is often an assumption that occupants, employees, and users of a facility will be safe should a fire occur. However, there are a variety of factors that could affect the actual fire safety of a facility that comply with the appropriate regulations (Meacham, 1999). Fuel type, loading, configuration, and location can change, leading to an increase in fire risk. Occupants may not see, hear or understand fire alarm signals as fire alarm signals. Fire detection and signalling systems, fire suppression systems, or smoke management systems may not be 100 % functional at all times (Cheng, 2017). Fortunately, many of these factors can be controlled for, if they are understood and addressed, within a fire safety management plan. To assist with such planning, this paper discusses various human behaviour and response issues that may affect life safety during a fire or emergency, and provides suggestions for integrating these issues into a fire safety management plan.

To facilitate successful management of both fire and health and safety it is vital to develop a solid base of understanding and the key elements that will provide a foundation upon which to build. For students, school personnel and safety practitioners presented information’s on the legal requirements and management considerations that will assist the workers to successfully minimize the risk of harm from fire in the workplace.

The present problems encountered in our school campus are in need a guidelines or policy manual to guide the students, personnel and official answer any calamities as part of the building maintenance. From this, the problems encountered will be partially answered.

STATEMENT OF THE PROBLEM

This research assesses the Technology Adoption of Enhanced Manual on Fire Safety and Protection Manual in private schools in Danao City, Cebu during school year 2019-2020 as basis enhanced management.

Specifically, it sought answers of the following:

1. What related information can be derived from:

1.1.Profile of the respondent-groups:

1.1.1. age and gender;
1.1.2. accreditation level;
1.1.3. length of stay in the school; and
1.1.4. appropriate training/seminar attended?
1.2.Schools:
1.2.1. Available fire safety and protection facilities and equipment;
1.2.2. Record of emergency of fires;
1.2.3. Training and seminar on fire conducted?
2. What is the level of implementation of fire safety management priorities as to:
2.1.Planning;
2.2.Organization;
2.3.Control;
2.4.Monitoring;
2.5.Review; and
2.6.Fire emergency Plan?
3. Are there significant difference on the perception of the respondent-groups as Fire Safety management?
4. What are the barrier and challenges on the implementation of the Fire Safety management?
5. Based on findings, what enhanced Fire Safety Management can be adopted?

RESEARCH METHODOLOGY

In the research study of The Fire Safety Procedures Manual, Colegio de San Antonio de Padua, Northeastern Cebu Colleges, and Sto. Tomas Colleges, Danao City, a mixed-method approach was used in order to gain a more complete understanding of the problem area. This approach consists of a combination of both quantitative and qualitative Research.

The quantitative research employed in this study was explained and predict concepts that can be generalized to other people and places that objectively measures the variable(s) of interest, which are identified, developed and standardized with attention to validity and reliability. While this study also utilized a qualitative research design, it gives a better understanding from peoples' experiences. Using both of these as models allows the research filled with information and the researcher to gather for more for his study. Furthermore, the purpose of the research was examined and evaluated existing School Campus Safety Program and investigate the extent of the conflict and effective safety measures in the whole campus. The respondents of the study were randomly selected as per requirements of the study including one hundred (180)Students, thirty(30)Faculty, fifteen(15)Fire Brigade and fifteen(15)Admin personnel, fifteen(15)safety maintenance personnel. The total respondents was two fifty five (255) only. The instrument to be used in this study was

adopted by Technology Acceptability Management (TAM) and DOLE D.O. 13 Series of 1998. It was two–set of questionnaires, one for the selected students, Faculty, Fire Brigade Personnel, Admin Personnel and Safety Maintenance Personnel. It will only ask responses on the effectiveness of the Fire Safety Procedures Manual. To uphold ethical and integrity of this study, the researchers asked a permission to the school head by giving a letter with researcher's made survey questionnaires. Upon approved by the school head, the researcher was distributed the questionnaire personally to the students and the Fire safety respondents. The researchers gathered the data from the survey questionnaire which was collated, tallied, listed and subject to the following statistical treatments. As regards to the statistical tool, it made used the weighted mean to determine the respondents' perception in the fire safety procedures manual. Also, t-test was utilized to determine the significance between the mean validations on the use of the fire safety procedures manual. The average weighted point of the weighted categories was used as the mean of the evaluated item. Thus, the following parametric scale was utilized to provide equal chances for each response category. For Fire Safety Procedures Manual at Colegio de San Antonio de Padua, Guinsay, Danao City the five points likert scale was used.

REVIEW OF RELATED LITERATURE AND STUDIES

Starting from the statement that time is the overruling factor in fire circumstances, this study dissects the egress operation in the - physical domain: threats of untenable conditions and cut off exit ways; Mathematical domain: users' velocity and egress flow rates as factors of the evacuation time; pre-calculation of the evacuation time in the building design stage; prediction of place and duration of traffic congestions: potential sources of panic; remedial measures in building outlay; Psychological domain: importance of self-control and adaptation ability in the phases of discovering the fire, the shock moment and decision-making reaction. There is a complaint about the nowadays poor character-building school education; Practical domain: special school risks versus specific advantages expected to further smooth egress operations; evacuation strategy and tactics; the importance to inform and direct the evacuees (e.g. by megaphone) and to organize the evacuation in priority order according to local threats. The paper considers the problems in special institutions attended by ambulatory and non-ambulatory impaired pupils. It motivates a drastic raise of night staff to pupil's ratio and proposes a specific evacuation scheme, concentrated on the rescue of non-ambulatory users by accurate organization of thoroughly trained staff teams.

The fire safety of existing buildings decreases over time. Based on factors such as space limitation and high construction costs, upgrading hardware construction is difficult, especially in existing hotel buildings due to their 24-hours operation. This

simple fire safety evaluation system for existing multi-purpose hotel buildings. Fire safety management is the most important section in the evaluation system, which includes fire prevention, and evacuation and mitigation strategies, accounting for a 54.95% weighting. In this study, an empirical evaluation was conducted on 16 multi-purpose hotel buildings. Of these test cases, five were determined to be unsafe. After reviewing the scores for each fire safety management plan factor, necessary improvement plans were proposed. This system will assist owners in undertaking improved fire safety management measures with less hardware renewal.

According to RT Jones, LA Sisson, the efficacy of group emergency fire-safety skills training for blind adolescents was examined. Eight subjects in a residential school were trained to respond to an emergency fire situation under simulated conditions. The intervention consisted of instructions, explicit corrective feedback, behaviour rehearsal, social and token reinforcement, and verbal and behavioural reviews. Participants' fire-emergency responses were assessed in simulated emergency situations as well as during unannounced night-time fire drills. A multiple-baseline analysis across subjects showed high levels of skill acquisition in all subjects during emergency simulations. Further, behaviours generalized to actual fire drills in six of the eight subjects. Results are discussed in terms of: (1) the cost-effectiveness of the group treatment strategy, and (2) the need for additional research in emergency safety skills with the visually handicapped. Limitations of the present methodology are indicated; suggestions for directions future investigations might take are offered.

RESULTS AND DISCUSSION

The purpose of this study was to assess the schools fire safety and protection management by formulating policy on fire safety emergency plan the results from the questionnaires answered by the respondent-groups in this study. The result of the Fire Safety Management Manual as a school fire safety and protection survey in the identified private schools in Danao City Cebu, Philippines was also been discussed.

The information was collected by means of questionnaires completed by both students and faculty. Respondents from students, faculty, Fire Brigade Personnel, Admin Personnel, and Safety Maintenance Personnel with the total of 90 respondents.

RELATED INFORMATION OF THE RESPONDENTS

The information of the respondent-groups of the three(3) private institution of Danao City are the following: Colegio de San Antonio de Padua, Northeastern Cebu Colleges and STo. Tomas Colleges.

As presented in Table 3, there were 5 respondent-groups rated in terms of AGE. Based on the result, 70.58% of the students rated. For students there were 170

respondents answered with the age bracket 18-24. Ten(10) respondents rated with 25-35 age bracket.

Table 3.

Age N=255

Respondent-Groups	Age			X	%
	(18-24)	(25-35)	(36-50)		
Students	170	10	0	180	70.58
Faculty	0	30	0	30	11.764
Fire Brigade Personnel	0	5	10	15	5.882
Admin Personnel	0	5	10	15	5.882
Safety Maintenance Personnel	0	5	10	15	5.882
Total:	170	55	30	255	99.99

Legends:

Age 18-24 - Students

Age 25-35 - Students, Faculty, Fire Brigade Personnel, Admin Personnel, Safety Maintenance Personnel

Age 36-50 - Fire Brigade Personnel, Admin Personnel Safety Maintenance Personnel.

X - Sum

% - Percentage

Table 4.

Gender N=255

Respondent-Groups	Gender		X	%
	Male	Female		
Students	*70*	*110*	*180*	*70.58*
Faculty	*14*	*16*	*30*	*11.764*
Fire Brigade Personnel	*12*	*3*	*15*	*5.882*
Admin Personnel	*8*	*7*	*15*	*5.882*
Safety Maintenance Personnel	*14*	*1*	*15*	*5.882*
Total:	*118*	*137*	*255*	*99.99*
Interpretation:	*Female respondents have higher than male.*			

Legends:

X - Sum

% - Percentage

In Table 4, there were 255 respondents included in the study. There were 70 male and 110 female students answered the questions in terms of GENDER. There were 14 male and 16 female Faculty; for Fire Brigade Personnel there were 12 male and 3 female answered in terms of GENDER; for Admin personnel there were also 8 male and 7 female; and for Safety Maintenance Personnel there were also 14 male and 1 female answered the questions in terms of GENDER.

The Philippine Accrediting Association of Schools, Colleges and Universities (PAASCU) is a private, voluntary, non-profit and non-stock corporation which was registered with the Securities and Exchange Commission of the Philippines. It is a

service organization which accredits academic programs which meet commonly accepted standards of quality education.

PAASCU is an accrediting body composed of different private educational institutions that stamp other private schools with a quality standard attained with regard to their programs.

Table 5.

Accreditation level N=30

PAASCU Accreditation Level	Colegio de San Antonio de Padua	Northeastern Cebu Colleges	STo. Tomas Colleges	X	%
	School 1	School 2	School 3		
On Process	*12*	*8*	*10*	*30*	*100*
L1	*0*	*0*	*0*	*0*	*0*
L 2	*0*	*0*	*0*	*0*	*0*
L 3	*0*	*0*	*0*	*0*	*0*
L 4	*0*	*0*	*0*	*0*	*0*
Total:	*12*	*8*	*10*	*30*	*100*
Interpretation:	*Complying PAASCU accreditation documents*				

Legends:

On Process - Submitted Documents for Accreditation

L1 - Accreditation Level 1

L2 - Accreditation Level 2

L3 - Accreditation Level 3

L4 - Accreditation Level 4

School 1 - Colegio de San Antonio de Padua

School 2 - Northeastern Cebu Colleges

School 3 - STo. Tomas Colleges

As presented in Table 5, there were 3 private schools CHED registered in Danao City. In School 1 there were 12 respondents from College de San Antonio de Padua answered the questions on accreditation level “ON PROCESS”; 8 respondents from Northeastern Cebu Colleges answered the questions on accreditation level “ON PROCESS” and 10 respondents STo. Tomas Colleges.

Therefore, the 3 schools mentioned above has pending application for accreditation. The schools has complying required documents for PAASCU accreditation.

Table 6.

Length of stay in the school N=240

Years of stay in School	1 yr to 5 yr.	6 yr to 10 yr.	11 yr to 15 yr.	X	%
Students	*180*	*0*	*0*	*180*	*75*
Faculty	*30*	*0*	*0*	*30*	*12.5*
Fire Brigade Personnel	*0*	*0*	*0*	*0*	*0*
Admin Personnel	*15*	*0*	*0*	*15*	*6.25*

Safety Maintenance Personnel	*15*	*0*	*0*	*15*	*6.25*
Total:	*240*	*0*	*0*	*240*	*99.99*
Interpretation:	*Only School Personnel has long stayed in the School*				

Legends:

School 1 - Colegio de San Antonio de Padua

School 2 - Northeastern Cebu Colleges

School 3 - STo. Tomas Colleges

As indicated in Table 6, there were 240 respondents stayed in the school campus. There were 180 students stayed in the school; 30 faculty; 15 Admin Personnel and 15 Safety Maintenance Personnel answered in terms of YEARS OF STAY IN SCHOOL.

Table 7.

Appropriate training/seminar attended N=255

Related Training and Seminars attended	Very Useful (VU)	Useful (U)	Not Useful (NU)	X	%
Maintenance Training	*0*	*0*	*15*	*15*	*5.88*
Disaster and Risk Management Training	*0*	*20*	*0*	*20*	*7.84*
Fire Safety and Protection Training	*220*	*0*	*0*	*220*	*86.27*
Total:	*255*	*20*	*15*	*255*	*99.9*
Interpretation:	*VERY USEFUL*				

Legends:

VU - Very Useful

U - Useful

NU - Not Useful

X - Sum

% - Percentage

VD - Verbal Description

As presented Table 6, there were 3 related training and seminars attended namely: Maintenance Training, Disaster and Risk Management Training and Fire Safety and Protection Training. The respondents rated 15 for “Not Useful” in terms of “Maintenance Training”; 20 for “Useful” in terms of Disaster and Risk Management Training; and 220 for “VERY USEFUL” in terms of Fire Safety and Protection Training.

Therefore, the respondent-groups need to implement and adopt the Fire Safety and Protection Training using the fire safety manuals for schools.

Table 8.

Available Fire Safety and Protection Facilities and Equipment N=255

Available Fire Safety and Protection Facilities and Equipment	Very Available (VA)	Available (A)	Not Available (NA)	X	%
Fire Alarm System	*0*	*75*	*180*	*255*	*14.285*

Fire Extinguishers	*45*	*60*	*150*	*255*	*14.285*
Sprinklers	*0*	*75*	*180*	*255*	*14.285*
Fire Hose Reels	*0*	*75*	*180*	*255*	*14.285*
Signage(Emergency Exit Sign)	*0*	*75*	*180*	*255*	*14.285*
First Aid Kit	*180*	*0*	*75*	*255*	*14.285*
Smoke Alarm	*0*	*75*	*180*	*255*	*14.285*
Total:	*225*	*435*	*1125*	*1785*	*99.9*
Interpretation:	*Need to acquire Fire Safety Facilities and Equipment*				

Legends:

VA - Very Available

A - Available

NA - Not Available

X - Sum

% - Percentage

VD - Verbal Description

In Table 7, the Availability of Fire Safety and Protection Facilities and Equipment in school for accreditation was need to acquire. There were equipment has NOT AVAILABLE during the conduct of survey namely: Fire Alarm System rated 75 for Available; 180 for NOT AVAILABLE.

For Fire Extinguishers rated by the respondent 45 for VERY AVAILABLE; 60 for AVAILABLE and 150 for NOT AVAILABLE;

Table 9.

Record of Emergency of Fires N=255

Record of Emergency of Fires	Very Rare (VR)	Rare (R)	Not Rare (NR)	X	VD
Fire	*75*	*180*	*0*	*225*	*VR*
Fire Prevention	*75*	*180*	*0*	*225*	*VR*
Detection and Warning	*75*	*180*	*0*	*225*	*VR*
Emergency Escape	*220*	*35*	*0*	*255*	*VR*
Total:	*445*	*575*	*0*		
Interpretation:	*VERY RARE*				

Legends:

VR - Very Rare

R - Rare

NR - Not Rare

X - Sum

% - Percentage

VD - Verbal Description

As indicated in Table 8, there 4 Records of Emergency of Fires rated by the respondent-groups namely: Fire, Fire Prevention, Detection and Warning, and Emergency Escape.

Based on the table presented above, there were 220 rated VERY RARE in terms of Emergency Escape recorded in the schools; 35 respondents rated RARE; and the rest of the respondents rated 75 for VERY RARE and 180 for RARE in terms of Fire, Fire Prevention and Detection and Warning as recorded in the schools emergency of fires.

Therefore, the school needs to have Fire Safety and Protection Management Manual as a guide to the personnel in the 3 schools in Danao City.

Table 10.

Training and Seminar on Fire Conducted N=255

Trainings and Seminar Conducted	Very Effective (VE)	Effective (E)	Not Effective (NE)	X	VD
Fire Drills	255	0	0	255	VE
DRRM	180	0	75	255	VE
Occupational Health and Safety	180	0	75	255	VE
Total:	615	0	150		
Interpretation:	VERY EFFECTIVE				

Legends:

VE - Very Effective

E - Effective

NE - Not Effective

X - Sum

% - Percentage

VD - Verbal Description

In Table 9, the respondents answered the questions about training and seminar on fire conducted. Based on the records from school emergency and maintenance, there were 255 respondents rated “VERY EFFECTIVE” in terms of Fire Drills, DRRM and OSH.

Therefore, the respondent-groups want to implement comprehensive trainings on fire safety and management program.

LEVEL OF IMPLEMENTATION OF FIRE SAFETY MANAGEMENT PRIORITIES

A fire safety management plan details your arrangements to implement, control, monitor and review fire safety standards and to ensure those standards are maintained. The plan describes the arrangements for effectively managing fire safety so as to prevent fire occurring and, in the event of fire, to protect people and property. The following information may give you guidance under Article 11 of the Regulatory Reform (Fire Safety) Order 2005. It is without prejudice to anything which may be required by an enforcing authority.

Table 11.

Planning N=255

Fire Safety Management Priorities in Planning	Very Aware (VA)	Aware (A)	Not Aware (NA)	X	VD
How the responsible person proposes to complete the fire safety risk assessment and determine priorities in eliminating any hazards and reducing risks to persons.	*0*	*75*	*180*	*255*	*NA*
Adopting a systematic approach for completing risk assessments to decide on priorities and to set objectives to eliminate or reduce risks.	*0*	*75*	*180*	*255*	*NA*
Selecting appropriate risk control measures.	*0*	*75*	*180*	*255*	*NA*
Establishing performance standards and implementing preventative and protective measures.	*0*	*75*	*180*	*255*	*NA*
Total:	*0*	*300*	*720*		
Interpretation:	*NOT AWARE*				

Legends:

VA - Very Aware

A - Aware

NA - Not Aware

X - Sum

% - Percentage

VD - Verbal Description

As presented in Table 10, The Fire Safety Management Priorities in Planning. There were respondents rated 75 AWARE and 180 NOT AWARE in terms of "*How the responsible person proposes to complete the fire safety risk assessment and determine priorities in eliminating any hazards and reducing risks to persons"; Adopting a systematic approach for completing risk assessments to decide on priorities and to set objectives to eliminate or reduce risks; and Establishing performance standards and implementing preventative and protective measures.*

Therefore, the respondents NOT AWARE about the Fire Safety Management Priorities in Planning. So, the researcher must implement and adopt the Fire Safety Manual to the three schools in Danao City.

Table 12.

Organization N=255

Fire Safety Management Priorities about the Organization	Very Aware (VA)	Aware (A)	Not Aware (NA)	X	VD
How health and safety information is communicated to all employees.	*0*	*45*	*210*	*255*	*NA*
What employee's involvement has been in complying with all aspects of the fire safety risk assessment?	*0*	*45*	*210*	*255*	*NA*
Who will decide on the preventative and protective measures and those involved in implementing them?	*0*	*45*	*210*	*255*	*NA*
Effective communication systems to employees and	*0*	*45*	*210*	*255*	*NA*

other employers or other responsible persons.					
Securing competence by having adequate information, instruction and training.	*0*	*45*	*210*	*255*	*NA*
A fire safety risk assessment	*0*	*45*	*210*	*255*	*NA*
An emergency / evacuation plan	*0*	*45*	*210*	*255*	*NA*
Details of fire drills and practice sessions	*0*	*45*	*210*	*255*	*NA*
Housekeeping and fire prevention measures	*0*	*45*	*210*	*255*	*NA*
Arson prevention	*0*	*45*	*210*	*255*	*NA*
Maintenance arrangements	*0*	*45*	*210*	*255*	*NA*
Details of fire doors/protected areas	*0*	*45*	*210*	*255*	*NA*
Total:	*0*	*540*	*2520*		
Interpretation:	*NOT AWARE*				

Legends:

VA - Very Aware

A - Aware

NA - Not Aware

X - Sum

% - Percentage

VD - Verbal Description

As indicated in Table 11, there were 12 Fire Safety Management Priorities about the Organization. Based on the data collected from the respondents, there were 45 AWARE AND 210 NOT AWARE as rated by the respondent-groups.

Therefore, the Fire Safety Management Priorities about the Organization was NOT AWARE. Meaning the researcher must implement, adopt and practice the Fire Safety Management Programs to the 3 schools in Danao City.

Table 13.

Control N=255

Fire Safety Management Priorities and Control	Very Aware (VA)	Aware (A)	Not Aware (NA)	X	VD
Clarify health, safety and fire safety responsibilities.	*0*	*75*	*180*	*255*	*NA*
Ensure those with responsibilities understand their roles and responsibilities.	*0*	*75*	*180*	*255*	*NA*
Set specific and measurable standards to judge performance.	*0*	*75*	*180*	*255*	*NA*
Ensure adequate supervision.	*0*	*75*	*180*	*255*	*NA*
Total:	*0*	*300*	*720*		
Interpretation:	*NOT AWARE*				

Legends:

VA - Very Aware

A - Aware

NA - Not Aware

X - Sum

% - Percentage

VD - Verbal Description

In Table 12, The Fire Safety Management Priorities and Control has 4 awareness that the respondents understand. The respondents rated as 75 for AWARE and 180 NOT AWARE in terms of "*Clarify health, safety and fire safety responsibilities": Ensure those with responsibilities understand their roles and responsibilities; Set specific and measurable standards to judge performance; and Ensure adequate supervision.*

Therefore, the researcher will implement to the three schools for the development of the FSM Program.

Table 14.

Monitoring N=255

Fire Safety Management Priorities and Monitoring	Very Aware (VA)	Aware (A)	Not Aware (NA)	X	VD
Have a plan and make routine inspections to ensure measures are in place and are being maintained.	*0*	*75*	*180*	*255*	*NA*
Investigate all accidents to ensure lessons are learnt and procedures altered if necessary.	*0*	*75*	*180*	*255*	*NA*
Record your monitoring activities and processes.	*0*	*75*	*180*	*255*	*NA*
Total:	*0*	*225*	*540*		
Interpretation:	*NOT AWARE*				

Legends:

VA - Very Aware

A - Aware

NA - Not Aware

X - Sum

% - Percentage

VD - Verbal Description

As presented in Table 13, there were three Fire Safety Management Priorities and Monitoring as follows: 75 for AWARE and 180 for NOT AWARE in terms of "*Have a plan and make routine inspections to ensure measures are in place and are being maintained"; Investigate all accidents to ensure lessons are learnt and procedures altered if necessary; and Record your monitoring activities and processes.*

Therefore, the Fire Safety Management Priorities and Monitoring must implement the program in schools.

Table 15.

Review N=255

Fire Safety Management Priorities and Review	Very Aware (VA)	Aware (A)	Not Aware (NA)	X	VD
Have mechanisms to ensure remedial work is carried out.	*0*	*75*	*180*	*255*	*NA*
Have a system to ensure remedial work not done is prioritized and completed.	*0*	*75*	*180*	*255*	*NA*
Review the management systems to ensure they remain effective.	*0*	*75*	*180*	*255*	*NA*
Total:	*0*	*225*	*540*		
Interpretation:	*NOT AWARE*				

Legends:

VR - Very Rare

R - Rare

NR - Not Rare

X - Sum

% - Percentage

VD - Verbal Description

As presented in Table 14, there were three Fire Safety Management Priorities and Review as follows: 75 for AWARE and 180 for NOT AWARE in terms of "*Have mechanisms to ensure remedial work is carried out."; Have a system to ensure remedial work not done is prioritized and completed.; and Review the management systems to ensure they remain effective.*

Therefore, the Fire Safety Management Priorities and Review must implement the program in schools.

Table 16.

Fire Emergency Plan N=255

Fire Safety Management Priorities about Emergency Plan	Very Aware (VA)	Aware (A)	Not Aware (NA)	X	VD
How people will be warned if there is a fire.	*0*	*75*	*180*	*255*	*NA*
What staff should do if they discover a fire.	*0*	*75*	*180*	*255*	*NA*
How the evacuation of the premises should be carried out.	*0*	*75*	*180*	*255*	*NA*
Where people should assemble after they have left the premises and procedures for checking whether the premises have been evacuated.	*0*	*75*	*180*	*255*	*NA*
Identification of key escape routes, how people can gain access to them and escape from them to a place of total safety.	*0*	*75*	*180*	*255*	*NA*
Arrangements for fighting the fire.	*0*	*75*	*180*	*255*	*NA*
The duties and identity of staff who have specific responsibilities if there is a fire.	*0*	*75*	*180*	*255*	*NA*
Arrangements for the safe evacuation of people identified as being especially at risk, such as those	*0*	*75*	*180*	*255*	*NA*

with disabilities, lone workers and young persons.					
Any machines/appliances/processes/power supplies that need to be stopped/isolated if there is a fire	*0*	*75*	*180*	*255*	*NA*
Specific arrangements, if necessary, for high-fire-risk areas	*0*	*75*	*180*	*255*	*NA*
Contingency plans for when life safety systems such as evacuation lifts, fire-detection and warning systems, sprinklers or smoke control systems are out of order	*0*	*75*	*180*	*255*	*NA*
How the fire and rescue service and any other necessary services will be called and who will be responsible for doing this	*0*	*75*	*180*	*255*	*NA*
Procedures for meeting the fire and rescue service on their arrival and notifying them of any special risks, e.g. the location of highly flammable materials	*0*	*75*	*180*	*255*	*NA*
What training employees need and the arrangements for ensuring that this training is given.	*0*	*75*	*180*	*255*	*NA*
Phased evacuation plans (where some areas are evacuated while others are alerted but not evacuated until later)	*0*	*75*	*180*	*255*	*NA*
Plans to deal with people once they have left the premises	*0*	*75*	*180*	*255*	*NA*
Total:	*0*	*1200*	*2880*		
Interpretation:	*NOT AWARE*				

Legends:

VA - Very Aware

A - Aware

NA - Not Aware

X - Sum

% - Percentage

VD - Verbal Description

As presented in Table 15, there were sixteen Fire Safety Management Priorities about Emergency Plan as follows: 75 for AWARE and 180 for NOT AWARE in terms of "*How people will be warned if there is a fire"; What staff should do if they discover a fire; How the evacuation of the premises should be carried out; Where people should assemble after they have left the premises and procedures for checking whether the premises have been evacuated; Identification of key escape routes, how people can gain access to them and escape from them to a place of total safety; Arrangements for fighting the fire; The duties and identity of staff who have specific responsibilities if there is a fire; Arrangements for the safe evacuation of people identified as being especially at risk, such as those with disabilities, lone workers and young persons;*

Any machines/appliances/processes/power supplies that need to be stopped/isolated if there is a fire; Specific arrangements, if necessary, for high-fire-risk areas; Contingency plans for when life safety systems such as evacuation lifts, fire-detection and warning systems, sprinklers or smoke control systems are out of

order; How the fire and rescue service and any other necessary services will be called and who will be responsible for doing this; Procedures for meeting the fire and rescue service on their arrival and notifying them of any special risks, e.g. the location of highly flammable materials; What training employees need and the arrangements for ensuring that this training is given; Phased evacuation plans (where some areas are evacuated while others are alerted but not evacuated until later); and Plans to deal with people once they have left the premises.

Therefore, the Fire Safety Management Priorities about Emergency Plan must implement the program in schools.

ARE THERE SIGNIFICANT DIFFERENCE ON THE PERCEPTION OF THE RESPONDENT-GROUPS AS FIRE SAFETY MANAGEMENT

The interpretation of the results of the study null hypothesis was tested at 0.05 level of significance.

H01. There was significant mean difference between the perceptions of the respondent-groups on the impact of fire safety management.

Table 17.

Significant difference on the perception of the respondent-groups as fire safety management N=255

Perception of the Respondents	An Expert About DRRM N=122		Non-Expert About DRRM N=56		Computed t-value	Critical t-value α=0.05 two tailed test	Decision
	X1	SD1	X2	SD2			
PERCEPTION OF THE RESPONDENT-GROUPS AS FIRE SAFETY MANAGEMENT	*2.45*	*0.06*	*3.09*	*0.08*	*0.36*	*2.04*	*Do not Reject Ho*

Therefore the null hypothesis, which states: "There is no significant mean difference between the perceptions of the respondents group towards the *Recommendations on School Disaster Risk Reduction Strategic Action Plan*", is needed.

This means that both the Experts and the Non-expert have the same perceptions on the recommendations, hence the Strategic Action Plan is needed and based on their perceptions there can be a good implication on it.

This implies that the annual SDRRM can be given by the respective coordinators and school head through Strategic Action Plan.

THE BARRIER AND CHALLENGES ON THE IMPLEMENTATION OF THE FIRE SAFETY MANAGEMENT

The presentation below is the barrier and challenges on the implementation of the Fire Safety Management.

Fire Safety Management plays an important role in enhancing the safety of buildings against fire outbreaks. The persistent increase in fire related issues amongst students' hostel accommodations calls to mind the role hostel management and occupants can play in order to ensure complete safety of lives and properties. Controlling fire outbreaks is associated with a lot of challenges. This study presents the results of a questionnaire survey which sought to assess the perceptions of students on challenges to fire safety management in multi-storey students' hostels around the Kwame Nkrumah University of Science and Technology campus. The findings from the study revealed that 'problems with electrical wiring and installations', 'inadequate water distribution systems', 'inadequacies in the fire departments', 'passive attitudes of owners/management towards housekeeping and maintenance', and passive attitudes towards personal fire protection' are the five critical challenges to effective fire safety management in the hostels. The results further showed that 'fire insurance policies', 'fire evacuation plans', regular maintenance and housekeeping', 'fire safety policies' and 'sanctions against those who disobey fire regulations', are all measures which when put in place can mitigate the outbreak of fire. Identifying the challenges to effective fire safety management and implementing the measures to control such challenges should assist in the control of fire outbreaks in students' hostels and other buildings.

Table 18.

Barrier and Challenges in Fire Safety Management N= 255

CHALLENGES	DESCRIPTION	REFERENCES	FINDINGS
1.Problems with Electrical Wiring and Installations.	*The electrical wiring installations starts with the materials durability and the good installation processes.*	*Agyekum, K., Ayarkwa, J., Amoah, P. Boateng, B.*	*All the factors were considered to be critical severe.*
2.Inadequate water distribution System.	*The management has always storage of water system in case of fire. There will be a water hydrant and the fire boxes outside the building.*		
3.Inadequacies in the Fire Department.	*It must have ready all materials, tools needed in case of fire.*		
4.Passive attitude of owners/management towards housekeeping and maintenance.	*The owners and officials of the Fire Safety management must always aware about fire Safety concerns.*		
5.Passive attitude towards Personal Fire Protection.	*The owner must acquire set of PPE for fire safety accident.*		
6.High Cost of installing of Fire Protection System.	*The management will make any alternative gadgets if in case the fire happens.*		
7.No consideration on Fire-resistive Building Design and Construction.	*The team and the organization must aware about fire resistive Building Design and Construction.*		
8.Poorly enforced	*Be positive about the supply of the tools,*		

and ineffective fire-related policies and regulations.	*materials and equipment for the protection of fires.*		

CONCLUSION AND RECOMMENDATION

Based on the findings and after a careful and thorough analysis and interpretation of the research study, it is concluded that the Fire Safety Management Manual meets the standards and is precise guide in Fire Safety and Security Procedures and Operations. Structural safety is essential for protecting the lives of building occupants and visitors, preventing damage to the environment, limiting property loss, and ensuring safe egress. Fire protection systems must be reliable and properly be taken good care to ensure life and fire safety. This study highlighted the importance of fire protection systems in mitigating the vulnerability of structures in an event of a fire. Therefore, it is recommended that the Fire Safety Management Manual be adopted and practice for Fire safety of the end users.

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