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Young Children's Fire Safety Knowledge Exhibited in Drawings

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Abstract
The aim of the study is to analyze children's learning experiences related to fire safety as portrayed in their drawings. Following a field trip to a fire station, children were asked to exhibit their learning experiences on a paper; including important and interesting experiences obtained during the visit. Research participants were kindergarten children aged five and six years old. When the data obtained from the study were analyzed, this study found out that the children mostly included pictures of fire truck, fire station, firemen and fire extinguish tools in their drawing. Findings of this study suggested a positive impact of learning visit to the fire station on children's knowledge about fire safety. Additionally, children gain better understanding about the responsibilities of a fireman that was not limited to only saving people and buildings from fire, but also include rescuing animals. The study implicated that including outdoor learning experiences such as field trips into part of the school programs is essential to support meaningful learning especially for young children. Also, it is important that children's knowledge being assessed in various means including their generated drawings.
Keyword: Young Children, Drawing, Field Trip, Fire Safety

Introduction

Fire Safety Education Program is one of the essential knowledge areas that needed to be taught to school children including young children. The National Preschool Curriculum Standard (Kurikulum Standard Prasekolah Kebangsaan) emphasizes the importance of aspect of children's personal safety from sources that may cause accidents and harm to themselves. Fire-related accidents often result in injuries and sometimes death, hence it is vital that the public including school children being equipped with fire safety knowledge and training. Awareness programs on the importance of fire safety in schools should be conducted periodically and students should be provided with real learning opportunities about fire safety. It is important that children are able to identify various sources, places and dangerous situation, respond appropriately during emergency or facing unsafe situation including the fire event (KSPK). It is vital to equip young children with fire safety knowledge and skills as such knowledge are beneficial to prevent tragedy (Cole & Kourofsky, 2004). Schools around the world conducted various fire safety education programs including gamification, fire safety

training and lessons delivered by teachers in classrooms. Pooley et al (2021) outlined various approaches and practices of effective fire safety education programs for children including visit to fire station to permit fire stimulation and interactive activities that help transfer knowledge and skill. In this study, a field trip to the fire station was planned to equip children with real life experience and knowledge on fire safety. The children's drawings about the visit were investigated to get insight into their knowledge about fire safety.

Researchers highlight drawings as an effective tool for eliciting students' knowledge and experience (Wang & Tsai, 2012). While drawings are commonly utilized in arts lesson, researchers are increasingly requesting children to produce drawings in various subjects including science (Detken & Brückmann, 2021; Dai, 2017; Chang, 2012), language and literacy (Kendrick & McKay, 2004) and mathematics education (Bakar, Mohamed, Yunus, & Karim, 2020; MacDonald & Murphy, 2019; Crespo & Kyriakides, 2007). This is because previous research highlight drawing as an enjoyable and easy activity for children (e.g., (Lewis & Greene, 1983; Hayes et al., 1994). Further, young children do not draw without intent; and their drawings represented their thoughts and feelings (Dai, 2017). This led to the use of drawing in research for various purposes such as assessment, intervention, and treatment (Malchiodi, 1998). Analyzing pictures drawn by children is an effective technique to identify their understanding of concepts, perceptions. While children sometimes find it difficult to respond to researchers' questions or interviews, they draw pictures without difficulty and voluntarily when they are invited to make drawings (Lewis and Greene, 1983). Further, drawings are also an alternate means for children who struggle to express themselves in words (Rennie & Jarvis, 1995). During the process of drawing pictures, children integrate their thoughts, perceptions and feelings on the topic with their observations, and conveys them on paper using different colors, shapes and lines (Malchiodi, 2005). Children reveal the way they comprehend the world and newly explored concepts by combining their exploration and observations with their own experiences and thoughts. Hence, it is not surprising that despite the concern that children might struggle to understand complex and abstract concepts involving science and mathematics subjects, analysis of children's drawings demonstrated their basic understanding of complex biological concepts through their depictions of interactions between plants and animals (Villarroel et al., 2018). Bakar et al (2020) also acknowledged children's basic understanding of addition concept as potrayed in the children's generated drawing.

Due to the fact that previous studies have proved the efficacy of drawing as research method in various topics and subjects across various level of education, the drawings of the children in this study related to fire safety will provide valuable data for the teachers and researchers regarding their knowledge on fire prevention and safety precautions as well as their attitudes towards the safety of self and places. Thus, this study has been conducted to investigate fire safety knowledge of the pre-school children through the pictures they draw. The findings of the current study are significant as they will contribute to the information of impact of fire safety education program and fire safety awareness; hence it will be a good example in establishing the knowledge of the pre-school children in Malaysia on fire safety knowledge.

Methodology

The field trip to the fire station was planned as part of safety education program to equip children with experience and knowledge on fire safety. In this article, the emphasis is on attaining children's knowledge and experiences pertaining to fire safety gained from a field trip to a fire station as portrayed in the children's drawings. Teachers commonly utilized

worksheets to assess what children gain from a field trip that resulted in limited information gained from the children's answers. Hence, this study utilized drawings that allow students to exhibit beyond only knowledge but also the experiences obtained from the visit, thereby providing rich picture about the lived experiences.

The participants of the study are children five and six years old. Forty children participated in the field trip accompanied by eight teachers. The children spent almost three hours at the fire station engaging in a range of activities planned by the teachers and the staffs of the fire department. The activities at the fire station included observation of the workstation and the surrounding environment, briefing about fire safety, explanation on fire prevention and description of duties of a fire man, inspecting the fire truck and fire extinguishing demonstration. On the next day, the children were required to draw whatever they observed, listened and experienced at the fire station. There was no specific instruction on how to draw, but children are probed to portray whatever they witnessed and learnt at the fire station.

The analysis of the children's drawings is based on inductive qualitative content analysis. Three themes emerged from the analysis of the drawings. These were: "the fire truck," "fire safety equipment," and "other duties of a fire man."

Findings

i) The Fire Truck

Analysis of the drawings showed that all the children portrayed the vehicle that they observed at the fire station. The children included the fire truck/ trucks as one of the important objects they witnessed during this visit. As can be seen in Figure 1a and 1b, the fire truck/trucks were located at the fire station. The children also illustrated the fire truck to be on action at the fire location and was used in an attempt to rescue an animal. In Figure 1c, the fire truck was used to transport the fire fighters to the source of fire (i.e. a house), and was later used to help combat the burning house. In another drawing (Figure 1d) the fire truck that was equipped with hydraulic tool helped the firefighter to reach greater heights to rescue the victim (i.e., this case a cat).

Figure 1a

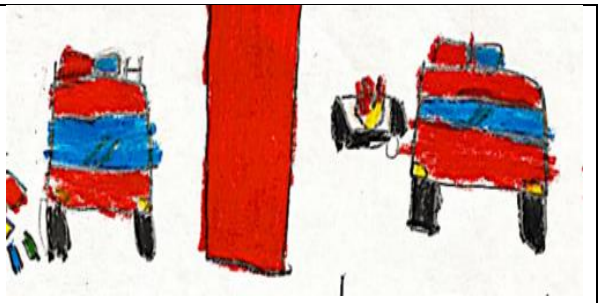

Figure 1b

Figure 1c

Figure 1d

Figure 1: Four samples of illustrations that contained fire trucks as the most important element portrayed in the children's drawings

The fact that all the drawings contained the fire truck indicates that children associate the fire truck as most critical to be present during emergencies situations to facilitate the duties of firemen in fire event and rescuing duties. Note that the children made detail observation of the fire truck in which they illustrated the standard tools found on nearly all fire engines including siren, ladders, fire hose and fire extinguishers.

ii) Fire Safety Equipment

A range of fire safety equipment were also illustrated by majority of the children (refer Figure 2). The visit to the fire station enabled the children to witness with their own eyes various fire safety equipment and tool commonly used by the fire fighters in their duties. The most spotted safety equipment illustrated by majority of the children is the fire extinguisher. As can be seen in Figure 2a, the drawing by Haris contains different equipment that are essential in the occurrence of a fire.

Figure 2a

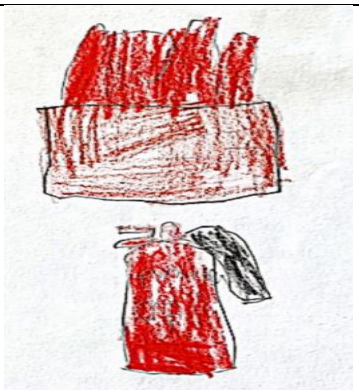

Figure 2b

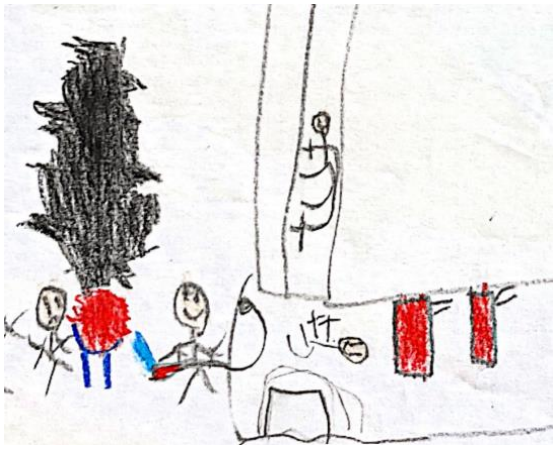

Figure 2c

Figure 2d

Figure 2: Examples of fire safety equipment portrayed in the children's drawings

In addition to a fire extinguisher, he also illustrated a fire hydrant beside the fire to link the importance of these tools to fight fire. In the briefing provided by the fireman, the children were informed that the water hydrants are used in supplying or refilling the tank to continue sourcing water if necessary. Additionally, he included the most important transport that is the fire truck which is used to transport the fire man and water to the fire location to enable them to combat the fire. The children recalled the fire extinguisher as among the most important yet a handy tool to fight fire. This was evident in the children's drawing (Figure 2a, 2b and 2c).

Notice that the children also observed that the fire engine carry equipment such as the water host (in addition to the fire extinguisher) for firefighting operations(refer Figure 2c and 2d). The elements of water were also apparent in these drawings (Figure 2c and 2d) noting the importance of water as the necessary medium to extinguish fire.

iii) Other duties of a fire man

Interestingly, the children did not only exhibit the duties of fire fighters to combat with fire to save people's life and properties. The children indeed were aware of the responsibilities of fire fighters that exceeds firefighting. This was evident through the pictures they drew in which they included additional duties of fire fighters that involve dealing with animals. Sometimes fire man were needed to help rescue animals from life threatening situations. As can be seen in Figure 3a, Razi portrayed the firemen rescuing a cat that was trapped on a top of a tree. The long ladder enabled the firemen to reach the cat safely and rescue it.

Figure 3a

Figure 3b

Figure 3c

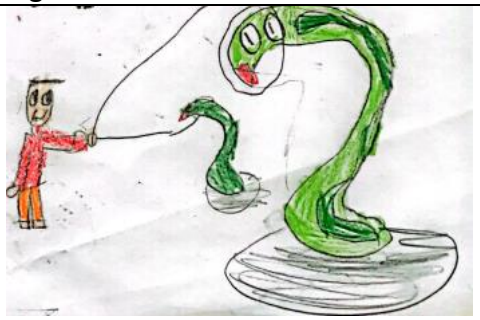

Figure 3d

Figure 3: Examples of other duties of fire men that include rescuing animals and protecting others from dangerous animals

Additionally, the children were also aware of the responsibilities of fire man to protect folks from dangerous animals like snakes. This was evident by the presence of the snake in Figure 3a, Figure 3c and Figure 3d. Note that in Figure 3d, Alia exhibited a fire man catching a snake. Despite having already portrayed the snake caught by the firemen, she replicated the snake

in a bigger size to highlight the job scope of a firemen to catch dangerous animals such as snake.

Discussion

The drawing task given to the children following the field trip to the fire station aimed to examine the children's acquisition of fire safety knowledge based on the drawings they produced. Studies by Bakar et al (2020) revealed that using drawings as an assessment method can help demonstrate children's knowledge and understanding of the topic learnt. Additionally, previous studies have proved the efficacy of drawings in facilitating children's recall of information and experiences (Barlow et al., 2011; Gross et al., 2009). It is remarkable that the children drew the fire truck in their drawings. Inspecting the fire truck with all the fire safety equipment and witnessing the fire truck used in the demonstration has certainly caused the children to notice the importance of the vehicle in fire combating operations. The presence of the fire truck in the children's drawings is in line with previous studies highlighting that children draw what they value as important (Wales, 1990).

The findings from this study are in agreement with previous studies showing the implementation of outdoor learning (through field trip) have a positive impact on children's knowledge. This is in light of children demonstrating a range of information on fire safety as evident in the children's generated drawings. Gerald (2019) highlighted the crucial roles of firefighters to help familiarize children with fire equipment, fire man's appearance and duties. This can be best implemented through various activities planned during the children's field trip to the fire station. Various equipment tool used in the fire rescue operation including the fire extinguisher, water host and water hydrant as evident in the children's drawings indicated strong proof that the learning experience were memorable enough to be recalled in detail as evident in the drawings of the trucks with a range of fire safety equipment. The children have certainly paid much attention and detail observation of the vehicle and the equipment related to fire rescue hence enabled them to remember this equipment well. As highlighted by Braund & Reiss (2006), field trips afforded children with direct experiences that enabled them to recall the information successfully (Barlow et al., 2011). Additonally, children's engagement with varied activities including firefighting demonstration and having direct contact with the fire man and fire trucks provided solid experiential learning to the children. Having the opportunity to use their sensory and engaging into various activities has help build children's knowledge of fire safety. Noticeably, these experiences and memories were recalled and illustrated through the student's drawings.

The children's drawing illustrating the fire man rescuing animals and catching snakes was an interesting note that signaled children's awareness of the fire man's duties that goes beyond combating fires. The children have certainly picked up interesting information about the duties of a fire man that were not restricted to saving people and buildings from fire that enabled them to portray such information in their drawings. This is because field trips provided children with authentic learning opportunities (Barlow et al., 2011); hence permitted them to recall important and interesting information they heard, listen and experience. As emphasized by Pooley et al (2021), information on fire safety taught by teachers and reinforced by firefighters had facilitated children's comprehension of fire safety. Among the factors that contributed to the attainment of knowledge about fire safety as exhibited in the children's drawings is due to the application of concrete method that is in accordance with the children developmental stage. Explanation delivered by the fire man was

easy; accompanied by concrete examples. As highlighted by Pooley et al., (2021), children absorbed details about fire safety successfully because the training suited the children's developmental level.

Conclusion

Knowledge about dangers of fire and ways to prevent from sources that are harmful are important knowledge that should be taught to all students since early age. Knowledge and experience relating to fire safety as exhibited by the children's illustrations in the current study suggest that drawing serve a crucial role in assisting children to retain important information of their observation. Hence, children's drawings should be valued as it requires cognitive abilities involving memory, recall of information and experiences, knowledge retention and focused observation during the drawing process. The drawing task that required the children to reflect on their observation and experiences may help lay the foundation upon which the skills and abilities of focused observation required for future learning (such as in scientific inquiry). Additionally, teachers should take into consideration young children who possessed limited proficiency in verbalizing their thoughts, reading and writing that often encounter frustration when asked to explain their thinking and experiences. In order to respond to the needs of young children, additional forms of representation should be promoted for exhibiting their ideas and observations. Various forms of representations to document the children's knowledge, ideas and observations may be considered including producing a drawing or a photograph.

The field trip to the fire station appears to have a positive impact on children's knowledge about fire safety and therefore has implications for the way teachers teach fire safety topic in classroom. Reflecting on the knowledge and experiences obtain from their visit to the fire station, it is necessary that teachers carefully plan activities during the visit as well as including follow-up activities to maximize the opportunity for young children to engage in experiential learning. As in the case of this study, receiving the information relating to fire safety firsthand from the fire man, observing the fire safety equipment and experiencing the firefighting demonstration were a lifetime experience that help make learning meaningful. Hence, outdoor educational visit should highly be promoted in school programs. Teachers should include learning visit (to various places) to make learning effective yet exciting. Furthermore, learning visit have the potential to foster children's knowledge through contextualized learning and exploration of real-life situations. It is also suggested that schools plan and carry out fire drills on a regular basis, as it will help children and teachers grasp the escape routes of the building and know what to do in the case of fire.

The evaluation of the drawings produced by the children is considered an effective method to get insight into children's knowledge about fire safety. Despite the fact that the thoughts of a limited number of children are examined, the data gathered in the current study is significant since there is a limited number of research that seek to investigate fire safety knowledge of the children through the pictures they portrayed. Future studies related to children's fire safety awareness and knowledge should be administered with consideration to include interviews with the children to gain rich picture into their thoughts related to fire safety.

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