A study on awareness of disaster risk reduction (DRR) among university students: The case of PETRONAS residential hall students

Cite as: AIP Conference Proceedings **2016**, 020005 (2018); https://doi.org/10.1063/1.5055407
Published Online: 27 September 2018

Faizatul Akmar Abdul Nifa, Chong Khai Lin, Wan Nurul Mardiah Wan Mohd Rani, and Ooi Jun Wei

A Study on Awareness of Disaster Risk Reduction (DRR) Among University Students: The Case of PETRONAS Residential Hall students

Faizatul Akmar Abdul Nifa[1, a)], Chong Khai Lin[2, b)], Wan Nurul Mardiah Wan Mohd Rani[3], and Ooi Jun Wei [4]

[1, 2, 4,] *School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia 06010 Sintok Kedah, Malaysia.*
[3] *UTM Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia, 54100 Kuala Lumpur, Malaysia.*

[a)]Corresponding author: faizatul@uum.edu.my
[b)]klchong@uum.edu.my

Abstract. Over a past few decades, the topic on disasters is always been discussed around the world until today. Disasters are not natural in some cases. It can be prevented before a hazard resulted into a destructive disaster. As we can see within this few years, the disasters are happening widely around Malaysia, such as the floods during the Northeast Monsoon season. The awareness of people must be raised to enhance and increase the knowledge and information on disasters. This study focusses on the level of knowledge on Disaster Risk Reduction (DRR) among PETRONAS students in order to increase the understanding regarding DRR and explore a method to come out with a suitable program that can enhance the awareness of DRR in UUM. Data gathered from 235 DPP PETRONAS students from different college via a questionnaire survey and the result is test by SPSS v.24 statistical technique. The reliability analysis revealed that there was significant among 14 items which has been test, Cronbach's Alpha = 0.834. Since this is a preliminary study on awareness of DRR among students in DPP PETRONAS, further research can be done within a larger scope of population to enhance the result of the study.

INTRODUCTION

Awareness can be considered as a concept referring to the ability of a person to perceive, to feel, or to directly aware of any events. People can be attracted by someone or object around them and be doubly careful to the related object or environment is known as self-awareness [5]. Awareness is difficult to control because human declarative memory is highly task-promiscuous [12] becoming involved even when performance would be better without it [9]. The skill to be aware, to notice, to be alert of the surrounding still can be practiced by; enhancing the knowledge in this field, practicing the awareness culture since younger age, participating in some related program or learning from the previous experience. DRR consists of lots of disciplines such as disaster management, disaster mitigation and disaster preparedness, but DRR is mainly focus on creating and developing a sustainable environment.

In general, disaster can be defined as a hazardous incident, no matter of natural, man-made or technological mistake by human that will causing serious physical damage or destruction, loss of life, casualties or other health impacts, property damage and also destroy the entire area/environmental system such as the economic, cultural and social life of people [1]. On December 2014, one of the critical disaster that happened in Malaysia was the widespread flooding at Kelantan, Terengganu, Pahang and Perak. A total of 200,000 victims were forced to evacuate from their homes and 21 people were killed in the floods. This disaster destroyed the parts of north and east Malaysia and the cost nearly exceed RM1 billion loses, according to Malaysian daily newspaper Berita Harian [3].

Proceedings of the 3rd International Conference on Applied Science and Technology (ICAST'18)
AIP Conf. Proc. 2016, 020005-1–020005-6; https://doi.org/10.1063/1.5055407
Published by AIP Publishing. 978-0-7354-1734-2/$30.00

Besides that, there was an amount of RM250 million lost by Keretapi Tanah Melayu Berhad (KTMB) due to the damage caused by the floods.

Table 1. List of natural disaster in Malaysia 2011-2014 [4].

Location	Year	Disaster	People affected
Kelantan, Terengganu, Pahang, Perak	December 2014	Flood	-200,000 victims were forced to evacuate. -21 people killed.
Cameron Highlands, Perak	November 2014	Flood Landslide	-3 people killed.
Ukay Perdana, Selangor	July 2013	Landslide	-3 construction workers killed. -1 injured.
Penang	June 2013	Storm	-2 people killed. -1 injured. -More than 100 houses destroyed.
Bukit Nanas, Kuala Lumpur	May 2013	Landslide	-9 cars damaged.
Puchong, Selangor	March 2013	Landslide	-300 people displaced.
Kelantan Terengganu Pahang Perak	December 2012	Flood	-108000 people displaced.
Selangor	August 2012	Flood	-200 families affected.
Penang	June 2012	Flood	-2200 people include tourist affected.
Perak	April 2012	Flood	-More than 1100 people were evacuated.
Johor Pahang Sabah region	December 2011	Flood	-1400 people forced to evacuate in Johor. -946 in Pahang -351 in Sabah region.
Segamat, Batu Pahat, Kluang and Muar, Johor	January 2011	Flood	-24000 people displaced. -5 people were killed.

According to Disaster Risk Reduction briefing paper [8], the affected population are stated with 847.5 million, 595,783 were killed by disaster, $74 billion of US dollar were spent to recover the economic damage by 1472 disasters around the globe. Mitchell et al. [10] mentioned that, a lot of previous studies have demonstrated that the poorest and most marginalised people are always affected by disasters and this has resulted in exacerbating of vulnerability, social inequalities and decrease the economic growth.

Frost-Killian [6], stated that:

> As we go about our daily business, the solid Earth seems safe enough, but there's far more going on beneath the surface than meets the eye. Things can change in a devastating flash through floods, earthquakes and other disasters that displace or kill the whole communities of people. The more we understand the natural forces that control the familiar landscapes of water, rocks and soils the better we can calculate – and minimise – the risks to people and property. (p. 28).

Some research findings reveal that, if the psychological and the physical awareness and preparedness were practiced and learnt by the people who live around the flood prone area, the awareness of people can possibly be minimizing the damage caused by flood and reduce the difficulties of rescue work to the disaster risk management authorities [7]. One of the real example in Cologne, Germany, two flood events happened in 1993 and 1995. Fink et al. (1996) pointed that "given similar exposure (10.63m of water level in 1993; 10.69m of water level in 1995) and almost the same sensitivity, approximately a 35 billion € was able to secure from the flood in the year of 1993 and

1995. The losses from a disaster can really be reduced by raising the awareness and preparedness of communities to disaster. Thus, the awareness on DRR is definitely important to the younger generation. This paper will study the awareness of DRR among UUM students.

Disaster Risk Reduction (DRR) and History

Disaster Risk Reduction (DRR), referring to the process of understanding, analysing and managing the causes and origins of disasters and the risks that accumulate and lead to disasters [17]. In 1990, only experts and practitioners were involved in the understanding and implementing of Disaster Risk Reduction (DRR) by the United Nations International Decade for Natural Disaster Reduction (IDNDR). At the early phase of Disaster Risk Reduction (DRR), there was difficulties to find any participation of social aspects. There was least government's involvement in the programme or disaster policy that targeted at reducing the risk and vulnerability to natural hazards in the year of 1999. Following by many tragic disasters in the next 10 years, governments start to rapidly focus to DRR. Until nowadays, almost all governments are officially paying attention and implemented policies in this field, including Malaysia.

In 2005, the United Nations International Strategy for Disaster Reduction (UNISDR) created the Hyogo Framework for Action (HFA) 2005–2015: 'Building the Resilience of Nations and Communities', which recommend the execution of DRR must include an organized planning and evaluation for succeeding the DRR activities. Malaysia adopted the HFA (2005-2015) together with another 167 countries in order to enhance the nation's awareness and also build the disaster resilience. After the 10 years of HFA, the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), was adopted by Malaysia and also 187 countries during the World Conference on Disaster Risk Reduction (DRR) in Sendai, Japan on 18 March 2015.

DRR in Education

When come to the Disaster Risk Reduction (DRR) in education, this is a crucial aspect in all of the country around the world to build resilience to disasters. According to World Meteorological Organization [16], over the past five decades, nine out of ten natural disasters around the world are directly or indirectly related to the extreme weather and climate change. In the post-2015 framework for DRR, the important of education and awareness-raising program have been agreed as the top priorities in the policy of disaster [13]. The educational and awareness-raising efforts have to be responsibility of everyone rather than implemented and promoted by governments and media agencies only.

Education is identified under the Hyogo Framework for action (HFA), as a crucial element to mitigate the impact of natural disasters. Petal [11] pointed that, in order to reduce the vulnerability of children to disaster and withstand natural hazards, DRR education is an important sector that must be well initiate in the developing countries. Adequate and sufficient attention must be applied to DRR education to enhance the sustainability in society [14]. The United Nations Children's Fund (UNICEF) is working hard to ensure the safety of school building and facilities in the disaster-prone area. DRR activities are also included and promoted into the school education system in order to raise the awareness and preparedness among students and teachers.

Besides that, the program on DRR and education was implemented by UNICEF with the collaboration of European Commission in Central Asia. A total of 50 senior government officials joined in the program. The knowledge and information on safety school was introduced to teachers and the disaster management authorities. UNICEF also teach the basic life-skills to the school children to improve their knowledge and ability to reduce the impact from disasters. All of these activities were organised to ensure the education system is suitable and the learning process among school children is under a safe environment.

DRR in Malaysia

One of the major disaster in Malaysia was the flood due to the downpour in the year of 2014. The flood has affected more than half a million people and the public infrastructure was damaged and cost losses was estimated at RM 2.8 billion. The five phases of disaster prevention, mitigation, preparedness, response, and recovery have been emphasized to tackle and solve the problem of floods, which are the major hazards in Malaysia. Malaysia has been an active community in the Hyogo Framework for Action (2005-2015) and the sustainable development was being included in the nation's primary development plan, which is currently in the 11th plan. In order to improve decision

making in urban planning, the DRR principles has been integrate into the Development Proposal Report (DPR) which under the Section 21A in Town and Country Planning Act (TCPA) to contribute to sustainable development. In 2011, the Melaka Declaration on DRR was adopted by government which the effort of DRR is compactable with the priority areas of the HFA. For integrating the DRR and climate change adaption (CCA) in Malaysia Action Plan for DRR (MyDRR), the Melaka declaration has provided guiding principles in this section to enhance the engagement and build resilience among the communities. Besides that, the green technology and climate change context which operated within a special committee was established under that National Council on Green Technology by the Prime Minister.

In the education sector, several programmes were carried out by the Ministry of Education to raise awareness and safety practices on disaster. Safe School Programme is one of the campaign to ensure school environment is under safe condition for students and teachers as well as a Smart Support Team that aimed to provide counselling and assistant to victims. In addition, some universities in Malaysia received funding and monetary assist, a total of RM20 billion by Minister of Education to improve the disaster management in Malaysia by conducting study and research on some river basins in the flood prone-areas.

After 2 years of the adoption of Sendai Framework for Disaster Risk Reduction (SFDRR) in 2015, the National Disaster Management Agency (NADMA Malaysia) was established under the Prime Minister's Department. For decisions making and effective actions to disasters with the science and technology (S&T), Malaysia has institutionalized the Scientific Expert Panel for DRR. In June 2016 and March 2017, 2 series of disaster risk management workshop were conducted with relevant DRR stakeholders in Malaysia. The information and updates of SFDRR has been discussed and identified with relevant terminology and indicators related to the country as well as mapping DRR-related data. With these positive development, Malaysia is able to reduce the disaster losses by the year of 2030.

Role of Youth in DRR

Over a few decades, the number of disasters happened around the world is exacerbated. Disasters are destructive, and it can definitely slow down the development of a country but as we think positively, it's provide opportunities to build back better and safer. The Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) [15] is a framework for all of the country around the world to implement effectively in the field of DRR for creating a sustainable and brighter future. Young people are encouraging to participate in DRR. During the Third UN World Conference on DRR in 2015, 200 young professionals and students from different country were brought together to exchange ideas and knowledge on DRR. When a task is required to done by young people, they always be creative, innovative as well as trying to be open-mindedness.

Young people have an important role to play in changing perspectives, driving positive changes in areas such as policy and accountability, and shifting mind-sets from focusing on disaster response to investing in disaster preparedness (UNISDR 2000). Davis (2010) said that, for the issues and risks which created over the past two centuries, the burden will drop on younger generation and they have to overcome the situation. When the resources for implementation is limited, young people may face difficulties even they start to take action [2]. Resources, instruments and facilities needed to provide for youth generation to strengthen and extend support to youth as an effective partner in DRR for a better generation and future.

RESEARCH METHODOLOGY

A questionnaire survey was conducted to collect data and information from DPP PETRONAS students in Universiti Utara Malaysia through online platform such as Facebook and WhatsApp. Literature review also been used in this project to gain and understand more about DRR. The questionnaire was divided into five parts: the demographic information, education opinion in DRR, culture practice in DRR, experiences in disasters and the method of exploration on DRR awareness related program in UUM. Education perspective question was derived from some questions such as "as a UUM student, do you aware of DRR" and "how many time should DRR related program be held in a year". The second parts evaluated the culture practice of UUM students with the question like, "have your parents talk about what disaster to you since your childhood is", "is there any fire extinguisher or first aid kit at your house". While a question asked "have you ever experienced any disaster in your life" in the third parts. Last parts of the questionnaire used to obtain opinion of UUM students regarding the explore method on DRR

awareness program in UUM. The Likert-scale question also being asked in different parts of the survey to study the agreement of UUM students based on each statement in the questionnaire.

FINDINGS AND DISCUSSIONS

The education perception was evaluated by 5 items (Cronbach's Alpha = 0.804) consisted of 2 item that asking opinion from students on the implementation of DRR and the knowledge of DRR among youth generation, and 3 items "In your opinion, UUM students understand the importance of DRR/the level of understanding on DRR is high and the preparedness to mitigate natural disaster is high (strongly disagree/strongly agree). Culture aspects was assessed by 6 items (Cronbach's Alpha = 0.821) asking using question, "It is important to be prepared for natural disasters/plan on how to protect yourself/easy access to important document/clearly know the location of first aid kit/paying special attention/know the nearest assembly point). There were 3 items (Cronbach's Alpha = 0.595) of disaster experience including "The impact of disaster can definitely change your life/can influence your sense of safety/lesson learned from others can promote knowledge of DRR). The answer was evaluated by providing the Likert-scale "strongly disagree, disagree, neither disagree or agree, agree, and strongly agree".

There are 235 respondents that participate in this survey. Most of the students are aware to Disaster Risk Reduction (DRR) from the different type of question asked in this survey. As we can see, 28.5% of male students conscious about Disaster Risk Reduction from the overall 41.7% of male students, which show that male students are more aware to the DRR topic in DPP PETRONAS. 76 female students aware on DRR compare to 61 female students that did not know about DRR.

CONCLUSIONS AND RECOMMENDATIONS

Climate change is one of the serious issues must be alerted and controlled for reducing the occurrence of disasters as well as minimizing the impact from destruction and disruption to the economic, people and education sector. In Malaysia, floods are the primary hazards that affecting most of the western half of the country. On 4 November 2017, many areas in Penang were flooded due to a nine-hour downpour and caused people dead and many people was forced to evacuate from their home. The rain comes without any warning sign. People's awareness and preparedness must be raised and increased by transferring knowledge to reduce the impact as much as possible. The impact from disasters is unpredictable, what we can do is by prevention and reduce the risk. The result of this project demonstrates that even 60.7% of PETRONAS students conscious about Disaster Risk Reduction (DRR), but there is still a large portion of students did not aware on DRR, with a percentage of 39.3% (92 person). The important finding is that mostly of 83% of students clearly stated that the DRR related program or education needed to be implemented at the early stage in education, which are the kindergarten (21%) and primary school (62%). This is the result that proved majority students agree with the early implementation of DRR among youth generation will raise the understanding in DRR. One of the good expectation from this study is almost 85% of students are interested to participate in the DRR awareness related program if the DRR program is organise in UUM before semester break instead of during semester break. Students will like to know more regarding (1) how to react when disaster happens, (2) the early warning system, (3) specific information on important issues and (4) the potential risks. In addition, a large portion of students (170 person) did not agree to the statement "The DRR awareness program should be organised after a disaster happened".

Disaster Risk Reduction must begin at home, in communities and in schools. Education institution plays a crucial role in this field for shaping children's mind to become a responsible citizen in the future. The topic of disaster must be learnt by children at an early age in order to reduce their vulnerabilities to disasters. The culture of prevention is also important to everyone, neither youth, adult nor seniority. In the hazard prone areas, policymakers have the responsibility to ensure and protect children from unwanted incidents no matter inside school and on the way to school. In order to improve the study on awareness of DRR among students and raise the awareness, further research need to be conducted as well as increase the disaster awareness program. With the increasing of natural hazards within the country, people must increase, enhance and learn about DRR in order to build disaster resilience and develop a sustainable environment for a better future.

Limitation of Study

This study involves a small sample size which the survey was only conducted and answered by 235 DPP PETRONAS students. The small sample size may affect the result to be inaccurate if compare with the study focus on more students in UUM. This is a review on DPP PETRONAS student and represented the perception and opinion within DPP PETRONAS students which may not represent the entire UUM population. Besides that, limited time is also one of the difficulties when searching for the related literature and information during the completion of the project.

REFERENCES

1. Castro, R. (2013). *Disaster Risk Reduction and Management*. *Slideshare.net*. Retrieved 9 October 2017, from https://www.slideshare.net/irpex/disaster-risk-reduction-and-management-28415360
2. Checkoway, B. (2011). What Is Youth Participation? Children and Youth Services Review 33 (2): 340–345.
3. Davies, R. (2015). Malaysia Floods – Kelantan Flooding Worst Recorded as Costs Rise to RM1 Billion – *FloodList*. *Floodlist.com*. Retrieved 25 September 2017, from http://floodlist.com/asia/malaysia-floods-kelantan-worst-recorded-costs
4. *Disaster Report. (2013).* Retrieved 28 September 2017, from http://www.disaster-report.com/2013/02/natural-disasters-in-malaysia-2012.html
5. Duval, S., & Wicklund, R. A. (1972). A Theory of Objective Self Awareness. New York: Academic Press.
6. Frost-Killian, S. (2008). 'Geohazards: The risks beneath our feet', Quest 4(2), 28−33.
7. Grothmann, T., & Reusswig, F. (2006). People at risk of flooding. Why some residents take precautionary action while others do not. Natural Hazards 38: 101-120
8. Kellett, J., & Sparks, D. (2012). DISASTER RISK REDUCTION. *Spending where it should count*, p. 2. Retrieved 26 September 2017, from http://www.alnap.org/resource/10061
9. Kim, J.J., & Baxter, M., G. (2001). Multiple brain-memory systems: The whole does not equal the sum of its parts. Trends Neurosci 24:324–330.
10. Mitchell et al. (2014). Why does disaster risk matter? Retrieved 26 September 2017, from http://www.preventionweb.net/risk/disaster-risk
11. Petal, M. (2009). Education in disaster risk reduction. In: Shaw R, Krishnamurthy RR (eds) Disaster management: global challenges and local solutions. Universities Press, India, pp 285–301
12. Poldrack, R.A., Clark, J., Pare-Blagoev, E.J., Shohamy, D., Creso, M.J., Myers, C., Gluck, M.A. (2001). Interactive memory systems in the human brain. Nature 414:546–550.
13. Salvano, B. (2015). Looking Back and Beyond Sendai: 25 Years of International Policy Experience on Disaster Risk Reduction. *Int J Disaster Risk Sci (2015) 6:1–7*. DOI 10.1007/s13753-015-0040-y
14. UNISDR. (2000). United Nations 2000 World Disaster Reduction Campaign to focus on disaster prevention, education and youth. Retrieved 7 November 2017, from http://www.unisdr.org/2000/campaign/pa-camp00-kit-eng.htm
15. UNISDR. (2015). Sendai framework for disaster risk reduction 2015–2030. Retrieved 7 November 2017
16. WHO. (2009). Climate information for reducing risk. Retrieved 6 November 2017, from http://www.wmo.int/gfcs/fact_Sheets
17. Wisner, B., Gaillard, J., & Kelman, I. (2012). *Handbook of Hazards and Disaster Risk Reduction and Management*. *Google Books*. Retrieved 6 November 2017, from https://books.google.com.my/books?hl=en&lr=&id=mY23AwAAQBAJ&oi=fnd&pg=PR1&dq=what+is+Disaster+risk+reduction&ots=lpNhuCLJ9S&sig=Ta_IARLfmYLkiKipmD5JxLAex9M&redir_esc=y#v=onepage&q&f=true