

# Recent Status on Disaster Prevention Teaching in Indonesia

-A case of pre-school teachers in Pacitan and Surabaya Cities, East Java-

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## **[Introduction and Research Background]**

Internationally, disasters have a major impact on children and youth and education systems. In many developing countries, children form the bulk of the population and along with women and the elderly are frequently the most vulnerable to natural disasters (Enarson et al., 2009). Studies of disaster trends suggest that each year 175 million children are likely to be affected by natural hazard related disasters alone. For example, some 38,000 students died in the 12 January earthquake in Haiti, which also killed 1,300 teachers and education personals (UNESCO,2010).

Also, during the Sichuan earthquake in May 2008, approximately 10,000 students were crushed in their classrooms and more than 7,000 school rooms collapsed. The 2007 Sidr cyclone in Bangladesh destroyed 496 school buildings and damaged 2,110 more. The Super Typhoon Durian in the Philippines caused large damage correspondent to 20 million \$US damage to school, including 90-100% of school buildings in three cities and 50-60% of school buildings in two other cities (UNESCO, 2010).

Indonesia, as the largest archipelagic country of the world is highly prone to the impacts of earthquakes, volcanoes and tsunamigenic earthquakes. Meteorological hazards are common with flooding and landslides frequent in the western islands while drought is persistent problem in many eastern areas which also suffer strong seasonal winds (Haynese et al., 2010). Between January and August 2015, Indonesia experienced 1,160 disasters, including drought, forest fires, volcanic eruptions, landslides, and floods. Also during that period, there were cases of 373 flooding, affecting 607,000 people. Rains in January 2015 submerged roads in Jakarta, and more downpours in February caused further flooding, affecting more than 27,000 people. The floods affected 351 schools in northern Jakarta (Japan Times, 2016). Such kind of suffering has been caused by shortage of knowledge or ineffective education.

Saving children should be always the first priority of all countries of the world and through education; children have big chance to get basic knowledge in order to build up their good attitude and behavior so that if they have to face natural disasters, they can think quickly and act effectively to save themselves and other people. Early education about disasters and prevention would prepare generations with deep understanding and awareness toward their environment and natural phenomena.

Teachers are the main actors in education. In order to effectively deliver knowledge and skills about disasters and prevention to the students, they are required to possess good teaching capacity. Such kind of teachers' capacity can be mastered and improved through not only sufficient pre- service but also effective in-service trainings. To guarantee that the teachers have good skills in implementing disaster prevention education at school, we need a research to assess their status on understanding about disaster prevention teaching.

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**[Aims of the Research]**

As shown above, shortage of knowledge or ineffective education will possibly make disaster heavier, it is needed to expand and heighten teachers' capacity for disaster teaching as main educator. Therefore, it is needed useful information for taking efforts in improving and/or expanding the teachers' capacity in disaster education via in-service-training.

Particularly the pre-school teacher should play important roles both to organize effective teaching in disaster prevention classes and save children if disasters happen to them following suitable judging. However, the researches for disaster lessons at an elementary school have been reported such as Tuswadi and Hayashi (2012)and Tuswadi and Hayashi (2014),any research reports on status of Indonesian pre-school teachers on those viewpoints above-mentioned could not be found. Accordingly, we have planned to examine the pre-school teachers' understanding about disaster teaching focusing on the implementation of disaster education at school, the topics of disaster teaching, availability of time for disaster teaching, teaching materials and teaching aids, teaching technique, and their understanding about disasters and mechanism.

**[Methodology]**

An exploratory research approach was used for this study. A non-experimental research design was used. A non-probability purposive sampling technique was adopted. Total of 97 pre-school teachers from Pacitan City and Surabaya City participated in the study. Knowledge and self-expressed practices are variables in this study. Questionnaire was used as the research instrument, which consists of three sections. Section I assessed the teachers' attributes about their sex, position, age, teaching experience, and dominant disaster experienced. Section II comprised items to assess the teachers' information about implementation of disaster education at school, the topics of disaster teaching, availability of time for disaster teaching, teaching materials and teaching aids, teaching technique, and their understanding

about disasters and mechanism. Section III consists of two questions which are the meaningfulness points regarding disaster education and the disaster teaching focus. For both questions the respondents select one from 9 items (see Table 2 and Table 3) for important rank1, rank2 and rank3 respectively. Those data were arranged using spread sheet and analyzed using descriptive and inferential statistics.

Table1 : Teachers responses distribution for Section I

		%	
Q1	You implement disaster education at schoo N=97	never	9.3
		almostnever	12.4
		Sometimes	73.2
		Often	5.2
Q2	What topics do you teach? N=75	environment protection	40.0
		Nature protection	10.7
		Flood	37.3
		Landslide	12.0
Q3	Time for disaster education at school	No time at all	1.1
		little time	56.0
		much time	42.9
Q4	Teaching materials and teaching aids	Nothing	20.2
		Little	52.8
		Some	27.0
Q5	Technique on how to teach disaster prevention	No idea at all	2.2
		little idea	25.8
		some ideas	68.5
		many ideas	3.4
Q6	Your understanding ondisaster and	no understanding at all	2.2
		little understand	55.1
		understand	42.7

**[Results]**

Section I: In this section, teachers' attributes were asked. The pre-schools teachers participating as the respondents in this research consist of 54.6% playgroup teachers and 45.4% of the kindergarten teachers (N=97). All teachers are females (100%). Their ages are in 31-40 years old (37.1%), 20-30 years old (28.9%), 41-50 years old (22.7%),and 51-

Table 2: Frequencies for teachers' selection of perceptions about meaningfulness points of disaster education and its important ranks

	Scientific understanding about nature and natural phenomena	Understanding on natural disasters in the future and its mechanism	Attitude or awareness on environment protection concept	Developing attitudes to save life during disasters	Developing attitudes to save belongings during disasters	Developing attitudes about importance of local community	Feedback toward Science subject	toward Social Science subject	awareness on importance of learning	total
importance rank1	24	5	43	11	0	0	0	0	5	88
importance rank2	4	14	20	31	6	5	4	0	2	86
importance rank3	6	4	7	12	2	7	1	1	43	83
total	34	23	70	54	8	12	5	1	50	257

Table 3: Frequencies for teachers' selection of perceptions about disaster teaching focus and its ranks

	Making students recall the important topics in textbook	Making students think deeply what they have to do during disasters	Making students like to watch TV about disaster and environments	Making students collect important information about past disasters (history) by visiting museum etc	Making students directly collect the data from the community affected by disasters	Making students share important information about disasters and discuss together	Teaching students on how to behave appropriately/ effectively when there is disasters	Making students take special class about disaster with invited scholars	Making students discuss about the equipments and first aid kit at home together with their family members	total
importance rank 1	1	46	9	7	7	14	7	0	0	91
importance rank 2	0	1	2	7	7	28	36	4	2	87
importance rank 2	2	3	0	1	2	11	20	4	43	86
total	3	50	11	15	16	53	63	8	45	264

60 years old (8.2%). Their highest percentage of teaching experiences background between 6-10 years (35.1%), while the rests are in 11-15 years:16.5%, 1-5 years:13.4%, 16-20 years:3.1%, 26-30 years:7.2%, 21-25 years:2.1%, and 30 years:-3.1%.

Section II: The simple tabulation of the responses for the questionnaire on teachers' status for disaster and its education are shown in Table I.

Based on the data presented in Table 1, it is shown that around 70.0% of the teachers stated that they have implemented the disaster education at their schools (Q1). As to topics implemented by teachers, environmental protection and flood are dominant (Q2). About the time for implementation, almost all teachers have little and much time, but the concrete number of the implementation cannot be clarified (Q3). The availability of teaching materials and teaching aids stay in insufficient level (Q4). Sixty eight point five percent of the teachers (68.5%) got some technique to teach disaster prevention (Q5). Less than 50.0% of the teachers have sufficient level of understanding on disaster and mechanism (Q6).

Section III: In relation to meaningfulness points of disaster education, we could present the data as shown in the table 2.

In the variation of teachers' meaningfulness points regarding disaster education, "Attitude or awareness on environment protection concept" is the dominant for important rank 1, and "Scientific understanding about nature and natural phenomena" as subdominant. In the total selection number of rank 1, 2 and 3 (shown in the bottom line of the table), "Attitude or awareness on environment protection concept" is also the dominant as same as the case of rank 1, "Developing attitudes to save life during disasters" as subdominant, "Improving awareness on importance of learning" as third dominant.

Regarding the disaster teaching focus, the teachers' responses can be seen in the data of the table 3. In the variation of teachers' disaster teaching focus, "Making students think deeply what they have to do during disasters" is the dominant for important rank 1, and "Making students share important information about disasters and discuss together" as subdominant. In the total selection number of rank 1, 2 and 3 (shown in the bottom line of the table), "Teaching students on how to behave appropriately/ effectively when there is disasters" is dominant, "Improving awareness on importance of learning" subdominant, "Making students think deeply what they have to do during disasters" as third dominant.

Also, "Making students discuss about the equipments and first aid kit at home together with their family members" is in considerable level.

### [Research Findings]

When we analyzed the correlation between the teachers' selection on topics of disasters to teach and their understanding toward disaster mechanism, no significant correlation was found (Fisher's exact test, 4x3 contingency table, P=0.343). In addition, there was no significant correlation between the teachers' selection on topics of disasters and the availability of teaching materials and teaching aids (Fisher's exact test, 4x3 contingency table, P=0.440), and the technique of teaching disaster prevention (Fisher's exact test, 4x4 contingency table, P=0.387).

Table 4: Frequencies for teachers' dominant disaster and their topics selection/understanding level of disasters

		Your understanding on disaster and mechanism				What topics do you teach?				
		no understanding at all	little understand	understand	total	environment protection	Nature protection	Flood	Landslide	total
DOMINANT DISASTER	Earthquake	0	16	6	22	4	3	8	0	15
	Flood	0	9	13	22	13	3	6	0	22
	Landslide	2	11	6	19	3	1	5	9	18
	Flood, earthquake, landslide	0	0	1	1	0	0	1	0	1
	Flood and landslide	0	5	2	7	2	1	4	0	7
	Landslide and earthquake	0	2	0	2	1	0	1	0	2
	Earthquake and flood	0	2	1	3	1	0	1	0	2
	Strong Wind	0	1	1	2	1	0	1	0	2
total	2	46	30	78	25	8	27	9	69	

Fisher's exact test, P=0.276

Fisher's exact test, P=0.006

In a case of significant variation in teachers' dominant disaster and their' understanding level on disaster and mechanism (table 4 right), no significant relationship has been founded between them (Fisher's exact test, 8x3 contingency table, P=0.276). However, based on the data in the left part of table 4, in the case of significant variation in dominant disaster for teachers and their topics selection, highly significant relationship between them has been founded (Fisher's exact test, 8x4 contingency table, P=0.006). Namely, teachers charged with little or some level understanding on disaster can have little or some ideas on the technique for disaster teaching.

As presented in the table 5, We have checked whether there is significant variation in teachers' understanding level on disaster and mechanism and their level on the technique of teaching disaster prevention. As a result, the teachers' understandings level on disaster and mechanism and their technique on methodology as how to teach disaster prevention is significantly related to each other (Fisher's exact test, 3x4 contingency table, P=0.002).

Table 5: Frequencies for teachers' understanding level on disaster and mechanism and their technique level on teaching disaster prevention

N=87

		Technique on how to teach disaster prevention				total
		No idea at all	little idea	some ideas	many ideas	
Your understanding on disaster and mechanism	no understanding at all	1	1	0	0	2
	little understand	0	17	30	1	48
	understand	1	4	30	2	37
	total	2	22	60	3	87

Fisher's exact test, P=0.002

Furthermore, we checked significant variation in teachers' understanding on disaster and mechanism and in their selection of meaningfulness points regarding disaster education for importance rank1. As a result, there is no significant relationship between them (Fisher's exact test, 3x5 contingency table  $P=0.291$ ), as well as the case between the former and the disaster teaching focus for importance rank1 (Fisher's exact test, 3x7 contingency table,  $P=0.327$ ).

Also, we have checked correlation between the variation of the technique of teaching disaster prevention and the selection of meaningfulness points regarding disaster education for importance rank1 (table 6). As a result, the variation of the former significantly related to the meaningfulness points (Fisher's exact test, 4x5 contingency table,  $P=0.006$ ). Many of teachers charged some ideas for the teaching technique have the meaningfulness point for making pupils' attitude or awareness on environment protection concept, and some of those teachers have the meaningfulness point for the scientific understanding.

Additionally, we have checked correlation between the variation of the technique of teaching disaster prevention and the selection of meaningfulness points regarding disaster education for importance rank1. In this case, there is no significant correlation between them (Fisher's exact test, 4x7 contingency table,  $P=0.575$ ).

Table 6: Frequencies for teachers' technique of teaching disaster prevention and their importance rank1

		Meaningfulness points regarding disaster education for importance rank1					total
		Scientific understanding about nature and natural phenomena	Understanding on natural disasters in the future and its mechanism	Attitude or awareness on environment protection concept	Developing attitudes to save life during disasters	Improving awareness on importance of learning	
Technique on how to teach disaster prevention	No idea at all	0	0	1	0	0	1
	little idea	6	2	5	6	3	22
	some ideas	15	2	36	5	2	60
	many ideas	2	1	0	0	0	3
	total	23	5	42	11	5	86

Fisher's exact test,  $P=0.006$

## 【Discussion and Conclusions】

Many teachers ideally weigh on pupils' thinking in their lesson on disaster prevention, and also the teachers regard the behavior when disasters happen to pupils so important. Both teachers' understanding level on disaster and its mechanism seem to relate less with their selection for meaningfulness point on disaster education. Also, teachers' understanding level on disaster and its mechanism relate less with their selection for disaster teaching focus. Teachers seem to get the educational way to manage disaster prevention lesson with less understanding disaster and its mechanism shown by the case of selecting disaster topics in which many teachers are occupied by their own experience on disaster. The level of understanding disaster mechanism seems to contribute getting technical ideas for disaster teaching. But the level less contributes to form the sense of educational values for disaster teaching. It suggests the necessity for more effective knowledge for these teachers.

Such the status may lead shortage of developing teaching materials depending on local conditions respectively. And working experience relates hardly to both their selection for meaningfulness point on disaster education (Fisher's exact test, 5x7 contingency table,  $P=0.377$ ) and selection for disaster teaching focus (Fisher's exact test, 7x7 contingency table,  $P=0.374$ ). It means educational values for disaster

teaching may hardly change throughout only their working experiences. However teacher tends to rely on his/her own "experience" in his/her education, continuous in-service training is important for them to get new knowledge and skills for more effective teaching. Particularly in the field of both disaster and its teaching, newer knowledge and information are very important to organize teaching technique and exercise.

After reports by Hayashi and Isozaki (2013) and Hayashi et al., (2014) for such kind of in-service training, collaboration by science experts of universities and/or special institutes concerning to disaster is effective. Therefore, we wish to recommend to organize intense in-service teacher training especially collaborated by science experts or researchers, focusing mainly on the mechanism of disaster and its prevention way, as well as on teaching technics and material aids.

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