

## Students' Ideology About Occurrence of Earthquake- A Survey Conducted in A Polytechnic College In Andhra Pradesh, India

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**Abstract:** We know that earthquake as a natural disaster creating large-scale destruction in many countries of the world to both mankind and property. One can save his life and property by knowing how to protect from an earthquake and to reduce the risk of destruction. A good knowledge imparting to younger generations about the occurrence of earthquakes raises its consciousness among citizens in the society too. In this study, the knowledge levels of the students studying diploma (Technical) in an engineering college in Andhra Pradesh, India was examined about an earthquake, reasons for the earthquake, do's and don'ts during earthquake etc. In this study, a descriptive quaternary method was adopted. The survey was conducted on 150 students. The result of the study revealed that in students' mind, an adverse image was recorded about the earthquake and the phenomena of the earthquake. This study also revealed that there was a large deficiency of knowledge of natural disasters, especially about the earthquake. It was observed during the study that none of the students out of 150 able to explain the exact meaning of earthquake and causes of earthquake completely and scientifically. Basing on this study some suggestions were concluded like to build environmental conscious educational programs, developing and spreading natural hazards education at institutions, creating opportunities to participate in the projects in relation with earthquakes or natural hazards.

**Keywords:** Earthquake, students, knowledge, occurrence, causes

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### I. Introduction

A natural disaster may be defined as an event which occurs due to natural factors, causing significant loss of life and property and also affects socio-economic and cultural activities of people. Some of the natural disasters include tsunamis, droughts, cyclones, floods, volcanoes, forest fires, landslides and earthquakes (Sahin.C., et al, 2003). If we observe throughout the history of the world, the biggest natural disasters are earthquakes. Earthquake is an unexpected and violent shaking of the earth due to natural or artificial causes. An earthquake is an event of shaking of the ground surface that is the result of spread in waves of sudden vibrations with the reason of breakages in Earth's crust (Bolt.B.A., 1999). Tectonic plates shifting can be considered as the main natural cause. We can mention some processes like underground caves collapse, mine workings, explosions, filling of water reservoirs etc, as artificial causes. Each year, there are about a million earthquakes on the Earth, but most of them are so weak that they pass unnoticed. Really strong earthquakes that can cause extensive damage and destruction, occur on the planet about once in every ten days. Most of them happen under the ocean, and as such, they have no disastrous consequences unless it turns into a Tsunami. The cause of the earthquake is the rapid shifts of the earth's crust at the time of the elastic deformation of strained rocks in the center of the earthquake. Most of the earthquakes occur near the surface of the Earth (Ohnaka.M., 2013, Bolt.B.A., 1999). Since earthquake is a natural disaster, we cannot prevent it but we can save ourselves and property by adopting some precautionary measures. The extent of damage to life and property is inversely proportional to the awareness levels of people (Ergünay, 1996; Basibuyuk.A, 2004; Kibici, 2005; Öcal, 2005). If people know how to protect themselves from earthquakes and arrange their lifestyles and houses, then the damage will be reduced to some extent (Canan, 2007). The knowledge about the earthquake and its causes and precautionary measures play a vital role among younger generations, to save themselves as well as their families and other people (Ross et al, 1993). At this point, the importance of students' ideology about earthquakes will come into light.

The students during their primary and secondary school education know a little bit about what is an earthquake, how it occurs, general damages due to the earthquake and what are the precautionary measures that people should know to save their life's during the earthquake (Öcal, 2005). The study conducted in Turkey in the year 1997 showed that there is a belief that people's fate causes more damage due to the earthquake (Aydm and Esen, 1997). Another study revealed that people easily fall into misconceptions about the earthquake and causes

if they learn in the informal way (Ross & Shuell, 1993). The study conducted by Tsai in Taiwan found that in students view the causes of the earthquake are a) sudden changes of the gravity b) supernatural powers and c) cultural myths (Tsai, 2001). By watching some programs in television and some movies students get misconceptions about earthquake and causes of it (Barrow & Haskins, 1993; Simsek, 2007). The students may fall into misconceptions even if they learned them in the formal education (Barrow & Haskins, 1993; Tsai, 2001; Oguz, 2005; Simsek, 2007). In Andhra Pradesh, earthquakes are included as a part of the curriculum in science and social sciences at both primary and secondary levels, the general public is still backward in following the precautionary and protective measures. Students learn about earthquakes theoretically but not practically. Even the sentences, expressions in textbooks or visual elements chosen regarding earthquake are not authentic. As earthquake distinguishes itself from other disasters, it should be considered very important. Basibuyuk (2004) emphasized that earthquake-related education should be started from primary school level in all educational programs in national and regional level. In this study students views were examined in-depth with qualitative data about what an earthquake is, how it occurs, what losses it is caused and what can be done to protect against earthquake.

In the literature review, it has been observed that any systematic study has not been carried out on this subject especially among diploma studying students about the earthquake and related issues. Thus, it is considered very important to carry out the study about what kind of perception that diploma level students have regarding the earthquake. This study also aimed to strengthen the knowledge of students regarding earthquakes.

## **II. Method of Study**

To analyze thoughts and beliefs of students about the earthquake and ways of protection from it, the descriptive quaternary method has been used. The reason for descriptive quaternary is to get each student's individual perception and his/her knowledge of the subject of the earthquake. For this study 50 from the first year, 50 from the second year and 50 from final year, a total of 150 students were selected. All the students are studying diploma in an engineering college in Andhra Pradesh in the district of West Godavari. The average age of first-year students was 16.2, the average age of second-year students was 17.6, and the average age of third-year students was 19.2, finally the average age of 150 students participated in this survey was 17.6. All the students completed their school education. The quaternary form used in this survey was given in appendix-I, the form was given to each student and ample time was given to answer the questions. Data obtained has been analyzed and interpreted in respect of different variables. Further, an analytical approach and percentage distribution have been applied

## **III. Results And Discussions**

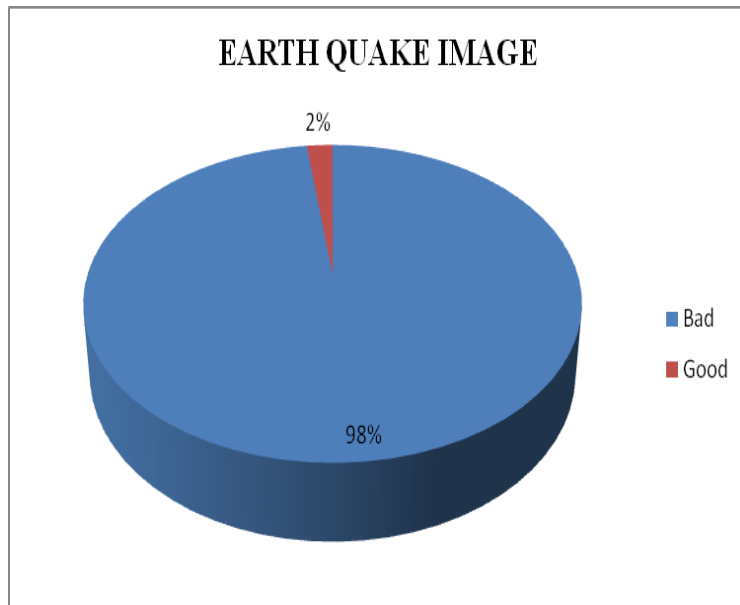
The results and discussions were based mainly on four responses from the survey. The first one is that "whether the earthquake is good or bad", the second is "causes of earthquake", the third one is "ways of protection against earthquake" and the fourth one is "sources of information about the earthquake".

## **IV. Earthquake Image**

Out of 150 students, except 3 express earthquakes as a bad thing and cause loss of life, property damage, destruction of houses, school, college buildings, and cracks on roads, railway lines and earthquake frightens everyone. Of the three students' opinions, the first one expresses earthquake is neither advantageous nor disastrous but it is a natural process and earthquake occurs when buildings are constructed close to one another. The second one opines that earthquake is desirable because it keeps the shape of the earth round like a ball; the third one says that earthquake may be good because it prevents contraction of the ground. This type of arguments clearly shows that students have lack of adequate knowledge about earthquakes. Above analysis is similar to Demirkaya's (2007) and Aydin & Coskun (2010) studies. Figure 1 shows percentage variations of students' ideology about earthquake image.

The general image about the earthquake in the minds of the majority of students is given below.

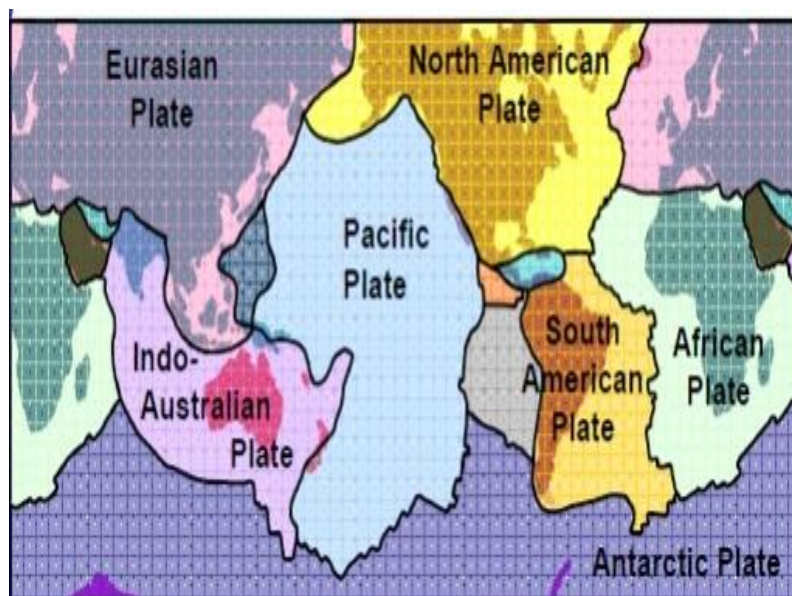
1. Damaged houses
2. Loss of lives of people
3. Injuries to people
4. Objects falling in the houses
5. Swinging lamps, fans, photodramas etc
6. Trembling buildings
7. Cracks inland
8. Shaking of ground



**Figure 1** Students' ideology about earthquake image

#### 4.1 Causes Of Earthquake

Majority of the students from all three years write at least one cause of earthquakes like faulting, a sudden lateral or vertical movement of rock along a broken surface and elastic rebound. But the exact scientific reason behind earthquake was not given by any student. Some interesting answers were found like "boiling water in the underground", "God wants it that way", "flash of lightning and thundering". These types of answers are less than 2%, and one interesting answer is that "God wants to control population explosion on earth". Adem Basibuyuk (2004) published, "Earthquake Knowledge in Adults and Analysis of Effective Factors" in National Education periodical and asked people why an earthquake does occur, 30% adults replied that earthquake is not a natural disaster, it is the consequence of sins committed by people in terms of religion and morality and is punished by God in the form of earthquake (Basibuyuk, A.,2004). The results are in accordance with Tsai's findings that many students had an opinion and a scientific / myth dual perspective about causes of the earthquake (Tsai, C., 2001). The results are consistent with the studies in the USA (Ross & Shuel, 1993).



**Figure2.** Major Tectonic Plates on the Earth's surface (USGS, 2015)

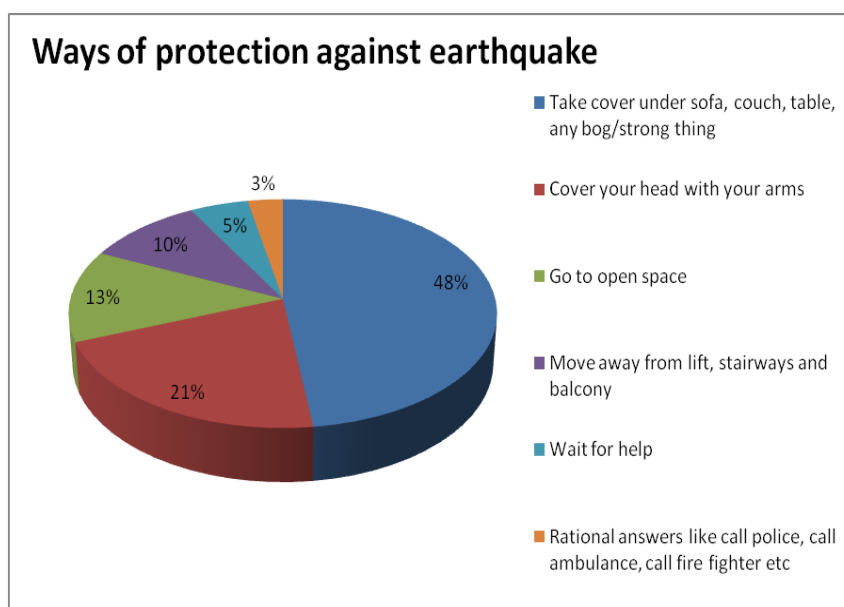
#### 4.2 Ways Of Protection Against Earthquake

From the results of this study, it is observed that almost all the students have some sort of knowledge regarding ways of protection from the earthquake. Table 1 shows the percentage of answers given by students

for the ways of protection against earthquake and the pie diagram shown in Figure 3 gives the percentage information of ways of protection against earthquake.

S. No.	Ways of protection	Percentage (%)
1	Take cover under sofa, couch, table, any bog/strong thing	48
2	Cover your head with your arms	21
3	Go to open space	13
4	Move away from lift, stairways, and balcony	10
5	Seeking help	05
6	Irrational answers like call police, call an ambulance, call firefighter etc.	03

**Table 1** Ways of Protection against Earthquake



**Figure 3** Ways of protection against earthquake

One student answered that people should move to places where there is no risk of the earthquake. Another student answered that we should move to the top of building in order to save ourselves. As shown in Table 1, the best way to protect ourselves against earthquake is to hide under solid furniture and cover our head with arms, but this is suggested by only 48% of students. It indicates that students do not have sufficient knowledge about how to protect themselves against earthquake. This also shows that students learn nothing from their curriculum regarding natural calamities like the earthquake.

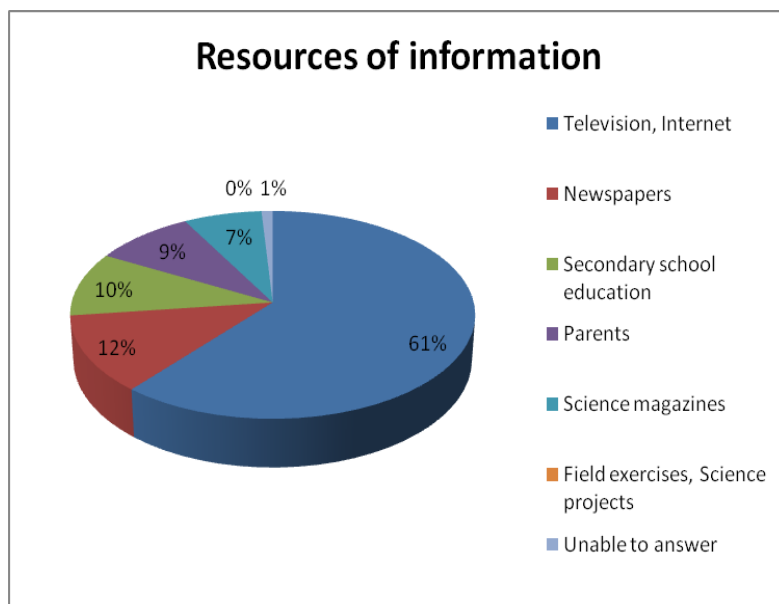
#### 4.3 Sources Of Information About Earthquake

Almost all students except two answered about the sources of information about the earthquake as they get it from television, newspapers, natural science lessons, social studies (primary and secondary school education), and parents. Table 2 gives the percentage of students' resources about the earthquake.

S.No.	Sources of knowledge about earthquake	Percentage (%)
1	Television, Internet	61
2	Newspapers	12
3	Secondary school education	10
4	Parents	09
5	Science magazines	07
6	Field exercises, Science projects	00
7	Unable to answer	01

**Table 2** Percentage of student's resources about earthquake

Out of 150 students, only one student is unable to answer from where he gets information about the earthquake. Mostly about 61% of students obtain information from television and internet. Surprisingly, no student has attended any earthquake-related field exercises or science projects, which are very important to this group of technical students. This indicates the large gap lies between theoretical and practical knowledge. Figure 3 gives information about resources of information about earthquake under pie diagram.



**Figure 3** Information about resources of information

### V. conclusion

This study carried on 150 diploma studying students revealed that there is an adverse image in students' minds regarding earthquake phenomena and its consequences. This study clearly indicates that students have no proper knowledge of natural disasters like earthquakes. It was observed during the study that few students answered rational answers but none of the students out of 150 are not able to explain the exact meaning of earthquake and causes of earthquake completely and scientifically. Lack of clarity in protection against earthquakes is clearly identified. It has been realized that more quality education should be provided for them in acquiring good knowledge about causes of earthquakes, ways of their protection etc. The field exercises and science projects which should be one and the most effective tools of education should be included in the regular course of study to gain knowledge about this type of disasters. Finally, it is concluded that it is the need of the hour to acquire more knowledge on earthquakes for technical background students. The study may be restudied with a wider sampling and different measurement tools should be developed and applied for obtaining more in-depth information.

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Appendix-I

**Swarnandhra College Og Engineering & Technology**

Palakol-Narsapur Road, Narsapur

Student Name:

Year: I/II/III

Date:

**Quaternary about earthquake**

1. What is an earthquake?
2. How does an earthquake occur?
3. Why does an earthquake occur?
4. Is earthquake advantageous or disastrous?
5. What should be done during an earthquake?
6. What should not be done during an earthquake?
7. Have you ever experienced an earthquake?
8. What are the sources from which you get information to answer questions?
9. Have you watched anything regarding earthquake on television/internet?
10. Do you believe that your living area is vulnerable to an earthquake?

**ANSWERS**

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