Measuring the level of public understanding of total solar eclipse from the mass media: Palembang as sample

F. G. Purwati, N. Ekawanti, Luthfiandari, P. W. Premadi
Astronomy Department, Institut Teknologi Bandung, Indonesia 40132

E-mail: fera.gustina@s.itb.ac.id

Abstract. The Total Solar Eclipse (TSE) on the 9th March 2016 received a huge attention from the mass media. Some of them intensively write articles about it even months before the TSE day. As we know media plays strategic role not only in raising public awareness but also interest. The aim of this project is to study the relation between the number of accesses to the media information and how well public learned the information delivered by the media. We prepared questionnaire consisting of seven semi-multiple choices on how public got information about TSE. We gave them choices of what they had heard to measure their basic understanding of TSE. Furthermore we add two “wrong” choices in the last questions to identify less serious respondents. We analyze 60 respondents of Palembang who visited Ampera bridge area. Our result shows no correlation between the number of information access and the level of understanding about TSE. We also found that local media did not provide the scientific content of TSE as well as the national media.

1. Introduction
As we know media plays strategic role in raising not only public awareness but also interest. Media can be a bridge to bring people to somewhere they never know before, rise up the imagination of knowledge, and a science communicator has more spirit to educate society too. Rosetta mission has successfully communicate the science of asteroid and how is important that mission for all, because so many feedback given from public such as 10 million live views on ESA livestream, 5.5 million page views on Rosetta blog, 92 kilo page likes on fan page FB Rosetta Mission and 287 kilo follower growth on twitter @ESA_Rosetta, data until November 2014 (Baldwin, 2016). In first quarter of 2016, Indonesia given the special astronomical event, which was total solar eclipse (TSE). TSE on the 9th of March 2016 received a huge attention from the mass media, especially in Indonesia as the only land passed by TSE, some of them intensively write article about it even months before TSE day. The amount of various media informed TSE had a correlation with public interest, such as Rosetta mission, but is that condition also correlated with increasingy public knowledge about that scientific event? We tried to find relation between the number of media accessed and their basic knowledge about TSE.

2. Method
We prepared questionnaire consisting of seven semi-multiple choices or using fixed response on how public got information about TSE. This questionnaire offered the respondent a closed set of responses from which to choose, we were not trying to capture new ideas or thoughts from the respondents. We
gave them choices of what they had heard from all media information to measure their basic understanding of TSE, we designed list covers all possible alternatives choice. Before we distribute the questionnaire we conducted a small test to make sure the questionnaire clear enough to answer. The questionnaire is in Bahasa Indonesia, but we showed the simple questionnaire on the table 2 in English. We also collected the articles from mass media (newspaper) and compared between the information provided with public response. Furthermore we added two “wrong” choices in the last questions to identify less serious respondents, to later exclude their response in the analysis.

**Table 1. Simply questionnaire in English version**

|   |   |
|---|---|
| 1. | Reason for going to Ampera Bridge today |
| 2. | Did you get any information TSE before these day? |
| 3. | Since when you got information about TSE 9 March 2016? |
| 4. | What kind of media did you get information about TSE today? (you can choose more than one media) |
|  | A. Newspaper (tick or write the brand *optional) |
|  | B. Broadcast media / TV/ Radio (tick or write the brand *optional) |
|  | C. Social media (tick or mention the brand *optional) |
|  | D. Website (tick or mention the brand *optional) |
|  | E. Direct announcement/ talkshow (tick or mention the event *optional) |
| 5. | Mention the frequency access those media (in average) |
| 6. | Are the article content easily to understand? |
| 7. | What kind of information that you got from media? |
|   | ☐ The TSE process |
|   | ☐ Sky condition will be like night during the TSE |
|   | ☐ We cannot directly see the Sun |
|   | ☐ The Sun will be bigger |
|   | ☐ The chicken will be crowing during the TSE |
|   | ☐ Duration of TSE only about 2 minutes |
|   | ☐ The Sun will be oval |
|   | ☐ Stars are visible in the sky during TSE |
|   | ☐ We can see the sun’s corona during TSE |
|   | ☐ Explanation why TSE rarely happened |

For the sample, we chosen respondent from one of the city which held big TSE event, there was Palembang. Ampera bridge became the centre of public for observing TSE in Palembang and then took random respondent out of the visitors. Respondent’s age ranges from 13-50 years old.

3. Result and discussion

We got 60 respondents for this project. We checked the correlation between the response to question 7th “what are the information they knew from mass media” if they choose the wrong answer we compare it with they respond on question 3rd “when they accessed the information”. We exclude 6 data because they are suspected as non-serious respondents and 2 respondents did not answer the questionnaire since they did know about TSE on that day. Just 86.67% samples were valid for the calculation. We divided age group based on Havighurst’s developmental task theory and education stages in Indonesia. There were 3 groups data divided by their age, group 1 teenagers (13-18 years old) high school students, group 2 young adulthood (19-29 years old) university students, group 3 middle adulthood (30-60) parent and professional [2].
3.1. Information mass media versus public understanding level

Figure 1. x = the number of accessed media, y = correct choice based on respondent’s answer on questionnaire (number 7). From left to right, group 1, group 2, and group 3.

On the figure 1 maximum number of accessed media is 8 type of media, on y axis the highest true answers is 6. We can see that each group on figure 1 did not draw a relation pattern of the number of media public accessed and correct choice they choose in the questionnaire number 7 (basic knowledge). We cannot find that the more media they accessed the more basic knowledge of TSE they got. Even though we cut the extreme data, for example in group 1 who accessed 1 media but got 6 right choices and in group 3 who accessed 6 media but only got 1 right choice, we still could not find any relation.

3.2. Content of media that accessed versus public understanding level

We investigated scientific content that delivered by media about TSE. Three kinds of media with the widest access to our respondents are TV, Facebook, and Newspaper. In TV we knew that TSE was not only shared in news, but also spread on other programs such as infotainment. Unfortunately we could not traced TV programs to compare against responses, as no broadcast record is available for public. So we identified information from newspaper, we collected 55 national and local mass media a week before TSE day, from 2 – 8 March 2016. We marked some points in those articles based on our questionnaire and compared with the public response to guess their comprehension level.

Table 2. Number of article’s content compared with questionnaire list. Kompas (national mass media), SP (Sriwijaya Post, local mass media), others (national mass media exclude Kompas), Public answers (data respondents from questionnaire)

| Info                                | Kompas | others | SP | total | Public answers |
|-------------------------------------|--------|--------|----|-------|----------------|
| The TSE process                     | 6      | 1      | 0  | 7     | 50             |
| Sky condition will be like night during the TSE | 9      | 2      | 0  | 11    | 42             |
| We cannot directly see the Sun      | 8      | 4      | 3  | 15    | 36             |
| The Sun will be bigger              | 0      | 0      | 0  | 0     | 10             |
| The chicken will be crowing during the TSE | 0      | 0      | 0  | 0     | 1              |
| Duration of TSE only about 2 minutes | 3      | 1      | 2  | 6     | 38             |
| The Sun will be oval                | 0      | 0      | 0  | 0     | 5              |
| Stars are visible in the sky during TSE | 1      | 0      | 0  | 1     | 5              |
| We can see the Sun’s corona during TSE | 12     | 2      | 1  | 15    | 3              |
| Explanation why TSE rarely happened | 4      | 0      | 0  | 4     | 16             |

articles 20 9 5 34
Data spread in wide range age and education stage, some questions were not sharp enough to get information needed from respondents. We realized that there was a double-barrelled question about idea so make it biased, such as in the question number 4, 5 and 7, which we asked about media and information written in there, but not asked specific type of media.

Large variations in number of sample of respondents for each age group. We took random respondents with a few sample made it hard to balanced age in each group that will be better if respondent are in the specific area and specific age.

From question number 4 we concluded that public in Palembang prefer to read local media (e.g. Sriwijaya Post) than national media (e.g. Kompas). However on table 2 shows that local media did not provide the scientific content of TSE as well as the national media, they mostly wrote about the festivities and announcement of Sholat gerhana, photo contest, etc before March 9th, 2016.

4. Conclusion
Our results shows no correlation between the number of information access and the level of understanding. The local media plays important role to rise public knowledge on scientific issue. Their big impact for public level of understanding would have been made better if local media also take the chance to increase the scientific content to educate public wisely. Inserting “wrong choices” is not enough to distinguish between their lack of seriousness in responding and the probability that they forgot about the whole of information and made guesses based on their feeling or experience.

5. Acknowledgement
We would like to thank to Mrs. Ely librarian of Bosscha Observatory who help to collect articles from mass media. This work also was supported by the Astronomy department which funds us in this symposium, and voucher scholarship from ITB.

References
[1] Emily Baldwin et al. 2016 Communicating Astronomy with the Public. 19 30.
[2] Michael J M 1993 A Comparison of Havighurt’s Adult Social Roles and Developmental Events by Gender, Age, and Socioeconomic Status Levels (Doctoral dissertation)