

# Information Behavior of University Students Living Outside the Disaster Area After the Kumamoto Earthquake

Sachi TAJIMA

Center for Liberal Arts, Tokai University  
Hiratsuka, Kanagawa 259-1292, Japan

Osamu UCHIDA

Dept. of Human and Information Science, Tokai University  
Hiratsuka, Kanagawa 259-1292, Japan

Keisuke UTSU

Dept. of Communication and Network Engineering, Tokai University  
Takanawa, Minato-ku, 108-8619, Japan

Makoto TOMITA

Dept. of Arts, Tokai University  
Hiratsuka, Kanagawa 259-1292, Japan

Yoshitaka KAJITA

Dept. of Civil Engineering, Tokai University  
Hiratsuka, Kanagawa 259-1292, Japan

Yoshiro YAMAMOTO

Dept. of Mathematics, Tokai University  
Hiratsuka, Kanagawa 259-1292, Japan

## ABSTRACT

A survey was conducted into the information behavior of university students regarding the Kumamoto earthquake in 2016. An initial survey was conducted 1-2 weeks after the earthquake. A follow-up survey was conducted for some of the participants one week later. We found that participants had a high awareness of the effectiveness of posting on social media during disasters. The survey also revealed that information behavior about disaster was related to the daily information behavior. Focusing on the content of social media, there was a behavioral trend to share information posted by others. With regard to the social media generation, it is necessary to create opportunities for contact with disaster prevention and disaster risk reduction information in daily life by means of social media as a person concerned. Moreover, it is important to improve literacy about social media information.

**Keywords:** Information Behavior, Social Media, Twitter, Social Networking Service, Disaster Information.

## 1. INTRODUCTION

The rate of use of social media continues to increase every year. In Japan, the usage rate has increased from 41.4% in 2012 to 71.2% in 2016 [1]. 97.7% of people in their twenties use social media, which is the age group with the highest usage rate. Although usage is heaviest among people between the ages of 10

and 39, social media use has penetrated a wide range of generations, with 78.3% of people in their forties and 60.8% of people in their fifties using social media.

Social media is also used during disasters. In Japan, in April 2016, the 2016 Kumamoto earthquake that recorded the magnitude 7.0 occurred. There were approximately 26.1 million tweets in one week in connection to the earthquake. This is approximately 23 times greater than the number of tweets posted one week after the Great East Japan Earthquake on March 11th, 2011 (1.15 million) [2].

In view of these situations, there are ever more initiatives that use private information on social media for disaster prevention and disaster risk reduction [3]. For example, Uchida et al. [4] developed a system to map the information posted via Twitter for use in evacuation, rescue and support. Information on social media is expected to have effective application in a wide range of fields, as such information is provided in real-time, offers positional information and is posted from a variety of perspectives. On the other hand, it faces new challenges, such as the difficulty of selecting appropriate information due to the overabundance of information, and the need to deal with the spread of outdated and mistaken information.

In this study, a survey was conducted into the information behavior regarding the 2016 Kumamoto earthquake to obtain findings that can contribute to the effective use of social media related to disasters. According to Miyabe, Aramaki, & Miura [5],

Twitter usage trends differ depending on the distance from the disaster area. In the Great East Japan Earthquake, there was a trend for sharing tweeted information in regions with minimal damage. This study targeted university students in Kanto region where was not directly damaged by the 2016 Kumamoto earthquake. Exploratory efforts to ascertain the actual situation were made without a hypothesis.

## 2. METHODS

The first survey was conducted from April 20 to 29, approximately 1-2 weeks after the 2016 Kumamoto earthquake. There were 1196 respondents at five universities/ junior colleges in the suburbs of Tokyo. The follow-up survey was conducted one week later. There were 369 respondents who participated the first survey. They were asked about the use of SNS at the time of a disaster in addition to usual SNS usage.

## 3. RESULTS

### Usual social media usage

Regarding tweets, replies and retweets on Twitter, 37.21% said that they made none, 37.79% said they made five or less, 6.77% said they made between 5 and 10, 14.72% said they made 10 or more, and 3.51% did not respond. We divided groups based on Twitter usage frequency. This distribution led to a definition of “non-users” with 0 uses, “casual users” with five uses or less, and “heavy users” with five uses or more.

### Use of social media during disasters

Heavier users of Twitter have more experience of transmitting and sharing disaster prevention/disaster risk reduction information (Table 1). Posting the situation of disasters on social media was thought to be the most useful disaster risk reduction activity (Table 2). There was no difference among the groups in this regard (Cramer’s  $V = 0.08$ ,  $p = 0.10$ ), and even the group that does not regularly use Twitter confirmed the usefulness of social media.

**Table 1.** The experience of posting disaster prevention /disaster risk reduction information on social media (%)

|                    | Non   | Casual | Heavy | $\chi^2$ |
|--------------------|-------|--------|-------|----------|
| posted information | 3.37  | 10.62  | 19.07 | 46.55**  |
| shared information | 4.27  | 18.14  | 33.07 | 102.58** |
| Not experienced    | 89.89 | 72.12  | 51.75 | 139.32** |

\*\* $p < 0.01$

**Table 2.** The usefulness of social media posts during disaster to disaster risk reduction (%)

|                   | Non-user | Casual | Heavy |
|-------------------|----------|--------|-------|
| Not at all useful | 3.15     | 1.77   | 1.17  |
| Not very useful   | 3.37     | 3.32   | 5.06  |
| Neither           | 23.15    | 20.13  | 23.35 |
| Quite useful      | 42.92    | 41.37  | 36.19 |
| Extremely useful  | 24.49    | 32.08  | 31.52 |

### Transmission of information about the 2016 Kumamoto earthquake

With regard to the 2016 Kumamoto earthquake, especially about “Basic information (e.g., epicenter and magnitude),” “Emotional expression (e.g., feelings of unease and concern for the disaster area),” “Advance preparations for earthquakes,” and “Necessary

measures in case an earthquake occurs (e.g., evacuation site and contact methods),” we asked about whether the individual spoke about or transmitted information on Internet to others. Although some people did not transmit information, despite usual Twitter usage, it was confirmed that the largest ratio was direct conversations with friends and family. Furthermore, for all of the topics, heavier Twitter users transmit more information to general people via social media.

Also, none of the groups proactively posted messages to disaster victims. However, some heavy users (17.90%) delivered messages to disaster victims by sharing contributions from others, although it was not in their own words.

### Change in information behavior

Information behavioral changes are considered based on data from the 288 respondents to the first and second surveys. The number of participants in each group of Twitter users was 36.46% non-users, 44.10% casual users, 18.40% heavy users and 1.04% non-respondents.

In the second survey, while a certain ratio of respondents had direct conversations with family and friends, there was an increase in the ratio of people who did not transmit information of any kind. Also, there was no increase in the transmission of information about advanced preparations for earthquakes or necessary measures to take when earthquakes occur.

Regarding the posting messages to disaster victims, in the second survey, a number of respondents who made no posts had increased among both casual users and heavy users. However, as in the first survey, heavy users delivered messages to disaster victims via retweets, replies and shares (16.98%).

## 4. DISCUSSIONS

Regardless of ordinary Twitter use, posting social media during disasters are considered to be useful to disaster risk reduction. This result supports current social movements in which various initiatives are being promoted to make effective use of social media information. Also, people who regularly use Twitter have more experience of transmitting and sharing disaster prevention/disaster risk reduction information. Information behavior about disaster was related to the daily information behavior. Furthermore, there was more experience of sharing rather than posting. The lack of posts made in one’s own words may reflect the low disaster prevention awareness of this generation. This may also be connected to the lack of knowledge of disaster prevention and disaster risk reduction. However, even if that was the case, those who recognize the importance or usefulness of disaster prevention or disaster risk reduction information found on social media want to transmit it to others, and this positive thinking leads them to actively share it with others.

Regarding advanced preparations for earthquakes and necessary measures after earthquakes, more than half did not talk about this in the first survey. Approximately 30% had spoken directly with friends and family. The ratio decreased even further in the second survey. These topics of communication require to assume themselves as the disaster victims. The participants were in a safe location some distance from the disaster area, so it may not have been perceived as a pressing issue. It was repeatedly reported that university students like those who were being surveyed were

victims of the 2016 Kumamoto earthquake. Even so, the participants may have had difficulty putting themselves in that position. This lack of imagination may also be connected to the lack of disaster prevention awareness among this generation. There will be a need for education-based mechanisms to make students think about disasters as personal experiences.

Almost no messages for disaster victims were posted. 17.90% of heavy users sent messages as retweets, replies, or shares. There were no self-produced messages, but positive action was taken in terms of trying to share sympathetic and beneficial messages found on social media with disaster victims. The spread of social media has provided a channel that enables people to think about and connect with disaster victims even if they are far away. In the results of this survey, the more common behavior was to share information rather than to post information by oneself. Such behavior is an incredibly useful means of delivering appropriate information to people that need it. However, there is at some risks of sharing outdated or mistaken information. It is necessary to analyze in detail the kind of information that is being shared. In addition, it is important to increase the literacy of social media users.

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