

Relationship between International Students' Information-gathering Capacity and Behavior Patterns after the Great East Japan Earthquake

Shaoyu Ye & Masao Murota

Graduate School of Decision Science and Technology, Tokyo Institute of Technology, Japan
shye@mr.hum.titech.ac.jp ; murota@hum.titech.ac.jp

Abstract: In order to investigate (a) international students' information-gathering capacities and their behavior patterns after the Great East Japan Earthquake, and (b) how their information-gathering capacities and cultural competency, as well as their demographic factors, related to their behavior patterns in the aftermath of the earthquake, we conducted a survey of over 500 international students enrolled at Saitama University 3-month after the earthquake. On the basis of 397 student responses, it was established that (i) the students primarily accessed Japan's mass media and various websites to collect relevant information; (ii) nearly half of the students stayed where they were while over half of them went to other places; (iii) their cultural competency in Japan and information-gathering capacities, as well as their demographic factors (age, gender, economic situation, nationality, Japanese language proficiency), all influenced their behavior patterns in the aftermath of the earthquake; and (iv) Chinese students had more diverse purposes for studying in Japan and higher cultural competency than students from other countries, which was found to be related to their behavior patterns. The implications and issues for future research are discussed in order to get a better understanding of how to support international students when emergencies, such as earthquakes, occur in future.

Keywords: *Great East Japan Earthquake, International Students, Information-gathering Capacity, Behavior Patterns*

Introduction

According to the statistics of the Japanese Student Services Organization (JASSO), the number of international students decreased by 2.6% (3,699) after the Great East Japan Earthquake (2012). Although over 100 countries expressed support of and help for Japan to reconstruct and recover immediately after the earthquake, many countries issued evacuation orders for their own citizens and supported the temporary return of their international students to their home countries because of the serious situation and radiation escaping from the Fukushima Daiichi nuclear power plant. In this sense, it can be said that the Great East Japan Earthquake may have greatly affected Japan's policy of accepting international students, as the Japanese government has stated that it wishes to accept 300,000 international students by 2020 (MEXT, 2008). Therefore, it becomes more and more important to consider how to support international students when emergencies such as earthquakes occur in future.

At present, there are some studies which focus on how to support international students after the Great East Japan Earthquake. For instance, Yamaguchi (2012) mentions that it is important to give appropriate advice and support international students properly after confirming their safety in the event of disaster. In addition, Fujiwara and Hachiwaka (2012) clarify the effects of using mailing lists to transmit information to international students at the time of the earthquake and of international students consulting with faculty members of the International Student Center at Ibaraki University via email in the earthquake's aftermath. In this sense, it is necessary to investigate international students' capacities of using media to collect earthquake-related information and clarify whether or not there is any influence of their demographic factors such as Japanese language proficiency on it. Furthermore, there are some research results showing that Japanese local residents preferred to use different media for collecting tsunami and other related information between the disaster-damaged area and the Tokyo metropolitan region (MIC, 2012). Thus, issues such as (a) how international students used media to collect relevant information after the Great East Japan Earthquake and (b) the relationship between their information-gathering capacities and demographic factors, need to be examined.

Additionally, there are some studies that focus on what kind of factors had influenced the international students' decision to continue to study in Japan (e.g., Koyanagi et al., 2012; Ogasa, 2012). For example, Ogasa (2012) interviewed four international students and found that although their behavior patterns were different immediately after the earthquake, all of them decided to stay in Japan to continue their studies because (i) they had some friends who would stay in Japan and support them, (ii) they decided to spend their valuable study period by themselves, and (iii) they shared sympathy with the general Japanese residents who tried to support people in the disaster-damaged areas. However, whether there is any difference between international students' behavior patterns in disaster-damaged areas and non-damaged areas remains unknown. Furthermore, it is reasonable to believe that those students, who have higher cultural competency, including higher Japanese language proficiency and capacities of collecting earthquake-related information, are likely to make appropriate decisions on their behavior patterns to evacuate immediately after the earthquake and on staying in Japan in the aftermath. Therefore, in order to clarify the above issues, there is a need to examine (a) the behavior patterns they preferred, and (b) the relationship between their cultural competency and their capacities of using media and behavior patterns after the Great East Japan Earthquake.

The purpose of this study, therefore, is to clarify (a) how international students in a metropolitan region used media to collect relevant information and what kind of behavior patterns they preferred, and (b) how their information-gathering capacities and cultural competency, as well as their demographic factors, related to their behavior patterns after the earthquake. Then, based on the results, we compare them with references about how to support international students in Japan and seek to obtain implications concerning aspects in the future.

Method

Target Group

The present study conducted a questionnaire with 518 international students who were enrolled at Saitama University, where people experienced the earthquake to some extent (lower/upper magnitude of 5). This survey was conducted in June 2011, 3 months after the earthquake. A total of 444 students submitted their responses by the deadline (recovery rate: 85.7%), and 397 questionnaires were analyzed to collect data. All of the analyzed students experienced the disaster and came back to continue their studies in Japan. The remaining responses were unusable because they were not in Japan when the Great East Japan Earthquake occurred.

Survey Items

The survey items included the three parts as follows.

(a) Personal Information: gender, age, nationality, major, student status, period of stay in Japan, Japanese language proficiency score resulting from the Japanese Language Proficiency Test (JLPT) and a self-evaluation of their Japanese language proficiency in reading, listening, speaking, and writing compared with Japanese adult native speakers by percentage. In addition, the survey asked about their likableness of Japanese students in

general (the degree to which international students would like to work and study with Japanese students) as rated on a 7-point scale (1. do not like at all, 4. neither like nor dislike, and 7. like very much), and their study purposes in Japan (Oka et al., 1996).

(b) Risk Management: (1) the place they were when the Great East Japan Earthquake occurred; (2) their behavior patterns after the earthquake (stayed where there were, evacuated to non-damaged areas such as the Kansai Region, temporary return to their home countries, other); (3) ways of gathering earthquake-related information (Japan's TV and radio, other countries' TV and radio, Japan's websites, other countries' websites, information from families and/or friends from home countries, information from friends in Japan, other); (4) ways of gathering earthquake-related information *from the university* (university's website, professors at the university, clerical staff, other); ways of gathering information usually (website, email, bulletin board, material distributed, other); and, (5) difficulty in understanding information from the university in Japanese (no problem at all, have difficulty sometimes, have difficulty in understanding always).

(c) Cultural Competency in Japan: the level of satisfaction with daily lives and adaptation to their lives in Japan (communication, culture experience and language fields) as rated on a 7-point scale (1. strongly disagree, 4. neither to say either, and 7. strongly agree).

Procedure

To avoid the influence of the international students' Japanese language abilities on their responses, we prepared the questionnaire in Japanese and then translated into English and Chinese. The translation accuracy was confirmed by translating back into Japanese from the other two languages.

In addition, we conducted a preliminary survey with four international students and revised accordingly based on their comments and feedback. Then we conducted a main survey using this revised questionnaire to investigate and analyze the above items.

We distributed the Chinese version of the questionnaire to Chinese students, whereas the other two versions to other international students. All of the students were free to download a different version from the university's website if they did not wish to use the one they originally received.

Results

Demographic Factors, Cultural Competency and Studying Purposes in Japan

The international students' demographic information is shown in Table 1. From the results, we found that the male-to-female ratio was 6:4, and their average age was 26.9 years. The six major countries of origin were China, South Korea, Malaysia, Bangladesh, Vietnam, and Sri Lanka, which was similar to JASSO's distribution (2012). Regarding the student status, about 1/3 were undergraduate students and over half of them were graduate students, whereas "others" included international exchange students, research students, and accredited auditors. Among their periods of stay in Japan, over 60% were between one and four years. A total of 166 students had passed the JLPT-Level 1, and the examination pass rate for "undergraduate students," "graduate students," and "others" was 55.2%, 31.6%, and 43.3% respectively, which showed that "undergraduate students" have the highest Japanese language proficiency and "graduate students" have the lowest. Over 80% of the students were privately financed students. The average score of their likeableness of Japanese students in general was 10.6, which meant they perceived Japanese students as somewhat likeable.

The questions of cultural competency (their satisfaction and adaptation) are shown in Table 2. The reliability of the responses to these 15 items was .67, which is considered to be reliable for its internal consistency. The average score of their competency was 76.97 ($SD=10.10$, range: 47–126), which showed that the international students adapted to some extent and were slightly satisfied with their lives in Japan.

Table 1 International Students' Demographic Information

Gender	Male: 236 (59.4%)	Female: 161 (40.6%)	
Average age	26.9 ($SD = 4.24$, Range: 19.1–44.0)		
Nationalities (Top 6)	Chinese: 55.4%	South Korean: 11.8%	Malaysian: 5.3%
	Bangladeshis: 5.0%	Vietnamese: 4.3%	Sri Lankan: 3.5%
Student status	Undergraduate: 34.3%	Graduate: 51.9%	Others: 13.8%
Period of Stay in Japan	Less than 1 year: 34 (8.6%)	1–2 years: 97 (24.4%)	2–3 years: 104 (26.2%)
	3–4 years: 67 (16.9%)	4–5 years: 35 (8.8%)	5–6 years: 22 (5.5%)
	6–7 years: 14 (3.5%)	Over 7 years: 24 (6.0%)	
Japanese Language Proficiency	JLPT: L1/N1 166 (41.8%)		
	Self-evaluation: Average: 56.4% $SD = 27.0%$ Range: 0.0% - 100.0%		
Economic situation	National Expenditure: 70 (17.6%)		Private Expenditure: 327 (82.4%)
Likeableness	Average: 10.6	$SD = 2.1$	Range: 4–14

Table 2 International Students' Cultural Competency

1. It is funny to do a research/study at the university.
2. Sometimes I am puzzled because I can not understand Japanese greetings and its courtesy.
3. I think my behaviors are limited because I am conspicuous for my foreigner identification.
4. My emotional changes became intense after coming to Japan.
5. I always feel lonely after coming to Japan.
6. I feel my expertise has been enhanced.
7. I can learn research methods, special skills, etc.
8. I am confident of getting my degree.
9. I associate with different types of people.
10. I have foreign friend/s.
11. My communication with professors has strengthened.
12. I can experience Japanese culture.
13. My knowledge of Japan has widened and my understanding about Japan has become better.
14. My Japanese fluency has become better.
15. I was able to learn other foreign languages too.

Figure 1 shows the international students' purposes of studying in Japan. From the results, we found that over 60% were "to change their own future," followed by "to get a degree," "to see Japan as it is one of the developed countries," and so on (multiple choices). In addition, significant differences were found among the eight purposes when conducting *Cochran's Q Test* ($p < .001$). Table 3 shows the results of multiple comparison tests (McNemar) among them. Here we can see there were no significant differences among Purposes 1, 2 and 5, nor among Purposes 3, 6 and 8, which suggests that purposes of 1, 2 and 5 were considered similarly, while purposes of 3, 6 and 8 might be similar, too. As there were significant differences between Purpose 4 and the other purposes, it can be said that Purpose 4 was considered the most important one.

Ge (1999) mentions that compared with other countries' students, Chinese students experienced more culture shock in understanding and accepting the Japanese culture and customs, dealing with interpersonal relationships and acquiring the Japanese language. And it is suggested that the more complicated studying purposes they have, the lower achievement of satisfaction for Chinese students. In order to examine this, we divided the students into two groups: the Chinese students and the others, and then conducted *t*-test (Independent-sample)¹. It was found that there were more diverse purposes for the Chinese students than the other countries' students ($t(393) = 5.31, p < .001$). In order to clarify whether there are any differences between the Chinese students and other countries' students, we conducted *t*-test (Independent-sample) and found that Chinese students had significantly higher cultural competency than other countries' students ($M_s = 79.91$ & $73.24, t(393) = 6.85, p < .001$), which is the opposite of Ge's implication (1999).

Finally, we conducted a Multiple Linear Regression Analysis taking the total score of the 15 items for Cultural Competency as the dependent variable, their demographic factors (age, gender, nationality, economic situation, period of stay in Japan, Japanese language proficiency, likeableness of general Japanese students)², and study purposes as independent variables. As a result, we found that nationality, age, likableness of Japanese students had significant influences ($\beta = -.29, p < .001$; $\beta = .14, p < .01$; $\beta = .33, p < .001$, respectively), while their Japanese language proficiency had slightly significant influences ($\beta = .12, p < .10$). The model's regression formula was $R^2 = .25, p < .001$.

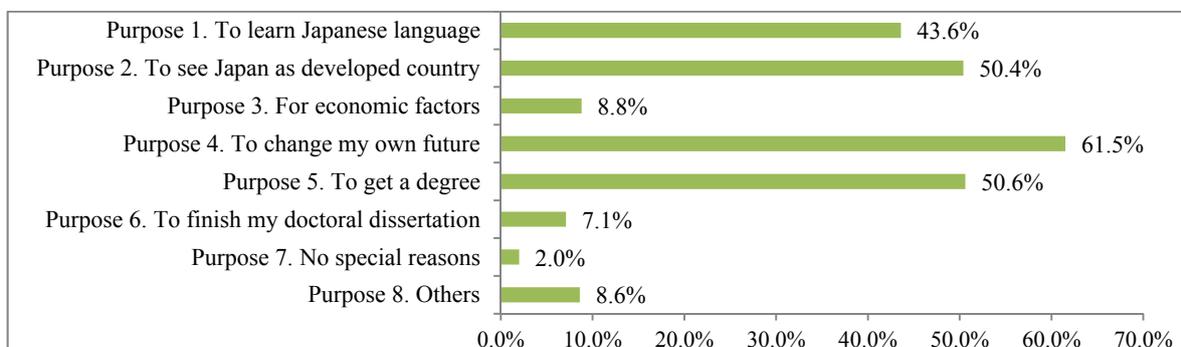


Figure 1. International Students' Study Purposes in Japan

Table 3 Results of Multiple Comparison Tests among the Purposes

	Purpose 1	Purpose 2	Purpose 3	Purpose 4	Purpose 5	Purpose 6	Purpose 7	Purpose 8
Purpose 1	—							
Purpose 2	-	—						
Purpose 3	$p < .001$	$p < .001$	—					
Purpose 4	$p < .001$	$p < .05$	$p < .001$	—				
Purpose 5	-	-	$p < .001$	$p < .01$	—			
Purpose 6	$p < .001$	$p < .001$	—	$p < .001$	$p < .001$	—		
Purpose 7	$p < .001$	$p < .01$	—					
Purpose 8	$p < .001$	$p < .001$	—	$p < .001$	$p < .001$	—	$p < .001$	—

Relationship between Information-gathering Capacity and Behavior Patterns

Regarding the place where the international students were when the earthquake occurred, we found that over 80% were in their residences (Saitama Prefecture), 3.1% were in other places, only 1 student was in the disaster-damaged area, and the remaining 15.1% were overseas including their home countries as it was the spring break between semesters. In addition, we found that 43.6% stayed where they were and 8.2% went to a non-damaged area (e.g., Kansai) in Japan, while 33.7% went back to their home countries and 14.5% went to other countries.

Then we analyzed the international students' ways of gathering earthquake-related information and found that they primarily used "Japan's media" mostly (72.7%), followed by "Japan's websites (66.6%)," "overseas' websites (56.9%)," "overseas' media (43.6%)," and so on (multiple choices). Regarding the source of information at the university, 74.0% used the "university's website," followed by "professors (36.5%)," "clerks at the university (11.7%)," and so on (multiple choices).

In order to clarify the influences of their information-gathering capacity, and cultural competency, as well as their demographic factors, on their behavior patterns immediately after the earthquake, we conducted Discriminant Analysis, taking their behavior patterns as the dependent variable, and their demographic factors, cultural competency and ways of gathering relevant information as independent variables (Table 4).

As Table 4 shows, Model 1 divided their behavior patterns as "stayed where they were" and "went to other places," while Model 2 examined the four patterns in detail. From the two models' predicted value of the Group Membership, we found that Model 1 is better than Model 2. Therefore, we used Model 1's results in this study. We can see that age, study purposes, capacities of information-gathering and cultural competency had positive influences, while negative effects for gender, economic situation, nationality, Japanese language proficiency were found. These results suggest that those older male Chinese government-supported students, who had more diversity of studying purposes and higher capacities of using media to collect related information in Japanese and cultural competency, preferred to stay where they were. On the other hand, those younger female privately-supported students, who had higher Japanese language ability, preferred to go to other places to evacuate. In addition, no significant effects for the period of stay in Japan and likeableness of Japanese students were found.

Table 4 Results of Discriminant Analysis

	Model 1 (1 Function)	Model 2 (3 Functions)	
		Function 1	Function 2
Canonical correlation	.24	.32(Function 1);	.20 (Function 2)
Wilks's lambda	$p < .05$	$p < .001$ (1-3);	$p < .05$ (2-3)
	Age: .40	.48	.01
	Gender: -.51	.01	.30
	Economic situation: -.23	-.23	.003
	Stay period in Japan: .05	.34	.55
	Nationality: -.20	.13	.73
	Japanese language: -.38	-.39	.55
	Study purpose: .25	-.08	-.05
	Likeableness of Japanese students: .01	.01	.05
	Information-gathering by Japanese: .45	.67	-.31
	Cultural Competency: .27	.32	.05
Group Centroids	Going nowhere: .23	Going nowhere: .29	-.01
	Others: -.25	Went to other areas: -.42	-.61
		Temporary return: .01	.07
		Others: -.64	.23
Predicted Group Membership	53.3%	33.3%	

Finally, regarding the international students' difficulty in understanding Japanese information from the university, 61.1% stated "no problem at all," 31.7% said "somewhat difficult" while the remaining 7.2% expressed that "it is always difficult to understand." Then we analyzed the relationship between their understanding of Japanese information and behavior patterns by conducting Chi-square test, but found no significant relationship.

Discussion

There are two main purposes of this study. The first purpose is to investigate how international students in a metropolitan region (Saitama Prefecture) used media to collect relevant information immediately after the Great East Japan Earthquake occurred, and what kind of behavior patterns they preferred, and their relationship. As a result, it was clarified that (a) the students primarily accessed Japan's mass media and various websites to collect relevant information, (b) over 2/5 of them stayed where they were and over half of them went to other places including non-disaster area in Japan, their home countries and other places, and (c) students who had higher capacities of gathering earthquake-related information preferred to stay where they were. From these results, it can be said that the capacities of using Japan's media might help them collect necessary information in order to make appropriate decisions about whether they should stay or go to other places including their home countries.

The second purpose of this study is to clarify how their information-gathering capacities and cultural competency, as well as their demographic factors, related to behavior patterns immediately after the East Great Japan Earthquake occurred. Table 4 shows that their age, gender, economic situation, nationality, study purpose, capacity of using Japanese media, and cultural competency all contributed to their behavior patterns. As international students' capacities of using Japan's media had the largest effects on their preference for staying where they were, followed by their cultural competency and age, it can be said that their decision to stay in Japan or not had been greatly influenced by these three factors. On the other hand, considering that students who had higher Japanese language proficiency preferred to go to other places, while their period of staying Japan had no effects on their behavior patterns, it is suggested that Japanese language proficiency and period of stay in Japan had far fewer influences than their capacities of using media and cultural competency. From these results, it can be said that one of the important ways to support international students when emergencies occur in the future might be to cultivate their capacity of using media and raise their cultural competency including their adaptation and satisfaction in Japan.

Additionally, in this study, we also examined the international students study purpose in Japan and its relationship with cultural competency and behavior patterns in the aftermath of the Great East Japan Earthquake. As a result, we found that the Chinese students not only had more diversity of study purposes in Japan than the other nationalities' students, but also had higher cultural competency compared with other nationalities' students and preferred to stay in Japan after the earthquake. The results of this study are different from those of previous research (eg., Ge, 1999; Oka et al., 1996). One of the reasons would be that this study targeted international students with more diversities, such as nationalities (Chinese, Korean, and others), economic situation (government-supported and privately supported), likeableness of Japanese students and Japanese language proficiency (score from JLPT and percentage from self-evaluation), and so on, while the previous research mainly focuses on privately-supported Chinese students. Considering that there are nearly two decades between the present study's results and that of the reference research, and the fact that Chinese students compose the largest percentage of international students in Japan, it is important to examine international students' study purposes and their cultural competency. Furthermore, as the students' capacities of using Japan's media had great impact on their behavior patterns and the wider the range of usage of different media, such as cell phones, smartphones, PCs and so on, there is a necessity to examine the international students' external and internal factors with the changing times.

Conclusion

In sum, (a) the international students in a metropolitan region (Saitama Prefecture) primarily accessed Japan's mass media and various websites to collect relevant information immediately after the Great East Japan Earthquake occurred, (b) nearly half of the students stayed where they were while over half of them preferred to go to other places including their home countries, (c) compared with other international students, Chinese students had more diverse purposes for studying in Japan and higher cultural competency, which was found to contribute to their behavior patterns after the Great East Japan Earthquake, and (d) their cultural competency in Japan and information-gathering capacities, as well as their demographic factors (age, gender, economic situation, nationality, Japanese language proficiency, etc.), all influenced their behavior patterns in the aftermath of the earthquake. In this respect, it can be suggested that the influence of international students' capacity of using Japan's media, their study purposes in Japan and their cultural competency had an important effect on their

response to emergencies.

Recently, risk management and responding to media have become a key issue when emergencies occur. However, from the viewpoint of a recipient, how best to use media and take advantage of the information becomes another important social issue as there are so many media and it is easy for users to transmit information even if it is incorrect. It is reasonable to imagine that people might believe incorrect information, such as rumors, more easily when an emergency happens (e.g., Sato, 2012; Sasaki, 2011). Therefore, how best to cultivate the user's skill and capacity in media literacy becomes an important issue to be examined further. The authors believe that the present study's results have some implications for future research in related fields.

The present study analyzed international students in a metropolitan region (Saitama Prefecture). However, there is also a necessity to examine and compare with data from international students in other places including disaster-damaged areas. In addition, from the viewpoint of interpersonal relationship's influence on behavior patterns and media usage, it is necessary to examine this in detail. Research for generalizing the findings of this study will also be a meaningful orientation in the future.

Note

1) As "Study purpose" is a nominal variable, we calculated by weighting way as follows: "1" point calculated for each purpose, and then used the total score if the students had multiple choices.

2) As "gender," "nationality" and "economic situation" are all nominal variables, we named "male" and "female" as "1" and "2" for "gender," "Chinese" and "the others" as "1" and "2" for "nationality," and "government-supported" and "privately-supported" as "1" and "2" for "economic situation," respectively.

Acknowledgements

Part of the results had been reported at the 27th Annual Conference of the Japan Society for Educational Technology, at Tokyo Metropolitan University. The authors would like to thank all of the international students who responded to the questionnaire.

References

- Fujiwara, C., & Hachiwaka, S. (2012). Conveying Information to International Students in the Aftermath of the Great East Japan Earthquake: Report on the Use of E-mail. *Bulletin of International Student Center at Ibaraki University*, 10, 29-42.
- Ge W. (1999). A Study of Cross-cultural Adaptation about International Students. *Bulletin of the School of Education, Psychology*, 46, 287-297.
- Japanese Student Services Organization (2012) International Students in Japan 2011. Retrieved June 3, 2013, from http://www.jasso.go.jp/statistics/intl_student/data11_e.html
- Koyanagi, S., Cho, E., Toichi, S., Amano, K., Zhang, H. (2012). On the Learning of Conjugation at the Elementary Level: A proposal for an explanation method from the learners' viewpoint. *Research on Japanese*, 32, 29-44.
- Ogasa, E. (2012). Determining Factors of Continuing Studying in Japan after the Earthquake on 11th March: In Case of Short-term Program Students. *Journal of Academic Japanese*, 4, 43-50.
- Oka, M., Fukada, H., & J, Y.H. (1996). Social Support of Chinese Students Studying in Japan at Private Expense. *Okayama Economic Review*, 27(4), 25-49.
- MEXT-Ministry of Education, Culture, Sports, Science and Technology. (2008). *Wagakuni no ryugakusei seido no gaiyo: Ukeire oyobi haken*. Retrieved June 12, 2013, from http://www.mext.go.jp/a_menu/koutou/ryugaku/081210.pdf
- Ministry of Education, Culture, Sports, Science and Technology (2008). Retrieved June 12, 2013, from <http://www.kantei.go.jp/jp/tyoukanpress/rireki/2008/07/29kossi.pdf>
- Ministry of Internal Affairs and Communications (2012). *Survey on Information and Communications upon Disasters. Chapter 3*. Retrieved June 3, 2013, from <http://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2012/chapter-3.pdf>
- Sato, R. (2012). Regarding the Reliability of Information Transmitted from Social Media. Retrieved June 26, 2013, from <http://www.jc.u-aizu.ac.jp/11/141/thesis/msy2011/09.pdf>
- Sasaki, T. (2011). The Practical Usage of Twitter on the East Great Japan Earthquake and its Future Prospects. Retrieved June 26, 2013, from http://www.yhmf.jp/pdf/activity/adstudies/vol_36_01_04.pdf
- Shigyo A.(2011). The Great East Japan Earthquake: How Net Users Utilized Social Media? The NHK Monthly Report on Broadcast Research, 61 (8), 2-13.
- Yamaguchi, H. (2012). University Staff's Responses to Large-scale Disasters in Japan: Preliminary Discussion from the great East Japan Earthquake's Field Notes. *Other Reports (International Exchange)*, Nagoya University. 1-18.