

A Case Study of Method to Activate and Continue Online Community for Promoting Pro-Environmental Behaviors

KITAMURA Takayoshi^{1,2}, INOUE Kouki^{1,3}, ISHII Hirotake¹ and SHIMODA Hiroshi¹

1. Graduate School of Energy Science, Kyoto University, Yoshida-Honmachi, Sakyo-ku, Kyoto, 606-8501, Japan

2. College of Information Science and Engineering, Ritsumeikan University, Nojihigashi 1-1-1, MinamiKusatsu, Shiga, 525-0058, Japan (ktmr@fc.ritsumei.ac.jp)

3. Present: Chubu Electric Power Co., Inc., Higashishincho 1, Nagoya, 461-8680, Japan

Abstract: The energy consumption in our daily lives has increased rapidly and it has been causing exhaustion of fossil fuel resource and environmental problems. In order to solve these problems, pro-environmental behavior (PEB) in our daily lives is one of the effective solutions. This study has proposed a method to activate and continue the online community for promoting their PEBs based on six principles of social psychology (scarcity, liking, reciprocation, social proof, commitment / consistency and response expectation). A case study based on the proposed method was conducted with 14 participants to validate whether it activates and continues online community and promotes their PEBs.

Keyword: pro-environmental behavior; online community; compliance-gaining strategies

1 Introduction

Communication is one of the effective method to promote pro-environmental behaviors (PEB) [1]. Aoyagi et al. proposed and have been studying online community styles for PEB [2][3]. In Japan, PEB online communities (PEBoc) have been often established as local communities' web site, however, their activities have not been active. One of the reasons is management failure. Unlike quitting smoking or alcohol, PEB gives the merit not to himself / herself but to environment. Therefore, it is considered PEBoc needs special guidelines. The authors proposed the activating methods of PEBoc, using the compliance-gaining strategies which are based on six principles of social psychology. They are scarcity [4], liking [5], reciprocation [6], social proof [7], commitment and consistency [8], and response expectation. In order to examine this method, a case study was conducted where the method was introduced to an inactive online community with 10 participants [9]. As the result, it was found that the messages posted to the community could be kept to be active and a half of participants' PEBs were improved. However, that proposal didn't focus on the long-term continuation of the community.

In this paper, the authors have proposed the method which considers long-term continuation and activator

management, and have evaluated it with another long term case study.

2 Activating model of PEBoc

Fig.1 shows the model for revitalizing PEBoc and promoting PEB using compliance-gaining strategies advocated by R.B. CIALDINI [10].

2.1 Promote posting and viewing to BBS

For promotion of posting, the following four principles have been applied;

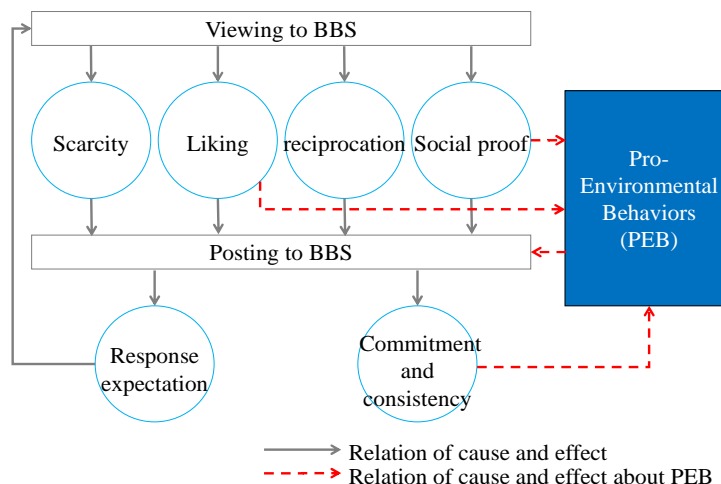


Fig.1 A model for revitalizing PEBoc and promoting PEB.

- Scarcity ^[4]: Time limited events to promote their behavior.
- Liking ^[5]: Someone's favorite person makes him/her want to communicate with the person.
- Reciprocation ^[6]: People want to reply if they get a good comment.
- Social proof ^[7]: If the BBS are thronged with many people's posting, the situation makes him/her to promote his/her posting.

For promotion of viewing BBS, the response expectation can be considered as follows;

- Response expectation: Although this principle is not included in the compliance-gaining strategies advocated by R.B. CIALDINI ^[10], posting actions to BBS would make him/her want to check others' responses later.

2.2 Promotion of PEB

For promotion of PEB, the following three principles have been applied;

- Liking: Someone's favorite person's PEB posting makes him/her want to do similar PEB and give a comment about it.
- Social proof: If someone recognizes that most people are doing the PEB at the BBS community, he/she would feel a need of doing the PEB.
- Commitment and consistency ^[8]: If someone once declares doing the PEB, he/she feels he/she has to do it.

2.3 A case study in 2012

In a case study conducted in 2012 ^[9], the authors proposed three mechanisms along with the proposed method as follows;

2.3.1 Use of digital photo frame (DPF)

Most kind of PEBs can be done in their residences, and digital photo frame ^[10] (DPF) can be sometimes seen in their living rooms. DPF connected to the Internet is employed in this method to inform the arrival of new posts at BBS. It is supposed that it activates the principles of scarcity, liking, reciprocation and social proof.

2.3.2 Holding a time limited event

In order to realize the principle of scarcity, the authors proposed the event which was held within a limited time. BBS members can add other photos in their DPFs, when they commit the PEB event. In this PEB event, they have to declare to do PEBs in the near future. This event is considered to be realized on the principle of commitment and consistency.

2.3.3 Employment of activators

In this study, activator means a mood maker of online community. They are some of the online community's members and they collaborate with management side. For the community management, the authors have proposed to ask to play the role of activators from community members. Because introduction of the activator can easily realize the principle of social proof. Three or more activators are chosen from the members of the community.

A case study was conducted in 2012 where the above method was introduced to a low-toned PEBoc with ten members for hour weeks. As the result, it was found that the messages posted to the community increased and a half of members' PEBs were significantly improved. However, in this case study, the proposed method has been focused on the activation of the community, therefore there still remained the issue of the management of activators for the long term operation.

3 Methods for activating and continuing PEBoc

The authors have been proposed three methods as follows for activating and continuing PEBoc from the result of the case study in 2012. These have been mainly made for the management of activators.

3.1 Providing topics for activators

This method provides hints of posting messages to be posted to the activators, because it is difficult and troublesome to keep finding the topics to BBS.

3.2 Alternation of activators' role

The activators' roles periodically take turn with other active community members, because the activators are volunteers, and their positive attitude for posting BBS might decrease by their long term roles. In order to keep their motivation, the role has to be taken turn periodically among the community members.

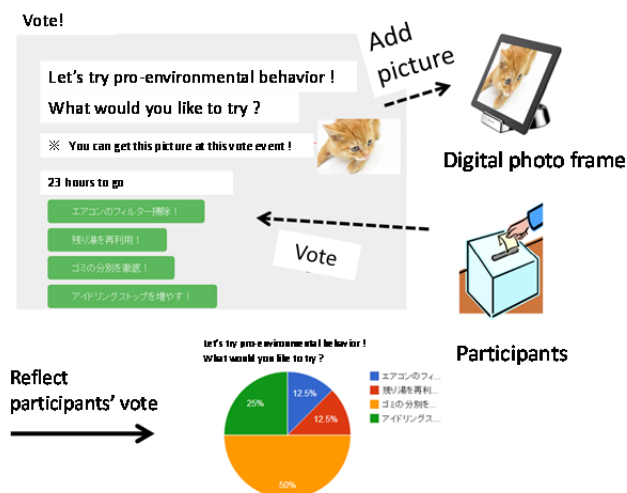


Fig.2 Overview of the voting event.

3.3 Voting event

Fig.2 shows the overview of voting event. The PEBoc BBS members can join a new event using the DPF. When they join this event, another picture is added to their DPFs. In order to utilize the principle of commitment and consistency, the contents of the voting are related to PEB. And this event has a time limitation (about 24 - 36 hours, once a week) in order to realize the principle of scarcity. The voting event provides the topic of BBS and members concern of PEB.

4 Case Study

4.1 Purpose

A case study was conducted in order to evaluate the effectiveness of the proposed method for activating and continuing PEBoc.

4.2 Method

4.2.1 Period

The period of this case study was 156 days from 26 February 2014 to 31 July 2014. Fig.3 shows the overview of the flow.

4.2.1 Participants

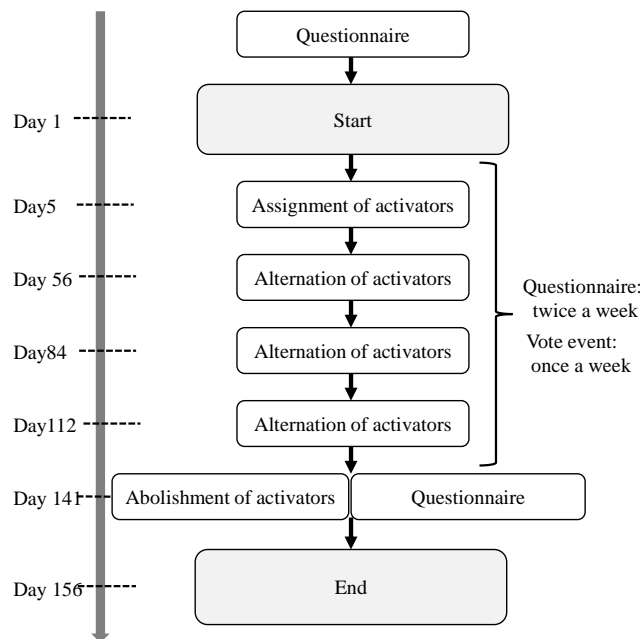


Fig.3 Flow of case study.

Table 1 Attribute of the Participant

Participant	Age	Gender	Residence
P1	39	Female	Kyoto, Japan
P2	39	Female	Kyoto, Japan
P3	37	Female	Kyoto, Japan
P4	47	Female	Kyoto, Japan
P5	46	Female	Kyoto, Japan
P6	46	Female	Shiga, Japan
P7	33	Female	Kyoto, Japan
P8	44	Female	Kyoto, Japan
P9	40	Female	Kyoto, Japan
P10	38	Female	Shiga, Japan
P11	49	Female	Shiga, Japan
P12	34	Female	Shiga, Japan
P13	40	Female	Shiga, Japan
P14	48	Female	Kyoto, Japan

Fourteen participants joined the case study. Table 1 shows their basic attributes. The conditions for participation were as follows;

- Having the interest of PEB or PEBoc.
- Their ages are in their thirties and forties.
- Residence area is Kyoto or Shiga (these are close and have similar climate in Kansai, Japan).

4.2.2 BBS and DPF

Fig.4 shows an example of BBS utilized in the case study. Not only text messages but also images can be posted to this BBS. On the top of BBS, trend words appear, which express participants' common interest and information of voting events. Fig.5 shows

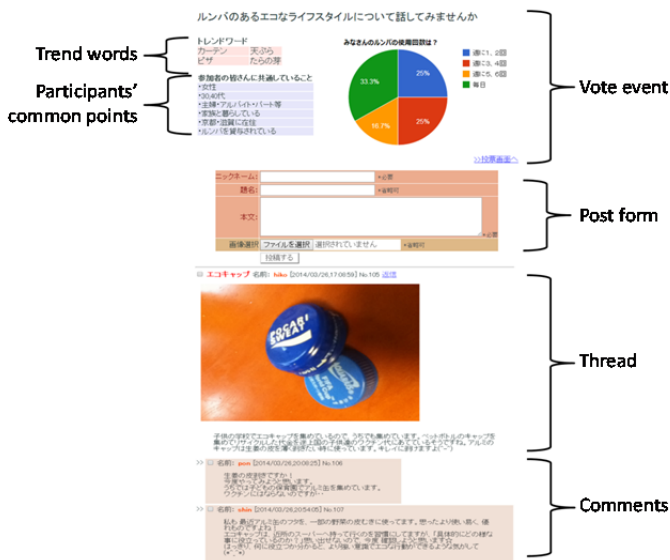


Fig.4 An example of BBS

activators of P2, P8 and P11 were not active participants. The first and the last several days of Day1-4 and Day 126-156 had no activators. The request method of playing the role of activator to the participants was by e-mail and telephone. The contents of instruction were as follows;

- Post new eco topic twice or three times a week. (The topic with image, if possible).
- Hints of the topics to be posted will be provided.
- If you find the thread about eco-life, reply it with a friendly and sympathy comment.
- This role is not your duty. The number of posting is just a target.
- This mail sends four participants include you.
- Keep secret that you are one of the activators.

Table 2 Alternation dates of activators

Change dates	Activators
Day 1-4	-----
Day 5-55	P4, P5, P6, P10
Day 56-84	P1, P9, P12, P14
Day 84-111	P3, P6, P7, P13
Day 112-140	P2, P8, P10, P11
Day 141-156	-----

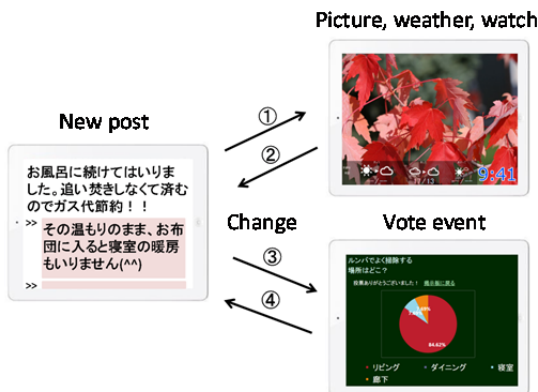


Fig.5 Transaction of DPF display.

transaction of the DPF display. The participants' DPF alternatively shows (1) new message posted to the BBS, (2) picture with current time and weather forecast, and (3) information of voting event or the result. In this study, iPad2 was employed as DPF to realize the above functions.

4.2.3 Activators

The number of activators was four persons at a time. In order to evaluate the condition to assign the activator role to the participants, their activity conditions were changed. Table 2 shows the alternation dates of activators. The condition of day 5-55 activators was active participants. The condition of day 56-84 and day 84-111 activators was active participants at that time and that they were not activators in the last Day periods. And day 112-125

4.3 Results

4.3.1 BBS activation and continuity

Fig.6 and Fig.7 shows the view count of BBS. It was found that they kept accessing BBS to the end of case study. The view count of the first several days was high, and it got lower immediately. They often accessed BBS because of their curiosity at the first several days, however it was not kept because of quick decrease of posted messages.

Fig.8 and Fig.9 shows the post counts of BBS. It was found that posting behavior had been continued to the end of the case study. However, the post count per week around Day 32 to 53, Day 74 to 81 and Day 95 to 102 decreased. Considering with the alternation dates of activators, these periods were about three weeks after when they started to play the role of activators. The result shows they got tired for the role.

After beginning of the activator alternation, the view and post count of BBS per week increased.

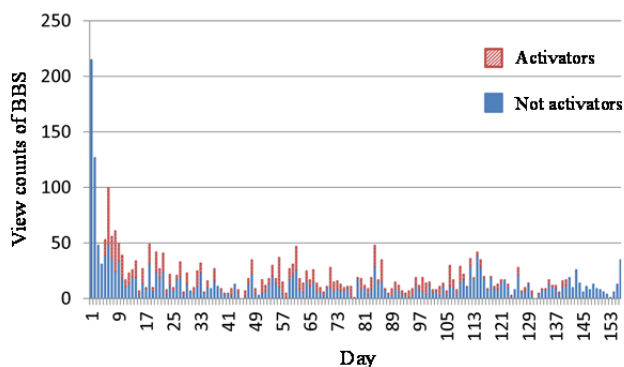


Fig.6 View counts of BBS per day.

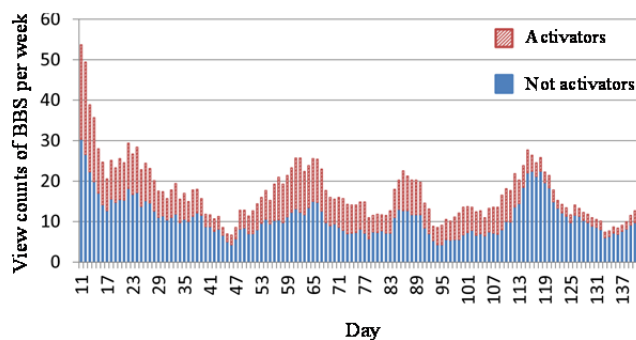


Fig.7 View counts of BBS per week.

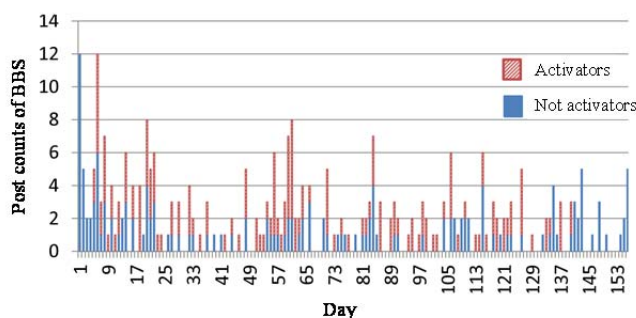


Fig.8 Post counts of BBS per day.

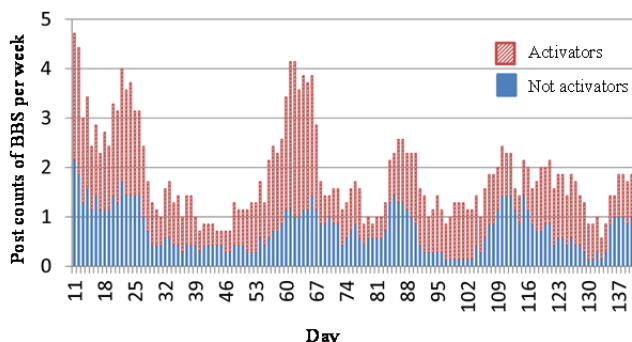


Fig.9 Post counts of BBS per week.

Therefore, it is supposed that the proposed method of activator alternation worked well for activating and continuing PEBoc.

4.3.2 Workload of activators

In this case study, all participants played the role of activators alternatively, therefore questionnaire survey was conducted for all the participants about the role of activator. Fig.10 shows the result. As the result, it was found that introduction of the activator was effective to continue the community in total. And the average of all participants' answer of question "How long would you like to continue the role of activator positively?" was about 12 days. Two week alternation of activator role was appropriate term to reduce their workload.

4.3.3 Voting event

Fig.11 shows the average results of all participants' answers about the voting event. It was found that it was easy for them to join the event. Although it was not clear that this event gave them a hint of their BBS posting, it gave some of them a hint of what participants were interested in.

4.3.4 PEB promotion

Fig.12 shows the change of their pro-environmental behaviors. They are calculated from the answers of all the participants for the typical 12 PEBs as follows at each period.

- You turn off the air-conditioner if you are absent from the room for more than 15 minutes.
- To save the consumption of electric power, your family try to gather in one room.
- You clean the filter of air-conditioner about once every two weeks.
- You turn off the power of PC and TV when you don't use.
- You try to tidy up the refrigerator when you put foods in it.
- You don't put hot food in the refrigerator.
- You don't leave the tap water running.
- Your family take bath in succession
- You reuse the water that has been used to wash rice for cleaning, pouring water on the flowers and so on.
- You bring your shopping bag. (You don't get a plastic bag from the shop).
- You reuse your old cloth to dust cloth.
- When you throw a kitchen garbage, away you try to drain the water.

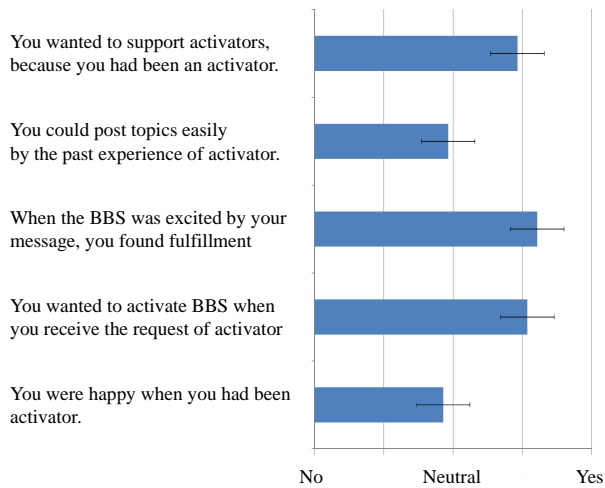


Fig.10 Results of questionnaire about activators.

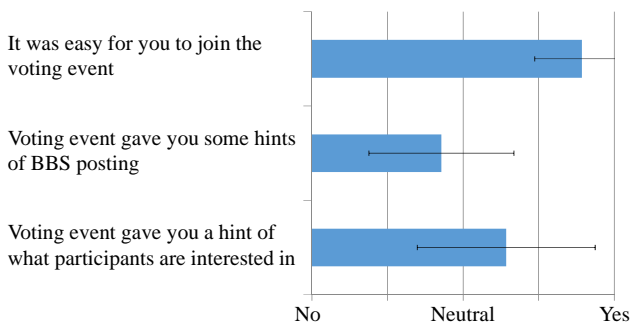


Fig.11 Results of questionnaire about voting event.

In all answers with visual analog scale, “7” means “most of time” while “1” means “never”. The result of t-test, the average of fourteen participants’ PEBs after the case study was significantly higher than that before ($p < .001$). Therefore, it is supposed that this

community promoted their PEBs in this case study.

4.4 Discussion

In this case study, the result of PEBoc management was successful, because they had kept accessing the BBS and posting messages for about 150 days until the end of the case study period. Furthermore, the participants’ PEB after the case study period had been promoted comparing with those before. However, the methods of activator management and voting event need to be improved by repeating more case studies. This study set alternation period as four weeks and it was decided by the result of Day 5 to 55. The role period of four weeks might be too long because the number of message posting decreased at the end of the period. The result of questionnaire shows that they thought the suitable period of the activator role was about two weeks, so that they felt the four week alternation was too long. However it was supposed the workload makes “want to support activators” after the periods of their role of activators.

One of the purposes of voting event is to provide a topic and share the members’ concern. On the other hand, it was hard to give a hint of posting BBS. Because of that, it is supposed that the former didn’t have less to do with the latter. Therefore, voting event and system need further consideration.

5 Conclusion

This study has proposed a method to activate and

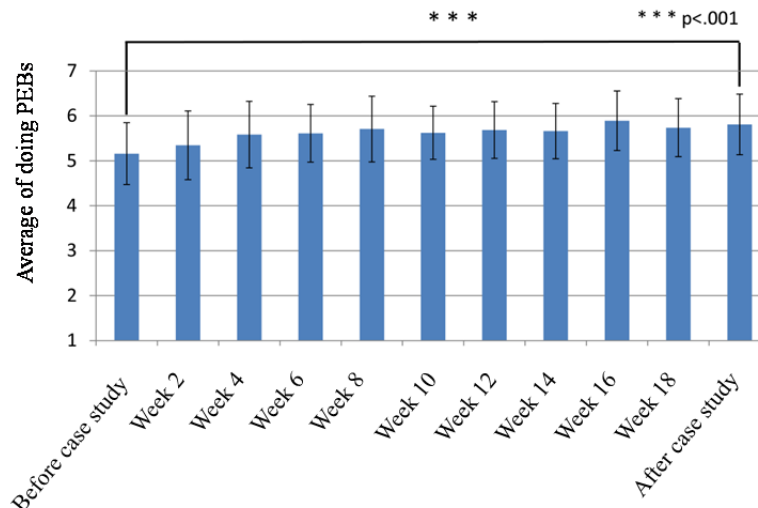


Fig.12 Change of participants' PEBs.

continue the online community for promoting PEB based on six principles of social psychology (scarcity, linking, reciprocation, social proof, commitment and consistency and response expectation). In this study, the activator management and the voting event have been focused because they are found to be important for long term operation of the online community from the result of case study in 2012.

The method of activator management is to give a role of activator to active members of the community. The role is taken turn to other members after a certain time period.

A case study based on the proposed method was conducted with fourteen participants to validate whether it activates and continues online community and promotes their PEBs. The result of case study succeeded PEB promotion and keeping the number of viewing and posting BBS.

However, there remains the issue of activators management for their alternation period. In this case study, the period of activators were four weeks (Day 55-), though the result of questionnaire shows suitable period of activators' role was two weeks, Therefore, this four weeks periods was supposed too long. Nevertheless there is a possibility that the heavy workload for long term activator role promoted their intention to support other activators after their experience of the role. And about the voting event, the result of questionnaire showed it supported to share the participants' concerns, though it was hard to provide a topic for posting BBS.

References

- [1] CHRISTIAN A. KLÖKNER: *The Psychology of Pro-Environmental Communication Beyond Standard Information Strategies*, Palgrave MacMillan, 2015.
- [2] SAIZO AOYAGI, OKI FUJIWARA, HIROTAKE ISHII, HIROSHI SHIMODA: *Proposal and Evaluation of Online Community Which Are Modeled on School Club Activities for Promoting Pro-Environmental Behavior*, First International Symposium on Socially and Technically Symbiotic Systems, 2012:27-1 – 27-7.
- [3] SAIZO AOYAGI, TOMOAKI OKAMURA, HIROTAKE ISHII, HIROSHI SHIMODA: *Proposal of a Method for Promotion of Continuous Pro-Environmental Behavior with Easy Communication*, 14th International Conference on Human-Computer Interaction (HCII2011), 2011:No.LNCS 6763.
- [4] LYNN, M.: *Scarcity effects on desirability: Mediated by assumed expensiveness?*, *Journal of Economic Psychology*, 1988, 10(2):257-274.
- [5] DRACHMAN, D., CARUFEL, A., INSKO, C.: *The extra credit effect in interpersonal attraction*, *Journal of Experimental Social Psychology*, 1978, 14(5): 458-465.
- [6] GOULDNER, A.: *The norm of reciprocity: A preliminary statement*, *American Sociological Review*, 1960, 25(2): 161-178.
- [7] FESTINGER, L.: *A theory of social comparison processes*, *Human Relations*, 1954, 7(2): 117-140.
- [8] TESSER, A., CAMPBELL, J., MICKLER, S.: *The role of social pressure, attention to the stimulus, and self-doubt in conformity*, *European Journal of Social Psychology*, 1983, 13: 217-233.
- [9] TAKAYOSHI KITAMURA, KOUKI INOUE, MATSUDA TAKUJI, HIROTAKE ISHII, HIROSHI SHIMODA: *A Method Using Compliance-gaining Strategies for Revitalizing Online Community*, HI symposium 2013: 41-48.
- [10] ROBERT B. CIALDINI: *Influence: Science and Practice* (5th Edition), Allyn and Bacon, 2008.
- [11] *Digital Photo Frames | Digital Picture Frames | S-Frame | Sony*: <http://www.sony.co.uk/hub/digital-photo-frames>, (last accessed 28-June-2015).

No Text