

Design of Ecobag to Reuse Cartons of Milk

Activity to reduce CO₂ at Local Shopping Street

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Abstract: Shopping bag (Ecobag) was designed which is reused of cartons of milk that is wasted in school lunch. The purpose of this study is to increase children's eco mind, to reduce plastic bags and to activate local shopping street through activity using Ecobag. By conducting this activity, the following results were obtained: 1) 958 of plastic bags were reduced during 36 days and it can convert to 206.9 kg of CO₂, 2) About Ecobag, design was satisfied by many of users but size and strength have a little problem, 3) By this activity an eco mind of almost children increased, 4) Questionnaire research was conducted after an activity, it is concluded that this activity program was accepted.

Key words: *Ecobag, Carton of milk, Environmental education, Reduce CO₂, Local shopping street,*

1. Introduction

At year 2007, IPCC (Intergovernmental Panel on Climate Change) have reported that "The probability which the cause of the global warming is artificial greenhouse gas is over 90%". Especially IPCC Fourth Assessment Report estimates the most influential material is CO₂ in artificial greenhouse gas. For that reason, "Kyoto Protocol" obliges Japan reduce 6% of CO₂ as compared with 1990^[1], and there are a lot of activities for reducing CO₂ in Japan. In some activities, there are reducing plastic bags when we use a returnable / reuse bag if we go to shopping. To reduce them, we can reduce CO₂. But almost of returnable bags are made from oil, and are imported from foreign countries (it needs energy).

The other hand, all of elementary schools in Sendai, milk is given in a lunchtime. Then a few of wasted cartons of milk (fig.1) are reused to toilet papers, but many of them become scrap. 55,000 cartons of milk are used every day at 127 Elementary Schools in Sendai (May 1, 2008).

From these backgrounds, the first purpose is to design a shopping bag (Ecobag) using cartons of milk (fig.2) as a local unused material with Kita-Rokubancho Elementary School. The second purpose is to use a n Ecobags for reducing plastic bags (CO₂) with Miyamachi Local shopping Street Organization. Through this activity, conducting an environmental education for children and activation of Miyamachi Local shopping Street are also one of purpose.

2. Method of study

This study was conducted as follows.

- 1) Lecture for children (47 numbers of 12 years old) - October 23,
- 2) Making Ecobags (fig.3) – October 23-28,
- 3) Shopping event (fig.4) by all children – December 4 and 18, (shopping activity by themselves were conducted from December 4 until January 8),
- 4) Ruffling event (fig.5) – January 9,
- 5) Questionnaire research for Children, parents and shop owners – January 13-23.

Design of Ecobag

This project has been conducted from year 2007 and final design (fig.2) was decided among some trial pieces. It consists from 3 parts of cartons of milk. In response to change numbers of 3 parts, shape and size can be changed. Woolen yarn to joint parts and handles were reused of unused material from their home. By a strength test an Ecobag can keep up to 3kg weight.

Ecoin as an Eco point

“Ecoin” which shape is circle was made of carton of milk (fig. 6). Diameter is 3.6cm and it has a small hole for hanging on a grip of an Ecobag. “Ecoin” means “Eco” and “Coin”, also included “CO₂”. Ecoin was given one every shopping. When 3 Ecoins will be collected, a ruffling will be drawn once. Ecoins were set 1500 on 23 shops.

Evaluation by Questionnaire Research

Questionnaire research was sent out to children, parents and shop owners after activity as follows;

For children:

- Q1 Could you enjoy to make an Ecobag?
- Q2 How did you feel your Ecobag when you use it (about size, beauty and strength)?
- Q3 How many Ecoin did you collect?

For parents:

- Q1 How many times did you use an Ecobag which was made by your child?
- Q2 After your child made an Ecobag, did shopping count increase on Miyamachi shopping street?
- Q3 How did you feel an Ecobag which was made by your child? (about size, design and strength)?
- Q4 Through this learning program, did your child's awareness for environment improve?

For shop owners:

- Q1 How did you feel an Ecoin (about labor, easy /not easy to handle and design)?
- Q2 Would you like to show an Ecobag made by children to others?
- Q3 Would you help this activity if it will be continued?

For children 47 questionnaire sheets were sent and 44 were collected. For parents 47 questionnaire sheets were sent and 33 were collected. For shop owners 23 questionnaire sheets were sent and 19 were collected.



Fig.1 Carton of Milk



Fig.2 Ecobag



Fig.3 Making Ecobag



Fig.4 Shopping



Fig.5 Ruffling



Fig.6 Ecoin

3. Results and Discussion

3.1 Reduce of CO₂

During 36 days (Dec 8 – Jan 8) activity Ecobags were used 958 times (689 times by children and 269 times by parents). Produced volume of CO₂ when 1 kg of plastic bag is made is 1,512g [2]. As the average weight of popular plastic bag is about 7g [3], produced volume of CO₂ is 216g per one plastic bag. Thus totally the Reduce volume of CO₂ is 206.9kg.

3.2 Evaluation of Ecobag

1) SIZE: A result of “SIZE” was shown as fig.7. By number of piece, children can make many kinds of Ecobags. From results, the sum of answers of “very good” and “good” is 79.6%, and the answer “even” is 20.5%. The other hand, answers from parents are stricter than their children’s one. The sum of answers of “very good” and “good” is 63.6%, and 16 points was lower compared to children’s one. To the contrary the answer of “even” increase 12.9 points. It is guess that Children’s goods (candy, snack, stationary etc) for shopping may be smaller than parent’s one. Negative answers are very few.

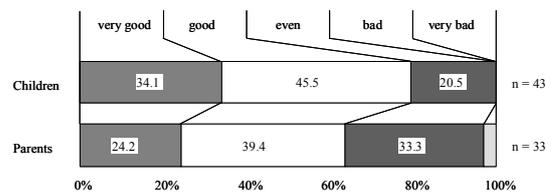


Fig.7 answer of “SIZE” of an Ecobag

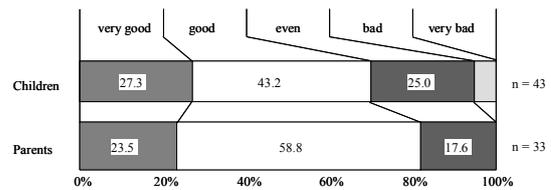


Fig.8 answer of “DESIGN” of an Ecobag

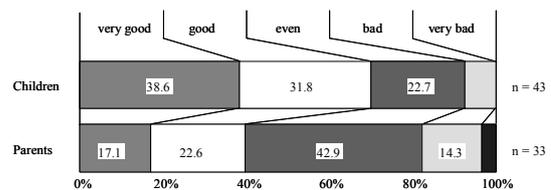


Fig.9 answer of “STRENGTH” of an Ecobag

2) Design: A result of “DESIGN” was shown as fig.8. From results, the sum of answers of “very good” and “good” is 70.5%. The other hands, answers from parents are better than their children’s one. The sum of answers of “very good” and “good” is 82.3%, and 11.8 points was higher compared to children’s one. Parents evaluate children’s works better. The sum of answers of “bad” and “very bad” is very few. As a result it guesses that there is no so many problems about designing.

3) STRENGTH: A result of “STRENGTH” was shown as fig.9. From results, the sum of answers from children of “very good” and “good” is 70.4%, but from parents’ one is 39.7%. Parents’ answer is 30.7 points lower than children’s one. The other hand, about the sum of answers of “bad” and “very bad”, children’s answer is 6.8% but parents’ one is 17.2%. Parents’ answer is 10.4 points higher than children’s one. It is shown that parent do not satisfy more than children. It guesses that makers were children, but users were parents, as the same reason of the question “SIZE”.

3.3 Eco mind of Children

Through this activity Eco mind of children may increase or not was checked by questionnaire research. It is shown of answer from parents as fig.10. As a result the sum of answer of “Yes” and “so so yes” is 94.3%. The other hand the sum of answer of “decline” and “very decline” is 0.0%. It is cleared that this activity made children’s Eco mind progress.

3.4 Activity program

Answer of “Enjoyment of making Ecobag” from children is shown as fig.11. As a result the sum of answer of “yes” and “so so yes” is 88.6%, and a negative answer is 0.0%. It was very hard because it took 4 days to make Eco bag, but it guess they make it with fun.

Next, answer of “number of shopping at Miyamachi shopping street” from parents is shown as fig.12. As a result the sum of answer of “yes” and “so so yes” is 73.5%, and an answer of “even” is 26.5%. It may be a kind of chance to go to shopping street for also parents.

Next, answer of “supports for next activity” from shop owners is shown as fig.13. As a result the sum of answer of “yes” and “so so yes” is 94.8%. It is cleared that almost shop owners may support this activity. Judging from these results, this activity may be accepted from many of stakeholders.

3.5 Exterior evaluation for this activity

This activity was competed in the biggest environmental contest in Miyagi Prefecture in 2008. As a result this activity was awarded the first prize^[4]. After this competition we were selected to the delegate of Miyagi Prefecture, and were awarded the special judge prize in the national convention at 2009.

4. Conclusions

In conclusion, we would like to state the following four points. 1) 206.9kg of CO₂ could reduce in this activity during 36 days. 2) About Ecobag “Design” is satisfied but “Size” and “Strength” have a few problems. 3) In this activity, 94.3% of parents judged their children’s Eco mind progresses. 4) This activity program was accepted from children, parents and shop owners.

Acknowledgement

We would like to express our thanks to children, their parents, teachers of Kita-Rokubancho Elementary School and Miyamachi shopping street organization.

References,

- [1] Kyoto Protocol to the United Nations Framework Convention on Climate Change, <http://www.ipcc.ch>
- [2] Plastic Waste Management Institute, <http://www.pwmi.or.jp>
- [4] Eco de Smile Contest, http://www.melon.or.jp/melon/contents/Global_Warming/eco/index.htm

Note,

- [3] We measured 50 plastic bags as examples. As a result the average weight was 7.0g per one plastic bag.

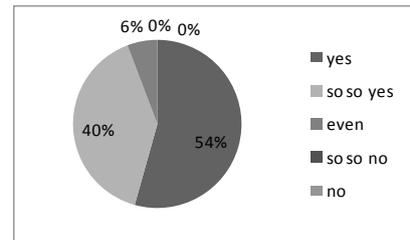


Fig.10 Did your child’s awareness for environment improve?

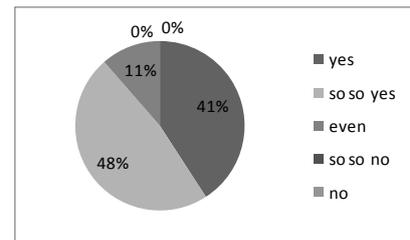


Fig.11 Could you enjoy to make an Ecobag?

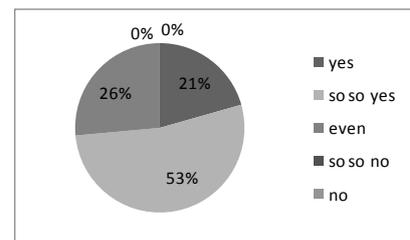


Fig.12 Did shopping count increase on Miyamachi shopping street?

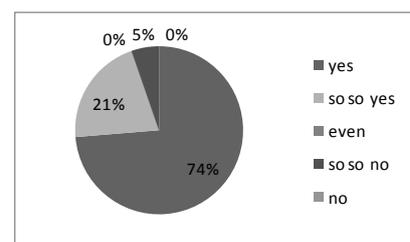


Fig.13 Would you help this activity if it will be continued?