

# KNOWLEDGE TRANSMISSION ON RECYCLE WASTE BANK WITH AN ACTIVE LEARNING PROCESS

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## ABSTRACT

Waste and human living now become inseparable. The problem of city waste flood was found to stem partly from the lack of public involvement. This is because waste management varies from area to area in terms of types of activities and policies, and other limitations to urge for serious and constant actions to be taken. In addition, the lack of consciousness in proper waste disposal has caused serious environmental problem in the society. The current research was aimed to transfer the knowledge and measure the satisfaction of participants in the transfer of knowledge on recycle waste bank by using an active learning process. A sample of 40 participants, selected by a simple random sampling, included 10 teachers and 30 students of Wat Doadong School, Samut Songkram province, Thailand. The transfer of knowledge on recycle waste bank with an active learning process involves 4 stages: 1) Educating on waste separation through playing games; 2) Educating on recycle waste bank through group process of knowledge bases rotation including such as working group setup base, bank members base, recycle waste deposit base, recycle waste bank accounting base; 3) Brainstorming to develop recycle waste management project; and 4) Presenting results, discussion and conclusion. Research procedure began with asking participants to complete a pretest and participate in the knowledge transfer activities on recycle waste bank. At the completion of the 4 stages, participants were again asked to complete a posttest and a satisfaction scale. Results suggested participants' learning achievement on recycle waste bank knowledge was higher at posttest than pretest at .05 level of significance, and highest level of satisfaction ( $\bar{X} = 4.58$ , S.D. = 0.74).

**Keyword:** Knowledge Transfer, Recycle Waste Bank, Active Learning

## INTRODUCTION

Given the current age of growing materialism, production process seeks to draw consumers with attractive colorful packaging. Most people prefer consuming products in beautiful packaging and good looking and as a result the amount of waste accumulates. Larger amounts of waste from packaging are papers, plastics, and metals which can be reused or processed to produce monetary value as well as to reduce the use of natural resources.

The intensity of waste problem continues to grow day by day due to increasing number of population. It is partly because people focus on the look and convenience when they buy things for consuming, coupled with the consumption value that disposal in single use is preferable. Some materials might be usable but mixed with waste. It is difficult to find suitable ways to manage such waste and even more difficult when they pile up and cannot be managed in time. Waste is refuse from human activities generally includes those non-hazardous such as papers, clothes, plastics, food scrap and those hazardous such as germs, foams, rubbers, broken glasses, colors, cleansing agents, chemicals that are harmful to health. As a community grows to become a city, the number of population will increase along with the growth of economy and new technologies, resulting in an increase of production and consumption. As a consequence, the amount of household waste and city solid waste will rise by

increased number of population and their activities. The problem of waste management is that the total volume of country wide municipal solid waste is around 3,420 ton/day while 2,667 ton/day or 88 % of them can actually be disposed with residual waste about 753 ton/day or 22 %. If waste management in this way continues, the amount of waste in communities around the country would reach approximately 7,370 ton/day and with residual waste around 1,620 ton/day. It was found that waste management in some communities was not that hygienic. Sanitary waste management system is in place in many communities however inefficient operation was the problem, and residual waste remained there at the management site. Urban communities in each city, for example, are capable of disposing certain amount of waste only during particular time. Huge pile of residual waste left outdoor have caused environmental problems, spoiled the landscape, produced undesirable odor, and even worse became germs breeding ground. These all can pose health effect on both the people involved in waste management and general public. Waste management will be more difficult in the future if local authorities failed to operate properly and effectively on waste management. Different waste management approaches exist, each however has its limitation in terms of environmental concerns especially with air and water since it usually needs a piece of land in the neighborhood to manage it. It can be seen that just a small amount of human-produced waste can cause many other problematic impacts. One way to reduce such problems is to minimize the volume of waste to be managed possibly by means of raising awareness among public and encouraging them to cooperate in waste separation. Management of waste problem currently practiced involves managing usable waste for direct use (Reuse) or processing (Recycle) for other uses, and some are processed as compost. [1]

Organizations today are competing for their success. Part of their success certainly comes from quality development of staffs. In doing so, a knowledge transfer process is a key to facilitate knowledge development of staffs. [2] Knowledge is accumulated from investigation, learning, proficiency, experience, and values that provide a framework for incorporating information with individual environment so that it can be utilized however in a way varied by individuals. [3] The hierarchy of knowledge as defined by Yamazaki [4] was depicted in the form of pyramid consisting (1) Data as facts, raw data, without interpretation; (2) Information as analyzed, synthesized data ready to use for management and decision making, incorporating context of belief, common sense or experience of information users, and in the form of measurable and tangible data, however with limitation of scope and time of use; (3) Knowledge as information through thinking process, comparing and connecting to experience to enable understanding of certain matter and usability in different situations without time limitation; and (4) Wisdom as knowledge within an individual that is usable. Knowledge is of 2 types: 1) Tacit Knowledge as a kind of knowledge within an individual originated from learning experience, belief and attitude which is difficult to transfer in written form, however, can be developed and shared with others; and 2) Explicit Knowledge as a kind of knowledge that can be transferred explicitly and logically, and can be stored and conveyed in any kind of medium such as books, reports, manuals for easy access and fast application.[5] The transfer of knowledge on recycle waste separation will help reduce the amount of waste that might impact the environment, by means of recycling and reuse, and even processing for other uses. It is important to promote teachers, students, all school staffs, and the locals to see the value of recycling and processing waste to make use of waste residues. Just like depositing money to general banks, setting up recycle waste bank is one way to facilitate systematic waste separation by depositing separated waste to waste bank from which these waste will be bought later by recycle waste collecting shops. Waste bank can also serve as an active part of local waste management system in which positive attitude are promoted among people to participate in setting up recycle waste bank in schools and communities. [6]

In the light of waste management problem, it is thus the author's focus to conduct this research on the transfer of knowledge on recycle waste bank in an attempt to provide knowledge and understanding on waste

management and how to operate recycle waste bank with the hope of raising consciousness among people to practice waste separation as an indirect way to sustainably reduce or remove waste.

### MATERIALS AND METHODS

In this research, a sample of 40 teachers and students of Wat Daodong School was included, and the following procedure was undertaken.

1. Examine relevant documents, texts, and research.
2. Construct research instruments including a learning achievement test (Pretest and Posttest) and a satisfaction scale.
3. Design a process of knowledge transfer activities on recycle waste bank using an active learning process in the 4 stages below.
  - 3.1 Educating on waste separation through playing games;
  - 3.2 Educating on recycle waste bank through group process of knowledge bases rotation including such as working group setup base, bank members base, recycle waste deposit base, recycle waste bank accounting base;
  - 3.3 Brainstorming to develop recycle waste management project; and
  - 3.4 Presenting results, discussion and conclusion
4. Collect data began with asking participants to complete a pretest and participate in knowledge transfer activities on recycle waste bank and at the completion of the 4 stages, participants were asked to complete a posttest and a satisfaction scale.
5. Analyze the data, draw conclusions, discuss the results, and disseminate the results.

### RESULTS AND DISCUSSION

Table 1 shows the result that the sample demonstrated their learning achievement on recycle waste bank knowledge at posttest than at pretest at a significance level of .05.

**Table 1. Comparison of learning achievement at pretest and posttest through the knowledge transfer on recycle waste bank using an active earning process**

	Number of Learners (n)	Mean Score ( $\bar{X}$ )	Standard Deviation (S.D.)	t-test
Pretest Score	40	11.05	1.60	16.77*
Posttest Score	40	17.13	3.01	

\*Significance level .05

In Table 1, learners performed higher learning achievement at posttest than pretest at a significance level of .05. This can be explained by the value of t-test computed by SPSS program that was higher than that obtained from T-Distribution Table at  $\alpha = .05$ ,  $df = 40-1$  for One-tailed, and  $t = 1.6991$ , suggesting that learning through knowledge transfer on recycle waste bank using an active learning process was effective in promoting learners' learning and increased knowledge.

In addition, the sample reported a highest level of satisfaction ( $\bar{X} = 4.58$ , S.D. = 0.74) toward the knowledge transfer on recycle waste bank through an active learning process. This may be attributable to the

design of this activity that offers fun from playing games, and group activity that allowed for their hands-on practice, shared creativity, and group work presentation. In this way, learners were constantly alert and eager in doing activities. This also aligns with the principles of active learning process that applies a range of teaching and learning methods and techniques to design lesson plans and activities that encourage learners' participation in class as well as learner-learner and learner-teacher interactions. Active learning process is thus a type of instruction management to equip learners with desirable traits to deal with changes in the current age. [7] Yananda Siraphatthada [8] in a research on the learning behavioral and effectiveness development of students in principles of marketing study by the active learning teaching, indicated that learner-focused active learning plan was effective in improving learning behavior and learning achievement of students majoring marketing. Such active learning approach can improve students' knowledge and understanding with a statistically significant difference of .05. Students expressed a highest level of satisfaction ( $\bar{X} = 4.58$ , S.D. = 0.74) on the knowledge transfer. This is possibly because the knowledge transfer process took a variety of activities that focus on practicing, brainstorming, shared learning that allows learners to acquire knowledge and learn with enjoyment.

### CONCLUSION

Recycle waste bank not only helps reducing the amount of community solid waste but also serves as an important learning source for children and the locals. One among the participating adults in this recycle waste bank project responded to the interview that "The waste bank not only helps community people to learn about the value of waste that it can be exchanged for money but it makes children learn to save up as well." Another adult who assisted in overseeing waste bank revealed that "We focus children on separating household waste and those waste on their way from school but never searching into any rubbish bins as they can be infected and it is against the principles of recycle waste bank." It can be observed that the operation of recycle waste bank had brought about a true new form of learning since it offered children opportunities to think by themselves, become ownership, and learn together in many ways. Children learned about how the recycle waste bank operates, savings, separating and recycling waste, working together in group, including how to run small business by themselves.

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### REFERENCES

- [1] Department of Pollution Control. (2017). *Waste Bank, the Contingency of Economic Crisis*. Retrieved on January 1, 2018. From [http://www.pcd.go.th/info\\_serv/pol\\_suc\\_wastebank.html](http://www.pcd.go.th/info_serv/pol_suc_wastebank.html).
- [2] Sakchai Tangprasert and Nalinpat Porrawatpreyakorn. (2014). Knowledge Transfer in the Context of Information Systems Integration: A Systematic Literature Review. *Information Technology Journal*. 10(2), 70-84.
- [3] Davenport, T. H. & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Massachusetts: Harvard Business School Press.
- [4] Yamazaki, H. (1999). *Measurement Analysis Knowledge Management*. Tokyo: The Yama Group.

- [5] Nonaka, I. & Toyama, R. (2003). The Knowledge-Creating Theory Revisited: Knowledge Creation As a Synthesizing Process. *Journal of Knowledge Management Research & Practice*, 1, 2-10.
- [6] Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment. (2017). *A Guide to Recycle Waste Bank*. (7<sup>th</sup> Ed.). Bangkok: Department of Environmental Quality Promotion.
- [7] Faculty of Mass Communication Technology Rajamangala University of Technology Thanyaburi. (2017). *Active Learning KM*. Retrieved on January 1, 2018. From <http://www.mct.rmutt.ac.th/km/?p=786>.
- [8] Yananda Siraphatthada. (2010). *The Learning behavioral and effectiveness Development of Students in Principles of Marketing Study by The Active Learning Teaching*. Bangkok: Suan Sunandha Rajabhat University.