

Participation in Waste Management of Undergraduate at Rajamangala University of Technology Thanyaburi

Korntouch Kosidphokin

Rajamangala University of Technology Thanyaburi, Thailand

E-mail : Korntouch_k@rmutt.ac.th

Abstracts

The purposes of this research were: (1) to study participation of waste management in undergraduate students of Rajamangala University of Technology Thanyaburi, (2) to examine knowledge, attitude, and practice of waste management in undergraduate students of Rajamangala University of Technology Thanyaburi (3) to compare knowledge, attitude, and skills of waste management classified by year levels and gender of undergraduate students of Rajamangala University of Technology Thanyaburi.

The findings indicated that the overview of undergraduate students of Rajamangala University of Technology Thanyaburi participated in waste management at a moderate level ($\bar{x}$) = 2.83). For waste management knowledge, the percentage of the score was 87.03, and the knowledge about the type of waste was the most students answered correctly. The mean score for waste management skills was at a moderate level ($\bar{x}$) = 3.23). According to the comparison, students at all levels had different knowledge, attitudes, and skills about waste management at the statistical level of .05. However, the comparison by gender found that male students had higher attitudes about waste management than female students.

Keywords: Participation; Waste management; Knowledge; Attitude; Practice

Introduction

Nowadays the community is growing due to the local people migration to work in big cities, the population is increasing and many problems such as the dependence on foreign capital and technology. This results in enormous use of natural resources till the destruction of natural resources and the environment destroying local culture and wisdom, especially the amount of solid waste that is increasing as a shadow, according to the Food Waste Index Report 2021 or the Food Waste Index Report 2021. It was told that people produced 931 million tons of food waste in 2019, or percentage. 17 percent of all food produced for consumers household is the most discarded food waste at 11 percent (79 kg/year) (Natetida Bunnag, 2021 : online), according to the Waste Generation and Recycling Indices 2019 report by Verisk Maplecroft. Environment Dataset presented that the situation of global waste is worrisome as more than 2.1 billion tons of municipal solid waste are generated each year, but only 16 percent or about 323 million tons that are brought into the recycling process. (Narongkorn Manochanphen, 2019 : online)

it was found that more than 60 million Thais were able to generate up to 14 million tons of waste per year, but the capacity to dispose, store or separate waste is less than 70 percent of the waste generated in Thailand; including improper waste management Resulting in the amount of residual waste in various places, including communities, hospitals, educational institutions especially during the year 2019 that the epidemic of infection The COVID-19 virus has been forced the Thai government to take strict measures to control travelling and gathering people in public spaces. Both announcement Emergency decree the exclusion period (curfew) as well as the closure of many establishments, especially pubs, bars, and restaurants under the 'Stay at home, stop germs for the nation' measures, has resulted in the use of food delivery businesses, more service and brings to an increasing amount of plastic waste since food delivery businesses prefer to use packaging that can be carried and shipped easily. single use-plastics by the Thailand Development Research Institute or TDRI has estimated that one order only will see an average of seven more plastic waste items, including food boxes, sauce bags, plastic spoons, plastic forks, cutlery bags, soup bags and plastic food handle bags. In addition, Thai Environment Institute also estimated that the COVID-19 crisis would increase plastic waste by 15%, from an average of 5,500 tons/day to 6,300 tons/day, excluding the waste generated by used masks. It is expected that the rate of disposable masks is about 1.5 - 2 million pieces / day (Office of the Health Promotion Fund, 2021 : 65-66).

Research objectives

1. To study the participation in waste management of undergraduates at Rajamangala University of Technology Thanyaburi.
2. To study the knowledge, attitude, and participative waste management practices of undergraduates at Rajamangala University of Technology Thanyaburi.
3. To study and compare the knowledge, attitude, and practical skills in waste management classified by year level and gender of undergraduates at Rajamangala University of Technology Thanyaburi.

Research Methodology

This research was survey research. It was conducted to study participation in waste management and to compare knowledge, attitudes, and practical skills in waste management classified by research scope, year level, and gender of undergraduate students at Rajamangala University of Technology Thanyaburi

1. Population and sample

The population consisted of 1,280 undergraduate students enrolled in general education courses in social sciences at Rajamangala University of Technology Thanyaburi in the second semester of the academic year 2013.

The sample group was 300 undergraduate students enrolled in general education courses in the social sciences at Rajamangala University of Technology Thanyaburi in the second semester of the academic year 2013. A simple random sampling was performed to determine the sample size from Taro Yamane's table at a 95% confidence level.

2. Scope of variables

Independent variable

personal information

1. Year level

2. Gender

Dependent variable

1. Participation in waste management

2. Knowledge of waste management

3. Attitudes toward waste management

4. Waste management practices of undergraduate students at Rajamangala University of Technology Thanyaburi

3. Research tools

1. Questionnaire for participation in waste management, 10 items

2. Quiz on waste management, 10 items

3. Questionnaire on attitude in waste management, 10 items

4. Questionnaire on waste management practice skills, 10 items

4. Data Collection

The researcher collected the information as detailed below.

1. The researcher used the questionnaire on the desirable characteristics of students to collect data from the sample group.

2. After that, the questionnaire was returned to be examined and scored according to the specified criteria and the collected data was calculated for further research results.

5. Data analysis

1. Basic statistical values such as mean, percentage, and standard deviation of basic data were analyzed.

2. The mean scores of knowledge, attitudes, and waste management practices were compared with the participation of students by using a t-test (Dependent).

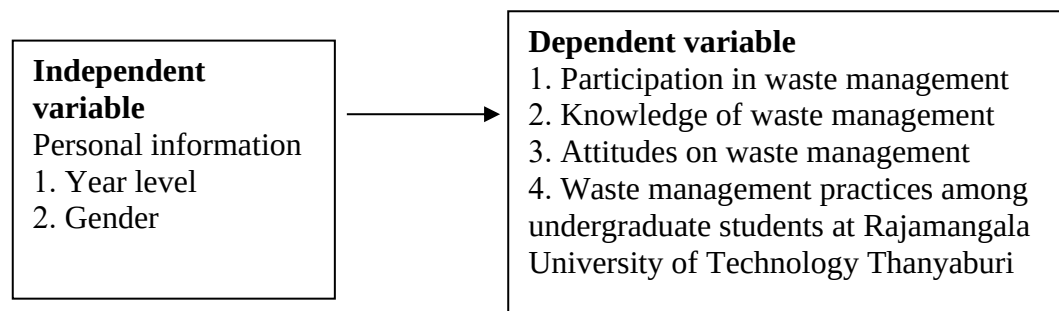
3. Analysis of variance was performed using a statistical F-test (One-way ANOVA).

6. Statistics for data analysis

1. Percentage, mean ($\bar{x}$), and standard deviation (S.D.)

2. T-test (independent) and One-Way Analysis of Variance (ANOVA)

Research Conceptual framework



แผนภาพที่ 1 กรอบแนวคิดในการวิจัย

Results

The researcher analyzed the data and summarized the results of the solid waste collection of undergraduate students at Rajamangala University of Technology Thanyaburi into 4 parts as follows.

1. Participation of undergraduate students at Rajamangala University of Technology Thanyaburi

The results showed that the participation in waste management among undergraduate students at Rajamangala University of Thanyaburi was at a moderate level, the mean participation was 2.83 and the standard deviation was 0.90. If considering each item, it was found that the student's participation in waste management methods had the highest mean of 3.00, the standard deviation of 0.90, followed by the perception of the university's waste management system with a mean of 2.98, a standard deviation of 0.92. The collaborative thinking for the cause of waste in the university was at the lowest level of 2.60, the standard deviation was 0.76. This is in line with the research by Salima Kerdhomkrom (2019, : 137-138) who studied the guidelines for people's participation in community solid waste management: Nakhon Si Thammarat Municipality found that the level of people's participation in community waste management Community solid waste management was at a moderate level. The people's participation in receiving benefits is at a high level. The participation in decision-making and participation in the assessment was low. and research by Anucha Kwansakul and his team (2018 : 219), who studied the level of people's participation in waste management of Pae-Ra Subdistrict Administrative Organization, Tha Phae District, Satun Province. People in overall waste management were at a moderate level ($\bar{x} = 3.26$). Operations Benefit and the evaluation aspect It was at a moderate level in all aspects.

2. Quiz on waste management among students at Rajamangala University of Technology Thanyaburi

The results showed that the knowledge score of students at Rajamangala University of Technology Thanyaburi was 87.03%. Regarding various types of waste at Rajamangala University of Technology Thanyaburi, it was the students who had the knowledge and answered the most correct questions. They got 292 correct answers out of 300, or 97.33%. Next was the knowledge of waste classification, the 3Rs principle for waste reduction, and the knowledge of the usefulness of bins. They got 283 correct answers out of 300, or 94.33 percent on all three questions. On the other hand, on the benefit of waste sorting, they answered only 172 of the 300 respondents, or 57.33 percent, which was considered the least knowledgeable of the questions. This is consistent with the research of Nimastura Wae and colleagues (2014 : 43) who studied. Waste management behavior of nursing students Boromarajonani College of Nursing, Yala found that most of them had a moderate level of knowledge and understanding about overall waste management. The overall opinion is at a good level. and have good overall waste management behavior.

3. Attitude in waste management among students at Rajamangala University of Technology Thanyaburi

The results showed that the overall attitude toward waste management among undergraduate students at Rajamangala University of Technology Thanyaburi was at a good level. The mean was 3.75 and the standard deviation was 0.91. If considered on a case-by-case basis, it was found that the students' trash collection was at a good level. The mean was 4.07

and the standard deviation was 0.84. The willingness to help reduce the amount of waste in the university was at a good level. The mean was 4.07 and the standard deviation was 0.88. Next was the love of the institution and the desire to be a green university using waste management activities. The mean was 3.97 and the standard deviation was 0.82. Attitudes toward waste management as a function of the university were the least average. The mean was 3.21 and the standard deviation was 0.96. This is consistent with the research of Paniphan Thepsorn (2017 : 51-52, who studied the implementation of the waste management policy of educational institutions in Chonburi province. It was found that the implementation of waste management policies of educational institutions in Chonburi province Overall, it's at a good level. When considering each aspect, it was found that In terms of raising awareness of waste reduction, the average was high first, followed by cultivating awareness of waste classification. Lastly, correct waste disposal awareness cultivating averages. and research by Thaksika Chachawat and colleagues (2018 : 168) who studied perceptions and behaviors about waste management among students of Boromarajonani College of Nursing, Phayao. Garbage was moderate at 82.7% and overall perception of waste management was moderate at 82.7% and research by who studied Factors related to solid waste separation of students in Maha Sarakham Rajabhat University It was found that the attitude about solid waste separation was high. The mean score was 2.59 (S.D.=0.49).

4. Waste management practice skills among students at Rajamangala University of Technology Thanyaburi

The results showed that waste management practices among undergraduate students at Rajamangala University of Technology Thanyaburi were at a moderate level. The overall mean was 3.23 and the standard deviation was 0.86. If considered on a case-by-case basis, it was found that every trash litter had the highest average. The mean was 3.98 and the standard deviation was 0.36. Collecting and sorting waste before disposing of it after completing various activities on a regular basis was at a moderate level. The mean was 3.33 and the standard deviation was 0.37. Attitudes toward shopping without plastic bags were at a moderate level. The mean was 2.91 and the standard deviation was 0.38. This is in line with the research of Chompoonut Songklang (2014 : 532) who studied the behavior of students in solid waste management. Ban Na Dee - Sang Bong School, Phasuk Subdistrict, Kumphawapi District Udon Thani Province found that students had behaviors in every practice related to solid waste management. The largest number is 40 students (55.56 percent) of the students dumped solid waste into the trash every time. The target group's solid waste management behavior was at a very desirable level ($\bar{x} = 3.63$). The item with the most desirable behavior was Students throw garbage into the trash every time ($\bar{x} = 4.38$), and this is consistent with the research of Ployrada Phumi and his team (2016, p. 389) who studied solid waste management behavior of Udon Thani Rajabhat University students. found that solid waste management behavior Overall, it was at a fair level ($\bar{x} = 1.60$).

5. Comparison of knowledge, attitude, and practical skills in waste management classified by year level and gender of students at Rajamangala University of Technology Thanyaburi.

The results showed that undergraduate students in years 1, 2, 3, and 4 or in different years had a statistically significant difference in knowledge, attitude, and practical skills in waste management at the 0.05 level. When classified by gender of students of Rajamangala

University of Technology Thanyaburi, it was found that the male students' attitudes towards waste management at the mean scores were significantly different than the female students at the 0.05 level. In terms of knowledge and practical skills in waste management, male and female students had the same knowledge and practical skills in waste management. This is inconsistent with the research of Anucha Kwansakul and colleagues (2018 : 219) who studied the level of people's participation in waste management of Pae-Ra Sub-District Administrative Organization, Tha Phae District, Satun Province, and Paphao's research. who studies public participation in solid waste management. of Khlong Yai Subdistrict Municipality Klong Yai District, Trat Province found that different sexes had the same level of participation in waste management. But in accordance with the research of Ratchachanan Srisupak and colleagues (2561 : 69) who studied Factors related to solid waste separation of students in Maha Sarakham Rajabhat University found that gender, age, faculty, year, knowledge factor attitude factor perception factor There was a statistically significant correlation to waste separation at the 0.05 level in the knowledge section. and practical skills in waste management Male and female students had no difference in knowledge and practical skills in waste management.

Discussion

Discussion on participation results of undergraduate students at Rajamangala University of Technology Thanyaburi

The results showed that undergraduate students at Rajamangala University of Technology Thanyaburi participated in waste management at a moderate level. The mean was 2.83 and the standard deviation was 0.90. Consistent with the study of Supoj Supphadung (2004) who studied the behavior of people's participation in solid waste disposal in Ban Chang Sub-district, Ban Chang District, Rayong Province found that the participation of local people in the waste management was moderate. Consistent with the study of Preecha Kullavanich (2005) who studied the relationship between knowledge of participation in solid waste disposal: a case study of Saen Phu Dat Subdistrict Administrative Organization, Ban Pho District, Chachoengsao Province found that local people's knowledge of solid waste disposal was moderate and their participation in solid waste disposal was comparatively low. It was also found that the relationship between knowledge and people's participation in solid waste disposal was statistically significant at the 0.05 level. The correlation coefficient (r) was 0.45, which was positive and moderately correlated. Consistent with the study of Somsamarn Asarat (2005) who studied the people's participation in solid waste management: a case study of That Thong Subdistrict Administrative Organization, Bo Thong District, Chonburi Province found that people with different occupations participated in solid waste disposal differently, and people with greater awareness of solid waste were more involved in solid waste disposal. Consistent with the study of Chatchai Nuanphen (2006) who studied the people's participation in waste separation in Roi Et municipality found that people of different sexes, ages, and educational backgrounds had a statistically significant difference in waste separation at the 0.05 level. Inconsistent with the study of Pawanpat Boonyachaichana (2009) who studied people's participation in waste management in Chiang Mai Municipality found that people were not involved in waste management. Inconsistent with the study of Kabkaew Panyathai (2011) who studied people's participation in solid waste management of Ko Kha Municipality, Lampang Province found that local people had a high level of knowledge and understanding and

awareness of waste management. Consistent with the study of Weerawan Boonchu (2010) who studied people's participation in waste management in Muang Nga Municipality, Muang District, Lamphun Province found that people's participation in municipal waste management was at a moderate level. The role of participation in waste management in communities and households was at a moderate level.

Discussion on the knowledge of waste management among students at Rajamangala University of Technology Thanyaburi

The results showed that the knowledge score among students at Rajamangala University of Technology Thanyaburi was 87.03%. Consistent with the study of Preecha Kullavanich (2005) who studied the relationship between knowledge of participation in solid waste disposal: a case study of Saen Phu Dat Subdistrict Administrative Organization, Ban Pho District, Chachoengsao Province found that local people's knowledge of solid waste disposal was moderate and their participation in solid waste disposal was comparatively low. It was also found that the relationship between knowledge and people's participation in solid waste disposal was statistically significant at the 0.05 level. The correlation coefficient (r) was 0.45. Consistent with the study of Kabkaew Panyathai (2011) who studied people's participation in solid waste management of Ko Kha Municipality, Lampang Province found that local people had a high level of knowledge and understanding and awareness of waste management.

Discussion on the attitude of waste management among students of Rajamangala University of Technology Thanyaburi

The results showed that the overall attitude toward waste management among undergraduate students at Rajamangala University of Technology Thanyaburi was at a good level. The mean attitude level was 3.75 and the standard deviation was 0.91. Consistent with the study of Kabkaew Panyathai (2011) who studied people's participation in solid waste management of Ko Kha Municipality, Lampang Province found that local people had a high level of awareness of waste management. Consistent with the study of Kabkaew Panyathai (2011) who studied the people's participation in solid waste management of Ko Kha Sub-District Municipality, Lampang Province, found that the main reason for community participation in waste management activities was cleanliness, beautiful scenery, and reducing environmental problems in the community as well as increased family income.

Discussion on the study of practical skills in waste management among students at Rajamangala University of Technology Thanyaburi

The results showed that waste management practices among undergraduate students at Rajamangala University of Technology Thanyaburi were at a moderate level. The overall mean was 3.23 and the standard deviation was 0.86. Consistent with the study of Kabkaew Panyathai (2011) who studied people's participation in solid waste management of Ko Kha Municipality, Lampang Province found that the community was able to separate and recycle it at a high level, including the proper disposal of household waste. The main reason for community participation in waste management activities is cleanliness, beautiful scenery, and reducing environmental problems in the community as well as increased family income.

Discussion on a comparative study of knowledge, attitude, and practical skills in waste management classified by year level of students of Rajamangala University of Technology Thanyaburi.

The results showed that undergraduate students in years 1, 2, 3, and 4 or in different years had a statistically significant difference in knowledge, attitude, and practical skills in waste management. Consistent with the study of Supoj Supphadung (2004) who studied the

behavior of people's participation in solid waste disposal in Ban Chang Sub-district, Ban Chang District, Rayong Province found that people with different levels of education, length of stay, sources of information, and frequency of information exposure had different participation behaviors in solid waste disposal. On the other hand, people of different gender, ages, statuses, occupation, and monthly incomes had the same behavior in participating in solid waste disposal. Consistent with the study of Chatchai Nuanphen (2006) who studied the people's participation in waste separation in Roi Et municipality found that people of different sexes, ages, and educational backgrounds had a statistically significant difference in waste separation at the 0.05 level. Consistent with the study of Kabkaew Panyathai (2011) who studied people's participation in solid waste management of Ko Kha Municipality, Lampang Province found that community cognition was statistically correlated with participation in waste management.

Recommendations

General recommendations

- 1) This research data should be used as decision-making data in student training to promote correct attitudes and skills in waste management at Rajamangala University of Technology Thanyaburi.
- 2) Training and participation activities should be organized for students so that they have a positive attitude and collectively qualify for good operational skills, including collaborative opinions, and spaces for the expression of knowledge and creativity, leading to further growth as a quality adult.
- 3) There should be regular support and promotion of waste disposal campaign activities in the university for good behavioral change and public mind that is useful to society in the future. It should also emphasize the correct disposal of waste based on the 3R principles in order to continue campaigning and conserving the environment in a balanced way for people's livelihood as a whole.

Recommendations for further research

- 1) Further research should be undertaken to find a suitable model to promote attitudes and practical skills among undergraduate students for appropriate and effective waste management and environmental conservation.
- 2) New strategies should be researched to encourage students to participate in sustainable waste management in the university.
- 3) There should be a study on how to promote multi-sector participation in implementing waste management and environmental conservation activities with the university.
- 4) The university should conduct a research study of the operational criteria for waste management or environmental management or conservation with the community or appropriate local organizations to operate in accordance with the needs of the community and the locality with the university as the host of operations.

References

- Anucha, K., Lattaphon, C. and Kornipa, S. (2018). *Level of people's participation in waste management of Pae Ra Subdistrict Administrative*
- Chompoonut, S. (2014). *Solid waste management behavior of students. Ban Na Dee - Sang Bong School, Phasuk Subdistrict, Kumphawapi District Udon Thani Province. at an academic conference 4th Sustainable Rural Development 2014 (532-539)*. Udon Thani: Udon Thani Rajabhat University.
- Natetida, B. (2021). *SDG News: Food Waste Index Report 2021*.Online .Retrieved March 19, 2021, from <https://www.sdgmovement.com/2021/03/17/food-waste-index-report-2021/>
- Narongkorn, M. (2019). *THE STANDARD: The situation of the world's waste and the country that produces the most waste in the world right now*. Online. Retrieved March 5, 2022, from <https://thestandard.co/garbage-situation/>.
- Nimastura, W., Samsu, S. and Premruedee, D. (2014). Research Article: Waste Management Behavior of Nursing Students. Boromarajonani College of Nursing, Yala. *Al-Hikmah Journal, Patani University*, 4 (8), 43-50.
- Office of the Health Promotion Fund. (2021). *ThaiHealth WATCH Thailand health trends 2021 : When plastic waste is coming back*. Online. Retrieved March 5, 2022, from Organization, Tha Phae District, Satun Province, at the 1st National Conference on Humanities and Social Sciences (p. 219-230). Songkhla: Songkhla Rajabhat University.
- Paniphan, T. (2017). *Implementation of the waste management policy of educational institutions in Chonburi Province*. (Master's Thesis). Chonburi: Burapha University.
- Ratchachanan, S., Ratiyaphon, S., Papawee, R. and Prapakorn, S. (2021). Factors Relating to Garbage Sorting of Students in Maha Sarakham Rajabhat University. *Public Health Research Journal Khon Kaen University*, 14 (2), 69-79.
- Salimar, K. (2019). *Guidelines for people's participation in community solid waste management : Nakhon Si Thammarat Municipality* (Master's Thesis). Bangkok: National Sarakham Rajabhat University. *Public Health Research Journal Khon Kaen University*, 14 (2), 69-79.
- Thaksika, C., Chanya, K. and Wannipa, W. (2018). Perceptions and behaviors related to waste management among students of Boromarajonani College of Nursing, Phayao. *Journal of Nursing, Public Health and Education, Boromarajonani College of Nursing. Ratchachonni Phayao*, 19 (2), 168-179.