



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v12-i14/15823> DOI:10.6007/IJARBSS/v12-i14/15823

Received: 15 October 2022, **Revised:** 17 November 2022, **Accepted:** 28 November 2022

Published Online: 09 December 2022

In-Text Citation: (Zain et al., 2022)

To Cite this Article: Zain, N. M., Anua, S. M., Marzuki, N. S., & Rahman, H. A. (2022). A Comparative Study on the Effectiveness of 3R (Reuse, Reduce and Recycle) Programme among Primary School Students in Tumpat, Kelantan. *International Journal of Academic Research in Business and Social Sciences*, 12(14), 196–210.

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Special Issue: Community Development, 2022, Pg. 196 - 210

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INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



www.hrmars.com

ISSN: 2222-6990

A Comparative Study on the Effectiveness of 3R (Reuse, Reduce and Recycle) Programme among Primary School Students in Tumpat, Kelantan

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Abstract

Currently, awareness towards environmental protection is increasing especially among young generation. However, such awareness initiative was still could not provide an impactful output towards environment. Hence this study was conducted to evaluate the effectiveness of 3R programme in primary schools by comparing the levels of knowledge, attitude and practices (KAP) on 3R between school with 3R programme and school without 3R programme. A cross sectional study was performed among 310 primary school students at Sekolah Kebangsaan Chabang Empat and Sekolah Kebangsaan Padang Pohon Tanjung. A validated questionnaire consist of sociodemographic data, knowledge, attitude and practice was distributed to respondents by systematic random sampling. Results showed that, school with 3R programme has a good knowledge (72.3%) and practice (47.7%). Meanwhile, school without 3R programme obtained high percentage in good attitude level (87.7%). Moreover, there were significant differences ($p < 0.05$) in both knowledge and practice scores between school with 3R programme and school without 3R programme. Across gender, both knowledge and practice scores were significantly different ($p < 0.05$) among female students between school with 3R programme and school without 3R programme. The attitude and practice scores were significantly different between school with 3R programme and school without 3R programme among students in level 1 ($p < 0.05$). Whereas, knowledge score was significantly different between the two schools among students in level 2 ($p = 0.001$). There were significant relationships between knowledge and attitude, between knowledge and practice and between attitude and practice for both schools however the correlations were positive and stronger for students in school with 3R programme compared to school without 3R programme. In conclusion, all primary school students should be given continuous awareness on 3R to increase their attitude and practice. The exposure given should be in different approach based on gender and standard level aspect.

Keywords: Environmental Health, 3R, Reduce, Reuse, Recycle

Introduction

The combination between increase in waste production and inadequate waste management can lead towards serious economic and socio-environmental issue. The factors such as exponential growth of population, urbanisation and the development of socio-economy, together with the improvement of living standard, have resulted in such increase in the amount of municipal solid waste generation throughout the world. It was estimated that an energy demand of 739 quadrillion British thermal units (Btu) at an increasing rate targeted at approximately 28% by 2040 is required to manage the annual solid waste production at 3.40 billion tonnes per year (Latifah, 2021; Kaza et al., 2018). On average the developed countries typically generated 521.95–759.2 kg per person per year (kpc) and 109.5–525.6 kpc typically by developing countries (Karak et al., 2012). Each year, governments spend a substantial amount of resources on the collection and disposal of solid waste, however the management system remain inadequate and expensive (Manaf et al., 2009). Therefore, ideally, healthy and safe environment can be achieved by managing the waste production systematically. One of a systematic waste management were the initiatives to reduce waste by the implementation of 3R (Reuse, Reduce and Recycle).

In addition, other than resource conservation and pollution control, another key that had been highlighted in the achievement of sustainable development was waste minimisation. It has been listed in the Agenda 21 of UN global action for global environmental sustainability (United Nation, 2017). In Malaysia, waste management and waste minimisation is within the responsibility of the local authorities. Hence, government agencies such as the Ministry of Housing and Local Government, Ministry of Environment, Ministry of Health, the various academic institutions and non-government organisations should work together to achieve this. Generally, the public is now aware of the 3Rs particularly among those residing in the larger local authorities and those who have participated in pilot recycling projects. In Malaysia there are many activities with regards to awareness and concern about the problem of waste, however, participation in recycling programme is still rather low especially among teenagers (Haliza, 2020). Thus, to spread the awareness of 3R, it should start within younger generation. Training and education should be provided among them to ensure this behaviour sustainable for life-long learning. Therefore, it can indirectly help our country to achieve a standard of well – managed waste management system. We had previously assessed and analysed the knowledge, attitude and practice (KAP) on 3R concept at two schools without prior 3R programme (Anua et al., 2022a) and then conducted an awareness programme to increase the KAP on 3R at one of the school without 3R programme in Tumpat (Anua et al., 2022b), which was a different school from the current study. Thus, this current study aims to evaluate the effectiveness of 3R programme in primary schools by comparing the levels of knowledge, attitude and practices (KAP) on 3R between school with 3R programme and school without 3R programme.

Methodology

Study Design

This is comparative cross-sectional study conducted from January to June of 2018. The study was conducted in District of Tumpat, Kelantan at selected primary schools based on the selection criteria that school has an existing 3R programme and school without 3R programme. Moreover, the distance between each school must within 15 km radius of one another.

Study Sample

The sampling method for selecting the schools was using the purposive sampling. A list of primary schools was obtained from District Tumpat Education Department and schools that fulfil the selection criteria were contacted. The list of school was grouped into two; schools that have 3R programme and schools without 3R programme. Fishbowl techniques have been used in which the list name of school that are willing to participate in the research have been put in a bowl and were selected randomly.

The two proportions formula was used to calculate the sample size based on the prevalence of attitude towards 3R between rural school (53.2%) and urban school (72.3%) (Haliza & Nr Atiqah, 2015). After considering 20% of dropout rate, total sample size required for both groups were 310 subjects.

The recruitment of the students was based on the inclusion criteria; able to understand and read in Malay, consented by parents and verbally consented by the students. We exclude students with learning disorder such as dyslexia, autism, attention deficit / hyperactive disorder (ADHD) and slow learner, those who absent during study and in unhealthy condition.

A systematic random sampling method was used for recruitment of study subjects. A list of students was obtained from all schools and students who fit the exclusion criteria were excluded as participants. In the new list, students were numbered and the multiple interval was calculated by dividing total number of subjects in a population with total number of respondents needed. Then, a stone was tossed on a piece of paper with numbers written on it. The number that the stone fall upon was chosen as the first student and the next students were chosen according to the calculated interval.

Study Instrument

This study used self-administered and self-developed questionnaire which has been MYIPO copyrighted (LY2018004547) based on SWCorp (2017) module and published in previous studies (Anua et al., 2022a; 2022b). The questionnaire consists of four parts.

- i. Part A on socio-demographic information of the students; including age, school, sex, standard, parent's occupation, race and religion.
- ii. Part B is on knowledge on 3R consists of 13 questions; four question on general knowledge, one question on reduce, one question on reuse and seven questions on recycle. Each correct answer has been given a score of 1 and for wrong answer will be given a score of 0.
- iii. Part C is on attitude towards 3R consists of 10 questions; one general question, three questions about reduce, four questions about reuse and two questions about recycle. Each correct attitude has been given a score of 1 and for wrong attitude have been given a score of 0.
- iv. Part D is on practice on 3R comprised of 10 questions. This part comprised of three general questions, two questions on reduce, two questions on reuse, and three questions on recycle. From those 10 questions, one question with either yes or no as answer and two questions were ranged using scale. One of them was ranging from never, sometimes, and always. The second question was ranging from never, every day, once a week and once a month. For the remaining seven questions, the students

must choose only one correct answer for good practice. For practice questions the highest total score point was 13 and the minimum of 0.

The scoring level was divided into 3 levels which are good, satisfactory and poor level. The 3 levels were determined according to Bloom's cut off points (Haliza & Aisyah, 2016). The score of 80-100% mean a good, a score of 50-79% mean satisfactory and poor was for the students with a score less than 50% of answers.

The content of questionnaire was validated by a group of expert panels including three lecturers specialised in this field of study, one officer from SWCorp and two primary school teachers. Improvement on the questionnaire was made based on their comments. The pilot study has been done among 30 primary school students consist of students from each year (year one until year six). The Cronbach alpha analysis was 0.761.

Data Collection

The data collection process was a fully self-administered and involved nine enumerators. The students were gathered and briefed about the purpose of the research. Consent forms and information sheets were distributed among the students for their parent's approval. After the parent's consent forms and verbal consent from the students had been obtained, the students were given the questionnaires on 3R. The students were allocated with 20 minutes of time to answer the questionnaires. Similar procedure was applied among the students at the school without 3R programme. A token of appreciation was given to both groups after completion of the questionnaires.

Variables

The dependent variable of this study was level of knowledge, attitude and practice. The independent variables of this study were exposure on 3R programme, school level and gender. Exposure on 3R programme was categorised into school with 3R programme and school without 3R programme. Gender factor were categorised as male and female. School level were comprised of level 1 which involved students from standard one to three and level 2 which involved student from standard four to six.

Data Analysis

Data have been analysed using Statistical Package for Social Sciences Software (SPSS) version 22.0. The socio demographic data, knowledge, attitude and practice of 3R have been analysed using descriptive statistics. Meanwhile, the comparison level of knowledge, attitude and practice between school with 3R programme and school without 3R programme have been determined using Independent T-test. Correlation between knowledge, attitude and practice have been determined by using Pearson correlation analysis. The comparison of knowledge, attitude and practice between both school by gender and standard level have been compared using Independent T- test.

Ethical Consideration

Permission was obtained from the Research and Ethical Committee in Health Campus of USM before starting the study (USM/JEPeM/17100559). Approval letters from Ministry of Education, Malaysia and Kelantan State Education Department have been received.

Participation was voluntary and written informed consent were obtained from parents meanwhile verbal consents were obtained from the students.

Results and Discussion

Socio demographic data

There were 155 students (100%, response rate) respectively from both group of schools with 310 students altogether had participated in this study. Table 1 shows distribution group of students according to gender, race and school level.

Table 1

Socio demographic data (n=310)

Socio demographic data	Frequency (%)	
	School with 3R programme	School without 3R programme
Age (mean, SD)	9.61 (1.849)	9.45 (1.759)
Gender		
Male	52 (34%)	62 (40.0%)
Female	103 (66%)	93 (60.0%)
Race		
Malay	150 (96.8%)	155 (100.0%)
Others	5 (3.2%)	0 (0.0%)
School Level		
Level 1	67 (43.2%)	85 (54.8%)
Level 2	88 (56.8%)	70 (45.2%)

Knowledge, Attitude and Practice on 3R

Based on Table 2, students from school without 3R programme have low knowledge about type of colour for 3R dustbins (items 3, 4 and 5; only 33.5% - 56.1% give correct answer) with $p < 0.001$. There were significant differences in knowledge about materials that cannot be thrown away in the recycling bin between these two groups of students ($p < 0.001$). Regarding 3R element, there was significant different on knowledge of example of reuse concept (used back of written paper) between students with and without 3R programmes ($p = 0.005$). The knowledge in term of effect of using contaminated water also shown significant difference between this group of students ($p = 0.006$).

Primary school students in this study were knowledgeable on 3R where majority of them obtained high correct response and no significant difference between groups. However, there were some items in knowledge that shows a significant difference between groups. The items were; type of colour for 3R dustbins, material that can be thrown away in recycling bin, the concept of reuse and the effect of used of contaminated water. This is the important basic knowledge about 3R that must be understood by everyone as well as among primary school students.

Mean score of knowledge among students in school with 3R programme (11.13) were significantly higher compared to school without 3R programme (9.99), $p < 0.001$. There were 112 students (72.3%) from school with 3R programme have good level of knowledge compared to only 59 students (38.1%) from school without 3R programme. Looking at the significant difference in the mean score knowledge between the two groups, this difference

might be due to the 3R exposure given by the local authority or agency (SWCorp) who actively engaged with the school. The findings in our intervention study also reported significant increase in knowledge score ($p=0.030$) between before and after 3R programme (Anua et al., 2022b). This shows the importance of exposure of 3R program in increasing knowledge among students. This is supported by Ermolaeva (2011), as the involvement and participation of students in environmental preservation and sustainable development is very important because it will influence their lives and affect the future of the environment. This is also reported in the study by Phan Haong and Kato (2016) among elementary school children in Vietnam, as there were changes and improvement on students' knowledge after environmental educational activities been given.

Table 2

Frequency and percentage of knowledge on 3R (n=310)

No	Knowledge Items	Frequency (%)		p value
		School with 3R Programme	School without 3R Programme	
1.	Materials that cannot be recycled	133 (85.5)	135 (87.1)	0.740 ^a
2.	Recycling logo	139 (89.7)	147 (94.8)	0.089 ^a
3.	Colour of recycling bin for ice cream wrapper.	127 (81.9)	52 (33.5)	<0.001 ^{a*}
4.	Colour of recycling bin for glass bottle	133 (85.8)	87 (56.1)	<0.001 ^{a*}
5.	Colour of recycling bin for used drawing paper	121 (78.1)	55 (35.5)	<0.001 ^{a*}
6.	Materials that cannot be throw away into recycling bin	132 (85.2)	150 (96.8)	<0.001 ^{a*}
7.	Correct 3R element when back of a used paper is used to jot down notes	124 (80.0)	102 (65.8)	0.005 ^{a*}
8.	Correct 3R element when bring your own bag when shopping	121 (78.1)	106 (68.4)	0.054 ^a
9.	Correct 3R element when separating wastes according to their types and colour of recycling bins	122 (78.7)	120 (77.4)	0.784 ^a
10.	Effect when people used contaminated water	145 (93.5)	154 (99.4)	0.006 ^{a*}
11.	Effect to the river and sea when wastes are thrown into them	148 (95.5)	146 (94.2)	0.608 ^a
12.	Effect of waste disposal	142 (91.6)	150 (96.8)	0.052 ^a
13.	Effect of open burning to human health	138 (89.0)	145 (93.5)	0.159 ^a
Total score of knowledge (mean, SD)		11.13 (2.84)	9.99 (1.96)	$p<0.001^{a*}$

Category of knowledge

Poor	14 (9.0)	3 (1.9)	p<0.001 ^{b*}
Satisfactory	29 (18.7)	93 (60.0)	
Good	112 (72.3)	59 (38.1)	

^aIndependent t-test, ^bChi square, *p<0.05

In general, students from school without 3R programme had better attitude towards 3R as compared to students from school with 3R programme in all item of attitude towards 3R (Table 3). However, for both schools (with and without 3R programme), the students had poor attitude on 2 items of the questionnaire. Firstly, on attitude in sending letter (48.8% and 50.3%) and secondly, on attitude of using plastic bag when shopping (49.0% and 52.9%). There were also significant differences in 3 items of attitude towards 3R between these group of students; attitude when saw empty bottle outside the class (p=0.006), attitude towards used towel (p=0.011) and attitude toward recycling activity (p=0.044).

Mean score of attitudes among students in both group of schools were almost similar (8.34 and 8.59 respectively) as well as for the distribution category of attitude. Attitude of students towards 3R between school with 3R programme and school without 3R programme was not significantly different (p=0.132). Similarly, moderate attitude level was reported among secondary school students on recycling (Haliza & Nur Atiqah, 2015). These findings are supported by Milutin, Stanko and Sonja (2014) on study of environmental awareness among students and they find that the level of environmental awareness, attitude, behaviour and knowledge of the students from primary to secondary schools are at a low level.

Table 3

Frequency and percentage of attitude on 3R (n=310).

No	Attitude items	Frequency (%)		p value
		School with 3R Programme	School without 3R Programme	
1.	Attitude when saw empty bottle outside the class	145 (93.5)	154 (99.4)	0.006 ^{a*}
2.	Attitude toward empty chocolate bottle	150 (96.8)	146 (94.2)	0.274 ^a
3.	Attitude in using both side of paper	128 (82.6)	131 (84.5)	0.646 ^a
4.	Attitude in sending letter	75 (48.4)	78 (50.3)	0.733 ^a
5.	Attitude toward used towel	137 (88.4)	149 (96.1)	0.011 ^{a*}
6.	Attitude toward empty chili sauce bottle	143 (92.3)	147 (94.8)	0.355 ^a
7.	Attitude of using plastic bag when shopping	76 (49.0)	82 (52.9)	0.495 ^a
8.	Attitude towards recycling activity	151 (97.4)	155 (100.0)	0.044 ^{a*}
9.	Attitude when saw chocolate's wrapper under the table in the class	145 (93.5)	148 (95.5)	0.454 ^a
10.	Attitude toward used school's attires	143 (92.3)	141 (91.0)	0.682 ^a

Total score of attitude (mean, SD)	8.34 (1.51)	8.59 (1.13)	0.107 ^a
Category of attitude			
Poor	6 (3.9)	1 (0.6)	0.132 ^b
Satisfactory	21 (13.5)	18 (11.6)	
Good	128 (82.6)	136 (87.7)	

^aIndependent t-test, ^bChi square, *p<0.05

In term of practice on 3R, students have good practice in all items except for 5 items with significant difference between those two group of students. First is on practice of using recycle food containers. Although it shows high percentage, but it was low among students with 3R programmes compared to students without 3R programmes (p=0.015). Similar pattern was seen in practice towards older shoe when get a new one, it was low among students with 3R programmes compared to students without 3R programmes (p=0.013). Third is on practice of thrown papers in correct 3R dustbins as 45.8% students in school without 3R programme did practice it as compared to students with 3R programme (61.3%) with p=0.006. In term of frequency of practice in carrying own bag during shopping, 49.7% students from school with 3R programme 'always' bring their own bag while 38.7% students from school without 3R programme 'sometimes' bring their own bag (p=0.010). Lastly is on frequency of practicing waste separation at home; as 43.2% students from school without 3R programme 'never' separate wastes at home and only 38.1% students from school with 3R programme practice separate waste 'every day' at home.

Table 4

Frequency and percentage of practice on 3R (n=310)

No	Practice items	Frequency (%)		p value
		School with 3R programme	School without 3R programme	
1.	Practice of using recycle food containers	141 (91.0)	151 (97.4)	0.015 ^{a*}
2.	Practice on thrown papers into correct 3R dustbins	95 (61.3)	71 (45.8)	0.006 ^{a*}
3.	Action taken when saw drains at school full of trash.	139 (89.7)	130 (83.9)	0.131 ^a
4.	Action taken when saw people thrown rubbish into the river	138 (89.0)	127 (81.9)	0.076 ^a
5.	Action taken when pant torn	147 (94.8)	146 (94.2)	0.803 ^a
6.	Action taken when saw trash beside the class	140 (90.3)	148 (95.5)	0.077 ^a
7.	Frequency on practice in carrying own bag when shopping			
	Never	31 (20.0)	44 (28.4)	0.010 ^{a*}
	Sometimes	47 (30.3)	60 (38.7)	
	Always	77 (49.7)	51 (32.9)	
8.	Practice towards older shoe when get a new one	139 (89.7)	150 (96.8)	0.013 ^{a*}

9.	Practice on bringing recyclable materials during recycling activity at school	121 (78.1)	119 (76.8)	0.686 ^a
10.	Frequency on practice of wastes separation at home			
	Never	37 (23.9)	67 (43.2)	0.001 ^{a*}
	Once a month	12 (7.7)	12 (7.7)	
	Once a week	47 (30.3)	21 (13.5)	
	Everyday	59 (38.1)	55 (35.5)	
Total score of practice (mean, SD)		9.95 (2.25)	9.17 (2.17)	0.002 ^{a*}
Category of practice				
	Poor	15 (9.7)	16 (10.3)	0.018 ^{b*}
	Satisfactory	66 (42.6)	89 (57.4)	
	Good	74 (47.7)	50 (32.3)	

^aIndependent t-test, ^bChi square, *p<0.05

Mean score of practice among students from school with 3R programme was higher (9.95) compared to school without 3R programme (9.17). There was a significant difference in level of practice between both group of students (p=0.018) as high percentage of students from school with 3R programme were in the category of good level of practice (47.7%) compared to students from school without 3R programme, high percentage were in the category of satisfactory level (57.8%).

In general, each practice items show good practice among students from school with 3R programme except practice on using recycle food container, saw trash beside class and practice toward old shoes. This may be influenced by other factors such as parental behaviour as proposed by Matthies, Selge and Klockner (2012). In term of practice of separation wastes at home and carrying own bag when shopping showed high practice among students readily exposed to 3R programme compared to students without 3R programme. This indicated a good practice in reducing waste. A study by Ruzian and Norizan (2014) stresses that environmental preservation and conservation activities are the responsibility of all humankind. Therefore, a great amount of awareness among the public shall be applied to ensure that the environment is sustained in the future especially in younger generation.

According to Tan and Norzaini (2011) the level of environmental protection practice is still low but they demonstrated that people were aware of the environmental issues that have occurred. Although, students from school with no 3R programme obtained low score on correct answer on knowledge and practice questions, but they still have awareness on how to keep the environment safe. However, awareness will be meaningless if there is no change in terms of practice and behaviour of society towards the environmental protection.

Comparison of knowledge, attitude and practice on 3R between school group by gender and standard level

In term of knowledge, among students in school with 3R programme, mean knowledge for female was higher than male but among students in school without 3R programmes, mean knowledge for male was higher than female (Table 5). Between school groups, the mean

difference was significant for female students ($p < 0.001$) but not significant for male student ($p = 0.107$). Mean knowledge was higher among students in level 2 than student in level 1 for both school groups. Between school groups, the mean difference was significant for students in level 2 ($p < 0.001$) but not significant for students in level 1 ($p = 0.109$).

In term of attitude, there was no differences of mean attitude for male and female within group and between group. Mean attitude was higher among students in level 2 than students in level 1 for both school groups. Between school groups, the mean differences were significant for students in level 1 ($p = 0.018$) but not significant for students in level 2 ($p = 0.080$).

In term of practice, among students in school with 3R programme, mean practice for female was slightly higher than male but among students in school without 3R programmes, mean practice for male slightly higher than female. Between school groups, the mean difference was significant for female students ($p = 0.008$) but not significant for male students ($p = 0.129$). Mean practice was higher among students in level 2 than students in level 1 for both school groups. Between school groups, the mean difference was significant for students in level 1 ($p = 0.048$) but not significant for students in level 2 ($p = 0.052$).

Shivakumara *et al*, (2015) reported different findings as they found no significant difference in environmental awareness between male and female. This condition might be contributed by the natural awareness they had within themselves, which led to the formation of good behaviour among male and female students in addition to the social and cultural characteristics that influence the level of sensitivity towards the environment (Aaron, 2010). However, Xiao and Hong (2010), and Vinz (2009), argued that there was a significant difference in the attitude towards the environment based on gender. Their research consistently shows that women have a more pro-environmental attitude than men. This study also found that women tend to make energy-saving practices that lead to sustainability consumption practices.

Table 5

Comparison on knowledge, attitude and practice between school with 3R programme and school without 3R programme by level and gender (n=310)

Variables	Mean (SD)			p value
	School with 3R programme	School without 3R programme		
Knowledge				
Gender				
Female	11.25 (2.66)	9.95 (1.81)		0.001*
Male	10.88 (3.20)	10.06 (2.17)		0.107
Standard level				
Level 1	9.52 (3.47)	8.85 (1.51)		0.109
Level 2	12.35 (1.31)	11.39 (1.49)		0.001*
Attitude				
Gender				
Female	8.31 (1.48)	8.67 (1.09)		0.060
Male	8.40 (1.58)	8.47 (1.18)		0.805
Standard level				

Level 1	7.51 (1.88)	8.11 (1.18)	0.018*
Level 2	8.98 (0.64)	9.17 (0.74)	0.080
Practice			
Gender			
Female	10.02 (2.31)	9.16 (2.13)	0.008*
Male	9.83 (2.15)	9.19 (2.25)	0.129
Standard level			
Level 1	9.30 (2.58)	8.52 (2.23)	0.048*
Level 2	10.45 (1.83)	9.97 (1.81)	0.052

Independent t-test, * $p < 0.05$

Correlation of knowledge, attitude and practice on 3R

There was positive large/strong correlation between knowledge and attitude ($r=0.711$); and between attitude and practice ($r=0.530$), while it is positive medium/moderate correlation between knowledge and practice ($r=0.490$) among students in school with 3R programme. Comparing to students in school without 3R programme, the correlation was positive small and medium between knowledge, attitude and practice. The correlation between knowledge score and attitude score; knowledge score and practice score; attitude and practice score for students in school with 3R programme were stronger compared to school without 3R programme ($p < 0.05$) (Table 6). Contradicted to Tikka, Kuitunen and Tynys (2000) stated that knowledge about environmental will not increase the practice on how individual managed their environment that surround them. However, according to Embong (2013), attitudes towards recycling also influences people to participate actively in recycling programmes. It indicates that students always practice and aware on the matter regarding 3R. Therefore, it is very important to arrange community activity programmes and make students to actively participate in them (Shivakumar & Vanadevappa, 2007).

Table 6

Correlation between Knowledge, Attitude and Practice (n =310)

Variables			Knowledge	Attitude	Practice
School with 3R programme	Knowledge	r	0.711	0.490	
		p- value	<0.001*	<0.001*	
	Attitude	r	1.00	0.530	
		p- value		<0.001*	
School without 3R programme	Knowledge	r	0.403	0.266	
		p- value	<0.001*	0.001*	
	Attitude	r	1.00	0.206	
		p- value		0.010*	

Pearson Correlation, * $p < 0.05$,

Correlation: small if $r = 0.10$ to 0.29 , medium if $r = 0.30$ to 0.49 , large if $r = 0.50$ to 1.0 (Cohen, 1988)

Study Limitation

One of the limitation when conducting the study was bias when guiding the students at level 1 to answer the questions. Explanations have been given to them verbally in classroom and this might influence researcher in leading them to answer correctly.

Conclusion

In conclusion, primary school students in this study have a good knowledge, attitude and practice on 3R. The knowledge and practices on the 3R among primary school students were significantly higher in school with 3R programme compared to school without 3R programme. Knowledge and attitude affect the practices in real life. The students were having some knowledge about 3R but did not practice in their life. Lack of facilities in applying 3R habits, less guidance from eldest people, 3R centre was far from their place were some of the issues which might had affected their practices.

Students, regardless of gender, should be provided with information and should be able to implement 3R practices on an ongoing basis. The students are less exposed to sustainability in the context of their impact in implementing environmental awareness, especially in promoting sustainable environment. Therefore, the school was among the best institution able to conduct the basic principles of sustainable development such as 3R element.

Recommendation

Younger generation is an important asset in maintaining sustainability of the future. Nurturing and educating on application of the environmental values should be inculcated from the early phase to shape positive behaviour towards the environment. Lot of efforts in shaping students' behaviour shall be performed to increase awareness on 3R habits, such as, reuse, reduce and recycling. These efforts could emphasises on promoting design competitions, awareness campaigns, outdoor activities (such as outdoor educational camping programmes) and environmental-related activities. This can increase the awareness and commitment of the students, and ultimately the environment can be maintained properly.

Furthermore, the government or any non-government organisations (NGOs) shall engage with more school without considering the location of the school. The government and NGOs should widely organised a campaign and provide adequate facilities to apply and practice 3R elements. The programme or activity that will be launched shall be suitable according to the gender and ages. If the aspiration is successful, the students will get more knowledge about proper way to manage waste daily. Therefore, it will increase their awareness and attitude towards 3R throughout the campaign or activity. Thus, making them to enjoy practicing 3R habits in their life.

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