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3R CONCEPT (REDUCE, REUSE, RECYCLE) AMONG FORM SIX STUDENTS IN KUDAT

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ABSTRACT The 3R concept (reduce, reuse & recycle) was introduced at the school to practice recycling thereby reducing waste generation at the source. However, awareness of the importance of this concept is still unsatisfactory among students. This study was conducted to identify the student's engagement and knowledge of the 3R concept and suggestions to increase student awareness at school. The survey involves a total of 100 students as respondents which is each school represents 50 students from SMK Kudat and SMK Abdul Rahim. The data obtained were analyzed by SPSS software (Statistical Package for Social Science) using descriptive analysis to obtain percentage and frequency as well as correlation analysis to assess the relationship between knowledge and student engagement in the 3R activities. The results found that each school has an alternative to implement the 3R concept. Student knowledge is mostly satisfactory. There is the relationship between the variables that are higher knowledge among students directly increases the level of involvement in 3R activities at school. The lack of 3R disposal bins has made students use an ordinary bin. Suggestion for the addition of 3R bins and the implementation of 3R activities among students.

Keywords: 3R concepts, knowledge, awareness, students etc.

INTRODUCTION

The 2007 report of the Intergovernmental Panel on Climate Change (IPCC) to the United Nations (UN) concluded that more than 90% of the causes of warming over the past 50 to 60 years are human contributed (Awani News, 2018). Area reclamation activities for social and economic development have caused environmental exploration to become unrestricted to the detriment of human beings and the environment. When this situation occurs, humans start

to think about how to save the environment for the sake of future generations. In this regard, the application of the 3R concept (reduce, reuse, recycle) is implemented as a measure to protect the environment. However, Malaysia is said to be one of the countries still lacking efforts to apply the 3R concept in daily life. Households still fail to separate solid waste as stipulated in the Solid Waste Management and Public Cleansing Act 2007 (Act 672). One of the suggestions to reduce waste generation is by strengthening the 3R concept through curricular and co-curricular programs in schools. The 3R campaign was implemented by placing 3R bins in schools to facilitate segregation and encourage the 3R concept (reduce, reuse, recycle).

PROBLEMS STATEMENT

Human activities are a major contributor to the increase and generation of waste. Recycling is an alternative to solve the problem of solid waste disposal. The 3R concept was introduced in schools to encourage students to practice recycling. The application of the 3R concept is easier through curriculum and co-curriculum. Although efforts to raise awareness on the importance of recycling have long been exposed in education, students' level of awareness is still unsatisfactory. Consequently, schools are faced with waste management where most of the waste produced in schools can still be recycled but not managed properly. Therefore, a study on the concept of 3R was conducted to identify student involvement and the best methods to increase awareness of the importance of the concept of 3R (reduce, reuse & recycle).

OBJECTIVE

The objectives of this study are as follows,

i. To study the level of knowledge on the concept of 3R practised among school students in SMK Kudat and SMK Abdul Rahim, Kudat.
ii. To identify the involvement of students in the implementation of the 3R concept carried out at SMK Kudat and SMK Abdul Rahim, Kudat.
iii. To suggest the best method to increase students' awareness of the concept of 3R in SMK Kudat and SMK Abdul Rahim, Kudat.

RESEARCH METHODS

This study uses a quantitative approach with a survey method. One hundred questionnaires were distributed to SMK Kudat and SMK Abdul Rahim students, each represented by 50 students as the study sample. Most researchers use this questionnaire instrument because it is easy to analyze statistically. At the same time, M.J Hizwan (2018) dan Schumacher & Mcmillan (2006) stated that assessing views and beliefs using questionnaires is more accurate. The data of this study were analyzed using SPSS software by descriptive analysis and presented in the form of tables and graphs. The interpretation of the mean score is according to Sumarni & Zamri (2018) and Jamal (2002) namely, 1.00-2.33 (low), 2.34-3.67 (medium), and 3.68-5.00 (high). This means score is used in analyzing the level of involvement and knowledge among students.

RESEARCH AREA

Kudat is a potential area for wind farm area development due to the strong wind gust factor in this area (Albani, 2013). It has 1287 km covering the small towns of Matunggong, Banggi Island, Malawali, Kudat, and Balambangan Island (Wong, 2016). In 2019, the estimated population in Kudat is 101700 people (Department of Statistics Malaysia, 2019). SMK Kudat and SMK Abdul Rahim which are the study area located at Kudat district.

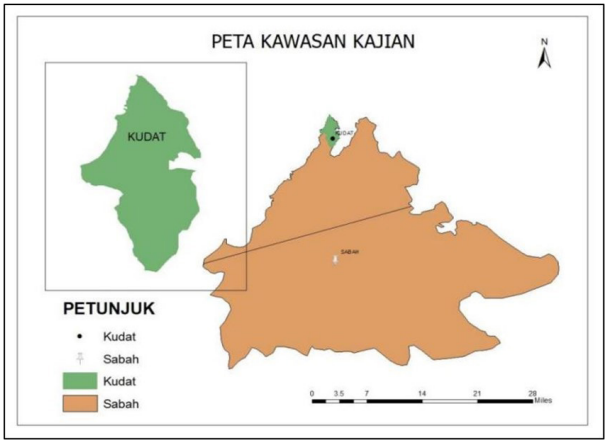

Figure 1 shows the location of the study area (Kudat City)
Source: modified from Google Earth Pro (2020)

LITERATURE REVIEW

Based on M.S Mazlan et al. (2015), a study conducted to identify the concept of sustainable consumption at Universiti Kebangsaan Malaysia (UKM) has involved 300 respondents consisting of 167 undergraduate students and 133 graduate students using a survey questionnaire. The probability sampling method utilizes random selection, and the information was analyzed using Statistical Package for the Social Sciences (SPSS) software. The authors state that the main challenge in nature conservation efforts is community awareness and acceptance. The study results showed that 153 respondents representing 51%, stated that environmental care does not start from oneself. Most students have less knowledge about the UKM Lestari Charter 2010 due to the lack of exposure given to the student. The university environment factors are too complex and have a diversity of sub-cultures, organizations, and entities. Monitoring and actions to involve the UKM community in caring for the environment are less supported by the student.

Zurina et al. (2016) conducted a study to examine students' level of knowledge, understanding, and willingness towards using environmentally friendly food containers to preserve the environment. This study involved 50 students of UKM who were randomly selected as the study sample, and data were analyzed using descriptive statistical analysis and chi-square test. The chi-square test is data that analyzes the frequency used to test whether litter has a significant relationship between the populations tested. The study results found that the majority of UKM students knew the disadvantages of using non-environmentally friendly products. However, students did not have the initiative to change the situation because packaging using polystyrene and plastic is widespread in residential college cafes. There is no significant difference between gender with the level of knowledge, understanding and awareness, and encouragement and readiness among students in using environmentally food-friendly food containers. The proposal to solve this problem is to work with all parties to create an environment for using environmentally friendly food containers as organized in other public higher education institutions.

Jamilah et al. (2011) conducted a study that highlighted environmental issues and effective conservation methods. This study uses a quantitative method through a survey of 100 respondents, of which 50 respondents are from Penang and another 50 respondents from Kuala Lumpur. The latter were randomly selected among the urban population of the two cities. This study found that public knowledge related to recycling programs is moderate for both states, namely 3.28 in Penang and 2.90 in Kuala Lumpur. In contrast, knowledge related to air pollution and noise pollution is low among the community. This difference explains that the level of education influences the public's level of knowledge regarding this issue. Environmental education is very important to give awareness to the community on the adverse effects of environmental issues. The legal method prioritizes conservation, while the non-legal method emphasizes protecting the environment through the prevention of issues that pollute the environment.

According to A. Shabudin (2009), an evaluation study of recycling programs was conducted in three areas in the state of Selangor. The sampling method used was selected at random, that is, a total of 360 form four students from 12 secondary schools. The study results found that the student's knowledge of the Solid Waste Recycling Program was high and positive. Implementation evaluation uses the CIPP Stufflebeam Evaluation Model, which focuses on process dimensions such as information dissemination process and program equipment facilities and focuses on product dimensions such as students' knowledge and attitudes towards the implementation of the program. The results of this study show a positive and weak correlation between disseminating information about the program with the knowledge of students. There was also a positive and weak relationship between the process of disseminating information about the program, the facilities of the program equipment, and the support of school administrators with student attitudes. However, there is a negative and weak relationship between problems with student's knowledge during the program implementation process. Overall, the study's findings indicate that the recycling programs conducted moderately improve students' knowledge and attitudes.

Tan et al. (2011) examines the relationship of commitment to the environment with environmentally friendly behaviour towards students. The data obtained were analyzed using descriptive analysis and inferential statistics. This study found that student commitment was at a high level while environmental behaviour was moderate. The findings show that the level of commitment is influenced by the stream of study where differences in teaching and learning techniques cause differences in commitment to the environment. In enhancing students environmentally friendly behaviours, learning activities outside the classroom can increase students' active involvement in environmental topics. Universities and accommodation colleges can play a proactive role through awareness campaigns. In addition, Corporate Social Responsibility activities by sponsoring and participating in awareness programs from time to time need to be enhanced.

RESULT OF STUDY

Respondent Demographics

Table 1 shows the demographics of the respondents

VARIABLES	SMK KUDAT		SMK ABDUL RAHIM	
	Frequency	Percentage (%)	Frequency	Percentage (%)
GENDER				
Male	17	34%	12	24%
Female	33	66%	38	76%
ETHNICITY				
Malay	4	8%	3	6%
Bajau	27	54%	20	40%
Rungus	2	4%	11	22%
Sungai	0	-	2	45
Other	17	34%	14	28%
RELIGION				
Islam	48	96%	36	72%
Christian	2	4%	14	28%

Based on the study results, female student's majority involved in this study, namely 66% (33 students) from SMK Kudat and 76% (38 students) from SMK Abdul Rahim. Significant differences between males and females are also evident when the number of female students enrolled in public institutions of higher learning nationwide is higher than males (Zalizan et al., 2005). At the diploma level, which is form six, it is also the same, males who continue their studies are only a few compared to females Most of the students are Bajau, 54% representing 27 students at SMK Kudat and 40% representing 20 students for SMK Abdul Rahim. According to Fadzilah et al. (2002), the Bajau tribe is also the second majority race in Sabah and the largest ethnic group that professes Islam who mostly live in Kudat, Kota Marudu, Pitas, Kota Belud, Tuaran, Kota Kinabalu, Putatan, and Papar. The students are Muslims, 96% (48 students) and 72% (36 students) respectively.

Knowledge of 3R Concepts

Table 2 shows the knowledge of the 3R concept

STATEMENT	SMK KUDAT		SMK ABDUL RAHIM	
	YES	NO	YES	NO
Do you know about 3R Concept?	49	1	50	-

Most of the students know the 3R concept, that is, 49 respondents representing SMK Kudat knew about the 3R concept (reduce, reuse & recycle) with a "Yes" as a response, and one gave a "No" response. Meanwhile, all 50 student's respondents at SMK Abdul Rahim are aware of the concept of 3R (reduce, reuse & recycle) by responding Yes. Students are aware of the 3R concepts introduced in the school as this is basic knowledge that students should know.

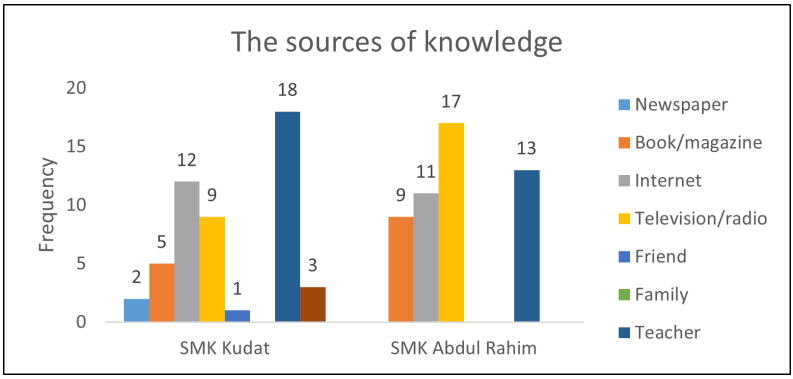

Figure 2 shows the source of knowledge, the color of the 3R bin and the definition of 3R

Based on Figure 2 below, students from SMK Kudat stated that the source of knowledge on the concept of 3R is through teachers, which is 18 students (36%) respondents. The lowest source of knowledge is from friends that are respondents representing only respondents 2%. For SMK Abdul Rahim, the highest value for the respondents' knowledge source is from television or radio, 17 students (34%) respondents. In comparison, the lowest value is nine students (18%) respondents who obtained knowledge from books and magazines. This source of knowledge is influenced by the learning methods implemented, and the student's favorites watching television and listening to the radio. According to Kamaruddin (1997), the teacher's role in the learning process is as a mentor or model and influence students' attitude. School students are said to be much more motivated through their teachers in the learning process (Noor Erma, 2014). Such a situation shows that the respondents of SMK Kudat obtained this source of 3R knowledge from teachers in the school because they thought that schoolteachers should convey the knowledge about 3R. However, respondents from SMK Abdul Rahim obtained a source of knowledge on the concept of 3R from television or radio cause of the student favorites and their hobbies as well.

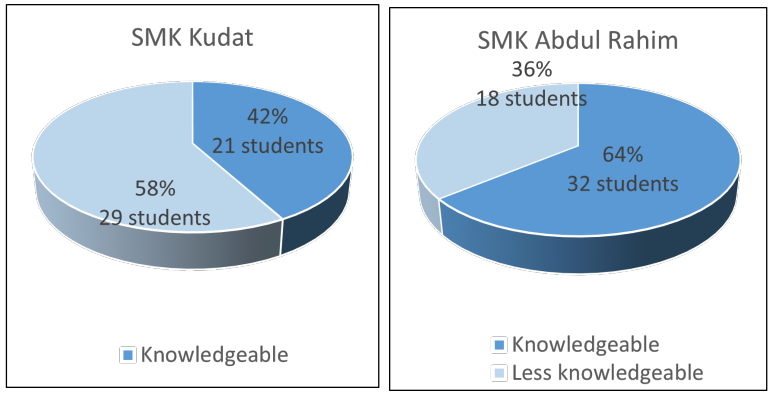

Figure 3 and **Figure 4** shows the answer of 3R bins color

The correct colour of the 3R rubbish bin is Orange, Blue, and Brown, a total of knowledgeable students 21 (42%) from SMK Kudat and 32 students (64%) from SMK Abdul Rahim. Twenty-nine students (58 %) from SMK Kudat and 18 (36%) from SMK Abdul Rahim gave less accurate answers. This type of colour confusion is likely due to the lack of 3R bins provided in schools, thus affecting their memory, and understanding regarding the colour of 3R bins. The study results found that most students in both schools who answered incorrectly only knew two types of 3R bins.

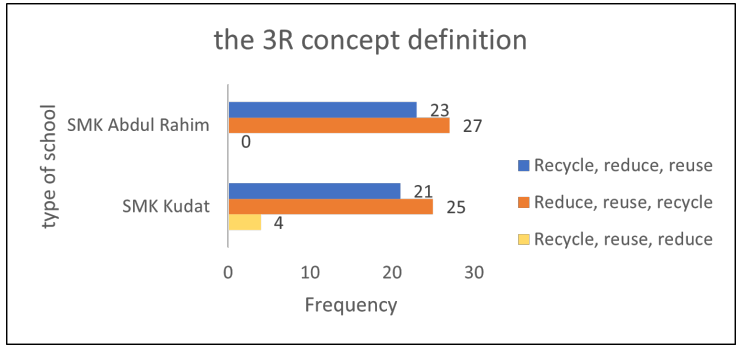

Figure 5 shows the 3R concept definition

The correct definition of 3R is "reduce, reuse, recycle", which is a total of 25 students (50%) from SMK Kudat and 27 students (54%) from SMK Abdul Rahim gave the correct response. A total of 42% from SMK Kudat

and 46% of students from SMK Abdul Rahim answered "recycle, reduce, reuse," while only four students from SMK Kudat answered, "recycle, reuse, reduce". This study shows that most students are still confused and have not understood the meaning of the concept of 3R, which is arranged in order of priority. However, both schools' number of correct answers is still the highest, although there is only a slight difference with less accurate answers.

Students Involvement to 3R Activities in Schools

Table 3 shows the students involvement to 3R activities in schools

No	INVOLVEMENT	SMK KUDAT						SMK ABDUL RAHIM					
		SD	D	NS	A	SA	MEAN	SD	D	NS	A	SA	MEAN
1.	I throw trash by type into the 3R bins.	2	1	21	18	8	3.58	1	5	27	15	2	3.24
2.	I prefer to use regular bins over 3R bins.	3	7	17	14	9	3.38	4	4	25	14	3	3.16
3.	The 3R trash bins inconvenient to use.	18	20	8	3	1	1.98	20	16	9	4	1	2.00
4.	My friends throwing trash according 3R category.	5	7	25	10	3	2.98	11	16	15	8	0	2.40
5.	I participated in 3R activities at school.	0	7	11	19	13	3.76	1	9	23	15	2	3.16
6.	I like recycling stuff.	0	1	12	20	17	4.06	3	5	15	16	11	3.54
7	Teachers remind about 3R practices in assemblies.	0	11	14	14	11	3.50	4	12	22	9	3	2.90

Based on Table 3, student involvement in 3R activities consisted of seven questions answered on a scale of 1 strongly disagree to 5 strongly agree. According to the interpretation of the mean range by Jamal (2002), there are two behaviour of student involvement in strengthening the 3R concept that is "fond of recycling" and "participating in 3R activities in schools" which have a mean score of 4.06 and 3.76 for SMK Kudat while 3.54 for SMK Abdul Rahim which "likes to recycle". This study shows that students mostly" like recycling stuff", however, their involvement is unsatisfactory due to the lack of facility and lower exposure. Student involvement such as "littering according to 3R categories", "use regular bins over 3R's", "friends littering

according to 3R's categories", and "3'R's reminders in school assemblies" were at moderate score levels for both schools. The lowest mean average was "friends throwing the garbage following the 3R category" with 2.98 and 2.40, and "3R bins are difficult to use", with the mean score 1.98 and 2.00 for each school. However, the statement is a negative question which reduces the Strongly Agree and Agree answers among students. For that statement, the use of 3R bins is not difficult to use.

Relation Between Knowledge and Involvement To 3R Activities among Students

Table 4 shows the relation between knowledge and involvement to 3R activities among students

Variables	Mean	Standard Deviation
Knowledge	3.12	0.56722
Involvement	2.34	0.52783

Table 5 Pearson Correlation Analysis

Correlation			
		Level of knowledge	Level of student involvement
Level of knowledge	Pearson Correlation	1	.527**
	Sig. (2-tailed)		<.001
	N	100	100
Level of student involvement	Pearson Correlation	.527**	1
	Sig. (2-tailed)	<.001	
	N	100	100

** . Correlation is significant at the 0.01 level (2-tailed)

Table 5 shows the correlation coefficient value between the variables of student knowledge with student involvement in 3R (reduce, reuse, & recycle) activities in school with r = 0.527. The significance level was 0.001<0.01 (very significant). A total of 100 students became the study's respondents to obtain the correlation between the variables of knowledge and student involvement, N = 100. The findings show a relationship between the variables that is r (100) = 0.527. This indicates there is a relationship between the variables that high

student knowledge directly increases the level of student involvement in 3R activities in school. The direction of the relationship is positive because the value of r=0.527 is positive means the higher level of students' knowledge, the higher level of students involved in 3R programs in school. Studies by M.A Noor & Azhar Abd Hamid (2013) and Murugan (2019) show a significant relationship between knowledge and recycling practices where there are differences in recycling practices between men and women. Women prefer to segregate items as their routine and a responsibility to take care of their family. Cheku et al. (2017) state that a concern and attitude towards the environment is essential to creating an environmentally responsible society. In this study, the better the students' knowledge level, the higher involvement in 3R activities in school. In further reducing the production of waste and improve the quality of the environment.

Suggestions For Improving 3R Concepts in Schools

Table 6 shows suggestions for improving the 3R concept in schools

NO	SUGGESTIONS	SMK KUDAT						SMK ABDUL RAHIM					
		SD	D	NS	A	SA	MEAN	SD	D	NS	A	SA	MEAN
1	Increase the quantity of 3R bins in schools.	1	1	1	23	24	4.36	1	2	3	13	31	4.42
2	Give rewards (money, medals, certificates).	1	3	14	24	8	3.70	0	3	9	33	16	4.02
3	Impose fines who not participate	3	7	17	12	11	3.42	7	4	13	21	5	3.26
4	Organize competitions for each class.	0	1	2	14	33	4.58	0	0	5	24	21	4.32
5	Organizes more 3R programs in school.	0	0	4	19	28	4.50	1	1	2	26	20	4.26

Based on Table 6, most of the students agreed with the suggestions to improve 3R practices in schools where the average mean shown was in the range of 3.26 to 4.42. There were five suggestions to increase awareness of the 3R concept in schools which were answered according to scale one strongly disagrees to scale five strongly agree. The suggestions are to "increase the quantity of 3R bins" with the highest average mean of 4.42 in SMK Abdul Rahim

and 4.58 on "organize competitions for each class." in SMK Kudat. Meanwhile, the average mean with the lowest score is 3.26 (SMK Abdul Rahim) and 3.42 (SMK Kudat), which "imposes fines or merit on students who do not participate in recycling activities". The other three suggestions are average; "giving rewards or prizes to active students", :3R competitions for each class", and "organizing more 3R concept activities" had the highest average mean of 4.32 (SMK Abdul Rahim) and 4.50 (SMK Kudat). Suggestions were implemented in group involvement and openly received a good response because students are more inclined and active in activities outside the classroom.

CONCLUSION

Overall, the student involvement and knowledge related to this 3R concept are seen to be very satisfactory, although some important elements are less emphasized. In this effort, the school, especially teachers, have tried various ways so that the importance of this concept can be applied among students. Among the things that have been done include the preparation of 3R bins, the organization of 3R concept programs, and the preparation of areas for recycling. Such alternatives should be multiplied so that more students are aware of the importance of the 3R concept and encourage more schools to strengthen the implementation of the concept. However, the limitation to this study is only involved a small scale and required a larger scope of the study.

REFERENCE

A. Albani, Kim Hwang Yong & Mohd Zamri Ibrahim. (2013). Wind energy investigation in northern part of Kudat, Malaysia. *International Journal of Enginering and Applied Sciences, 2 (3),*14-22

Berita Awani. (2018). *Peningkatan suhu bumi ancaman kepada penduduk dunia.* Dilayari daripada *https://www.astroawani.com/berita-dunia/peningkatan-suhu-bumi-ancaman-kepada-penduduk-dunia-18 7721*

Ahamad Shabudin Bin Yahaya. (2009). *Penilaian program kitar semula sisa pepejal di sekolah menengah dalam tiga kawasan pihak berkuasa tempatan di Negeri Selangor"*. Tesis Ijazah Doktor Falsafah (tidak diterbitkan). Universiti Putra Malaysia.

Jamilah Hj. Ahmad, Hasrina Mustafa, Hamidah Abd Hamid & Juliana Abdul Wahab. (2011). Pengetahuan, sikap dan konsep masyarakat Malaysia terhadap isu alam sekitar. *Akademika, 81*(3), 103-115.

Kamaruddin Husin. (1997). *Psikologi dalam bilik darjah*. Utusan Publications and Distributors.

Mazaitul Shima Mazlan, Shahirah Umamah Abdul Mutalib & Er Ah Choy. (2015). Faktor sikap pelajar dalam peningkatan tahap kelestarian kampus: Kajian kes Universiti Kebangsaan Malaysia. *Malaysian Journal of Society and Space, 11*(8), 52-65.

Mior Ahmad Noor, M. A. N., & Abd Hamid, A. (2013). Tinjauan pembudayaan kitar semula dalam kalangan pelajar "Technical Vocational Education and Training" (Tvet). *Journal of Techno-Social, 5(2).* Dilayari daripada https://publisher.uthm.edu.my/ojs/index.php/JTS/article/view/1418

Muhammad Jeffery Hizwan bin Said. (2018). Tahap sikap kerja dan hubungannya dengan prestasi kerja pekerja: Kajian di Syarikat Triple A. Kertas Cadangan Penyelidikan Sarjana Muda. Dilayari daripada https://www.researchgate.net/publication/324056198

Murugan A/L Mini Ratamun. (2019). Pengetahuan dan amalan kitar semula oleh guru pelatih institut pendidikan guru. *Jurnal Penyelidikan IPGK BL Tahun 2019, 6, 13-25.*

Noor Erma, A., & Leong, K. (2014). Hubungan antara sikap, minat, pengajaran guru dan pengaruh rakan sebaya terhadap pencapaian Matematik Tambahan Tingkatan 4. *JuKu: Jurnal Kurikulum & Pengajaran Asia Pasifik, 2*(1), 1–10.

Noor H. Cheku, Ibrahim Mamat & Mohd Yusri Ibrahim. (2017). Faktor penentu amalan kitar semula generasi Y di Terengganu. *Sains Humanika, 9*(3), 9-15. Dilayari daripada https://www.researchgate.net/publication/317785244_Faktor_Penentu_Amalan_Kitar Semula_Generasi_Y_Di_Terengganu

Portal Rasmi Jabatan Pengurusan Sisa Pepejal Negara. (2015). Kitar Semula (3R). Dilayari daripada https://jpspn.kpkt.gov.my/index.php/pages/view/131

Sumarni Lapammu & Zamri Mahamod. (2018). Tahap pengetahuan, sikap, dan kesediaan pelajar tingkatan empat terhadap penggunaan pembelajaran persekitaran maya VLE FROG dalam pembelajaran bahasa Melayu. *Jurnal Pendidikan Bahasa Melayu – JPBM, 8* (1), 53-62.

Tan Pei San & Norzaini Azman. (2011). Hubungan antara komitmen terhadap alam sekitar dengan tingkah laku mesra alam sekitar dalam kalangan pelajar universiti. *Jurnal Personalia Pelajar*, *14,* 11-22.

Wong Hock Tsen, Lee Hock Ann, Rosazman Hussin, & Ejria Saleh. (2018). Mariculture in Kudat and Kota Marudu Sabah, *Jurnal Kinabalu, 24.* Retrieved from http://jurcon.ums.edu.my/ojums/index.php/ejk/article/view/1661

Zalizan Mohd Jelas, Saemah Rahman, Roselan Baki & Jamil Ahmad. (2005). Prestasi akademik mengikut gender. *Jurnal Pendidikan, 30*, 93-111.

Zurina Ahmad Saidi & Er Ah Choy. (2016). Penggunaan bekas makanan mesra alam di Malaysia: Kajian awal pengetahuan dan kesanggupan pelajar Universiti Kebangsaan Malaysia. *Malaysian Journal of Society and Space, 12* (10), 113-126.