

Is The Craft-Making Materials in Elementary School Student Books 2013 Curriculum Suitable with 3R (Reduce, Reuse, Recycle) Principles?

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Abstract. The amount of damage that has been caused by waste as a form of human indifference to the environment requires real action to deal with it. Various efforts have been made to reduce waste in Indonesia. One of which is to integrate the principles of 3R waste management (reduce, reuse, and recycle) in the materials for making handicrafts in elementary schools. This study aims to analyze the suitability of the material for making handicrafts with the 3R principle. This study uses a qualitative descriptive research method with content analysis techniques. The data source is the Student Book for 1st grade to 6th of elementary school Curriculum 2013. The research instrument used is a checklist containing the criteria for the suitability of craft-making materials with 3R principles. The results showed that the material for making handicrafts in the elementary school student books was very suitable with the 3R principles. 1st grade has a suitability category of 61.11%, 2nd grade is 75%, 3rd grade is 100%, 4th grade is 83.33%, 5th grade is 100%, and 6th grade is 83.33%. So that the overall suitability of all grades is 83.78%, which means the material is very suitable with the 3R principle.

Keywords: Environment-based Learning, 3R (Reduce, Reuse, Recycle), Student Book, Handicrafts, Elementary Schools.

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INTRODUCTION ~ Currently, the earth that humans live on is almost like a disaster full of damage. Even the damage that occurs is mainly caused by humans themselves, especially in densely populated areas. The decrease in green open space is due to population growth, so that development continues. The rapid pace of economic growth affects the selection of goods that are not environmentally friendly (Supriatna, 2017). Even Kamsiati (2017) added that Indonesia is one of the largest plastic waste dumping countries in the sea. Based on these illustrates that humans who live on earth have destroyed their own homes.

The amount of damage that has been caused by human indifference to the

environment requires the formation of real actions to deal with these problems. Various efforts have been made to reduce waste in Indonesia. One of the efforts that are considered to produce positive results in reducing waste is integrating environmental care into learning in schools. There are many activities that can be carried out in schools to provide knowledge to students about the importance of protecting the environment. As one example, Nuta Supakata, et al, researched by implementing RRR communication strategy through environmental camp as a comprehensive communication tool to promote the RRR concept to elementary school students (Supakata, Puangthongthub, Srithongouthai, Kanokkantapong, & Chaikaew, 2016).

Students understand more about solid waste management through reducing, reusing, and recycling activities through the camp. This indicates that integrating waste management activities in education can be done to reduce waste and give students an understanding of the importance of protecting the environment.

In Indonesia, every learning has been regulated in a curriculum that has been determined by the ministry of education in Indonesia so that every school can use it throughout Indonesia. In the current curriculum in Indonesia, namely the 2013 Curriculum, learning is carried out using thematic concepts. The point is that every material that students must study is integrated with other relevant material. So that students see the material as a unified whole, including material on the importance of protecting the environment. In addition, learning in the 2013 Curriculum is focused on improving cognitive aspects and affective and psychomotor aspects. One way is by doing craft-making activities. Furthermore, the Ministry of Education and Culture, Agency for Research, Development, and Books at the Policy Research Center (2020) stated that crafts are an effort that schools can make to facilitate functional physical-motor development. That means the material for making crafts is essential in schools to maximize the psychomotor development of students.

Craft-making material is material that is taught in elementary schools from 1st grade to 6th grade. According to the Cambridge Dictionary, handicraft is a skilled activity in which something is made in a traditional way with the hands rather than being produced by machines in a factory or an object made by such an

activity (Cambridge University Press, 2021). Crafts are made of various materials that can produce decorations or art objects, or goods for use. According to Raharjo (2011), craft has value as alternative creativity, namely an item produced through hand skills. Then more fully, Sumanto and Sukamti (2018) say that crafts are activities related to the manufacture of an item or product resulting from skilled handwork or activities related to goods produced through hand skills.

Crafts can be grouped based on function or utilization; some handicraft products are adapted to their names: (1) handicrafts made with practical or applied function orientations. And (2) handicrafts are made primarily as works of art or decorative objects to enjoy the impression or value of beauty Sumanto and Sukamti (2018). In elementary school learning, there are handicrafts oriented towards practical functions such as making tissue boxes, hats, etc., and arts-oriented crafts such as making sculptures, masks, etc.

Craft-making activities in elementary schools are found at every grade level, from 1st grade to 6th grade. All craft-making activities are contained in a book commonly referred to as the Student Book. The government officially issues the book through the Center for Curriculum and Books of the Republic of Indonesia. In addition, the book must be used by students as a guidebook and an activity book that will make it easier for students to be actively involved in learning (Ministry of Education and Culture of the Republic of Indonesia, 2018). In the book, there are many craft-making materials taught to students from 1st grade to 6th grade, one of which is

done to reuse waste or unused items. Thus students will learn to manage unused items into useful items (recycle), reuse waste that can still be used (reuse), and as a form of reducing environmental pollution (reduce).

Reduce, reuse and recycle is one of the waste management methods supported by the Indonesian government. In more detail, in Law Number 81 of 2012 concerning the Management of Household Waste and Waste Similar to Household Waste, there are three main activities in the implementation of waste reduction activities, namely limiting waste generation, recycling waste, and reusing waste. These three activities embody the principle of environmentally sound waste management called 3R (reduce, reuse, recycle).

Reduce means activities to reduce waste production and do not make excessive consumption patterns. Kurniasari (2019) describes the activities included in reducing, which are reducing the use of goods that cannot be recycled, and reducing the use of goods that are not really needed. Escario, Rodriguez-Sanchez, & Casaló (2020) added reduce including reducing the use of products that use packaging. Meanwhile, reducing materials or saving money was conveyed by Hermawati Nur (2019) as one of the reduced activities.

Then, reuse is the activity of reusing items that are still fit for use. Law Number 81 of 2012 states that what is meant by reuse is an effort to reuse waste according to the same function or a different function and/or reuse part of the waste that is still useful without going through a processing process first, for example, filling return a drink bottle with drinking water or use a

can as a pencil case. While recycling is an effort to use waste into valuable goods after going through a processing process first, for example, making sculptures using unused newsprint pulp.

Research conducted by Trisnawati and Khasanah states that using the 3R concept (reuse, reduce, recycle) can help the government create a healthy, clean and comfortable environment (Trisnawati & Khasanah, 2020). Furthermore, Handayani and Purwanto show that making crafts using used goods can foster an attitude of caring for the environment in students (Handayani & Purwanto, 2019). Thus, using used goods in a craft can foster students' environmental care attitude while creating a healthy, clean and comfortable environment.

Applying the 3R principle in making handicrafts in elementary schools is a fundamental step to prevent environmental pollution. However, has elementary schools' craft-making material in the 2013 Curriculum Student Book maximally applied the 3R principle? Craft making materials needs to consider the decisions of choice, reduce, reuse, and recycle, which requires more effort put into the current waste management system with better equipment and education (Chow, So, & Cheung, 2016). In other words, every material used in making handicrafts, in order to create environmentally sound waste management, must use materials in the form of used goods that are no longer used, easy to obtain as a form of saving money from buying new goods, and creating something useful from the use of used goods. Therefore, based on the explanation above, this study will discuss the suitability of the material for making handicrafts in the 2013 Curriculum

student books with the 3R principle (reduce, reuse and recycle).

METHOD

This research uses a descriptive qualitative research method. Meanwhile, the researcher uses the content analysis technique, which aims to conclude the book's contents with an objective and systematic identification. The content analysis of the craft-making materials was carried out in the Student Books for 1st grade to 6th grade of the 2013 Curriculum elementary school. The materials for crafting were analyzed and seen for their conformity with the 3R (reduce, reuse, and recycle) principles. The data collection instrument used in this study was a checklist containing the criteria for the suitability of craft-making materials with the 3R principle. The criteria for conformity between the material and the 3R were adopted from Masyhud (2016). Meanwhile, the conformity indicators are prepared suitable with Law Number 81 of 2012 concerning Management of Household Waste and Waste Similar to Household Waste, including 1) Reduce: handicrafts are made by utilizing waste/used goods that cannot be decomposed by natural processes, materials not items that have just been obtained or purchased, and craft materials are easily decomposed by natural processes, 2) Reuse: Utilize waste

or used items that can be reused, and 3) Recycle: Use waste or used items into useful items after through a preprocessing process.

RESULTS

Based on the researcher's observations of the Student Book, the material regarding making crafts is found in 1st grade to 6th grade. Each type of craft making in each grade is analyzed according to the 3R principle. The results of the analysis are described in detail below based on the tables that have been made.

For each craft-making material that is suitable with one 3R principle, it is given a score of 1, if it is suitable with two principles, it is given a score of 2, and if it is suitable with the three principles, it is given a score of 3. The maximum score that can be achieved by 1st grade is 18. The maximum score that can be achieved by 2nd grade is 24. The maximum score that can be achieved by 3rd grade is 21. The maximum score that can be achieved by 4th grade is 18. The maximum score that can be achieved by 5th grade is 18. The maximum score that can be achieved by 6th grade is 12.

Information:

S = Suitable

FS = Fairly Suitable

NS = Not Suitable

Table 1. Data Analysis of the Suitability of Craft Making Materials with 3R in 1st grade

Grade	Craft Making Material	Score	Percentage	Criteria
1 st	Make photo frames using paper pulp	3	100%	S
	Create 3-dimensional works using clay	2	66,66%	FS
	Decorate pencils using chicken feathers	1	33,33%	NS
	Make hats and decorate them using chicken feathers	1	33,33%	NS
	Make a boat using used bottles	3	100%	S
	Making a windmill out of paper	1	33,33%	NS
	Total Score		11	
Percentage of Compliance with 3Rs in 1 st Grade		61,11%		Suitable

Table 2. Data Analysis of the Suitability of Craft Making Materials with 3R in 2nd grade

Grade	Craft Making Material	Score	Percentage	Criteria
2 nd	Make decorations using seeds	2	66,66%	FS
	Make decorations using shells	2	66,66%	FS
	Making tissue boxes using cardboard	3	100%	S
	Make photo frames using cardboard	3	100%	S
	Make a pencil case using used bottles	3	100%	S
	Make decorations using dried leaves	3	100%	S
	Make decorations using beads	1	33,33%	NS
	Create 3-dimensional works using soap	1	33,33%	NS
Total Score		18		Suitable
Percentage of Compliance with 3Rs in 2 nd Grade		75%		

Table 3. Data Analysis of the Suitability of Craft Making Materials with 3R in 3rd grade

Grade	Craft Making Material	Score	Percentage	Criteria
3 rd	Make a mosaic using dry leaves	3	100%	S
	Make a chicken doll using used cardboard	3	100%	S
	Making a hat using newsprint	3	100%	S
	Make a hand fan using cardboard and ice cream sticks	3	100%	S
	Make a phone using a can	3	100%	S
	Make a toy car using used cardboard	3	100%	S
	Make a toy house using paper	3	100%	S
	Total Score		21	
Percentage of Compliance with 3Rs in 3 rd Grade		100%		

Table 4. Data Analysis of the Suitability of Craft Making Materials with 3R in 4th grade

Grade	Craft Making Material	Score	Percentage	Criteria
4 th	Making a windmill out of paper	1	33,33%	NS
	Making color discs using paper	2	66,66%	FS
	Make a simple magnifying glass using a bottle and water	3	100%	S
	Make a periscope using cardboard and a mirror	3	100%	S
	Make a collage using paper / cloth / plastic.	3	100%	S
	Make a mosaic using waste paper	3	100%	S
	Total Score		15	
Percentage of Compliance with 3Rs in 4 th Grade		83,33%		

Table 5. Data Analysis of the Suitability of Craft Making Materials with 3R in 5th grade

Grade	Craft Making Material	Score	Percentage	Criteria
5 th	Making a chessboard using cardboard	3	100%	S
	Make a moving doll using cardboard	3	100%	S
	Make a mask using cardboard and newspaper	3	100%	S
	Making sculptures using paper pulp	3	100%	S
	Making a coffee solution using a plastic cup	3	100%	S
	Making jumput batik using cloth	3	100%	S
	Total Score		18	
Percentage of Compliance with 3Rs in 5 th Grade		100%		

Table 6. Data Analysis of the Suitability of Craft Making Materials with 3R in 6th grade

Grade	Craft Making Material	Score	Percentage	Criteria
6 th	Making sculptures using plasticine	3	100%	S
	Making a solar cooker using plywood	1	33,33%	S
	Create a space using embossed paper	3	100%	S
	Making notes using a glass filled with water	3	100%	S
Total Score		10		Very
Percentage of Compliance with 3Rs in 6 th Grade		83,33%		Suitable

DISCUSSION

1st grade

Following table 1, the material for making handicrafts in 1st grade of elementary school has a conformity percentage of 61.11%, meaning that the material is said to be suitable with the 3R principle. Making 3-dimensional works using materials that are easily decomposed by natural processes, namely clay, is a good thing to do to protect the environment. Still, these materials are not materials that come from used goods that are reused, so that the level of conformity is not optimal for the principle of reuse. Likewise, crafts using chicken feathers still do not reflect the principle of reduce and reuse, even though the objects used are easily decomposed by natural processes, but if viewed from the point of view of good waste management, chicken feathers can be replaced by using objects that are difficult to decompose, such as straws that are not biodegradable. Pasted with paper shaped like a chicken feather. That way, one of the materials that are difficult to decompose by nature (straws) can be utilized.

The material that must be used in making the windmill is a colored paper which students can buy new paper (not used paper). This is not suitable with the 3R principle because the paper is made from trees, which means that the use of new colored paper is less relevant to the reduce principle, because saving paper is saving trees (State Council of Educational

Research and Training, 2012, p. 112). Therefore, it can be replaced by suggesting students use used paper or replaced by plastic bottles that are then cut out and shaped like a propeller. Utilizing used bottles instead of paper as propellers on windmills will help nature more because plastic bottles are a material that is difficult to decompose by nature (Desy, Sugito, & Atmaja, 2018). However, the principle of recycling in every craft in 1st grade of elementary school is said to be appropriate because all handicrafts produce useful objects through the process of processing objects. The rest, making handicrafts in 1st grade, is very suitable with the 3R principle.

2nd grade

The material for making crafts in 2nd-grade elementary school has a conformity percentage of 75%, meaning that the material is said to be suitable with the 3R principle. However, there are still some materials in the manufacture of handicrafts in 2nd grade that still have not maximally applied the 3R principle. As in the craft of making ornaments, students can be provoked to buy new beads. Students will find it difficult to find beads at their disposal or unused at home, so students will likely buy them. In fact, one of the goals of recycling is to reduce the use of new raw materials (Yuliarty, Anggraini, & Kristiana, 2019). Therefore, it would be nice if the use of beads could be replaced using small pieces of straws of different colors to be used as

decorations. The use of cut straws instead of beads is a better thing from the point of view of the 3R principle because it utilizes objects that are difficult to decompose by natural processes.

In addition, there are materials for making crafts to make 3-dimensional works using soap. The material is considered not to apply the 3R principle because the material used is soap. Making carvings using soap will leave a lot of remnants of small pieces of soap wasted. It is harmful to the environment if the remains of the carvings are not managed properly. Soap that is wasted into the soil will increase the pH of the soil, causing the separation of soil components and threatening the level of soil biological activity, while soap that is wasted into rivers is harmful to aquatic plants and causes the eutrophication process (Chirani, Kowsari, Teymourian, & Ramakrishna, 2021). The process of eutrophication is water pollution caused by the emergence of excessive nutrients into aquatic ecosystems that can cause mass fish death (Suryo, 2015). Therefore, it would be better if you replace it by using clay or plasticine made from food ingredients that are easily decomposed by nature.

3rd grade

The material for making crafts in grade 3 of elementary school gets a 100% conformity percentage, which means that the making of crafts in grade 3 is very suitable with the 3R principle. The materials used are easy to obtain, so there is only a small chance that students will buy them because it is enough to look for the materials that will be easy to find. In addition, the use of materials such as cardboard and used newspapers are

various waste materials used for making useful products (State Council of Educational Research and Training, 2012). Furthermore, the use of paper in the manufacture of toy houses is suitable with the 3R principle because the paper recommended in the Student's Book is used paper, not new colored paper as in the manufacture of rattles in 1st grade. So, the materials for making crafts in 3rd grade already reflect the 3R principle. Where the materials used are materials that can be reused and valuable as a craft.

4th grade

Next is the material for making handicrafts in 4th-grade elementary school, which has a percentage of 83.33%, which means that the material is very suitable with the 3R principle. However, there are similarities in making handicrafts in 1st grade and in 4th grade, namely making windmills, so the explanation is not much different from the explanation described in 1st grade. As for the manufacture of color discs, there is a mismatch of the materials used with the reduce principle. The main ingredients of manufacture color discs can be added using waste cardboard. Apart from reducing waste, the use of cardboard on color discs will make them last longer.

5th grade

The material for making handicrafts in 5th-grade elementary school has a conformity percentage of 100%, which indicates that the craft is suitable with the 3R principle. All craft-making materials have applied the 3R principle. The materials used utilize used objects and utilize objects that are difficult to decompose by nature. This is an excellent thing to do because using non-recyclable

objects is a real contribution to reducing waste.

6th grade

The material for making handicrafts in 6th-grade elementary school has a suitability percentage of 83.33%, which means that the material for making handicrafts is suitable with the 3R principles. The materials used in each crafting material already utilize objects that can be reused and are easily digested by nature. Except for the manufacture of solar cookers, the material used is plywood. Even though the material is easily decomposed by nature, from a 3R point of view, if you can still use objects that can be reused, then take advantage of objects that can still be used repeatedly. An alternative material is a cardboard (corrugated one).

Based on the description and results of the analysis regarding the suitability of the material for making handicrafts in the Student Books for 1st grade to 6th grade of elementary school Curriculum 2013 with the 3R principle (reduce, reuse, recycle), if each score obtained from the entire grade (93) is divided by the total score that can be achieved (111) then the result is multiplied by 100, then the percentage of conformity is 83.78%, so the researchers get an idea that in general, the material for making handicrafts in the 2013 Curriculum Elementary School Student Book is suitable with the 3R principle.

CONCLUSION

Based on the analysis results, the suitability of the material for making handicrafts in the Student Books for 1st grade to 6th grade of elementary school Curriculum 2013 is very suitable with the

3R principle. The percentage of conformity is 83.78%. While the level of suitability of the craft-making materials in each grade with the 3R principle in more detail is: 1st grade is suitable with the percentage of conformity of 61.11%, 2nd grade is suitable with the percentage of conformity of 75%, 3rd grade is very suitable with the percentage suitability of 100%, 4th grade is very much suitable with the percentage of conformity of 83.33%, 5th grade is very suitable with the percentage of conformity of 100%, and 6th grade is very suitable with the percentage of conformity of 83.33%.

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