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To cite this article: H Suyitno *et al* 2018 *J. Phys.: Conf. Ser.* **983** 012080

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# Strategy for integration of coastal culture in learning process of mathematics in junior high school

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**Abstract.** Traditional life in the fishing family is part of the local culture. Many School-age children in the fishing family drop-outs due to lack of parents motivation and the environment was less supportive. The problems were: (1) How the strategy of integration of local culture in learning process of mathematics in Junior High School (JHS)? (2) How to prepare the Mathematics Student's Book for grade 7 of JHS that based on coastal culture, that has an ISBN, has international level, applicable, and in accordance with the current curriculum? The purposes of this research were: (1) to obtain the strategy of integration of local culture in learning process of mathematics in JHS, through FGD between UNNES and UKM; (2) to obtain the experts validation, through Focus Group Discussion (FGD) between UNNES and UKM toward the draft of the Mathematics Student's Book for grade 7 of JHS that based on coastal culture; (3) produces Mathematics Student's Book for grade 7 SMP which based on coastal culture and has an ISBN, international, applicable, and in accordance with the curriculum. The research activity was a qualitative research, so that the research methods include: (1) data reduction, (2) display data, (3) data interpretation, and (4) conclusion/verification. The main activities of this research: drafting the Mathematics Student's Book of Grade 7 which based on coastal culture; get the validation from international partners; conducting FGD at Education Faculty of *Universiti Kebangsaan Malaysia* through the program of visiting lecturers for getting the Mathematics Student's Book of grade 7 which based on coastal culture, registering for ISBN, and publishing the reasearch results in International seminar and International Journals. The results of this research were as follows. (1) Getting a good strategy for integration of local culture in learning process of mathematics in JHS. (2) Getting the Mathematics Student's Book for grade 7 of JHS that based on coastal culture, that has an ISBN, international level, applicable, and in accordance with the current curriculum.

## 1. Introduction

There were three main reasons why this joint research should be carried out. First, there was a big task for educators and institutions, especially Universitas Negeri Semarang (UNNES) to participate in suppressing the number of drop-out students from families of fishermen in taking the Basic Education. Second, the need for the integration of conservation in learning, especially which based on coastal culture need to be implemented in the learning process early on. Third, there has been MoU between Universitas Negeri Semarang (UNNES) with Universiti Kebangsaan Malaysia (UKM) that need to be followed up with real action, so there is real cooperation between the two universities. Among others by conducting the activity of joint research and joint publication. By visiting Lecturers to complete a



Mathematics Student's Book which based on coastal culture through a Focus Group Discussion (FGD) in UKM involving lecturers of UNNES and UKM.

Indonesia is an archipelagic country. Beach or coastal stretches hundreds of kilometers. As a result, the fishing community including school-age children also reach a very large number. These children are the future assets for the advancement of the nation. Traditional life in the fishing family is part of the local culture. Many School-age children in the fishing family drop-outs due to lack of parents motivation and the environment was less supportive. Due to the heavy duty of fishing in the sea, many fishermen families pay less attention to the education of their children. Not to mention the advent of the opinion that the high school level of education is not required in relation to the working life of the fishermen. There are some argue that the search for fish in the sea as a fisherman, does not need a high school until next level. As a result, in basic education often encountered that the children of fishermen families experiencing of drop-outs.

In order for the children of fishermen families have thought about the need for school, it is necessary to develop a Student's Book, especially mathematics based on coastal culture. If the parents see this Student's Book when students learn from the Student's Book, it is expected to appear the awareness of parents and students that the knowledge acquired in school are able to provide benefits to the environment of life as a family of fishermen.

The problems that will be solved through the joint research were as follows. (1) How the strategy of integration of local culture in learning process of mathematics in Junior High School (JHS)? (2) How to prepare the Mathematics Student's Book for grade 7 of JHS that based on coastal culture, that has an ISBN, international level, applicable, and in accordance with the current curriculum?

Based on the problems formulation above, then the objectives of this join research were as follows. The objectives of this research: (1) to obtain the strategy for integration of local culture in learning process of mathematics in JHS, through FGD between UNNES and UKM; (2) to obtain the experts validation, through Focus Group Discussion (FGD) between UNNES and UKM toward the draft of the Mathematics Student's Book for grade 7 of JHS that based on coastal culture; (3) produces Mathematics Student's Book for grade 7 JHS which based on coastal culture and has an ISBN, international, applicable, and in accordance with the curriculum.

### *1.1 Life Atmosphere in the Fishermen Village*

Life of the fishermen in the fishermen village, very poor condition. They tend to be poor. According to the National Committee of Indonesian Fishermen Organization (KPNNI) in 2009, about 90% of fishermen in Indonesia living in poverty. This is confirmed by the research results of Cimen [1] and Zaenuri, Suyitno, Rokhman, and Suyitno [2], who reported that fishermen in Indonesia besides living in poverty, education levels of fisherman citizens were also low.

Actually, the Indonesian government's efforts to promote education in the fishermen village speed is quite good. The government also facilitates with school buildings, teachers, and facilities/ infrastructure complement. The Indonesian government also programmed 9-year compulsory education. However, the government's efforts in the education sector is still confronted with problems of poverty who experienced by families of fishermen.

The low level of children education of fishermen's families, partly due to the following factors. (1) Motivation of parents to educate their children is very low. They consider that higher education is not required to be a fisherman. (2) Children fisherman in the school age has begun trained to assist the work of their parents, for example, catch fish in the sea, helped to organize the process of separation of fish by species and large-small fish, the drying process the fish, the fish storage, or helped the transport fish to the market. (3) Poverty makes the children of school age feel reticent to attend in the school because learning in school needs books, stationery, school uniforms, sports uniforms, and others.

### *1.2 Coastal Culture as the Part of Environmental Conservation*

Preserving the coastal culture is part of preserving the environment conservation. In order for the students to appreciate the meaning of the need to safeguard the environment, especially in coastal

areas, the coastal culture worthy of inclusion on the underlying mathematics in schools in coastal areas. Furuto [3], Stigler and Hiebert [4], wrote about the importance of incorporating elements of local culture like the rural culture or coastal culture in mathematics. It will be able to motivate the learning of the students and also foster a sense of love for the environment.

Wake [5] stated that the latest trend in math education today, offering some hope to change the role of mathematics in the context of safeguarding the countryside or the environment in which students live. In particular, the math can be empowered to help the teachers to connect the school math with the lives of students and their community environments. In fact, Tandiseru [6]) wrote that the mathematics learning based on localculture effective to improve of students' creative thinking skills. Students become familiar and close to life in their environment.

Involving the cultural environment in the learning of mathematics is often referred to as ethnomathematics. Rosa and Orey [7] stated that ethnomathematics was study the cultural aspects in mathematics. Furthermore it is said that if mathematics is regarded as a cultural construction, then mathematics is a product of cultural development as well. Additionally, ethnomathematics in higher thinking, can be described as the way in which the certain cultured people to use mathematical ideas and mathematical concepts in handling quantitative, relational and spatial aspects of their lives.

Within the scope of regionalism more refined, Cheriani, Mahmud, Tahmir, Manda, and Dirawan [8] in his study wrote that in mathematics learning is based on Bugis culture clearly which is very close to this coastal culture, it can increase the ability of JHS students in problems solving. This is in accordance with the opinion of Hasanuddin [9] which stated that mathematics should be linked to real life. Thus, the Coastal Culture as part of environmental conservation should be included as a base in mathematics learning in JHS.

Now, the current curriculum in Indonesia is Curriculum of 2013 Revised Edition. Student's Books for mathematics in JHS that are ready and available at any educational institution with an adequate amount. In fact, the drop-out rate of children of the school age of fishermen are still very high. The motivation for the children to the fishermen families want to go to school is also very low. Thus, it should be sought and found a way for the school-age children from the fishermen families, so that like to back in school.

The research team believes that one of the tools to encourage the growth of motivation in school is the procurement of Student's Bookthat has minimum national standard, but has content based on coastal culture. Hopefully, if the parents reading this Student's Book, students also learn from this mathematics Student's Book, it will grow motivation that children of the school age of fishermen can go to school or continue their education. Mogari [10] argued that incorporate local cultural elements that were relevant in the study of mathematics for the students was necessary. The students will find that math is very helpful.

This Mathematics Student's Bookbased on coastal culture, prepared by considering: (1) compliance with the basic competencies that established by Ministry of Education and Culture of Indonesia; (2) equal to the contents Student's Book of Curriculum of 2013 Revised Edition, that made by the government of Indonesia; (3) easy to read and understand by the students in the 7th grade of JHS; (4) a description of all the material, exercises, and tasks that exist in the Student's Book is based on coastal culture; (5) the contents of this Student's Book as well as for children movivatorof fishermen family, because it provides new insights that mathematics is very useful to support a better life than the existing ones.

## 2. Methods

This research used a research method with the qualitative approach, which had the characteristics of a natural setting as the data source directly, descriptive and more important process to obtain accurate results. The analysis in this qualitative research tends conducted inductive analysis and meaning were essential.

Preliminary study and making a draft of Math Student's Book were as follows: (1) At the phase of preliminary was planned as follows: literature study, study/field data collection at the coastal regions,

and a description and analysis of the findings in the field (model factual). (2) Based on the description and analysis of the findings in a factual, then begin to exploring forms of coastal cultures and their relation to mathematics concepts. (3) Making a draft of Math Student's Book of JHS based on Coastal Culture as spirit booster of fishermen's children in school.

Further conducted research activities as follows: printing the draft of Mathematics Student's Book of Grade 7 which based on coastal culture; get the validation from international partners; conducting FGD through the program of visiting lecturers for getting the Mathematics Student's Book of grade 7 which based on coastal culture, registering for ISBN.

Based on the problems formulation and the objectives of this join research then the indicators of successful research were as follows. (1) Got the strategy for integration of local culture in learning process of mathematics in JHS, through FGD between UNNES and UKM; (2) Got the experts validation, through Focus Group Discussion (FGD) between UNNES and UKM toward the draft of the Mathematics Student's Book for grade 7 of JHS that based on coastal culture; (3) Got the produces of Mathematics Student's Book for grade 7 SMP which based on coastal culture and has an ISBN, international, applicable, and in accordance with the curriculum.

### 3. Result and Discussion

The results of research were as follows. The first, got the strategy for integration of local culture in learning process of mathematics in JHS, through FGD between UNNES and UKM. Strategies include: (a) Teachers must know the lives of fishermen and their problems. (b) Teachers need to give students insight that math is very necessary and can solve many problems related to the life of fishermen. (c) Teaching mathematics by using textbooks of mathematics whose examples were related to the lives of fishermen. (d) There were efforts of parents and local government to motivate the fishermen children to go to school. The second, got the experts validation, through Focus Group Discussion (FGD) between UNNES and UKM toward the draft of the Mathematics Student's Book for grade 7 of JHS that based on coastal culture. The experts validation is used to correct the draft. The third, got the produces of Mathematics Student's Book for grade 7 SMP which based on coastal culture and has an ISBN, international, applicable, and in accordance with the curriculum. For discussion, note the following description. The book was expected to be used by students from fishing families. Children of fishermen's families, in terms of ability of thought, not inferior to the children of the city. Only, children and parents of fishermen families need to be motivated so that the children want to go to school, as shown in Figure 1.



**Figure 1.** Math student's book for grade 7 of JHS that based on coastal culture

The Focus Group Discussion at Fakulti Pendidikan Universiti Kebangsaan Malaysia which discusses about: (1) strategy for integration of local culture in learning process of mathematics in Junior High School; (2) content of the draft of the Mathematics Student's Book for grade 7 of JHS that based on coastal culture.

Figure 2 shows an example of the book snippet of Mathematics Student's Book for Grade 7 of JHS that Based on Coastal Culture a page 6:



**Figure 2.** Part of Mathematics Student's Book

From the above-mentioned snippet, it shows that this research has resulted in a Mathematics Student's Book for grade 7 of JHS that based on coastal culture.

#### 4. Conclusion

Based on the description in this article it can be concluded things as follows: (1) The strategy for integration of local culture in learning process of mathematics in JHS, through FGD between UNNES and UKM. Strategies include: (a) Teachers must know the lives of fishermen and their problems. (b) Teachers need to give students insight that math is very necessary and can solve many problems related to the life of fishermen. (c) Teaching mathematics by using textbooks of mathematics whose examples were related to the lives of fishermen. (d) There were efforts of parents and local government to motivate the fishermen children to go to school. (2) Research team had prepared a Mathematics Student's Book for grade 7 of JHS that based on coastal culture. That book had ISBN namely 978-602-1034-92-7.

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