

Research article

The Presentation of Indonesian Cultural Perspective in Mathematics Textbook

Dyana Wijayanti* and Mohamad Aminudin

Mathematics Education Department, Universitas Islam Sultan Agung, Indonesia

Abstract.

Contents related to the cultural perspective of a region must be integrated into the design of their curricula (including textbooks) at all levels. The government of Indonesia has facilitated students and teachers across the country free access to online downloadable learning resources. With a focus on issues about the presentation of a cultural perspective in Indonesia mathematics textbooks, this study examined a widely used curriculum resource series for lower secondary school and high school – *Buku Sekolah Elektronik* – published by the Indonesian Government that be accessed for free, to explore how the cultural influence is manifested in the two series of resource books. For data collection and analysis, the authors developed a framework by Fan (2018) who has classified cultures into six types concerning people's beliefs, values, and ways of interacting. More precisely, the authors considered geography as a variable for data collection. As result, they found that the introduction of geography in Indonesian junior high school mathematics textbooks is still minimal.

Keywords: Indonesian cultural perspective, mathematics textbooksCorresponding Author: Dyana
Wijayanti; email:
dyana.wijayanti@unissula.ac.id

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1. Introduction

It is not like in the 1950s, study about textbooks has getting attention from researchers nowadays. At the same time, issue about sustainable development has emerged in education sector. In relation to this condition, United Nations Development Programme has targeted sustainable development goals which are blueprints to achieve a better and more sustainable future. In making it happen, there are several interrelated challenges such as, poverty, climate change, environmental degradation, health, proper education etc. Culture plays an important role in facing these challenges. After all, [1] stated that sustainable development develops and manifests in culture. In education sector, we can see elements of culture in curriculum in many countries in the world, including Indonesia

Indonesia has adapted culture as an inseparable part of the recent curriculum. In the mathematics core competence for lower secondary school it said that ...understanding

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knowledge (factual, conceptual and procedural) based on curiosity about science, technology, art, culture related to visible phenomena and events'[2]. This document surely need to emerge not only in teaching learning but also in textbooks. It is because textbooks is a potential implemented curriculum. Additionally, textbooks have a very important role in learning mathematics[3,4]. Textbooks are equally important learning resources both for students to learn mathematics and for teachers to plan and teach in the classroom. In fact, in some cases, teaching in mathematics classes is generally planned and disseminated using math problems and activities found in textbooks. So it can be predicted that books are an important factor in educational practice.[5,6,7]. In short, its not only students who depend on textbbok, teacher also lean a lot on textbook.

Research on culture-based textbooks is important. However, not many studies have raised this issue. [8] have carried out an international study of mathematics textbooks taken from various international journals. As a result,[8] stated that although research on textbooks (including research on textbook comparisons) occupies a dominant position of 63%, only a few studies discuss culture. The research conditions in Indonesia are also not too favorable. This is proven in pre-research activities by looking for articles in SINTA. SINTA (Science and Technology Index) is a portal provided by the government whose function is to assess the performance of journals based on accreditation and citation standards, by indexing all national journals that have been accredited by the National Journal Accreditation. We can find SINTA in <https://sinta.kemdikbud.go.id/>. On that page, the researcher focuses on mathematics education articles with the theme of textbooks and culture from September 2019 - August 2020. The results of the study state that there are no articles that focus on culture-based textbooks. Even so, there are 15 articles (non-textbook research) with the theme of ethnomathematics From International research perspective,[8] employed a broad concept of culture and established a conceptual framework that classifies culture into six types in relation to people's beliefs, values and interactions concerning them. However, in this study, they focus on comparing culture mathematics textbooks between Chinese series and the English series (translated from Chinese series).

Thus, knowing how the bargaining position of research on textbooks in Indonesia that focuses on culture is very interesting. From the above explanation, this study examined widely used curriculum resource series called 'Electronic school books' from lower secondary school. In facilitating the importance of textbooks, the Indonesian government through the curriculum and book center implements the procurement of textbooks. In the process, the government held a textbook competition that invited textbook authors to be judged. If it meets the assessment standards, the committee will

buy the copyright and upload the book to the <https://buku.kemdikbud.go.id/buku-teks> page. This textbook, called the Electronic School Book (BSE), is a book that can be accessed online by both teachers and students for free. In short, this study aims to find out how the influence of culture in mathematics textbooks in Indonesia.

2. Research Methods

In terms of research paradigm, this research is a case study focusing on electronic school books from lower secondary school. *Buku Sekolah Elektronik* (BSE) is an initiative by the Ministry of National Education where residents can download more than 1300 elementary, junior high, high school and vocational school textbooks after registering as a member of the BSE database free of charge. The ease of access of the book is one of the reasons for us to use the book as the focus of our research. This is with the assumption that the textbook is used dominantly by all students/teachers in Indonesia. Here are the titles of the books we studied (table1).

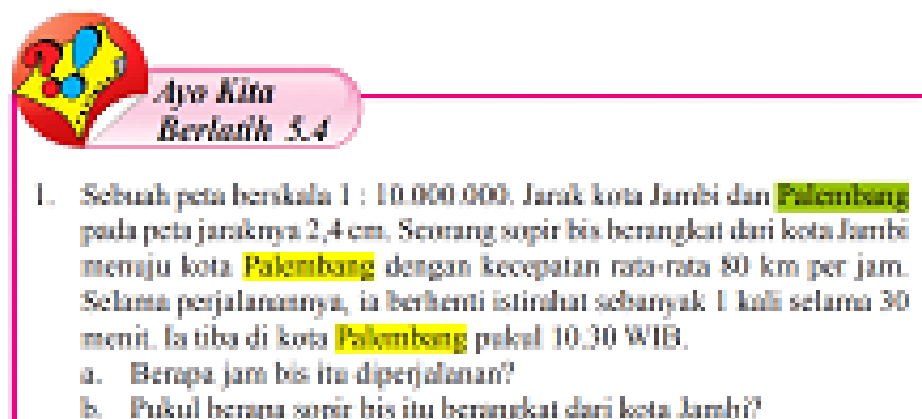
TABLE 1: Short cut keys for the template.

Grade	Title	authors	Year published
VII (1 st Semester)	Matematika	As'ari, A. R., et. all	2017
VII (2 nd Semester)	Matematika	As'ari, A. R., et. all	2017
VIII (1 st Semester)	Matematika	As'ari, A. R., et. all	2017
VIII (2 nd Semester)	Matematika	As'ari, A. R., et. all	2017
IX	Matematika	Subchan, S. et. all	2018

Document analysis methods were employed to collect and analyze the data; after the data were collected from each textbook, similarities and particular differences were examined from a comparative perspective. In terms of data collecting, we will take the definition used by[8]. He operationally defines culture as symbols created by humans, including artifacts, behaviors, languages, and words (characters), organizations and identities, and moreover, behind and related to the symbols, the beliefs, values, customs, regulations, and patterns shared by humans of a social group. Then, we collect the data about culture in textbooks in explanation, example, and task section utilizing[8] categorization namely geography[9], artifacts, flora and fauna[10], organizations[11], ways of behaving, and customs[12], history [5], identity[1]. However, due to time-limited, we will focus only on geography topics which are classified into cities, or regions, scenic areas, or architecture.

3. Result and Discussion

Geography is related to cities or regions, scenic areas, and architecture which have particular meaning by members of society. In this section, we will consider explanations, examples, or tasks in textbooks that present Indonesian geography. For example, the readers can see from Figure 1 that the task present Palembang province.



Ayo Kita Berlatih 5.4

- Sebuah peta berskala 1 : 10.000.000. Jarak kota Jambi dan Palembang pada peta jaraknya 2,4 cm. Seorang sopir bus berangkat dari kota Jambi menuju kota Palembang dengan kecepatan rata-rata 80 km per jam. Selama perjalanannya, ia berhenti istirahat sebanyak 1 kali selama 30 menit. Ia tiba di kota Palembang pukul 10.30 WIB.
 - Berapa jam bus itu diperjalanan?
 - Pukul berapa sopir bus itu berangkat dari kota Jambi?

Figure 1: Indonesian province in mathematics textbook [9].

From 7th grade mathematics textbook (Table 2) we can see that the authors provide some Indonesian geography. We found that there are 14 cities or region in Indonesia from 7th grade mathematics textbooks. Uniquely, the authors mention 6 cities in east java province and 2 cities in east Kalimantan province. While the other, the authors only mention one city in each province. Thus in total, there are only 8 out of 34 provinces that are provided in the textbooks.

It is suprisingly that mathematics textbooks grade VIII focus only on three provinces namely east java, central java and Jakarta. However, the authors not only mention cites or region, they also provide scenic areas and architecture building. For example, Candi Borobudur (Borobudur temple) dan Masjid Agung Demak (Demak Great Mosque).

Similar to textbooks grade VIII, the authors from grade IX also mention three provinces (East Java, west Sumatra, and south kalimantan). However, two types of geography are mention here; archietcure, and scenic area. This information can be seen on Table 4.

Geography deals with cities or regions, scenic areas, and architecture. The good thing is that junior high school math textbooks provide all three terms in geography. Unfortunately the distribution is not so optimal. Another fact states that, grade 7 textbooks only provide 8 provinces. In addition, the 8th and 9th grade textbooks only mention 3 provinces. This shows that multicultural values have become a consideration in writing mathematics books, but they are not optimal. This is in accordance with

TABLE 2: Cities or regions in Indonesia from mathematics textbooks grade VII.

No.	Cities or regions	Province
1	Banyuwangi	East Java
2	Bondowoso	
3	Jember	
4	Situbondo	
5	Bawean Island	
6	Malang	
7	Samarinda	East Kalimantan
8	Balikpapan	
9	Medan	North Sumatra
10	Palembang	Soth Sumatra
11	Jambi	Jambi
12	Belitung Island	Bangka Belitung Islands
13	Natuna Besar Island	Kepulauan Riau
14	Jakarta	DKI Jakarta

TABLE 3: Cities or regions in Indonesia from mathematics textbooks grade VIII.

Cities or regions	Scenic areas	Architecture	Province
Ketapang			East Java
RogoJampi			
	Pasuruan Botanical Garden		
		Great Mousqe, Demak	Central Java
		Borobudur temple, Magelang	
		The National Monument	Jakarta

TABLE 4: Cities or regions in Indonesia from mathematics textbooks grade IX.

Scenic areas	Architecture	Province
	Suramadu bridge	East Java
MadaKaripura waterfall		
	Jam Gadang (Minangkabau for "Big Clock")	West Sumatra
	Barito bridge	South Kalimantan

the fact that research on mathematics textbooks that carry cultural themes is also still very minimal, even practically non-existent. However, there are several studies on worksheets and teaching materials that are still sectoral.[13] describes the development process and punctuality of exploratory student work in the context of Banten culture. Meanwhile, [14] tested the effectiveness of mathematics teaching materials based on the Mandailing culture. In other subjects such as Indonesian, the culture in textbooks has

also not received attention. This is in accordance with the statement of [15] in Indonesian textbooks. In this study, it was found that the Indonesian multicultural values used in Indonesian textbooks were very minimal.

As we all know, geography is one way of looking at culture. There are still some other things such as artifacts, flora and fauna, organization, ways of behaving, and customs, history, identity. So it is necessary to expand the reach of culture in analyzing mathematics textbooks. Like what has been carried out by [16] who analyzes how book texts present the concept of original mathematical knowledge. The author has few examples of native culture of learners but rich implementation ideas using foreign cultures.

Mathematics may be a particularly challenging domain to map students' everyday cultural practices onto and mathematics education researchers have yet to develop and agree on methods that can be used to document cultural practices and processes within mathematics classrooms and systems [17]. However from another point of view [18] explained that mathematics teachers, students, their experiences, and their culture are extremely important factors in the teaching of mathematics and in making it more meaningful and more relevant. In addition, he said that teaching math through cultural relevance and personal experiences helps students know more about reality, culture, society and themselves.

4. Conclusion

The mention of geography (provinces) in class VII is more than The mention of geography in class VIII and IX. Additionally, in general, the introduction of provinces in Indonesian junior high school mathematics textbooks is still minimal. This may be due to the nature of mathematics in which somehow challenging subject to connect to culture. However, it is necessary to consider a more diverse distribution because mathematics Textbooks (BSE) can be accessed and used throughout Indonesia.

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