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Mathematics Textbook of Grade 5 Based on Bell Criteria

Trini Andira✉[1] and Tatang Herman[2]

[1,2,] Program Studi Pendidikan Dasar, Sekolah Pascasarjana, Universitas Pendidikan, Indonesia

✉ triniandira13@gmail.com[1]

Abstract. This study aims to determine the suitability of grade 5 mathematics textbooks that meet the criteria of material suitability, methods of delivering material, physical characteristics of books, and book instructions for teachers based on Bell's criteria. This study uses a descriptive qualitative approach. Data collection uses documentation techniques in the form of books and observation techniques in the form of questions based on Bell's criteria. Data retrieval is done directly where the researcher conducts face-to-face meeting with the teacher at school. The data source of this study was obtained from the grade 5 Mathematics Book published by ESPS Erlangga Curriculum 2013 Revised 2016 on the Fractions Chapter. The results obtained indicate that the suitability of the material against Bell's criteria for the Fraction Chapter is in the very good category. the suitability of the method of delivering material is in the very good category, the suitability of the physical character of the book is in the good category, and the manual for the teacher is very good.

Keywords: Student Textbook, Bell Criteria

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INTRODUCTION ~ The COVID-19 pandemic has changed the world of education, which usually learns face-to-face, has turned into online learning or distance learning. Even at a distance, the learning process must be carried out effectively and efficiently so that learning objectives can be achieved (Helmi, 2020). Therefore, both teachers, students, and parents need to work together to streamline the learning process (Fitriani, 2021). Government policy to conduct online learning, one of which is learning mathematics. Mathematics is a subject that must be given at every level of education. Mathematics is very important because it has become a daily need for everyone starting from small children to adults (Naraeni, Uswatun, & Nurasiah, 2020). For this reason, mathematics teachers must be selective in choosing media for the learning process. For example, media that can be used in the learning process are textbooks to support students in online learning.

Each school uses student textbooks published by the Ministry of Education and Culture which have been assessed for quality based on the assessment criteria from the National Education Standards Agency (BSNP) (Soedjadi, 2000). Package books that have been assessed have an International Standard Book Number (ISBN) and there is a Copyright page at the beginning of the package book (Tarigan, 2009). According to Putu Semaraning, I, A (2021), the analysis of conformity with the BSNP is carried out by referring to (1) the content feasibility component consists of competency standards (SK) implicitly listed, basic competencies implicitly listed, conformity of book contents with competency standards and basic competencies , (2) the presentation component consists of a table of contents, the purpose of each chapter, a concept map or summary, keywords (key-words), questions/practice questions in each chapter, and a bibliography , (3) the

graphic component consists of the skin of the book, the content of the book, readability (suitability in the selection of letters, illustrations and formats), print quality (clarity, flatness, and color of the print), and the physical strength of the book (content paper, leather material, and binding system).

The number of textbooks in circulation provides many choices for students and teachers in determining which books to use. One of them is a mathematics textbook. The quality of mathematics textbooks will improve the quality of mathematics teaching (Djago and Guntur, 1986). According to Bell (1981), there are four main criteria that can be used to evaluate mathematics textbooks, namely (1) criteria related to mathematical material, (2) criteria related to the method of delivering material, (3) criteria related to physical characteristics, and (4) criteria related to guidance for teachers. The mathematical material contained in textbooks must not only be correct, but must also be adapted to the learning objectives and types of students (Bell, 1981). Then, the method of delivering the material is also important in the evaluation of the book, to ensure the validity of the teaching and learning methods used, and to determine the suitability of the book with the level of intellectual development and level of student ability (Bell, 1981). Then, what must be evaluated is the physical characteristics of the textbook (Bell, 1981). If the textbook has a teacher edition or a guide for teachers, then the special aids need to be evaluated as a teaching resource (Bell, 1981).

Based on the explanation above, the researcher will analyze the fifth grade mathematics textbook based on Bell's criteria with the reason that Bell's criteria are presented in more detail, and several criteria according to Bell are not included in the BNSP criteria assessment, for example the truth of facts, skills, and mathematical principles, the approach used and text writing errors, so it is necessary to analyze the mathematics textbooks published by Erlangga using Bell's criteria.

METHODS

The research method used in this research is descriptive qualitative. Which aims to determine the quality of students' mathematics textbooks (Azwar, 2007). The data source of this research is the fifth grade mathematics textbook published by ESPS Erlangga Curriculum 2013 Revised 2016. The title of the book is ESPS Mathematics. The contributors to the manuscript are Gunanto, M.Pd, Dhesy Adhalia, S.Si. The editors are Tuti Aprianti, S.Pd, Bambang Sutrisno, M.Pd. The content designer for this book is Jatmiko, and the cover designer is Ahmad Haerani. Published year 2018. Erlangga Publisher. Printing PT Gelora Aksara Pratama. The thickness of the book vii, 168 pages. The focus of this research is on the Fractions chapter. This Fractions chapter is located in the first order in the book published by ESPS Erlangga. The data collection method used is documentation and observation in this fifth grade math student's book.

This research began by selecting textbooks first, so that the fifth grade mathematics book ESPS Erlangga Curriculum 2013 Revised 2016 printed in 2018. After selecting textbooks, the research continued by conducting a library study on Bell's criteria. Bell has four criteria in analyzing a book, namely:

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(1) criteria related to mathematical material, (2) criteria related to the method of delivering material, (3) criteria related to physical characteristics, and (4) criteria related to instructions for teachers. To analyze the suitability of the book based on the material there are 21 criteria, to analyze the suitability of the book based on the method of delivering the material there are 21 criteria, to analyze the suitability of the book based on physical characteristics there are 11 criteria, and to analyze the suitability of the book based on the teacher's instructions there are 19 criteria. Bell's criteria is a translation from English. These criteria were then used as an instrument to analyze the mathematics textbook ESPS Erlangga Curriculum 2013 Revised 2016 print 2018. Data collection was obtained by using an analysis sheet. In the width of the analysis of the suitability of textbooks related to mathematics, methods of delivering material, physical characteristics, and instructions for teachers there are columns of "Data", "Suitability", "Suggestions for Improvement", and "Description". The "Data" column contains the data found for each criterion. The "Conformity" column contains the suitability of each criterion, and at the bottom of the "Conformity" column there are "Yes" and "No" columns in the form of a check list. The check list is carried out by placing a check mark (√) in one of the columns for observing the suitability of the textbook for content on the Bell criteria. While the column "Suggestions for Improvement" is filled in if there is a discrepancy from the results of the analysis. The "Annotation" column contains the reasons for the data that has been found in the textbook.

Each indicator or criterion, if in accordance with the findings, will be given a score of 1, otherwise it will be given a score of 0. Then the indicators are added up to find out the total number of each instrument.

After the scoring is done, proceed with data processing. The data from this research is presented in the form of a percentage of the results of the suitability of the ESPS Erlangga mathematics textbook for the 2013 Revised 2016 Curriculum 2018 printout against Bell's criteria. The formula used to calculate the scores of all indicators on the instrument can be seen in table 1. After obtaining the percentage results, it is continued by classifying the suitability of the categories used as table 2.

The results of this study are not only in the form of the percentage of conformity results. However, in the form of descriptive sentences from the results of the analysis carried out on the ESPS Erlangga mathematics book, 2013 Revised 2016 curriculum, printed in 2018 with the subject matter of the Fractions chapter.

Table 1 Formula For Calculating Percentage

$$P = \frac{The\ number\ of\ correct\ questions}{The\ number\ of\ questions\ per\ criteria} \times 100\%$$

Note: P is the percentage of the suitability of the book

Table 2 Criteria for Percentage of Book Suitability

The Suitability Percentage	Criteria Category
$80\% < P \leq 100\%$	Very Good
$60\% < P \leq 80\%$	Good
$40\% < P \leq 60\%$	Fair
$20\% < P \leq 40\%$	Poor
$P \leq 20\%$	Very Poor

RESULTS

From the results of the analysis carried out on the ESPS Erlangga mathematics book, 2013 Revised 2016 curriculum, printed in 2018 with the subject of the Fractions chapter, based on Bell's criteria in analyzing the suitability of books based on mathematical material, it was found that of the 21 indicators that Bell had in analyzing books based on mathematical material, there were indicators 12, namely "Does the book emphasize proof?" In Erlangga's math book, the proof of fractions uses more examples of problems, so the proof is not emphasized. This indicator is related to the 11th and 14th indicators, namely "Is the correct logical form used in proving the proposition/theorem?" and "Are the proofs, explanations and examples complete, and understandable to students using the book?" In this study, the examples and explanations are complete but use more examples of questions.

Then based on the results of the analysis of the suitability of the book in the method of delivering material, of the 21 indicators owned by Bell's criteria in analyzing the biki based on the method of delivering material on the 1st indicator, "To increase student motivation, are examples of interesting questions and problems presented in the book?" After being analyzed, the book published by Erlangga Buku presents an interesting example, namely questions related to everyday life. Then on the 4th indicator, namely "Is at a higher level of abstraction, a spiral approach is used in the development of the principle concept?" Erlangga's book provides discussion procedures from a simple way, from concrete to abstract. Then on the 5th indicator, "Is the content presented for students to find some mathematical principles?" in Erlangga's book, the book does not give students to discover the principles of mathematics.

Then, based on the results of the analysis of the suitability of books in physical characteristics, of the 11 indicators that Bell has in analyzing books based on physical characteristics, the second indicator is "Is the title appropriate and attracts students' attention?" In Erlangga's book, this book is very interesting for students to study because there are very interesting colors & pictures to attract students' attention. The third indicator is "Are the pictures shown in the book modern or up to date?" in Erlangga's book, this book contains up to date and colorful pictures or the latest

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pictures that are being talked about a lot at this time and are often encountered by book users. In the 11th indicator, "Are examples, student exercises and activities related to the material presented in full?" Erlangga's book contains examples and student exercises related to the material being presented.

Based on the results of the analysis of the suitability of books related to teacher instructions. Based on the Bell Criteria, of the 19 indicators owned by the Bell criteria in analyzing books based on teacher instructions, the 1st indicator is "Do publishers provide additional services related to education?" In Erlangga's book there are additional services related to education, for example there is a QR Code scan in the form of animation, video, and audio that can be read and heard which is presented on each page of the book's contents. Then, the second indicator is "Are special learning resources needed to complete the textbook?" Erlangga's book contains an introductory chapter on the use of books. Then, on the 17th indicator, "Is there an answer key for the practice questions in the book or is there a companion answer book?" In Erlangga's book there is an answer key to the exercises but in the form of a companion answer book which is only given to the teacher.

The following table presents the percentage of book suitability based on Bell's criteria.

Table 3 Percentage of Book Suitability Based on Bell Criteria

BELL'S CRITERIA	SUITABILITY PERCENTAGE
Appropriateness of Maths Material	83,99%
Appropriateness of Material Delivery Method	83,01%
Suitability of Physical Characteristics of Books	77,78%
Appropriateness of Instructions for Teachers	80,39%
Overall Average Percentage	**81,29%**

CONCLUSION

From the results of the analysis conducted on the ESPS Erlangga mathematics student textbook, 2013 Revised 2016 curriculum printed in 2018 with the topic of the Fractions chapter, it was concluded that (1) The suitability of the mathematics material in Erlangga's textbook based on Bell's criteria could be categorized as Very Good, with a percentage of 83.99%. (2) The suitability of the method of delivering material in Erlangga's textbook based on Bell's criteria can be categorized as Very Good, with a percentage of 83.01%. (3) The suitability of the physical characteristics of books in Erlangga's textbook based on Bell's criteria can be categorized as Good, with a percentage of 77.78%. (4) The suitability of the manual for teachers in the Erlangga textbook based on Bell's criteria can be categorized as Very Good, with a percentage of 80.39%.

From the results of the percentage above based on the Bell criteria, the overall percentage value is 81.29%. From this data, it can be seen that the percentage of the suitability of Erlangga's book against Bell's criteria is categorized as very good

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