
VALIDITY OF SCIENCE BOOK ORIENTED SETS IN ENVIRONMENTAL POLLUTION MATERIAL FOR JUNIOR HIGH SCHOOL STUDENTS

Karennina Putri Aristyani¹, Siti Nurul Hidayati^{2*}

^{1,2} Jurusan IPA, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Surabaya

*E-mail: sitihidayati@unesa.ac.id

Abstract

This study aimed to describe the validity of SETS-oriented science book for junior high school students in environmental pollutions materials. In this research, researcher uses a quantitative descriptive method and uses validation sheet in the form of questionnaire as data-collection techniques. The questionnaire contains the criteria of material feasibility, language, and presentation. The result of validation gave the material feasibility score 3.9, for the language is 3.6, and the presentation criteria scored 3.9. So, it can be concluded that a science book with SETS-oriented is very well to be used as a learning facility according to the assessment of the validator.

Keywords: *science book, SETS, validation.*

PREFACE

Science learning can be started by giving the phenomena that occur in the environment. As well as material on the Basic Competence 3.8. class VII junior high school about “Menganalisis terjadinya pencemaran lingkungan dan dampaknya bagi ekosistem”. The material close to the phenomenon that is happening in the student's environment. If a learning process is initiated with the phenomena that occur in everyday life, then students will have problem-solving skills with how to hone the skills of scientific (Indriyani, 2016).

Based on the observations made showed that not optimal utilization of the environment as a source of learning to make students become not accustomed to the phenomena that occur in everyday life is closely related with concept science (Aenahar, 2019). Learning is done by connecting the phenomena around students and made of learning more meaningful (Zuchdi, et al., 2012). Science learning is emphasized on the investigation of events and phenomena found in the environment as a whole.

Learning SETS according to the Putra is an approach that is contextual which can help students to make learning more meaningful (Humairoh, 2015). SETS learning approach also focuses on issues or phenomena that exist in the environment that can train the learners in identifying, analyzing, and applying concepts and skills in solving problems in everyday life.

The results showed that by applying approach of SETS in learning can increase the students motivation (Retno, 2018). The application of the learning SETS approach able to improve the classical completeness and

the learning outcomes of students (Sudarman, 2007; Maghfiroh and Sugianto 2011; Ragil and Sukiswo, 2011).

In learning to use science book as a means to make the students more active (Pratiwi, 2014). Science book be effective if it can be a source of knowledge and enrich the learning process. Science book itself is expected to support the learning that helps students to construct the knowledge on a concept. Teaching materials that can be used in learning can be combined with the approach. As well as science book which are oriented with the approach of SETS (Pratidina, 2016).

The use of science book oriented SETS focuses more on the phenomenon or social issues in the community. With the use science book oriented SETS then can teach science contextually. Develop science book for junior high school should consider related to the level of breadth, depth of material, the structure of matter, the aspect of graphics, and aspects of the presentation of the material (Anwar, 2014).

If students are actively engaged in the search for information can be used as a provision to resolve the problems. And in the end, the students can get the opportunity to play a role in the community to participate in solving the problems that have been identified previously (Khasanah, 2015).

Science book oriented-SETS according to Nugraha able to increase the student's critical attitude and effectively used in the learning (Ardiansyah, 2015). Teaching materials should be developed through a process of standardization through the activities of validation.

Science book can support teaching and learning and achieve the goal of learning should be through the stages of validation (Indriyani, 2016). Assessment criteria the

validation of science book adapted to the standard of BSNP covering the aspects of content, presentation, linguistic, and graphic. Assessment validation if you get a score of ≥ 2.51 to say is valid and deserves to be used in learning (Riduwan, 2013).

METHODOLOGY OF RESEARCH

This research is included in quantitative descriptive research. Where Gay and Petter explained that quantitative descriptive research aims to describe a phenomenon in a factual, systematic, and accurate (Hidayat, 2020).

Data collection techniques performed by using sheets of the questionnaire the validation of the rating scale using a scale of *Likert scale* as in Table 1.

Table 1. Criteria Scale *Likert*

Criteria	Value
Poor	1
Fair	2
Good	3
Excellent	4

(Riduwan, 2013)

From the scores obtained are then averaged and converted in accordance with the assessment criteria presented in Table 2.

Table 2. Category Of Validation Results

Criteria	the Average Score
Least valid	1,00-1,50
Less valid	1.51-2.50
Valid	2,51-3,50
Very valid	3,51-4,00

(Riduwan, 2013)

Based on the assessment category validation Table 2, the material taught is said to be valid if you get an average score of ≥ 2.51 to.

RESULT AND DISCUSSION

Based on the results of the validation of the teaching materials developed, obtained results of the validation by the three validators that two lecturers of experts from the Department of IPA UNESA and one science teacher in junior high school. In the process of validation, the results obtained in the form of advice and also the value of the validation by the validator. Following the advice given is presented in Table 3.

Table 3. Recapitulation The Advice of Validator

No.	Point Review	Validator Advice
1.	Learning Objectives	- Learning Objectives that were created before the revision use of the word operational work that is less varied
2.	Table layout	- Table layout on “kadar logam berat sebagai pencemar” to cover a text
3.	Description on the image	- Add image description to be easily understood by the reader
4.	Evaluation	- Before revision of evaluation questions has not yet been made

No.	Point Review	Validator Advice
5.	Use of sentence	- Use a foreign phrase that is not italicized - Use of the word “sedang” should not be placed at the beginning of a sentence - Writing a scientific name the first word begins with uppercase, and the second word starts lowercase - Use of the phrase “semakin kebal” is changed to “resisten”
6.	Material about soil pollution	- Paragraph which explains about causes of pollution of the soil by the activity of nature which was created before the revision is not yet fully apparent - Biodegradation is a core part of bioremediation on a paragraph about efforts to reduce the pollution of the ground

After revised in accordance with the advice of the validator, then the validator gives the assessment of the teaching materials that have been developed. Aspects assessed include the criteria of material, presentation and language. Following the results of the validation are presented in Table 4.

Table 4. The Results Validation Science Book

No.	Evaluation criteria	Score			Average	C*
		V ₁	V ₂	V ₃		
A. Feasibility of Material						
1.	The suitability of the material with the KD	4	4	4	4	VV
2.	The accuracy of the material	4	4	4	4	VV
3.	Currency of material	4	3	4	3,7	VV
4.	Encourage productivity and stimulate curiosity	4	3	4	3,7	VV
5.	Match with the main components of SETS	4	4	4	4	VV
6.	Match with Indicator Problem Solving	4	4	4	4	VV
Average score					3.9	VV
B. Feasibility of Presentation						
1.	Presentation Techniques	4	4	4	4	VV
2.	Supports of the presentation	4	4	4	4	VV
3.	Use of symbols, words, and the term	4	4	4	4	VV

4.	Cover Design	4	3	4	3,7	VV
Average score					3.9	VV
C. Feasibility of Language						
1.	Straightforward	4	4	3	3,7	VV
2.	Communicative	4	4	3	3,7	VV
3.	Match with KBBI*	4	3	3	3,3	VV
Average score					3.6	VV
Tendency Criteria						VV

Description :

- V₁, V₂, V₃ : Validator ; C : Criteria
- VV : Very Valid
- KBBI : Kamus Besar Bahasa Indonesia

The validity of the teaching materials reviewed from the results of the validation by a third validator using a questionnaire validation. The questionnaire contains the criteria of the material, presentation, and language (Adoption from BSNP in Kadir, 2016). Based on the validation result in Table 4, the teaching materials that are developed to get the assessment with the tendency of the criteria is very valid.

Teaching materials said to be feasible if the aspects in the teaching materials to get a score of ≥ 2.51 (Riduwan, 2013). The results of the validation on the feasibility criteria of the material, teaching material-oriented SETS show the suitability of the material with basic competencies and learning objectives that will be achieved. The concept presented in the teaching materials developed are contextual with the link between the concept of environmental pollution and conditions in the student's environment.

On the feasibility criteria of the material there are six sub-criteria. Two sub-criteria each get a score of 3.7, with a revision in the sub currency of material in part efforts to control soil pollution. While in the sub encourage productivity and stimulate the curiosity show that the teaching materials less invites students to explore more information.

From the results of the validation on the feasibility criteria presentation on the sub-criteria cover design get a score of 3.7. This is due to the colors used on the cover of the less bright. The teaching materials also come with images that reflect situations and conditions in their environment at this time. So students become more interested and increase her curiosity about the material being taught. Given the image on the teaching materials make it the better according to the criteria of BSNP (Wati, 2015).

On feasibility criteria the language of the average score obtained by 3.6. In these criteria to get the advice of the validator. As added glossary at the teaching materials. This is to avoid words that are not understood. Sub-criteria of the communicative meaning of the language used by the author can be understood by the reader. The use of language for junior high school students according to Devetak using language that is not complicated (Elvionita, 2019).

The criteria language should be adjusted with the grammar of Indonesian is good and right, the use of

foreign names and scientific names are consistent (Badan standar Nasional Pendidikan, 2006).

Teaching materials SETS this presents the material pollution of the environment which is holistic. Where on the components of Science presented the concept of the cause of the pollution itself, then the components of the Environment presented the concept of the impact of pollution on the environment of life. Another case in component Technology presented the concept of prevention efforts that can be done.

Technology can be done the way the settlement of environmental pollution. And on the components of the Society presented a concept related to how prevention efforts that can be done by involving the community so that the environmental pollution that has already occurred is not getting worse.

The innovation of science books developed this is by integrating with the learning approach. The integration of the learning approach is SETS. The concept of learning approach SETS according to Woolnough when students learn science is not only studying one discipline of science, but rather blends between the concept of science with its influence on environment, technology, and society (Kadir, 2016).

CONCLUSION

The feasibility of teaching material developed was reviewed from the eligibility criteria of the material, presentation, and language to get the assessment of the validator with the criteria of tendency is very valid. So it can be concluded that the science book-oriented SETS on the material pollution of the environment for junior high school students declared feasible for tested.

REFERENCES

- Aenahar, N. (2019). Meningkatkan Kemampuan Pemecahan Masalah Ipa Melalui Model Learning Cycle 7E Pada Siswa Kelas Iv Sekolah Dasar. *Prosiding Seminar Nasional Pendidikan KALUNI*, 2, 490–497. <https://doi.org/10.30998/prokaluni.v2i0.124>
- Anwar, Syaeful. (2014). *Pengolahan Bahan Ajar*. Bandung: UPI Press.
- Ardiansyah, Rifqie. (2015). Pengembangan Bahan Ajar Berbasis Science, Environment, Technology, Society (SETS) dalam Pembelajaran Fisika Bab Alat Optik di SMA. *Jurnal Pendidikan Fisika*, 4, (1), 75-79.
- BSNP. (2006). *Akademik Instrumen Penilaian Bahan Ajar Teks Pelajaran*. Jakarta: Badan Standar Nasional Pendidikan.
- Devetak, Vogrinz. (2013). The Criteria for Evaluating the Quality of the Science Textbooks (<https://www.researchgate.net/publication/>)
- Elvionita, S., Fauzi, A., & Ratnawulan. (2019). Evaluating the validity of integrated science textbook on the theme of tsunami using webbed model based on Polya problem solving to enhance students' preparedness toward disaster. *Journal of Physics: Conference Series*, 1185(1). <https://doi.org/10.1088/1742-6596/1185/1/012062>

- Gay L. R. and Peter. *A Educational Research Competencies for Analysis and Application*. New Jersey: Prentice- Hall.
- Hidayat, Z., Sarmi, R. S., Ratnawulan, & Desnita. (2020). Validity of science student books with the theme of energy in life based integrated local materials using integrated models for 21st century learning. *Journal of Physics: Conference Series*, 1481(1). <https://doi.org/10.1088/1742-6596/1481/1/012116>
- Humairoh, Farisa, Wasis. 2015. Pengembangan E-book Interaktif Berbasis Salingtemas (Sains, Lingkungan, Teknologi, Masyarakat) pada Materi Fluida Dinamis untuk Meningkatkan Pemahaman Konsep Siswa dan Penerapannya. *Jurnal Inovasi Pendidikan Fisika*, 4, (2), 69-75.
- Indriyani, Rusmi, Waluyo, Joko, dan Jekti Prihatin. (2016). Validitas Perangkat Pembelajaran IPA Model Inkuiri Terbimbing untuk Melatihkan Keterampilan Pemecahan Masalah Siswa SMP Materi Pencemaran Lingkungan. *Jurnal Pembelajaran dan Pendidikan Sains*, 1, 77-85.
- Kadir, A. (2018). Pengembangan Bahan Ajar IPA Berbasis SETS Pada Siswa MTsN 1 Kendari. *Al-Izzah: Jurnal Hasil-Hasil Penelitian*, 12(2), 1. <https://doi.org/10.31332/ai.v12i2.638>
- Maghfiroh dan Sugianto. (2011). Penerapan Pembelajaran Fisika Bervisi SETS untuk Meningkatkan Kemampuan Berpikir Analitis Peserta Didik Kelas X. *Jurnal Pendidikan Fisika Indonesia*, 7, 6-12.
- Nugraha, D. A. (2013). Pengembangan Bahan Ajar Reaksi Redoks Bervisi SETS, Berorientasi Konstruktivistik. *Jurnal Innovative Science Education*, 2, 27-34.
- Pratidina, Febri Rosela, Pamelasari, Stephani Diah, dan Khusniati, Miranita. (2016). Keefektifan Penggunaan Modul Cahaya Berbasis Salingtemas terhadap Keterampilan Proses Sains Siswa. *Unnes Science Education Journal*, 5(2), 1235-1241. <https://doi.org/10.15294/USEJ.V5I2.11914>.
- Pratiwi, D, Suratno, dan Pujiastuti. 2014. Pengembangan Bahan Ajar Biologi Berbasis Pendekatan SAVI (Somatic, Audiotory, Visual, Intellectual) pada Pokok Bahasan Sistem Pernapsan Kelas XI SMA dalam Meningkatkan Motivasi dan Hasil Belajar Siswa. *Jurnal Edukasi UNEJ*, 1 (2), 5-9. <https://doi.org/10.19184/jukasi.v1i2.1392>.
- Ragil dan Sukiswo. (2011). Penerapan Pembelajaran Sains dengan Pendekatan SETS pada Materi Cahaya untuk Meningkatkan Hasil Belajar Siswa Kelas V SD. *Jurnal Pendidikan Fisika Indonesia*, 7, 69-73.
- Retno, Raras Setyo, D. M. (2018). Implementasi Sets (Science Environment Technology and Society) Pada Pembelajaran Ipa Sd Berbasis Inquiry Terhadap Berpikir Ilmiah Siswa Kelas 4 Mi Al-Irsyad Madiun Implementation of Sets (Science Environment Technology and Society) in Learning Ipa S. *Jurnal Pembelajaran Biologi*, 7, 5-9.
- Riduwan. (2013). *Skala Pengukuran Variabel-variabel Penelitian*. Bandung: Alfabeta.
- Sudarman. (2007). *Pola Peningkatan Kualitas Pembelajaran Lingkungan Hidup Siswa Kelas XI IA SMA Negeri 9 Semarang pada Pokok Bahasan Pencemaran Lingkungan Melalui Pendekatan Kontekstual Berwawasan SETS*. *Jurnal Lembaran Ilmu Kependidikan Universitas Negeri Semarang*. Jilid 36, 1, 53-60.
- Wati, H. M. (2015). Validitas Bahan Ajar Berbasis Metakognitif pada Materi Anabolisme Karbohidrat. *E-journal Bioedu*, 4 (3).