
Eligibility of the Conservation Education Guidebook for Senior High School

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Abstract. Indonesia does not yet have a curriculum that implements conservation education, several schools have carried out conservation activities but do not yet have guidebooks or written documents related with the programs, so it is necessary to prepare a conservation education guidebook. This study aims to determine the eligibility of a high school conservation education guidebook. This study uses the R&D research method with the ADDIE limited to the development stage. The eligibility test of the conservation education guidebook was carried out by validating by five validators with the validation sheet assessment instrument and analyzed using Aiken's content validity and ICC (intraclass correlation coefficient) reliability. The aspects assessed in the validation test are material aspects, presentation, language, and guidebook graphics. The results of Aiken's validity were obtained for the material aspect, namely 0.92 very high categories, presentation aspect, namely 0.87 very high categories, language aspect, namely 0.93 very high categories, and graphic aspect, namely 0.92 very high categories. The average validity of the four aspects is 0.92 in the very high categories. The results of the ICC reliability analysis showed a reliability value of 0.965 and agreement between validators was at a very good criteria index. It can be concluded that the high school conservation education guidebook is eligible to use.

Keywords: Conservation Education, Eligibility, Guidebook

Introduction

The world's environmental problems have become an interesting issue for many researchers. The importance of building awareness of environmental issues has become a global issue and agenda for researchers and educators (Hafida & Wahid, 2018; Mauliza, et al., 2021). There are still many students and the community who do not have the character and understanding of caring for the environment (Dolins, et al., 2010; Hafida & Wahid, 2018). In various international documents and articles emphasizing the importance of training students to build environmental awareness in environmental education (Okur-Berberoglu, et al., 2014; Li, 2018; Türkoğlu, 2019; Junkaew, et al., 2021). Indonesian people do not have the knowledge and awareness to care about the surrounding environment, which is a factor causing the increasing threat of biodiversity conservation in Indonesia (Suryanda, et al., 2016; Apriyani & Adisti, 2021). In fact, in the last few decades, biodiversity in Indonesia has decreased which has led to a decline in the quality of the environment, so that conservation needs to be done for the sake of human survival (Sutherland, et al., 2016; Nugraha, et al., 2021). The importance of

building a responsible environmental care character through schools can contribute to solving environmental problems (Mauliza, et al., 2021). Conservation is an effort to preserve various damaged components by maintaining, managing and repairing damage to the damaged environment (Fidela, et al., 2020; Purmadi, et al., 2020). The purpose of conservation is to protect and preserve biodiversity and prevent damage to nature (Klein, et al., 2009; Horreo, et al., 2015).

Curriculum development and learning processes applied in the classroom can also help increase students' awareness of the environment (Marziah, et al., 2015). Conservation education is an effort to build awareness and concern for the environment and biodiversity in the environment in the field of education (Rachman, 2012; Fidela, et al., 2020). Conservation education is a project-based activity that involves students, teachers, and communities related to environmental natural resource management (Jacobson, et al., 2006; Esson & Moss, 2016). The purpose of conservation education is to provide understanding and improve environmental care attitudes so that they are ready to respond to environmental problems that occur (Rachman, 2012; Fidela, et al., 2020). For schools that have received the Adiwiyata award, the term conservation education is familiar. Schools hold various programs and activities to support the implementation of conservation education (Dolins, et al., 2010; Ardoin & Heimlich, 2013).

According to Rachman (2012) the world of education in Indonesia has not included conservation education or has not implemented learning with learning tools that utilize nature and the environment around schools in an organized manner. According to Susilo et al. (2016) the learning designs used in Indonesian schools have not integrated conservation education. Based on Prasetyo's analysis (2014) of 27 syllabus and lesson plans (RPP) in Semarang and Jawa Tengah that only 8% strictly implement conservation education in learning. In fact Prasetyo (2014) found that only 8% of lesson plans implemented environmental action learning activities and methods. Strengthened by the opinion of Tamnge et al. (2022) who acknowledges that until now conservation education has not been implemented in the world of education in Indonesia, until now Indonesia does not have a curriculum that implements conservation education in the teaching and learning process in schools.

To find out more regarding conservation education in Indonesian schools, interviews were conducted in three schools as well as directly observing the condition of the school program being implemented to support conservation education. Based on the results of interviews with SMA Negeri 2 Mempawah Hilir, SMA Negeri 1 Mempawah Hilir, and SMA Negeri 2 Pontianak, the three schools already have school programs in protecting the environment around the school. The program in each school involves students as main participants in programs to support the implementation of reforestation and conservation activities in schools. However, the three schools do not yet have guidelines or handbook regarding the implementation of the conservation education school program. They also do not yet have a written document on the implementation of activities related to the conservation education program in schools.

A guidebook is a printed learning tool that contains information and step-by-step instructions in the form of writing, pictures, etc. that can guide readers to find out information in an interesting and complete way (Santoso, et al., 2015; Hidayat, 2016; Savitri & Setiawan, 2018; Maisyarah, et al., 2021). In research conducted by Atkinson (2005), the Prince of Wales Island conservation education and interpretation guidebook can help provide direction to the public regarding programs designed by the United States Department of Agriculture-Forest Service (USFS) and provide strategic direction and integration of the USFS program to the public who live in forest areas and districts. Jacobson et al. (2006) also explained that guidebook can help people become aware of and understand conservation targets and help readers learn new information and skills in conducting conservation education. In the research conducted by Loury et al. (2021)

guidebooks also help achieve learning objectives related to environmental literacy and conservation. Besides that, Sriyati et al. (2022) found that through teaching materials that utilize local wisdom of plants in the forest can increase students' environmental awareness and literacy skills in plant conservation efforts. This guidebook was developed to help people understand conservation targets, have new skills in conducting conservation education, become a guide in building awareness and developing problem-solving skills against environmental challenges. This study aims to determine the eligibility of a high school conservation education guidebook.

Methods

Research on the eligibility of a high school conservation education guidebook using the R&D research method with a limited ADDIE development model refers to Astuti et al. (2017); Dewi (2018) is only at the analysis, design, and development stages, to the stage of producing products that have been improved. The process of preparing the guidebook refers to Haryono (2019). The stages of this research include: (1) the analysis stage, namely by conducting interviews with the school and studying literature, compiling instructional objectives and a guidebook writing framework, determining participants who will use the guidebook, collecting information sources for material development, determining the delivery of the guidebook to participants, and make a guidebook development schedule (2) the design stage is by taking an inventory of the tasks carried out during the guidebook development process, compiling the objectives and indicators of the guidebook achievement, and selecting the guidebook testing strategy (3) the development stage is developing conservation education materials and making guidebook storyboards, compiling conservation education materials into storyboards of guidebooks, and developing validation sheets as a guidebook assessment tool (4) the validation stage is conducting a validation assessment of high school conservation education guidebooks, analyzing the validation results using Aiken validity analysis and ICC reliability analysis.

The sampling technique used is a simple random sampling that is determine experts as validators to test the eligibility of high school conservation education guidebooks. The eligibility test of the conservation education guidebook was carried out by validating by five validators consisting of 2 lecturers in biology education and 3 high school biology teacher. Data collection techniques were obtained from the validation sheets of high school conservation education guidebooks, which about eligibility guidebook consists of four aspects assessment, namely the material, presentation, language, and graphic aspects of the guidebook. The validation data include assessment Likert scale scores of four aspects assessment.

The data analysis technique was carried out in the form of data analysis as a result of validation which was carried out with five validators. At this stage, five validators were involved to provide an assessment of the guidebook. After the guidebooks were assessed by five validators, the data validation result are analyzed using Aiken's validity analysis (Aiken, 1985). The Aiken validity formula used refers to Aiken (Harmurni, 2019):

$$V = \frac{\sum s}{[n(c-1)]} \quad (1)$$

Remark:

S : $r - l_o$

Lo : The lowest validity rating score

C : The highest validity rating score

r : The number given by the appraiser on the assessment aspect

Applications are declared valid if the results of Aiken validity analysis calculations are in the category range 0.80 - 1.00, which means very high validity, 0.60 - 0.79 means high validity, and 0.40 - 0.59 means moderate validity (Sutama, et al., 2014). After calculating the Aiken's validity value for each assessment indicator and the average validity value, then the ICC reliability value is calculated using the validation data obtained referring to the Koo & Li (2015) procedure. The ICC reliability formula used refers to Koo & Li (2015):

$$\rho = \frac{MS_R - MS_E}{MS_R + \frac{MS_C - MS_E}{n}} \quad (2)$$

Remark:

MS_R : Man square for rows

MS_E : Man square for error

MS_C : Man square for columns

n : Number of subjects

The application is declared reliable if the results of the ICC reliability analysis calculation are in the index range of $0.75 \leq ICC < 0.90$ which means good criteria and $ICC \geq 0.90$ means very good criteria (Koo & Li, 2015).

Results and Discussion

The conservation education guidebook for senior high schools is the result of the development and literature study of conservation education materials for senior high schools. This guidebook contains a discussion and purpose of conservation education, the meaning of conservation behavior change and program models to build responsible conservation behavior, linking and reaching schools with conservation education, five conservation education programs in high school, and conservation education in teaching and learning in the classroom by applying three scientific approach learning models. The conservation education guidebook was validated to determine the eligibility of the guidebook in line with Savitri & Setiawan (2018); Panjaitan et al. (2019); Luzyawati & Lissa (2020); Nursamsu et al. (2020); Panjaitan et al. (2020). The result validation of the high school conservation education guidebook are presented in Table 1.

Table 1. Validation Results Analysis of High School Conservation Education Guidebook.

Validators	Assessment Indicator															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Validator 1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	46
Validator 2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	60

Validator 3	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	59
Validator 4	4	4	4	4	4	3	4	4	4	4	4	3	4	4	4	58
Validator 5	3	4	4	4	4	4	4	4	4	4	4	4	4	3	4	58

The analysis of the validation results was carried out with reference to the content validity Aiken (1985). The results of the analysis of the content validity of the high school conservation education guidebook are presented in Table 2.

Table 2. Results of Content Validity Analysis of High School Conservation Education Guidebook.

Assessment Aspect	Assessment Indicators	Aiken Validity Value	Category
Theory	The suitability of the material describes the background with the usefulness of the instructional objectives to be achieved The suitability and completeness of understanding of the steps in each stage of its implementation Compatibility of illustrations, graphics, data tables, pictures, and photos with the material Reliability of information, references and quotations	0.92	Very High
Presentation	Order of presentation of material Giving motivation and attraction Compliance with the structure of the guidebook	0.87	Very High
Language	Readability and clarity of information and use of language in the guidebook Use of grammar and spelling	0.93	Very High
Graphics	Use of fonts (size and font), spacing, and paragraphs Suitability of layout Decoration (illustration images, photo documentation, accurate data tables) Matching color and display design	0.92	Very High
Average		0.92	Very High

The results of the validation analysis of the high school conservation education guidebook get the Aiken validity value in the range of 0.87–0.93 in the very high category. The average validity of Aiken's analysis on the four aspects of the assessment is 0.92 in the very high category. The following describes the value of the validity of the four aspects of the assessment.

Aspect of Theory

The value of validity in the assessment of material aspects is 0.92 in the very high category. Assessment of material aspects consists of five assessment indicators, namely the suitability of the material describing the background with the usefulness of the instructional objectives to be achieved; suitability and completeness of understanding of the steps in each stage of its implementation; the suitability of the needs of high school

teachers and the achievement of the objectives of the guidebook; suitability of illustrations, graphics, data tables, pictures, and photos with the material; and the reliability of information, references and citations. The first assessment indicator is the suitability of the material describing the background with the usefulness of the instructional objectives to be achieved. Based on the results of the validator's assessment, the material in the high school conservation education guidebook has already described the background with the usefulness of the guidebook's instructional purposes. In line with Leo (2017); Dewi (2020) the material that needs to be conveyed to the reader must be in accordance with the background picture with the objectives to be achieved. The development of the guidebook was carried out because of the urgency in awareness of environmental issues that became global issues and agendas (Hafida & Wahid, 2018; Mauliza, et al., 2021). Indonesian people do not have the awareness and character of caring for the surrounding environment (Dolins, et al., 2010; Suryanda, et al., 2016; Apriyani & Adisti, 2021), so it is necessary to develop curriculum and learning processes that can increase students' awareness of the environment in order to improve sustainability live (Marziah, et al., 2015; Sutherland, et al., 2016). Conservation education is expected to be an effort to protect, preserve, and prevent natural damage by building awareness and concern for the environment and biodiversity in the environment in the field of education (Klein, et al., 2009; Rachman, 2012; Horreo, et al., 2015; Fidela, et al., 2020).

The second assessment indicator is the suitability and completeness of understanding the steps in each stage of its implementation. Based on the results of the validator's assessment, the material in the guidebook is appropriate and the steps in each stage are complete. This is in line with Muslich (2016); Kurniawati (2017); Leo (2017) that the material is presented sequentially and complete in steps to help readers understand each stage of the material. The third assessment indicator is the suitability of the needs of high school teachers and the achievement of the objectives of the guidebook. Based on the results of the validator's assessment, the material in the guidebook is in accordance with the needs of high school teachers and in accordance with the achievement of the objectives of the guidebook. Muslich (2016); Leo (2017) states that the material to be included in the book must be adapted to the needs of the reader and the material presented must be able to achieve the objectives of the guidebook.

The guidebook is prepared to achieve learning objectives related to environmental literacy and conservation (Loury, et al., 2021). The purpose of conservation education that will be achieved in the guidebook is to provide understanding and improve environmental care attitudes so that they are ready to respond to environmental problems that occur (Rachman, 2012; Fidela, et al., 2020) and increase students' environmental awareness and literacy skills in plant conservation efforts (Sriyati, et al., 2022). The fourth assessment indicator is the suitability of illustrations, graphics, data tables, pictures, and photos with the material. Based on the validator's assessment, the presentation of illustrations, graphics, data tables, images, and photos in the guidebook is in accordance with the material presented. According to Muslich (2016); Kurniawati (2017); Leo (2017); Dewi (2020) the presentation of illustrations, graphics, data tables, images, and photos must be in accordance with the material presented, with this presentation it can help readers understand the material presented and provide an overview to the reader from illustrations, graphics, data tables, images, and photos presented. The fifth assessment indicator is the reliability of information, references, and citations. Based on the results of the validator's assessment, the material in the guidebook is compiled based on reliable information and references and includes quotes for each material from the information and references contained in the guidebook. In writing when using ideas or other information, it is necessary to pay attention to whether the sources of information and references can be trusted, and always add quotes to the

material published to prevent the act of stealing ideas or plagiarism (Muslich, 2016; Kurniawati, 2017; Leo, 2017; Dewi, 2020).

Aspect of Presentation

The value of validity in the assessment of the presentation aspect is 0.87 in the very high category. The assessment of the presentation aspect consists of three assessment indicators, namely the order of presentation of the material; providing motivation and attraction; and conformity to the structure of the guidebook. The first assessment indicator is the order in which the material is presented. Based on the validator's assessment, the presentation of the material in the guidebook is sequential. The presentation of the material is arranged according to the order of the goals to be achieved and presented from general to specific (Leo, 2017; Dewi, 2020) the material in the guidebook must be presented coherently in accordance with the sequence of events or events (Pusat Kurikulum dan Perbukuan, 2008). The guidebook contains information and step-by-step instructions that can guide readers to find out information in an interesting and complete way (Santoso, et al., 2015; Hidayat, 2016; Savitri & Setiawan, 2018; Maisyarah, et al., 2021).

The second assessment indicator is the provision of motivation and attractiveness. Based on the validator's assessment, motivation and attractiveness have been presented in the guidebook by presenting an attractive appearance on the background of the first chapter material page (Figure 1a) and listing environmental problems that occur in the surrounding environment (Figure 1b). Leo (2017); Dewi (2020) states that the presentation of motivation and attractiveness in the material attracts the attention of the reader and helps the reader understand the content of the material presented. The third assessment indicator is conformity with the structure of the guidebook. Based on the validator's assessment, the guidebook has been presented in accordance with the structure of the guidebook. The structure of the guidebook refers to Siregar & Pramesti (2017); Pusat Kurikulum dan Perbukuan (2008), namely the front cover of the guidebook, foreword, instructions for using, table of contents, list of pictures, list of tables, section of contents containing materials related to conservation education and conservation education programs in high school, glossary, bibliography, appendix, and back cover page. The guidebook is designed to refer to the Unesco book size standard, which is 15.5 cm x 23 cm with margins on the top, bottom, left 2.1 cm and right 2.2 cm (Permana, et al., 2018). According to Leo (2017) in writing a book the author must pay attention to the standards of content and structure of books that apply both nationally and internationally.



(a) Page background view (b) Problems in the environment
Figure 1. Presentation of motivation and appeal in guidebooks

Aspect of Language

The value of validity in the assessment of the language aspect is 0.92 in the very high category. The assessment of the presentation aspect consists of three assessment indicators, namely the readability and clarity of information and the use of language in the guidebook; the suitability of punctuation, vocabulary, sentences and paragraphs; and use of grammar and spelling. According to Muslich (2016); Kurniawati (2017); Leo (2017); Dewi (2020) in writing material or conveying information must be clear and readable by the reader, the language used must be used effectively and efficiently. The use of punctuation marks must be in accordance with the general guidelines for Indonesian spelling (PUEBI) and pay attention to vocabulary, sentences, and paragraphs that will be compiled in conservation education materials (Muslich, 2016; Leo, 2017). The use of grammar must be standardized and spelling must be adapted to PUEBI (Muslich, 2016; Kurniawati, 2017; Leo, 2017). The conservation education guidebook was prepared to help provide direction to the public regarding conservation education programs and help the public understand and be aware of conservation targets, so that in its delivery it is necessary to pay attention to the delivery of information and new skills in conducting education (Atkinson, 2005; Jacobson et al., 2006). The presentation of language in the conservation education guidebook can be seen in Figure 2.

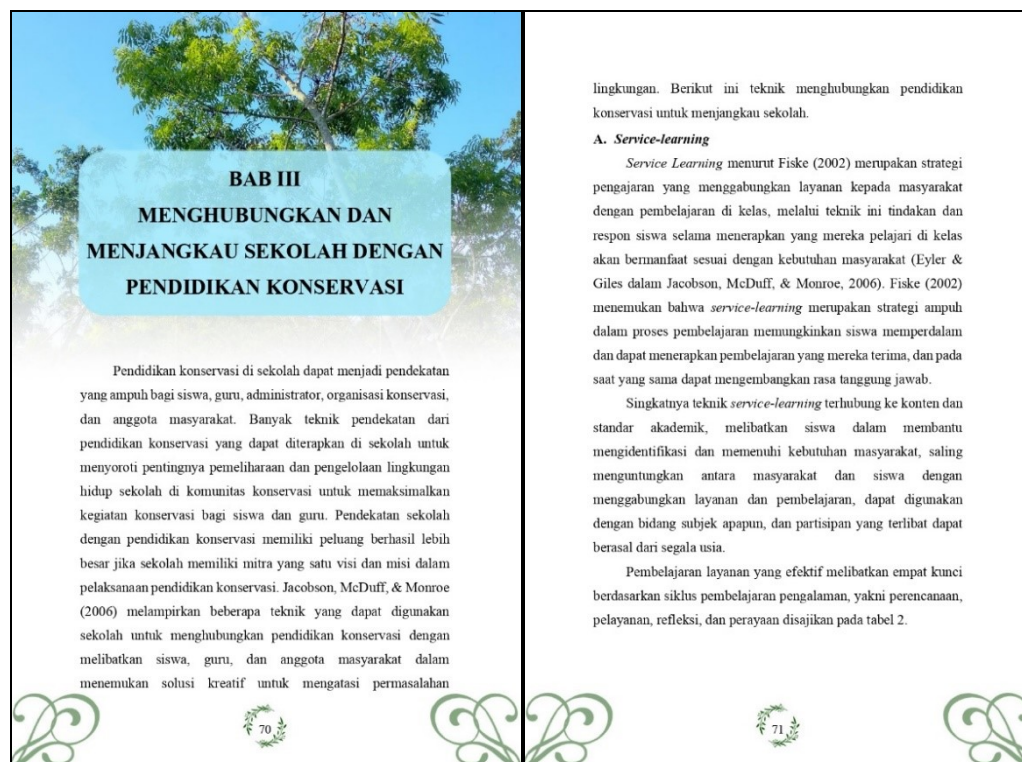


Figure 2. Presentation of language in conservation education guidebooks (in Bahasa)

Aspect of Graphics

The value of the validity of the assessment of the graphic aspect is 0.87 in the very high category. The assessment of the presentation aspect consists of four assessment indicators, namely the use of fonts (size and letters), spaces, and paragraphs; suitability of layout; decoration (illustration images, photo documentation, accurate data tables); and color match and display design. The first assessment indicator is the use of fonts (size and letters), spacing, and paragraphs. Based on the validator's assessment, the use of fonts, spaces, and paragraphs in the guidebook is correct and can be clearly read by the reader. The choice of font, spacing and paragraph sizes will affect the reader, if the use is correct and appropriate, the reader will easily read and understand the information contained (Kurniawati, 2017; Leo, 2017).

The second assessment indicator is the suitability of the layout. Based on the validator's assessment, the suitability of the layout is in accordance with the structure of the book which refers to Siregar & Pramesti (2017); Pusat Kurikulum dan Perbukuan (2008) and book writing standards by Unesco (Permana, et al., 2018). Kurniawati (2017); Leo (2017) states that in compiling a book, it is necessary to pay attention to the layout with the structure of the book and the standard of the book's content. The third assessment indicator is decoration (illustrated images, photo documentation, accurate data tables). Based on the validator's assessment, the guidebook is equipped with illustrated images, documentation images, and data tables to attract readers' interest (Figure 3). According to Leo (2017) by presenting decorations can help eliminate boredom while reading, attract readers' interest, and help readers understand the material presented. The fourth assessment indicator is the suitability of color and display design. Based on the validator's assessment, the color and display design of the guidebook is appropriate, it can be seen on the cover page of the guidebook (Figure 4) and the material page of the first chapter (Figure 5). According to Dewi (2020) the color and

design of the guidebook display will affect reading interest, the selection of attractive colors and designs helps attract the attention of readers.

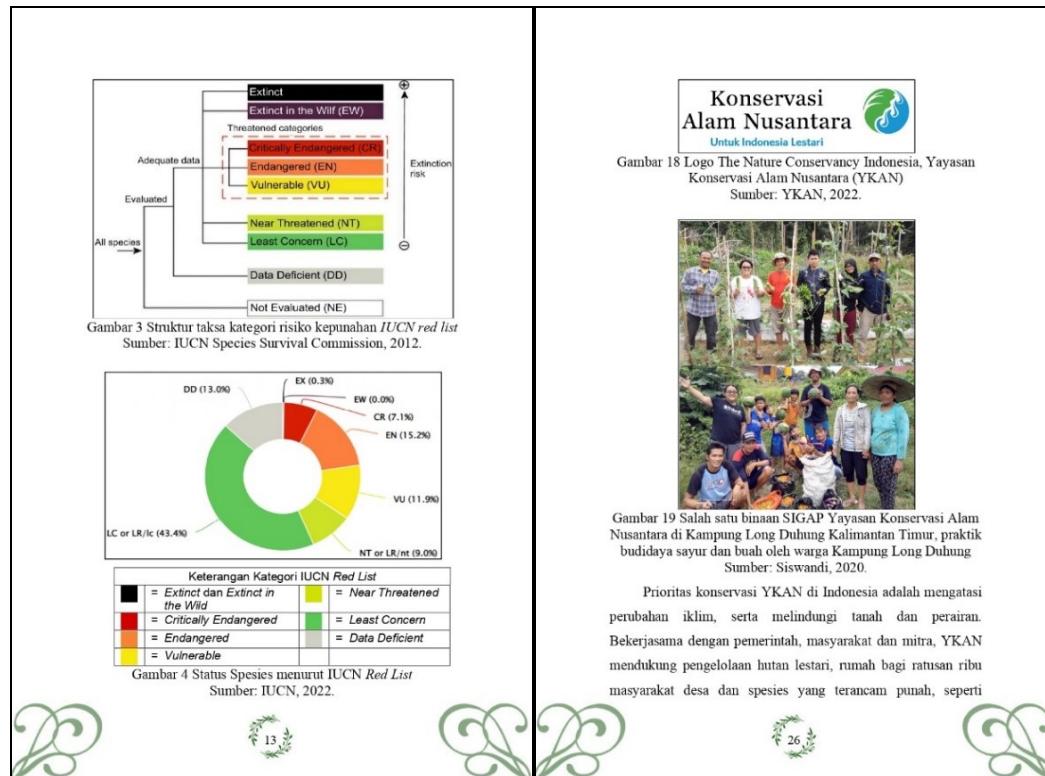


Figure 3. Decoration on conservation education guide (in Bahasa)



Figure 4. Guidebook cover page design (in Bahasa)



Figure 5. First chapter of material page (in Bahasa)

The conservation education guidebook was validated by five validators to determine the eligibility of the guidebook in line with Savitri & Setiawan (2018); Panjaitan et al. (2019); Luzyawati & Lissa (2020); Nursamsu et al. (2020); Panjaitan et al. (2020). The analysis of the validation results was carried out with reference to the ICC (Intraclass Correlation Coefficient) referring to the reliability of the Koo & Li (2015). The result reliability of the high school conservation education guidebook are presented in Table 3.

Table 3. Results of ICC Reliability Analysis of High School Conservation Education Guidebook.

	Intraclass Correlation ^b	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	Df1	Df2	Sig
Single Measures	.647 ^a	.360	.941	28.515	4	56	.000
Average Measures	.965 ^c	.894	.996	28.515	4	56	.000

Based on the results of the validation assessment on the design of the conservation education guidebook, a reliability analysis was carried out using the ICC formula (Koo & Li, 2015). The results of the reliability analysis using the ICC in high school conservation education guidebooks get an average agreement value of the validators as appraisers of 0.965 and Koo & Li (2015) these results indicate that the guidebook is in the good category (average range of index 0.75).

Conclusion

The evaluation of the high school conservation education guidebook by the validator consists of four aspects of the assessment, namely the material, presentation, language, and graphic aspects of the guidebook. The results of the validator's analysis of the high school conservation education guidebook obtained Aiken's validity value in the material aspect, namely 0.92 very high category, presentation aspect, 0.87 very high category, language aspect, 0.93 very high category, and graphic aspect, namely 0.92 very good category. The average validity of the four aspects is 0.92 in the very high category. The results of the ICC reliability analysis show that the reliability value is 0.965 and the agreement between the validators is in the very good criteria index. The results of the assessment indicate that the developed conservation education guidebook is valid and is in the good reliability category so that the high school conservation education guidebook is eligible to use.

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