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Validation of Integrated Science Teacher book with the theme of the Human Body System Adaptation to Temperature Changes using Integrated Type of 21st Century Learning

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Abstract. This study aims to Determine the validation of the Integrated Natural Science teacher book with the theme senses of sight and optical devices using Integrated Integrated model of 21st Century Learning at the junior high school in Talamau district. This research method used research and development, using Plomp development models. The instrument used was a validation questionnaire. The collection of data validation technique uses a questionnaire that was previously validated by five validators. Data collected was Analyzed using qualitative descriptive through assessment and percentage. Results of analysis of the validation of the Integrated Natural Science teacher book with the theme senses of sight and optical devices using the Connected Integrated model of 21st Century Learning has an average value of 0.88 this is Showed that is developed was valid.

1. Introduction

The 21st century is the century of knowledge and technology, especially communications and information. The learning 21st century is learning that integrate literacy, skills knowledge, skills and attitudes, as well as mastery of technology. The learning is holding on a pivotal role in preparing graduates to be able to deal with a 21st century. The four skills that must be possessed by graduates of the 21st century, namely: critical thinking and problem solving, communication skills, creativity and innovation, collaboration. By that reason, teachers should be able to equip learners in learning to deal with 21st century [1] [2]. In addition, certain skills become essential requirement in maintaining the community life of the 21st century There are several categories within the framework of 21st century skills, namely: digital capabilities, thinks the discovery, communication skills and be productive. To meet the demands of the 21st century, a knowledge must be supported by critical and creative thinking skills, character and ability to apply information technology [3].

Support in the learning process so that more directly is the absence of guidance, in the form of a book teachers and students' books. In the previous curriculum textbook used by teachers and students are the same. This changed with the curriculum in 2013, called the textbook because it consists of a book teacher and student books that have been provided by the central government as one of source in school textbooks. Minister of education and culture can provide for the needs curriculum states, also in which there are teacher training and curriculum complementary documents such as syllabus, teacher's books and student's books.



Teacher book is a book that is used by teachers as reference handle in the learning process. This book is a living document that is constantly improved, updated, and updated in accordance with the dynamic needs and changing times. The book teacher talked about the problems in the classroom, which is used as instruction for using student literacy book became an important part in a learning process. Learners are able to carry out activities with a maximum literacy course will gain the learning experience more than compared other students. The learning process will start from a simple matter to the evaluation difficult. With the low level of thinking that will be the stairs for learners to improve competence toward someone who has the critical mindset. The learners who have the ability to critical thinking, creativity, collaboration and good communication will also increase the character, would make it have a responsible attitude, work hard, be honest in they life. The learners who experience the learning process by carrying out literacy activities provide reinforcement learning and teacher character in the learning process in the face of the 21st century [2].

In addition to integrating the learning skills of the 21st century the role of teachers and teaching materials to be important to facilitate student learning both at school and during their studies in the home. One of the teaching materials namely books .The learning integrated unified science teacher makes learning more relevant, effective, efficient and provide variation in teaching style [3]. In this study using a model of integration [5] [6] The model of integration is an integrated learning model that uses an approach to the field of study. In learning should be applied by means of integrating knowledge of Natural Science (IPA) into the learning material in the form of thematic integration between knowledge. Studies related to science teaching that is; biology, physics and chemistry that included integrated learning. The theme taken in this research is the system of human body's adaptation to temperature changes. This theme is a combination of two materials physics and physics; object biology. The physics material namely IPA object and observations, temperature and heat, and biological material life organization system. With the integration of the learners will acquire knowledge and skills in their entirety so that learning is understood in accordance with the concepts learned.

Problems in the field mention that Integrated science teaching has not been applied properly. Teachers still use the lecture method in the learning process that is not in accordance with the demands of the curriculum, 2013. Learning-centered teachers that students' critical thinking skills are less well trained, and finally when faced with a problem of the students would have trouble solving them critically. Teaching materials are used only in the form of books published *Kemendikbud* teacher. Integrated science teacher at SMPN 3 Talamau not optimal to use a book the teacher in the learning process, so that the learning process Integrated Science is not running optimally.

Of the various problems found in the field, there are several solutions that can help solve the problem. One solution is to create an Integrated Science Teachers Books integrated type of learning integrates 21st century learning that encourages students to be active and support the teachers' ability and creativity in designing and implementing learning. Therefore, the researchers plan to develop a means of supporting learning such as books junior high school science teachers with the theme of the human body's adaptation system to temperature changes with the type of integrated learning 21st century learning will help teachers in the learning process. With the teacher's book, expected to be guides and teachers handle in the learning process in accordance with the basic competencies that must be mastered learners.

2. Methods

This type of research used is descriptive research. This study aims to determine the validity of the Integrated Science teacher book with the theme of the human body system adaptation to temperature using a type of integrated 21st century learning. Validation of data obtained from three experts who are lecturers Padang State University consists of 2 of physics, one person from Indonesian and two practitioner who is a science teacher at SMPN 3Talamau. Validation of this teacher guide includes content validity, construct validity, the validity of the language, and validation of graphic. The instrument used in this study questionnaire validity test. Data were collected through questionnaires

filled validity test by experts and practitioners. The validity of the test questionnaires were prepared using the modified Likert scale of Riduwan [11] with a 1-4 following four options:

Table 1. Answer Score for validation Sheet

Score	Category	% Achieved Indicators
1	Strongly Disagree (HD)	0-25
2	Disagree (D)	26-50
3	Agree (A)	51-75
4	Strongly Agree (HA)	76-100

Having obtained the data, and then analyzed by using the formula V Aiken is [12]:

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

$$s = r - lo \quad (2)$$

where: R = number given by the assessor, lo = score lowest validity (in this case = 1), c = highest validity score (in this case = 4) and n = number of assessors. Categories validity based on the final value obtained is shown in Table 2. The book was developed as valid if it has reached a score ≥ 0.6 .

Table 2. Validity Product Categories

Score	Criteria
≥ 0.6	valid
<0.6	Invalid

3. Results and Discussion

Results of this study was the validation of a book teachers include content validation, construct validation, validation of language and validation of graphic. Thus, this study emphasized the validity of the three validation. According to [13] instrument is said to be valid if the instrument can be used to measure what should be measured.

Teacher book is validated by a validator 5, consisting of three experts who are lecturers Padang State University consists of 2 of physics, one person from Indonesian and two practitioner who is a science teacher at SMPN 3 Talamau. Results obtained from this study is the book of Integrated Science teacher with the theme of the human body system adaptation to changes in temperature using a type of integrated 21st century learning that has been valid and feasible for use. Data validation results Integrated Science teacher book with the theme of the human body system adaptation to changes in temperature using a type of integrated 21st century learning can be seen in Table 3.

Table 3. Results Validation of Integrated Science Teacher Book

No.	Validation component	Average value	Category
1	Content Validation	0.87	valid
2	Construct Validation	0.88	valid
3	Language Validation	0.87	valid
4	Graphical Validation	0.91	valid
Average		0.88	valid

Based on the analysis of data validation table above, the average value of the Integrated Science teacher validating books in general was 0.88 with a valid category. The average value of the contents obtained validation 0.87 with a valid category. This is evidenced by aspects of the validation of the content of that material disajikan in the book of teachers in accordance with the demands of KI, KD

and indicators are formulated, the mapping of learning activities and competencies to be developed, indicators of achievement for learners clearly mentioned in every chapter, learning objectives clearly stated in each chapter, a description of the material in the book's themes of teachers in accordance with the system of the human body's adaptation to temperature change, the theme of the book readers gain knowledge of teachers, books are presented in accordance truth science teacher, teacher book presented in accordance with the depth of material, answer evaluation questions relevant to about- about the student books, teacher book learning activities in accordance step integrated learning model type, and the enrichment of the relevant teacher books with material covered.

As for the average value of 0.88 was obtained construct validation with valid category. Aspects validation of this construct is a book the teacher made in accordance with the structure of the book the teacher force, the introduction page book science teacher consists of a cover and table of contents, the material in the book the teacher clearly delineated on a map of concepts, measures of integrated learning model of integrated stated clearly in book teacher, learning activities book teachers in accordance with the approach of the scientific, assessment in the book the teacher is easily understood, reference books teachers are listed in the bibliography, the picture in the book the teacher explains the material with clear and common explanation in the book the teacher is clear and easy understood.

The average obtained validation of the language that is 0.87 with a valid category. Aspects validation of this language is the language used properly in accordance with procedures Indonesian, the language used is not ambiguous, the language used is simple and easy to understand, consistent in the use of symbols / lambing, book science teacher refers to the EYD, using the term in accordance with the the concept of the subject and the information presented in the book the teacher clearly.

As for the average grade graphical validation is 0.91 with valid category. Graphical validation aspects assessed font used is clear and legible, layout and layout proportional teacher book, illustrations and photo books right teacher in accordance with the material, the design look attractive teacher book reader, and a mix of colors in the book attractive teacher.

Based on the description above, the Integrated Science teacher book with the theme of the human body system adaptation to changes in temperature using a type of integrated 21st century learning has met the validity component. This is evidenced by looking at the average value of the validity of the teacher guide that is 0.88, then book teachers have valid and deserves to be tested to the field.

4. Conclusion

Based on the results of the validation has been done, the obtained total average value of 0.88 with a valid criteria. It can be concluded from this study that the book teachers have valid and feasible to be used or tested in the learning process.

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