Validity of integrated natural science teacher book with theme senses of sight and optical devices using connected model integrated 21st century learning

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

1. Introduction
The world development of the 21st century is marked by the progress and the demands of technologies, which may lead to regression. Life in the 21st century demands a person to master a range of skills [1]. 21st century learning is learning that integrates quality characters, literacy and the competencies and technological knowledge.

Competencies and abilities that a person must have to face the demands of the 21st century are very complex. There are seven types of life skills needed in the 21st Century. According to [2] Wagner (2010) stated seven skills needed in the 21st Century namely (1) the ability to think critically and problem solving, (2) collaboration and leadership, (3) agility and adaptability, (4) initiative and entrepreneurial spirit, (5) being able to communicate effectively both orally and in writing, (6) being able to access and analyze information, and (7) having curiosity and imagination [3]. The 21st century requires education to prepare students who are able to face global economic competition. Partnership for 21st Century Skills emphasizes that 21st century learning must teach 4 competencies namely communication, collaboration, critical thinking, and creativity. [4] Frydenberg & Andone (2011) also stated that in facing 21st century learning, everyone must have critical thinking skills, knowledge and digital literacy skills, information literacy, media literacy and master information and communication technology.

One of learning in junior high school are required to have 21st century skills that are learning science. IPA is a branch of science which deals with natural phenomena systematically. In general, IPA includes
three basic sciences, including biology, physics, and chemistry. The third basic science is called integrated learning. Integrated science teaching is learning that try to combine several subjects from various fields of study Physics, Biology, and Chemistry into the discussion. So that makes the learning does not stand alone, but into a unity [5] [6].

Integrated Science Learning emphasizes on providing direct experiences to improve competency in order to explore and understand natural phenomena in everyday life by using a scientific approach [7]. In addition, through an integrated science teaching students can learn about nature and the phenomena that occur therein intact. This allows students actively searching, digging, and found the concept of science in life. In planning for integrated science teaching selected objects developed into a theme that will be the focus of the study uses the concept of physics, biology, and chemistry. One integrated science teaching is an integrated learning type connected. This type of learning model that is focused connect or combine one concept, one topic, and the skill with others [8][9].

In Curriculum 2013 teachers are required to be able to develop the resources of an educator's own learning. Learning resource is everything that is available in the learning environment that serves to membanu learning process for teachers and students. One source of learning that teachers and students use a textbook [10]. Based on Regulation of the Minister of Education and Culture No. 8 of 2016 on the textbook states that there are two kinds of books used as reference textbooks in teaching, namely student books and teacher books. Student book is a handbook students to achieve the learning objectives and competencies. Book teacher is a teacher handbook containing instructional strategies, teaching methods, instructional and assessment techniques for each subject or learning theme.

Judging from the utilization of the student book and teacher books are an integral part in the learning process. In other words, the teacher is a guide book in book pengguanaan students. But seen many teachers using guide books is not in line with the books used by students. Moreover, in the book there is a teacher who is not pengintegrasaian So the 21st century skills needed a teacher guide that integrates 21st century learning skills integrated science teacher guide should incorporate the concept, ideas and topics and skills so that educators can help learners to have 21st century skills and understand the competency as a whole by implementing integrated learning.

Therefore, to facilitate teachers to use students' books by developing an Integrated Science teacher book as a guide book students currently learning activities in the classroom. In connection with the matter, in this study formulated research problem is how the validity of Integrated Science teacher book with the theme of the sense of sight and optical devices using a type of integrated Connected 21st century learning.

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 senses of sight and optical devices using a type of integrated Connected 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 13 Kerinci. Validation of this teacher guide includes content validity, construct validity, the validity of the language, and validation kegrafikan. 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:

| 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’s is [12]:

$$V = \frac{\sum s}{n(c - 1) + lo}$$  (1)

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 $\geq 0.6$.

| Score  | Criteria   |
|--------|------------|
| $\geq 0.6$ | valid     |
| $<0.6$   | Invalid    |

3. Result and Discussion

Results of this study was the validation of a book teachers include content validation, construct validation, and validation kegrafikan language. 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 13 Kerinci. Results obtained from this study is the book with the theme of Integrated Science teacher sense of sight and optical devices using a type of integrated Connected 21st century learning that has been valid and feasible for use.

Data validation results Integrated Science teacher book with the theme senses of sight and optical devices using a type of integrated learning Connected 21st century can be seen in Table 3.

| No. | Validation component     | Average value | Category |
|-----|--------------------------|---------------|----------|
| 1   | Content Validation       | 0.87          | valid    |
| 2   | Construct Validation     | 0.88          | valid    |
| 3   | Validation Language      | 0.87          | valid    |
| 4   | Validation Kegrafikan    | 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 disajiikan 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 of teachers in accordance with the election theme of the sense of sight and optical instruments, the theme of the book the teacher adds to the knowledge of readers, book teachers presented in accordance with the truth of science, books teachers presented in accordance with the depth of material, answer evaluation questions relevant to the matters at student books.
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 connected is 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 is 0.91 with validation kegrafikan valid category. Kegrafikan 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 book with the theme of Integrated Science teacher sense of sight and optical devices using a type of integrated Connected 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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