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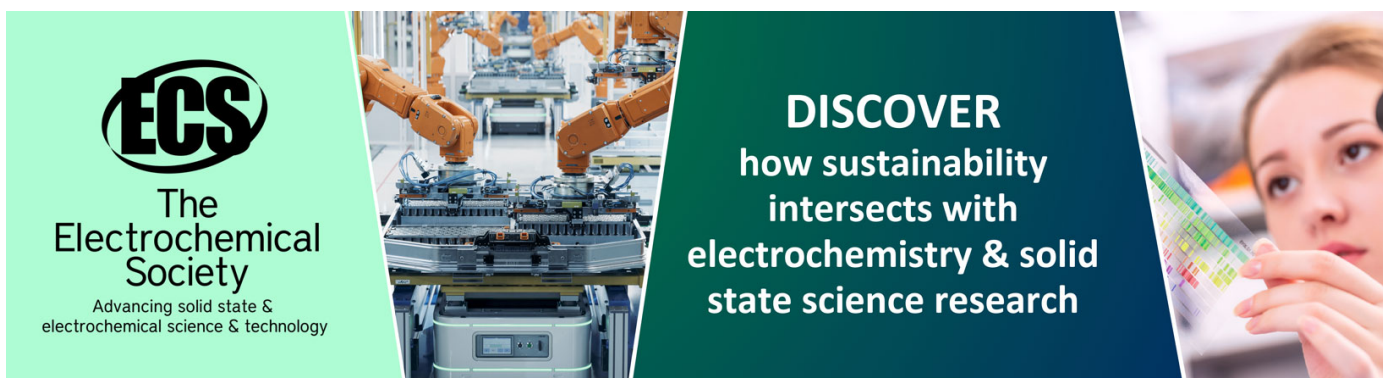
Validity of student book development science integrated with blood fluid theme using integrated learning type connected integrated 21st century learning

To cite this article: Tri Anidya Putri *et al* 2020 *J. Phys.: Conf. Ser.* **1481** 012111

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Validity of student book development science integrated with blood fluid theme using integrated learning type connected integrated 21st century learning

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Abstract. This study aims to determine the validity of integrated science student books with the theme of blood fluid using a type of connected 21st century learning is integrated into the material used books for independent learning in the learning process for students. This research method uses research and development (R&D). The research instrument used was a questionnaire validation assessment sheet. Data analysis is a descriptive analysis with a Likert scale and validity value is calculated by the Aiken formula. The results of the validation analysis of student books developed obtained a validity value of 0.86 with valid criteria. From the result of the analysis it can be concluded that the integrated science student book with the theme of blood fluid using integrated type 21st century learning can be used in the learning process.

1. Introduction

21st Century Learning is learning that integrates literacy skills, knowledge skills, skills and attitudes, and mastery of technology. One of the skills needed in the 21st Century is High Order Thinking Skills (HOTS) that students must learn to face global challenges. [1]

Integration of 21st century learning in student books is expected to make students able to face 21st century challenges. Century demands These 21 can be fulfilled by implementing education that prepares students to master a variety of skills to become successful individuals in life. 21st Century learning is a major competency that every student must have in order to be able to carry out learning activities with enthusiasm in daily life [2]. Where in the 21st century requires students to have a skill, knowledge and ability in the fields of technology, media and information, learning and innovation skills as well as life and career skills. In the 21st century education plays an important role in ensuring students have learning and innovation skills, skills in using technology and information media, and can work, and survive by using skills for life [2].

One of the skills needed in the 21st century is the high-level thinking skills that students need to face global challenges. Indicators of higher-level thinking skills related to the ability to solve new problems that are not routine and unpredictable, the ability to carry out analytical, synthesis, systematic, evaluation, and ability to make various predictions that are useful for natural and life phenomena rationally, critically and creative [3] [4]. 21st Century learning there are four skills that must be possessed by every student, namely higher order thinking skills, communication skills, critical thinking



skills, collaboration skills and creativity. In limited teaching time each teacher faces a great challenge in teaching 21st century learning skills to each student [5].

In accordance with the demands of the 21st century, the Indonesian government has made efforts to improve the quality of education in Indonesia. One of the efforts made is to improve the curriculum, namely the 2013 curriculum. The 2013 curriculum is applied to all subjects including natural science (IPA). Where IPA is a branch of science that studies the natural phenomena systematically. Integrated Science learning includes three basic sciences, namely: physics, biology and chemistry. Integrated science learning has the aim to improve efficiency and effectiveness in learning and can increase students' interest and motivation [6]. Science as a systematic and regularly organized knowledge, generally accepted (universal), and in the form of a collection of observational and experimental data. The nature of science includes four main elements, namely the attitude of curiosity about objects, natural phenomena, living things and causal relationships that cause new problems that can be solved through correct procedures. These four elements constitute a unified IPA that cannot be separated. [7]

Science student textbooks are developed using an integrated type connected learning model. The connected type is integrating one concept, skill, or ability of a continuous process in one subject or another sub-subject in one field of study so that learning becomes more meaningful and effective. Integration in connected patterns can help students develop concepts in a sustainable way. Integrated learning of connected types is an inter-field integration model of study, where this type links two or more cognate fields of study [8]. This model focuses on making explicitly linking one topic with another, one skill with another skill, one concept to another, linking work one day to the next, or even one semester idea to the next. The key to this model is a deliberate attempt to connect ideas in the discipline, rather than assuming that students will automatically understand the relationship [9]. The integration of these connected patterns can help students develop key concepts continuously, resulting in an internalization process [9]. Some of the advantages of integrated type connected learning include; learners have a broader picture by integrating ideas between fields of study; learners can develop key concepts continuously, so that the internalization process occurs; integrating ideas in inter-field studies allows students to study, conceptualize, improve, and assimilate ideas in solving problems [8]. This connected type can be applied to the theme of blood fluid. In artikel have to validate the integrated science student books with themes of blood fluid integrated 21st century learning aims to encourage learners have a 21st century learning skills in the learning process. To form learners with character, the Integrated Science student book must be developed as a source of information in which the book has facts related to the concept of learning. So, we need a book that can stimulate students' mindset in attitudes, knowledge and skills [10].

Student books that are already in school today are still undergoing revisions because there are still shortcomings and achieving goals that are not yet optimal. In the learning activities and competency tests of books that already exist in schools have not been presented in the form of themes. Furthermore, the student book is not in line with the expectations of learning demands 21, the learning objectives are not detailed, and the integrated learning model has not been applied to the student book. Based on the facts that have been formulated the problem in this study is how the validity of integrated science books students with the theme of blood fluid using integrated learning type integrated learning 21st century learning.

2. Research Method

Methods used in this research descriptive research that aims to determine the level of validity books integrated science students with the theme of blood fluid using an integrated learning type of *connected* integrated learning 21st century response data were obtained from three validator namely Padang State University lecturer. Data collected through a questionnaire filled out by experts and practitioners, after the data were obtained, were analyzed using the formula Aiken's:

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

Where: $s = r - lo$ (r = number given by the validator, lo = lowest validation score in this case = 1), n = number of validators (in this case = 3), c = highest validation assessment number (in case this = 4). and n = Number of appraisers.

The category of product validity obtained can be seen in Table 1. The developed book is said to be valid if it has reached the interval ≥ 0.6 .

Table 1. Category of Product Validity

Achievement	Category
≥ 0.6	Valid
<0.6	Invalid

3. Results and Discussion

This book is validated by 3 validators namely Lecturer at Padang State University. The results obtained from this study are integrated science books for students with the theme of blood fluids using integrated learning integrated type learning integrated 21st century learning has been declared valid. This can be seen in Table 2.

Table 2. Validation Student Book

No	Aspect	Average	Criteria
1	Content Validation	0.82	Valid
2	Construction Validation	0.90	Valid
3	Language Validation	0.85	Valid
4	Graphic Validation	0.89	Valid
	Average	0.86	Valid

Result The validation of science books for students Integrated with the theme of blood fluid using integrated learning type connected integrated learning in the 21st century, which was assessed by the validator in Table 2 can be seen as a general average of 0.86 in valid criteria. From the assessment of content validation aspects, it is found that an average of 0.82 is in the valid criteria. Content validation aspect is the material presented in the teacher's book is in accordance with the demands of KI, KD and Indicators formulated, the description of the material in the student's book is in accordance with the selection of blood fluid themes, the illustrations given at the beginning of the student's book are relevant to the description of the material, description of the material and examples given is relevant and attracts the attention of students, the questions in the exercise questions help students achieve learning goals, student books are presented in accordance with the truth of science, students' activities in the student book are presented containing integrated learning models connected types, student activities in accordance with scientific approach, the theme of blood fluid inbooks student adds to the knowledge of readers, learning activities in student books have trained 21st century learning skills.

The average value of construct validation is 0.90 within valid criteria. Where aspects of construct validation are the systematic presentations in each sub-theme in student books arranged consistently, the preliminary pages of natural science student books consist of covers and table of contents, the presentation of learning activities in student books uses in accordance with the demands of the 2013 curriculum, the material compiled in the science student books show cohesiveness, according to the theme and follow the steps of integrated learning type connected, natural science student books are consistent in using symbols / symbols, the material in student books clearly drawn on the concept map, science student books include clear references, pictures in student books can explain material clearly, the science student book has a balance between picture illustrations with writing, the cover page of the science student book has a clear reference list.

The average value of language validation is 0.85 within the valid criteria. Where aspects of language validation are in the books students' science use good and correct language according to the rules of Indonesian grammar. The use of language in student books can provide clear information for readers, books students' science use language with enhanced spelling, science students' books have used the terms are in accordance with the concepts that are the subject, the language is adjusted to the stage of development of students (communicative), the language used is simple, straightforward and easy to understand.

The average value of graphics validation is 0.89 within the valid criteria. Where aspects of the validation of graphics are in the book student science that has been made. The type of letters used is easy to read, the layout and layout of student books is proportional, the illustrations of images and photographs of books students are appropriate to the material, the design of book display student attracts the reader, the color combination in the book student interesting to see.

The validation results show that the Integrated Science student book with the theme of blood fluid uses integrated learning integrated type integrated learning in the 21st century, has been declared valid by the validator.

4. Conclusion

Based on the results of the validation done, the average total value is 0.86 with valid criteria, so it can be concluded from this study that the Integrated Science student book with the theme of blood fluid using integrated type integrated learning integrated learning 21st century learning is valid. The suggestion in this study is the student book from the results of this study can be considered by teachers in developing teaching materials as an effort to improve student grades and understanding in school.

Acknowledgment

The authors would like to thank the Directorate General of Higher Education (DIKTI), Ministry of Research, Technology and Higher Education, Indonesia, for the Research (*Grant of the Postgraduate TEAM* 2019).

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