Needs analysis in the development of natural science student books connected type integrated of local cultural wisdom

Dina Mariani 1 and Usmeldi 2,*

1Student of Master of Physics Education, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang, Indonesia
2Department of Electrical Engineering, Faculty of Engineering, Universitas Negeri Padang, Jl. Prof Hamka, Padang 25131, Indonesia

* usmeldy@yahoo.co.id

Abstract Science learning is packed with themes, so that students can see a meaningful relationship between the concepts of science subjects in a comprehensive and integrated manner, but there are still many teaching materials, especially books for science students that are not integrated or are still separated separately by subject. Needs analysis in developing student books for Integrated Science learning is important, because it can be a guideline for developing student books. This study aims to determine the need to develop a book of connected type connected science students integrated with local culture with a theme. The method used is descriptive, by using an instrument in the form of a questionnaire covering student analysis, material analysis, and task analysis. For data analysis techniques performed in the form of scoring using a Likert scale. Based on the results of the analysis concluded that the existing student books have not described the integration specifically and not yet contained local cultural wisdom, which should be developed. Therefore, the researchers concluded that the integrated science students’ book type connected integrated with local cultural wisdom needs to be developed for science materials that can be integrated.

1. Introduction
Learning science in education has been introduced to students since elementary school, junior high school and senior high school. The 2013 curriculum outlines that science learning in junior high school consists of a combination of Physics, Chemistry and Biology subjects that are packaged with themes or topics, so that students can see meaningful relationships between the concepts of Physics, Chemistry, and Biology. In the 2013 Curriculum Development Guidelines, it is stated that science learning at the junior high school level is carried out on an integrated basis. Science teachers must also have an interdisciplinary ability in science shown in the science (knowledge) of science and also in relation to the environment, technology and other fields. This is what underlies the need for science teachers to have competence in teaching science in an integrated (integrated) manner, including integration in the field of science, integration with other fields and integration with the attainment of attitudes, scientific processes and skills.

Implementation of the 2013 Curriculum makes Teacher and Book Books as one of the facilities prepared by the Ministry of Education and Culture in accordance with Permendikbud Number 71 of 2013 concerning textbooks [1]. The Minister of Education and Culture explains that the Teacher's Book is a guide for teachers in teaching and learning [2]. This is in accordance with Permendikbud Number
51 of 2014 in article (1) paragraph 1, it is explained that setting textbooks as student books and teacher's guidebooks for primary and secondary education [3]. Student Books are student learning resources that contain learning materials, student activities, practice questions, summaries, concept maps, and evaluations [2].

The student book describes the effort students must take to achieve the expected competencies. In the learning process, students are encouraged to obtain information from various learning resources available around them. Therefore, the role of the teacher is very important in improving and adjusting the absorption of students with the availability of the book. The teacher is expected to enrich it by creation in the form of other activities that are appropriate and relevant that are sourced from the social and natural environment of each region. Thus, the teacher is the main controller in the teaching and learning process in the classroom need to pay close attention to student books and teacher handbooks that have been provided by the government.

UU no. 20 of 2003 concerning the National Education System, Article 1 states that national education is education based on Pancasila and the 1945 Constitution of the Republic of Indonesia which is rooted in religious values, Indonesian national culture and responsive to the demands of changing times. Based on the sound of the article above, it appears that National Education emphasizes the value of religion, culture and the demands of the times, which shows the characteristics of the 21st century people. According to Wibowo & Gunawan (2015, p. 125) local cultural wisdom is very appropriate for building student character values accompanying effect in a learning at school. Local wisdom is a fruit or outcome of a particular community / ethnicity through their experience and is not necessarily experienced by other communities. Local wisdom is very strongly attached to certain communities / ethnicities, because the value of local wisdom is tested and through a long process, even age is almost equal to the existence of a particular society or ethnicity (Wibowo & Gunawan, 2015, p. 17). The above view shows the importance of understanding local culture as one of the elements integrated into the education system, especially learning in schools. The content of local culture is said to be integrated if there is mixing, linking, and internalizing values, traditional norms and other local cultural content in learning science, especially in an integrated manner. Local culture content can be integrated in various ways, namely through reading texts, supporting texts, exercises and tasks contained in textbooks / students.

According to the Minister of Education and Culture Regulation No. 22 of 2016 concerning the standard process of primary and secondary education [5]. Learning science is done in an integrated manner because science is a holistic science, not a partial science between Physics, Chemistry and Biology. The implementation of science learning based on the 2013 curriculum has different characteristics with the implementation of learning to accord to the previous curriculum. The 2013 curriculum mandates the implementation of learning to be carried out, in order to develop character values for students. This is stated in Permendikbud Number 20 of 2016 concerning Competency Standards of Graduates which mandates that graduates must have noble character, related knowledge, and thinking and acting skills through a scientific approach.

According to Fogarty (1991: 15) there are ten integrated science learning models, namely 1) the fragmented model (model illustrated), 2) the connected model (model connected), 3) the nested model (nested model), 4) the sequenced model (sorted model), 5) the shared model (divided model), 6) the webbed model (model netted), 7) the threaded model (strained model), 8) the integrated model (integrated model), 9) the immersed model (sunset model, 10) the networked model (network model). One integrated learning model that can be used is a connected type integrated learning model. Through integrated learning to type connected students will have a more comprehensive picture of certain aspects, so that students more quickly understand science learning. Integration in natural science learning can be done, if the various science studies are put together or integrated into one unit using themes.

The local cultural science textbooks are developed by providing cohesiveness that students are expected to be able to understand science learning in a whole and broad way and provide meaning for students. But the reality in the field, shows the complaints presented by the teacher and students related to the 2013 Integrated Curriculum Science students' book at this time. The teacher explained that the physics teacher teaches physics while the biology teacher teaches biology, it can be concluded that the
delivery of the science material has not been seen in an integrated manner because the science teacher teaches according to the field of study mastered. Next, the contents of the textbook or student are concise.

Seeing the importance of integrated science students' textbooks, the researcher raised the title, which is needs analysis in the development of integrated science books for local integrated type of cultural wisdom. The purpose of this research is to develop a book of Natural Sciences students who are connected with quality integrated Local Culture

2. Method
This type of research is descriptive research with a qualitative approach, which is a study that aims to provide an overview of the reality of objects objectively studied. The development model used in this study is the Plomp development model. Plomp development model consists of 3 phases, namely 1) preliminary research, 2) prototype phase (design phase), and 3) assessment phase (assessment phase) [6].

3. Results and Discussion
Need analysis is a part of the preliminary research phase in the plomp model, the purpose of this phase is 1) to obtain information about existing problems and the possibility of needing improvement / innovation, 2) to get the temporary characteristics of the product to be developed.

Important activities that will be carried out at this stage are needs analysis including graduation competency standard analysis, analysis of learning activities, student analysis, assessment analysis, and media analysis. Information gathering was carried out by observing with an instrument in the form of a questionnaire at Sijunjung 1 Junior High School. The results of the study obtained from the analysis of the study using the instruments developed are:

3.1 Analysis Competency Standard of Graduate
Competency Standards of graduate requalification that cover the attitudes, knowledge, and skills of students that must be fulfilled or achieved from an education unit at the primary and secondary education level [7]. Graduation Standard Analysis is shown in Figure 1.

![Analysis of Graduates Competency Standard](image)

**Figure 1.** Analysis of Graduates Competency Standards

Figure 1 shows that the dimensions of knowledge have very high compared to the dimensions of skills and attitudes. This shows that in the learning process only requires the achievement of competence from knowledge only, resulting in a lack of formation of character learning that is accompanied by local culture, this is in accordance with Wibowo & Gunawan (2015, p. 125) local cultural wisdom is very appropriate to build the value of the student's character which is the accompanying effect in learning in school.
3.2 Analysis of Learning Activities
The implementation of learning activities is the implementation of the learning implementation plan that has been compiled. Learning activities include preliminary activities, core activities and closing activities [8]. Analysis of learning activities conducted by Sijunjung State 1 Junior High School is shown in Figure 2

![Figure 2. Analysis of Learning Activities](image)

Figure 2. Analysis of Learning Activities

Figure 2. Showing the low level of integrated science learning activities, where of the three indicators are still in sufficient category, this is because the teacher has more lectures in delivering the material. Furthermore, the material given to students has not yet been integrated in isolation between physics, chemistry and biology, in other words when teaching a theme, the teacher tends to explain the substance of the material in accordance with the teacher's understanding and educational background. This fact is not yet in accordance with the 2013 curriculum which outlines that science learning in junior high school consists of a combination of Physics, Chemistry and Biology subjects that are packed with themes or topics, so that students can see meaningful relationships between the concepts of Physics, Chemistry, and Biology.

3.3 Assessment Analysis
Assessment is an inseparable part of a teaching and learning to process. Assessment is a collection of valid, reliable information and aims to improve appearance. Assessment requires good information and good information must be valid and reliable. The assessment in education are the process of getting information about the achievements or performance of students. The assessment analysis conducted at Sijunjung 1 Public Middle School is shown in Figure 3.
Figure 3. Assessment Analysis

Figure 3. Shows there is one indicator that is still in sufficient category, namely on the implementation indicator. The implementation of learning conducted at school is not comparable with the planning and reporting process, this happens because the teacher is too focused on planning classroom learning and reporting, so the learning process is not optimal.

3.4 Character Analysis of Students

The condition and characteristics of students is one of the considerations that must be considered before developing a learning aid tool, both regarding the interests and talents of students, the tendency of learning styles and the basic abilities of students. Students who are considered to have good basic skills will be different from students who have little or no basic skills [9]. Student Character Analysis can be seen in Figure 4.

Figure 4. Student Analysis

Figure 4. Shows the analysis of students there are significant results, in which the indicators of spiritual attitudes are in the very good category, social attitudes in the good category, knowledge in good categories, the initial ability of students in good categories, learning styles, and motivation are also in good category. Based on the results of the analysis there are two indicators that have a low value of knowledge and learning style with a value of 77.50. This is because science learning still looks common, the material in the textbook used is still lacking specifications on a theme so that in the explanation it is still separate between each discipline that results in students not understanding the learning well, plus
the learning that is still using transfer of knowledge and lecture methods, to make students feel bored and bored in learning

3.5 Learning Media Analysis
Learning media serves to help teachers in the learning process so that learning will attract more students' attention to foster learning motivation; Learning materials will be more clearly defined so that students can better understand them and enable them to master and achieve learning goals. Analysis of learning media used in SMP Negeri 1 Sijunjung can be seen in Figure 5.

![Learning Media Analysis](image)

Figure 5. Analysis learning media

Figure 5. Shows the existence of gaps in the use of learning media used by schools where for the indicators of quality of learning and quality of techniques to obtain the highest score, while the quality of the content gets lower scores. It can be seen that the quality of the content used in the learning media used by school teachers is still low and not in accordance with global challenges. Where the teacher must be able to make and use learning media which can later attract students to be more motivated and able to make students think critically. Based on the results of the analysis carried out, it is clear that the learning done at school has not been carried out optimally in accordance with the goals of education, one of which is to answer global challenges. Global challenges can be faced if learning starts to be carried out and implemented in accordance with education that integrates knowledge, skills and attitudes, as well as mastery of technology, information and computers and local culture. These skills can be developed through various models or types of activity-based learning that are in accordance with the characteristics of competencies and learning materials, to overcome these weaknesses in order to meet the needs of student books in accordance with the demands of the 2013 curriculum, the Book of Natural Sciences students is integrated local wisdom. This is what makes the writer interested in conducting a development research with the title Development of Student / Text Integrated Science Book Integrated Local Connected Type of Culture at SMPN 1 Sijunjung

4. Conclusion
From the analysis carried out, it can be concluded, First, in the analysis of the standard, the competency of graduates shows that in the new learning process requires the achievement of competence from knowledge only, resulting in a lack of formation of character learning. Second, the analysis of learning activities still seems to have not met the expected or in the sufficient category because the teacher uses the lecture method more in delivering the material. Furthermore, the material given to students has not yet been integrated in isolation between physics, chemistry and biology, with the meaning when teaching a theme, the teacher tends to explain the substance of the material in accordance with the teacher's understanding and educational background. Third, in the analysis of the implementation of learning carried out in school is not comparable with the planning and reporting process, this happens because
teachers are too focused on planning classroom learning and reporting, so the learning process is not optimal. Fourth, in the analysis of students' characters there are two indicators that have a low value, namely knowledge and learning to style. This is because science learning still looks common, the material in the textbook used is still lacking specifications on a theme so that the explanation is still separate between each disciplines that result in students not understanding the learning well. Fifth, the analysis of learning media on the quality of the content gets a lower value. It can be seen that the quality of the content used in the learning media used by school teachers is still low and not in accordance with global challenges. Where the teacher must be able to make and use learning media that can later attract students to be more motivated and able to make students think critically and incorporate local cultural wisdom as accompaniment to character education.

References
[1] Permendikbud Nomor 71 Tahun 2013 tentang Buku Teks Pelajaran dan Buku Panduan Guru untuk Pendidikan Dasar dan Menengah. Jakarta : Departemen Pendidikan dan Kebudayaan.
[2] Latiful Jannah, Mohamad Nur, Suyono Jurnal Desain Bahan Ajar Materi Gelombang dan Bunyi Model Inkuiri Terbimbing untuk Melatihkan Keterampilan Proses Sains Siswa SMP. Pendidikan Sains Pascasarjana Universitas Negeri Surabaya, Vol. 6, No.1, Nov 2016. ISSN : 2089-1776.
[3] Permendikbud Nomor 51 Tahun 2014 Tentang Buku Teks Pelajaran dan Buku Panduan Guru untuk Pendidikan Dasar dan Pendidikan Menengah. Jakarta : Departemen Pendidikan dan Kebudayaan.
[4] M.Agus Martawijaya, Jurnal Buku Fisika peserta didik berbasis kearifan lokal untuk meningkatkan karakter dan ketuntasan belajar, Pendidikan Fisika FMIPA Universitas Negeri Makasar.
[5] Permendikbud Nomor 22 Tahun 2016 Tentang Standar Proses Pendidikan Dasar dan Menengah. Jakarta : Departemen Pendidikan dan Kebudayaan.
[6] Plomp, T. 2013. Educational Design Research : An Introduction. Netherland : enschede.
[7] Abidin, Yunus. 2014. Desain Sistem Pembelajaran Dalam Konteks Kurikulum 2013. Bandung: Refika Aditama.
[8] Muijs, Daniel dan David Reynolds. 2008. Effective Teaching Teori dan Aplikasi. Yogyakarta: Pustaka Pelajar.
[9] Yaumi, Muhammad. 2016. Prinsip-Prinsip Desain Pembelajaran. Jakarta: Kencana Prenamedia Group.
[10] Kementerian Pendidikan dan Kebudayaan. 2017. BSE Buku Guru Ilmu Pengetahuan Alam/ Kementerian Pendidikan dan Kebudayaan. Jakarta : Pusat Kurikulum dan Perbukuan, Balitbang, Kemendikbud.
[11] Aji Pamungkas, Bambang Subali, Suharto Lunuwuh jurnal Implementasi Model Pembelajaran IPA berbasis kearifan lokal untuk meningkatkan kreativitas dan hasil Belajar Siswa. Program Studi Pendidikan Fisika, Universitas Negeri Semarang.
[12] Aida Nurul Safitri, Subiki, Sri Wahyuni Jurnal Pengembangan Modul IPA Berbasis Kearifan Lokal Kopi Pada Pokok Bahasan Usaha dan Energi. Program Studi Pendidikan Fisika FKIP Universitas Jember.