JPSD Vol. 7 No. 1, Maret 2021
ISSN 2540-9093
E-ISSN 2503-0558

DEVELOPMENT OF STUDENT WORKSHEETS BASED ON CONTEXTUAL TEACHING AND LEARNING IN SCIENCE LEARNING

Sulistyowati, Nur Inayah Syar

IAIN Palangkaraya

nur.inayah.syar@iain-palangkaraya.ac.id

Article Info

History*:*
Submitted
September 24th, 2020

Revised
February 18th, 2021

Accepted
March 13th, 2021

Abstract

This research was conducted based on the results of observations made by researchers when teaching science courses to prospective MI/SD teacher students. The main problem faced by students is the difficulties in presenting the science concept from textbooks or modules, learning media (videos and PowerPoint slides), and virtual laboratories into real-life contexts. Students also have difficulty learning independently and are less active in the learning process. The purpose of this research is to develop Student Worksheets (LKM) based on Contextual Teaching and Learning in Science Studies and Learning courses. The research method used was Research and Development (R&D). The development design used in this research was ADDIE. The results showed that the CTL-based Student Worksheet Development (LKM) was developed using the ADDIE design which includes analysis stage (needs and curriculum analysis), the design stage (combining LKM components with CTL stages), the development stage (making instruments and feasibility test), implementation stage (distribution of LKM to determine the students' perceptions) and evaluation stage (final stage revision of LKM). Based on the results of the feasibility test, the LKM is in the "Very Feasible" category.

Keywords: Student Worksheet, CTL, Science

A. Introduction

Natural Sciences (IPA) is one of the main subjects that students must master based on the formulation of learning outcomes in the special skills fields of the PGMI Study Program. The KKNI-based PGMI Curriculum Development Team in (Tim Penyusun, 2016) specifically mentions the details of the learning outcomes of the Study program, namely being able to apply the science learning theory in MI/Elementary School contextually.

The results of observations by the researchers when teaching the Science courses 1 in Even Semester 2019 in two different classes of the PGMI Study Program showed that the main problem faced by students was the difficulties in presenting the science concept from textbooks or modules, learning media (videos and PowerPoint slides), and virtual laboratories into real-life contexts. Especially for abstract concepts such as matter and its changes, motion, force, and effort; temperature and heat; Light.

Contextual Learning (CTL) provides direct experience in the form of steps that allow students to think critically and creatively in increasing their intellectual potential (Johnson 2007). So, students can practice their high-order thinking skills appropriately. Contextual learning allows students to connect theory and knowledge gained with the context of everyday life. Presenting the real situations in front of students will encourage them to use a scientific approach and apply it in their daily life (Bustami, Syafruddin, and Afriani 2018; Susialita 2016).

The steps of the CTL approach according to primary and secondary education (Dikdasmen) (in Santi, Panjaitan, and Maulana 2017) namely constructivism, questioning, inquiry, community learning, modelling, reflection, and authentic assessment. If applied in science learning, CTL is proven to be more effective when compared to conventional learning models (Mukhtar 2015; Ridwanulloh 2016). CTL can encourage students' critical thinking skills and motivate them to explore and express opinions in a group (Bustami et al. 2018). Based on the research conducted by (Santi et al. 2017), The CTL approach with teaching materials of Lesson Plan (RPP)and Worksheets applied to science material

(Sound Energy and Its Nature) not only improves learning outcomes but also has a positive effect on the percentage of student activities.

Worksheets can be used as a media for implementing the contextual learning. The CTL approach and the use of worksheets have been shown to have a significant positive effect on students' understanding, motivation and activities. The combination of the two produces a CTL-based Worksheet. (Nursanti, 2019) applying Student worksheet (LKM) with the contextual approach at the mathematics subjects and finds an increase in visual, symbolic, and verbal representations in students. A number of researches regarding the application of CTL-based student worksheets in junior high school students prove that there is an increase in students' critical thinking skills and scientific attitudes (Ummah, Wilujeng, and Piyambodo 2018).

Several researches regarding the application of CTL-based student worksheet (LKM and LKS) have been conducted and have shown positive results. Previous research on this topic has been applied in various subjects or courses at the elementary, junior high, high school and university levels. However, no research has been found regarding the CTL-based student worksheet (LKM) applied to students of prospective teacher of MI/Elementary School. This attracted the attention of researchers because one of the competencies that PGMI students should have is the mastery of the Science concepts. The purpose of this research is to develop Student Worksheets Based on Contextual Teaching and Learning in Science Learning Courses in MI/Elementary School.

B. Research Methodology

Research on the development of Student Worksheets (LKM) is a type of Research and Development (R&D) research. The development design that will be used in this research is ADDIE. (Mulyatiningsih 2012) described the ADDIE development design stages, starting from analysis, design, development, implementation and evaluation.

The analysis or processing technique of the data in this development research is descriptive quantitative. The analysis was done by calculating the percentage of each aspect of the LKM feasibility criteria and students' perception questionnaires by using equations (1):

$$K = F/(N \times I \times R) \times 100\% \quad \ldots\ldots\ldots\ldots (1)$$

Explanation:

K = Percentage

F = Total Number of Answer

N = Highest Score

I = Number of Question

R = Number of Respondents/Validator.

C. Research Result and Discussion

The needs analysis is an analysis carried out as a first step before making Student Worksheets (LKM). This aims to determine the need for teaching materials to be used in the course of Study and Learning Science MI/Elementary School 2. This analysis was carried out based on the questionnaires that had been distributed to students who would take the Course of Study and Learning Science MI/Elementary School 2. Questionnaires in the form of Google form were distributed to all PGMI study program students of the fourth Semester. Table 4.2 shows the results of the needs analysis of the PGMI Study Program for the Course of Study and Learning Science MI/Elementary School 2.

The Student Worksheet (LKM) criteria needed by students are based on distributed questionnaires, which include learning accompanied by easy to understand examples and theoretical summaries, accompanied by illustrations, examples, and brief material, simple and easy to understand, contain pictures with steps/procedure of work, and brief and clear material, reflecting the characteristics of the subjects in MI/Elementary School, and can adjust to the current situation.

Curriculum analysis is carried out so the researchers know what material will be included in the student worksheet (LKM). These materials are adjusted to the course achievements and the level of material that allows them to be developed in student worksheet (LKM) CTL. The four materials

appointed contained physics, chemistry, biology content, and a combination of three of them. Curriculum analysis produces 4 chapters which will be included in the Student Worksheet.

The first chapter is "Materials and Its Characteristics" consists of practicum for the manufacture of types of mixtures, analysis of the relationship between temperature and solubility levels, and making posters of physical and chemical changes. The second chapter is "Temperature and Heat" consists of a practicum of making a simple thermometer and a demonstration of heat transfer. The third chapter is "Plant and Animal Respiration" consists of practicum of making a simple respirometer and the factors that affect respiration. Chapter four "Environmental Pollution" consists of a practicum of making water purification equipment and observing the types of pollution in the surrounding environment.

The CTL approach contains 7 main components, namely: Constructivism, Discovering/Inquiry, Asking, Learning Community, Modelling, Reflection, Actual Assessment (Dirjen Dikdasmen Depdiknas, 2003: 10). These seven components form the basis for designing the stages in the student worksheet (LKM). Each stage is represented by a different symbol and will be a sign of that stage in the Student Worksheet (LKM). At the Design Stage, produced the design of the parts of the Student Worksheet (LKM) that follows the main components of the CTL Approach.

Figure 1 LKM Cover

Figure 2 Objectives

Figure 3 Brief Material

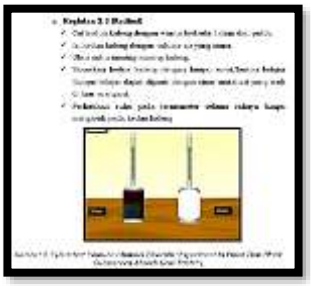

Figure 4 Procedure

Figure 5 Observation Result

Figure 6 Discussion Material

Figure 7 Sample Cases

Figure 8 Reflection

The next stage is the development stage. This stage is the product realization stage. Student Worksheets (LKM) have been prepared based on the designs in the previous stage. Furthermore, the student worksheet (LKM) is validated (feasibility test) by two experts, a material expert (content and presentation feasibility) and a language and design expert (language and graphic).

Table 1 Content Feasibility Aspect Test Results

No	Content Feasibility Components	Percentage (%)	Description
A	Worksheet Coverage	100	Very Feasible
B	Material Accuracy	94,44	Very Feasible
C	Updates	91,67	Very Feasible
D	Contains Productivity Insights	100	Very Feasible
E	Stimulates Curiosity	91,67	Very Feasible
F	Developing Life Skills	91,67	Very Feasible
G	Based on Contextual Teaching and Learning	92,5	Very Feasible
H	Cohesiveness	100	Very Feasible
	Average	95,24	Very Feasible

Tabel 2 Language Aspect Test Results

No	Language Components	Percentage (%)	Description
A	Accordance with Students' Developments	87,5	Very Feasible
B	Communicative	100	Very Feasible
C	Dialogical And Interactive	87,5	Very Feasible
D	Straightforward	87,5	Very Feasible
E	Coherence and Orderliness	100	Very Feasible
F	Conformity with Rules of Language	75	Very Feasible
G	Use of Terms and Symbols	100	Very Feasible
	Average	91,07	Very Feasible

Table 3 Presentation Aspect Test Results

No	Presentation components	Percentage (%)	Description
A	Presentation Technique	100	Very Feasible
B	Material Presentation Support	100	Very Feasible
C	Presentation	100	Very Feasible
	Average	100	Very Feasible

Table 4 Graphic Aspects Test Results

No	Graphic Components	Percentage (%)	Description
A	Worksheet Cover Design	91,67	Very Feasible
B	Worksheet Design	96,3	Very Feasible
	Average	93,98	Very Feasible

The graph of the feasibility comparison of each aspect (feasibility of Content, Language, Material Presentation, and Graphics) is shown in Figure 9.

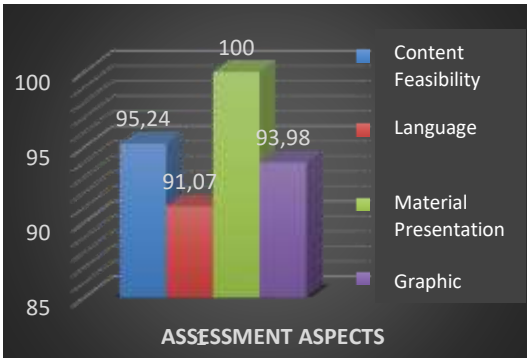

Figure 9 Comparisons of Analysis Results of Each Aspect of Feasibility Test

After the researchers made a number of revisions to the Student Worksheet, then the implementation stage was carried out. In this case, the researchers collected student assessment data on the student worksheet (LKM) using the questionnaires. The results of the questionnaires will serve as the basis for the author as an evaluation material in revising the final stage of the student worksheet (LKM).

At the evaluation stage, the researchers evaluate and revise the final stage based on input from students.

Students assess that the student worksheet is good enough with various components developed according to the CTL stage. Student Worksheets (LKM) are easy to understand because it uses effective sentences, consisting of various activities that are closely related to their daily lives. Moreover, this student worksheet (LKM) is also quite simple, equipped with a lot of discussion material and there are columns for writing reflections, containing case examples, illustrations, and brief material that can motivate students to study the student worksheet (LKM).

The points that are revised in the student worksheet (LKM) in this second stage are the addition of a glossary because there are many terms that are difficult to understand in student worksheets (LKM). Furthermore, there is also advice on adding the written line markers in the reflection section, improving image quality, adding images to the section on air pollution and heat transfer, typing errors, changing the position of the summary with practice questions, clarity of procedures for filling out the observation result sheets and working steps, and clarify the periodic system of the elements in the chapter of materials and its characteristics.

The first stage that needs to be done before developing the Student Worksheets (LKM) and instruments is the analysis stage. The student worksheets (LKM) development begins with analysing the student needs. The needs of Student Worksheets (LKM) analysis is carried out on the students who took the course of Study and Learning Science at PGMI Study Program, Tarbiyah Department, FTIK IAIN Palangkaraya.

Students need and want the student worksheets (LKM) that are simple and easy to understand, have detailed work steps, and can adapt to the student's situation (in other words, they are easy to use and require materials that are easy to find). The use of student worksheets (LKM) in the course of Study and Learning Science is an integral part. Student worksheets (LKM) is not only intended for practicum activities but also observation activities and projects assigned to students.

Worksheets have enormous benefits, both for educators and students. Febriana (2014) revealed that

worksheets allow teachers to be able to teach concepts or ideas in a concrete manner and motivate students to be active in learning.

Worksheets can be developed based on the trends or needs of students in a particular place. The use of worksheets in science subjects is very necessary because it can improve learning outcomes (Setyorini 2014; Tarigan, Agung, and Parmiti 2019) and students' activities (Suratmi, Laihat, and Fitrianti 2019).

After the needs analysis stage is complete, continued with curriculum analysis which also includes concept analysis to adjust the material in the student worksheet (LKM) with the course achievements and the breadth of the material that allows being developed in the CTL student worksheet (LKM). The analysis was also carried out by noticing the basic competencies in science learning in MI/Elementary School.

Curriculum analysis aims that researchers know and adapt the material to the expected competencies and serve as guidelines in developing Worksheets. This will determine the concepts needed in the learning process (Yudhi 2017).

Based on the consideration of efficiency and limitations of development, the material to be developed is in the form of student worksheets (LKM) which includes the contents of Physics, Chemistry, Biology, and a combination of the three of them. The four chapters are Material and Its Characteristics, Temperature and Heat, Animal and Plant Respiration, and Environmental Pollution.

The second stage after analysing the needs and curriculum is the design stage. This student worksheet (LKM) was developed based on the CTL Approach which contains 7 main components, namely: Constructivism, Discovering/Inquiry, Asking, Learning Society, Modelling, Reflection (Fiteriani and Solekha 2016; Ratnawati, Trisnawati, and Prasetyo 2020).

The components in the CTL are translated into the parts that construct the student worksheet (LKM). The constructivism stage is represented by “Example Cases in Everyday Life”. The discovering stage is represented by the observation activities in student worksheets (LKM), starting from the preparation of tools and materials to work steps. The learning community

stage is included in the “Results of Observations”. The questioning stage is included in the “Discussion Materials”. The modelling stage is included in a further discussion. The Reflection stage is written in the "Reflection" section on the student worksheet (LKM). Lastly, the authentic assessment stage is included in the working of the practice questions working at the end of the student worksheet (LKM).

The use of developed worksheets on a contextual-based is known to improve science process skills (Fanani & Fauziah, 2018), motivation (Wati 2019), learning outcome (Usmaedi and Alamsyah 2016), help students achieve the learning goals (Ratnawati et al. 2020). The next development stage of student worksheets (LKM) after the design stage is the development stage. At this stage, the researchers developed a feasibility test instrument, developed the student perception questionnaires instruments, and conducted a feasibility test on the experts. The results of the feasibility test are in the form of revised student worksheets (LKM) based on assessments, suggestions, and input from experts.

After the design stage, it was continued at the implementation stage of distributing student worksheets (LKM) to students to find out students' perceptions of student worksheets (LKM) which will be discussed next. Then it closes with the final stage in the form of an evaluation of the implementation results of student worksheets (LKM) which allows researchers to do the second stage revise in order to produce a final draft of the student worksheet (LKM) which ready to be printed.

The feasibility test instrument used was adapted from BSNP with the addition of a CTL component and the cohesiveness of the material. Faridah (in Nurhayati, 2020) explained that BSNP is a professional and independent institution in charge of developing, monitoring, and evaluating the national education standards. Furthermore, they are also in charge of “conducting the national exams, providing recommendations to the government and local governments in quality and control assurance of education, assessing the appropriateness of content, language, presentation, and graphics of textbooks”. The standard in

this case is the feasibility of content, language, presentation, and graphics on Student Worksheets.

The instrument was developed by researchers based on the aforementioned standards. According to the BSNP Report (in Handoyo 2016), the benefit of the assessment instrument is to get a tool to be able to assess the standardized textbooks and can also be used to assess the appropriateness of content, language, presentation, and graphics. Thus, students can achieve the learning objectives or competencies that were previously targeted.

The results of the feasibility test for each aspect are in the "Very Feasible" category. The highest percentage was achieved in the material presentation aspect, namely 100%, followed by the content feasibility aspect of 95.24%, the graphic aspect of 93.98% and the last one, the language aspect of 91.07%. The student worksheet (LKM) revisions was included the revisions on the table of observation results, work steps, and details writing of quantity units.

The presentation aspects include of presentation techniques, supporting the material presentation, and presentation, the three of its reach a 100% of feasibility percentage. This means that student worksheets (LKM) have advantages in terms of logical and consistent presentation of chapters, coherent concepts, and the balance of substance between activities on the Worksheet.

Content feasibility aspects are include worksheet coverage, material accuracy, up-to-date, contain the insight of productivity, stimulate curiosity, develop life skills, CTL components, and cohesiveness. The component that achieved the highest percentage in this aspect was insight of productivity and cohesiveness. This shows that this student worksheet (LKM) has advantages in presenting activities that can motivate and foster a spirit of independence, work ethic, innovation, creativity, and competitiveness. Moreover, this student worksheet (LKM) also contains science material which is divided into physics, chemistry, biology and a combination of the three of them.

CTL-based worksheets will be integrated with life skills education which is outlined in the activities and practicum therein. This trains students to construct conceptual understandings

independently through various activities such as exploring, processing, and problems solving. Thus, students will be able to carry out learning independently, relating to everyday life (Prastiwi 2016).

The graphic aspect includes the cover design and sheets design which are both in the "Very Feasible" category. This shows that student worksheets (LKM) have fulfilled the provisions of letters and illustrations that are clear and easy-to-read, and cover designs and worksheet designs that have a proper, appropriate, and proportional layout, typography, and illustrations.

The last aspect, if it is viewed from the language aspect, this student worksheet (LKM) has advantages in communicative language and illustrations, integrity and coherence between chapters and paragraphs, and consistent use of terms and symbols. From this language aspect, there is one component that is the lowest compared to all components in this student worksheet (LKM) feasibility assessment, namely "Conformity with Rules of Language" which only reaches a percentage of 75%.

Apart from these components, two other components that have a fairly low percentage compared to other components are "Conformity with Students' Developments", "Dialogical and Interactive" and "straightforward". These results indicate the deficiencies of this student worksheet (LKM) apart from a grammar and spelling perspective, namely that there are concepts, language or terms that are still difficult for students to understand. This is in accordance with the results shown by the student's perception questionnaires which contains suggestions of adding a glossary to the student worksheets (LKM) so that the difficult terms can be understood properly. This will be updated in the final stage revision of the student worksheet (LKM). The ability to motivate students and the ability of student worksheets (LKM) in building interactive communication is not very visible yet, as well as several sentence structures and normative terms that need further review.

The students' perception questionnaires shows that the use of the CTL approach in the Student Worksheet gives interest to students because of the

problems and illustrations are appointed close to their daily lives. Worksheets that allow students to become acquainted with problems that exist around their environment can train students to think of the solutions to these problems and ultimately be able to apply them (Prastiwi 2016).

Students' perceptions of worksheets are influenced by various things. Afifah et al. (2017) found that writing, images, and colors can affect students' motivation in studying the worksheets. Aside from that, the practice questions in it allowing students to gain knowledge and train them to learn independently.

Among the three aspects assessed by students, the usefulness aspect reached the highest percentage. This means that according to students 'perceptions, this student worksheet (LKM) helps them to understand science material, ease them in the learning process, the students' interest in using student worksheet (LKM) enables them to be interested in exploring science material and gives them motivation in the learning process.

D. Conclusion

Development of CTL-based Student Worksheets (LKM) is developed using the ADDIE design which includes the analysis stage (needs and curriculum analysis), the design stage (combining LKM components with CTL stages), the development stage (making instruments and feasibility test), implementation stage (distribution of LKM to determine the students' perceptions) and evaluation stage (final stage revision of LKM). Based on the results of the feasibility test, the LKM is in the "Very Feasible" category with the percentage of the material presentation aspect of 100%, followed by the content feasibility aspect of 95.24%, the graphic aspect of 93.98%, and the last one is the language aspect of 91.07%.

References

Afifah, Nurul, Eka Purnama Sari, and Rena Lestari. 2017. Pengembangan Lembar Kerja Siswa (Lks) IPA Terpadu Berorientasi Contextual Teaching and Learning (Ctl) Pada Materi Ciri-ciri Makhluk Hidup Kelas VII Di SMP Negeri 1 Rambah Hilir. *Journal: eArticle, Universitas Pasir Pengaraian*.

Bustami, Y., D. Syafruddin, and R. Afriani. 2018. The Implementation of Contextual Learning to Enhance Biology Students' Critical Thinking Skills. *Jurnal Pendidikan IPA Indonesia* 7(4):451–57.

Dwi Fanani, Riski, and Nuril Maulida Fauziah. 2018. Keefektifan LKS Berbasis Contextual Teaching and Learning (CTL) Untuk Meningkatkan Keterampilan Proses Sains Siswa Pada Materi Pesawat Sederhana. *PENSA E-JURNAL: PENDIDIKAN SAINS* 6(02).

Febriana, Lucky Chandra. 2014. *Pengembangan Lembar Kerja Siswa (LKS) Fisika Materi Tekanan Mencakup Ranah Kognitif, Afektif, Dan Psikomotor Sesuai Kurikulum 2013 Untuk Siswa SMP/MTs / Lucky Chandra Febriana*. Universitas Negeri Malang.

Handoyo, Alvinia Glori. 2016. *Analisis Kesesuaian Modul Bahasa Mandarin Rumah Bahasa Universal Kelas VII SMP Kristen YSKI Semarang dengan Rambu-Rambu Kelayakan Isi BSNP*. Universitas Negeri Semarang.

Hendracipta, Nana, and A. Syachruroji. 2015. Pengembangan Bahan Ajar Praktikum IPA Berbasis Aktifitas. *JPsd (Jurnal Pendidikan Sekolah Dasar)* 1(2):1–4.

Johnson, Elaine B. 2007. *Contextual Teaching and Learning: Menjadikan Kegiatan Belajar-Mengajar Mengasyikkan Dan Bermakna*. Bandung: Mizan Learning Center.

Mukhtar. 2015. Penerapan Model Pembelajaran Contextual Teaching and Learning untuk Meningkatkan Pemahaman Matematis Mahasiswa dalam Mata Kuliah Pembelajaran Matematika Kelas Rendah. *JPsd (Jurnal Pendidikan Sekolah Dasar)* 1(1):53–58.

Nurhayati, Dian. 2020. *Analisis Kelayakan Buku Teks Al-Qur'an Hadits Kelas IX MTs Berdasarkan BSNP (Kelayakan Isi, Kelayakan Penyajian Materi, Kelayakan Bahasa)*. diploma, IAIN Ponorogo.

Nursanti, Ria. 2019. Improving Students' Mathematical Representation Ability Through Student Worksheets: A

Contextual Approach on The Topic Of Relation and Function For Eighth Grade Students Of Junior High School 3 Batu Ampar. *Jurnal Pendidikan Matematika Dan IPA* 10(2):284–98.

Prastiwi, Ellen Dwi. 2016. Pengembangan Lembar Kegiatan Siswa (LKS) Berbasis Contextual Teaching and Learning (CTL) Terintegrasi Pendidikan Kecakapan Hidup Materi Bioteknologi. *BioEdu* 5(3).

Ratnawati, Ratnawati, Pemi Trisnawati, and Dian Estu Prasetyo. 2020. Pengembangan Lembar Kerja Siswa (LKS) Berbasis Model Contextual Teaching and Learning Pada Materi Pesawat Sederhana ai Kelas V SD Negeri 04 Koto Salak. *Menara Ilmu* 14(1).

Ridwanulloh, Agus. 2016. *Pengaruh Model Pembelajaran Contextual Teaching And Learning (Ctl) Terhadap Hasil Belajar Siswa Kelas V Pada Materi Pesawat Sederhana.* Universitas Pendidikan Indonesia.

Santi, Dwi Kartika, Regina Lichteria Panjaitan, and Maulana Maulana. 2017. Pendekatan CTL dalam Materi Energi Bunyi dan Sifatnya Untuk Meningkatkan Hasil Belajar Siswa (PTK pada Siswa Kelas IV SDN Cipameungpeuk Kecamatan Sumedang Selatan Kabupaten Sumedang). *Jurnal Pena Ilmiah* 2(1):301–10.

Setyorini, Windy. 2014. *Pengembangan LKS Fisika Terintegrasi Karakter Berbasis Pendekatan CTL untuk Meningkatkan Hasil Belajar*. Universitas Negeri Semarang.

Suratmi, Laihat, and Rizki Fitrianti. 2019. Appplication of LKPD Based on South Sumatera Local Advantages as Efforts to Improve Results and Students-Learning Activities. *Jurnal Pendidikan Sekolah Dasar* 5(1):61.

Susialita, T. 2016. The Development of Audio-Visual Student Portfolios (LKS) Contextual Teaching And Learning-Based (CTL) on Sound Chapter Of Science Subject For Deaf Students. *Jurnal Pendidikan IPA Indonesia* 5(2):192–98.

Tarigan, Berwina Ngalemisa Br, Anak Agung Gede Agung, and Desak Putu Parmiti. 2019. Pengembangan Lembar Kerja Siswa (LKS) Bermuatan Karakter Untuk Meningkatkan Hasil Belajar IPA. *Journal of Education Technology* 3(3):179–85.

Tim Penyusun. 2016. *Kurikulum Berbasis Kerangka Kualifikasi Nasional (KKNI)*. Jakarta: Prodi PGMI FTIK UIN Syarif Hidayatullah Jakarta.

Ummah, Heru Khoirul, Insih Wilujeng, and Erfan Piyambodo. 2018. Pengembangan Lembar Kerja Peserta Didik (LKPD) Materi Pemanasan Global Berbasis Contextual Teaching Learning (CTL) untuk Meningkatkan Keterampilan Berpikir Kritis dan Sikap Ilmiah Peserta Didik SMP Kelas VII. *Pend. Ilmu Pengetahuan Alam-S1* 7(1):53–62.

Usmaedi, Usmaedi, and Trian Pamungkas Alamsyah. 2016. Penerapan Metode Pembelajaran Contextual Teaching Learning (CTL) terhadap Hasil Belajar dan Self-Esteem Siswa Sekolah Dasar Pada Mata Pelajaran Pendidikan Pancasila dan Kewarganegaraan (PKn). *JPsd (Jurnal Pendidikan Sekolah Dasar)* 2(2):215–23.

Wati, Rosi Yulistia. 2019. *Penerapan pembelajaran fisika berbasis CTL (contextual teaching and learning) melalui metode eksperimen untuk meningkatkan motivasi dan hasil belajar siswa pada materi tata surya kelas VII MTs. Al-Madaniyah Jempong Barat Kota Mataram.* Universitas Islam Negeri Mataram.

Yudhi, Prima. 2017. Analisis Kebutuhan Pengembangan Lembar Kerja Siswa Berbasis Realistics Mathematics Education (RME) Pada Materi FPB dan KPK untuk Siswa Kelas IV Sekolah Dasar. *Menara Ilmu* 11(74).