




# Psychocentrum Review

ISSN 2656-8454 (Electronic) | ISSN 2656-1069 (Print)

Editor:  Yuda Syahputra

Publication details, including author guidelines

URL: <http://journal.unindra.ac.id/index.php/pcr/about/submissions#authorGuidelines>

## Development of Science Teaching Materials Using the CTL Approach to Improve Self-Control of Elementary School Students

**Muthyara Daryus, Firman**

Universitas Negeri Padang

---

### Article History

Received : 9 October 2022

Revised : 24 November 2022

Accepted : 30 November 2022

### How to cite this article (APA 6<sup>th</sup>)

Daryus, M., & Firman, F. (2022). Development of Science Teaching Materials Using the CTL Approach to Improve Self-Control of Elementary School Students. *Psychocentrum Review*, 4(3), 357–366. DOI: 10.26539/pcr.431707

The readers can link to article via <https://doi.org/10.26539/pcr.431707>

### Correspondence regarding this article should be addressed to:

Muthyara Daryus, E-mail: [muthyaradaryus@gmail.com](mailto:muthyaradaryus@gmail.com), Universitas Negeri Padang, Padang, and Indonesia

---

SCROLL DOWN TO READ THIS ARTICLE



Universitas Indraprasta PGRI (as Publisher) makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications. However, we make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Universitas Indraprasta PGRI. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information.



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

Copyright by Daryus, M., & Firman, F. (2022)

The authors whose names are listed in this manuscript declared that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript. This statement is signed by all the authors to indicate agreement that the all information in this article is true and correct.

Original Article

## Development of Science Teaching Materials Using the CTL Approach to Improve Self-Control of Elementary School Students

Muthyara Daryus<sup>1</sup>, Firman<sup>2</sup>  
Universitas Negeri Padang

---

**Abstract.** This study aims to describe and develop science teaching materials using the CTL approach to improve self-control of fifth grade students at SD Negeri 21 Lubuk Lintah Padang which are valid, practical and effective. This type of research is development using a modified 4-D model. The results of this study are the average score of science teaching materials using the CTL approach with a validity value of 89.4% (valid). The results of practicality by the teacher obtained results of 87.5% (practical), and from the results of practicality by students obtained results of 84.5% (practical). The results of the effectiveness of using teaching materials get an average of 0.74 (effective). It can be concluded that science teaching materials use the CTL approach to improve self-control of fifth grade elementary school students which results are valid.

---

**Keywords:** Science Teaching Materials, CTL, Self-Control, Covid-19

Corresponding author: Muthyara Daryus, E-mail: [muthyaradaryus@gmail.com](mailto:muthyaradaryus@gmail.com), Universitas Negeri Padang, Padang, and Indonesia.



This work is licensed under a CC-BY-NC

---

### Introduction

According to Mulya et al. (2020), there are several ways in which a person can be infected with Covid-19, namely: 1) Accidentally inhaling splashes of saliva from a sneeze or cough of a sufferer of COVID-19. 2) Holding your mouth or nose without washing your hands first after touching an object that has been splashed with the saliva of a Covid-19 sufferer. 3) Close contact with a Covid-19 sufferer, for example touching or shaking hands. For this reason, prevention needs to be done early on, one of which is in the field of Elementary School (SD) education. In order to slow down the transmission of Covid-19, it is necessary to change learning methods.

According to Adriana et al. (2020), schools need to implement several methods, such as offline and online. The offline method is carried out only for one meeting a week with the aim of delivering assignments that have been given for one week and sticking to the established health protocols. According to Adriana et al. (2020); Goddess (2020); Jamilah & Mulyadi, (2020); Tien et al. (2019) Online methods are used to provide learning to students through the Zoom application, Google Meet, Google Classroom, and Whatsapp groups.

Both of these methods are carried out to still be able to interact with students in providing learning material.

One of the subject matter related to the transmission, prevention, and how to maintain the health of Covid-19 is science learning. According to Adriana et al. (2020); Avania & Sholikhah (2021); Wiradharma et al. (2021) Science learning really requires students to be active in discovering and experiencing for themselves the meaning of the teaching materials provided by the teacher with the aim that students can add insight into the environment around them, be able to solve problems related to nature, and apply them in everyday life.

During science learning, the approach used to provide material related to Covid-19 is a contextual approach (Contextual Teaching and Learning/CTL). According to (Afriani, 2018; Anggraini, 2017; Daryus et al., 2021, 2023; Panjaitan, 2018), CTL is a learning concept that can help teachers connect between the material being taught and situations that are happening in the real world.

The material used during Covid-19, of course, needs to be developed teaching materials that are adapted to the K13 curriculum with the Covid-19 situation. The development of teaching materials is carried out such as materials and LKPD (Student Worksheets). The material developed is of course related to Covid-19 such as the process of spreading Covid-19, symptoms when Covid-19 is identified, the process of entering the Covid-19 virus in the body, and how to maintain health from transmission of Covid-19.

After being given the development of material on infectious diseases with the aim of students being able to increase self-control in maintaining a healthy body, especially in the spread of Covid-19. According to Kurnia (2021) the importance of high self-control for every individual or community during the COVID-19 pandemic, also needs to be accompanied by strategies to comply with strict health protocols.

Self-control is one of the internal factors that influence individual tendencies to regulate and pay attention to appropriate ways to behave in various situations, controlling emotions and impulses from within such as breaking habits, resisting temptation, and self-discipline. Daryus et al. (2021; 2023); Fachrurrozi et al. (2018); Triastuti & Sutoyo (2020); Grace (2021).

Based on the results of research that has been conducted by Daryus et al. (2021) regarding the Development of Science Learning Modules Based on Contextual Teaching and Learning for Grade IV in Elementary Schools with the results showing that the module development carried out in CTL-based Science subjects that was developed was very valid. Then research conducted by Daryus et al. (2023) with the title Development of integrated thematic teaching materials using a contextual approach in increasing student self-control to prevent Covid-19 transmission in elementary school with the result that the development of integrated thematic teaching materials uses the CTL approach to increase student self-control in preventing Covid-19 that has been developed to get an average of 89.4% in the valid category.

Based on the explanation above and the research that has been done by Daryus et al. (2021, 2023) it can be concluded that the development of science teaching materials using the CTL approach needs to be carried out in order to find out whether there is an increase in students' self-control over the teaching materials they have learned about covid-19. Therefore, it is necessary to conduct research with the title *Development of Science Teaching Materials Using a Contextual Approach to Improve Elementary School Students' Self-Control*.

## Method

The type of research conducted is research and development (R&D). The device development model is the 4D approach, with this approach consisting of 4 stages of development, namely 1). Define, 2) Design, 3). Development, and 4). Dissemination.

## Participants

The development of science teaching materials based on the Contextual approach is focused on theme 4 (Health Is Important) at SD Negeri 21 Lubuk Lintah in grade V.

## Sampling Procedures

The sampling process was carried out using total sampling or saturated samples which were students of SD Negeri 21 Lubuk Lintah in class V with a total of 30 students.

## Materials and Apparatus

The materials used in this study included (1) product validation results questionnaire, (2) teacher response questionnaire, (3) student response questionnaire, (4) student learning outcomes sheets. while the qualitative data obtained from the results of the trial implementation were in the form of observation sheets on the use of teaching materials using the CTL approach. The tools used are Microsoft Word for making questionnaires, the Canva application for designing teaching materials, and Microsoft Excel for data analysis.

## Procedures

The following is the procedure carried out, 1) conducting a preliminary study to obtain initial data, 2) conducting interviews with teachers and students, 3)

conducting validity testing of science teaching materials by lecturers and teachers. There were 4 lecturers and 1 teacher as a validator involved in the process of developing science teaching materials, 4) conducting practicality testing by teachers and students. There was 1 teacher and 30 grade 5 students who were involved in filling out practical questionnaires, 4) giving pre-test and post-test questions to students, 5) processing data to get research results



## Data Analysis



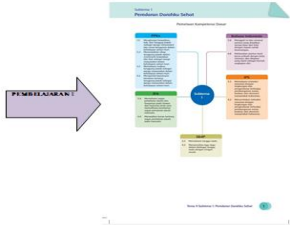
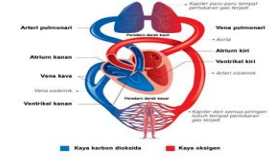
The data that has been collected is then processed according to the existing formula. This is described as follows: 1) analysis of the validation of teaching materials from the validator on all aspects assessed, presented in tabular form. 2) Practicality analysis, data obtained by calculating the scores of students who answered each item as contained in the questionnaire. Teaching materials practicality test data were analyzed by percentage (%). and 3) Analysis of Effectiveness, pre-test questions are used to obtain data on students' initial knowledge learning outcomes prior to learning activities, while post-test questions are used to obtain data on student knowledge learning outcomes after using thematic teaching materials with post-test questions the same as pre-test questions.

## Results

The following is the result of the development of science teaching materials that have been validated by the lecturer, which can be seen in the following table.

**Table 1.** Teaching Materials Before and After Validation

NO	NAME	BEFORE REVISION	AFTER REVISION
1.	Front cover		

NO	NAME	BEFORE REVISION	AFTER REVISION
2.	Core Competency	<p><b>KOMPETENSI INTI</b></p> <p>KI.1. Mengetahui, memahami dan mengagumi aspek-aspek yang diteliti.</p> <p>KI.2. Memiliki perilaku jujur, disiplin, tanggung jawab, santun, peduli, dan percaya diri dalam berinteraksi dengan keluarga, teman, guru, dan tetangganya.</p> <p>KI.3. Memahami pengetahuan faktual dengan cara mengamati (mendengar, melihat, membaca dan menanya) dan memiliki kemampuan untuk mengolah informasi, melakukan eksperimen, dan memiliki sikap kritis dalam berinteraksi dengan keluarga, teman, guru, dan tetangganya.</p> <p>KI.4. Menyajikan pengetahuan faktual dalam bahasa yang jelas, sistematis, dan logis, dalam karya yang estetis, dalam gerakan yang mencerminkan anak sehat, dan dalam tindakan yang mencerminkan perilaku anak beriman dan berakhlak mulia.</p>	<p><b>KOMPETENSI INTI</b></p> <p>KI.1. Mengetahui, memahami dan mengagumi aspek-aspek yang diteliti.</p> <p>KI.2. Memiliki perilaku jujur, disiplin, tanggung jawab, santun, peduli, dan percaya diri dalam berinteraksi dengan keluarga, teman, guru, dan tetangganya.</p> <p>KI.3. Memahami pengetahuan faktual dengan cara mengamati (mendengar, melihat, membaca dan menanya) dan memiliki kemampuan untuk mengolah informasi, melakukan eksperimen, dan memiliki sikap kritis dalam berinteraksi dengan keluarga, teman, guru, dan tetangganya.</p> <p>KI.4. Menyajikan pengetahuan faktual dalam bahasa yang jelas, sistematis, dan logis, dalam karya yang estetis, dalam gerakan yang mencerminkan anak sehat, dan dalam tindakan yang mencerminkan perilaku anak beriman dan berakhlak mulia.</p>
3.	Constructivism step	<p><b>1. Konstruktivisme</b></p> <p><b>Ayo Membaca</b></p> <p><b>VIRUS COVID-19 DI INDONESIA</b></p>  <p>Apa yang kamu ketahui tentang Covid-19 di Indonesia?</p> <p>Bagaimana kamu menyikapi penyakit Virus Covid-19 tersebut?</p> <p>Apa yang akan kamu lakukan ketika berada dalam pandemi Covid-19 tersebut?</p>	<p><b>1. Konstruktivisme</b></p> <p>Konstruktivisme pada bagian ini adalah siswa membangun dan mengkonstruksikan pengetahuan yang sudah ada sebelumnya.</p> <p><b>Ayo Membaca</b></p> <p><b>VIRUS COVID-19 DI INDONESIA</b></p> <p>Penyakit Virus Corona (Covid-19) dengan cepat meluas ke seluruh belahan dunia, menimbulkan perhatian pada aktivitas sehari-hari. Akibatnya, masyarakat harus mengikuti protokol kesehatan yang ketat. Hal ini juga berlaku di Indonesia. Jumlah penyakit akibat Covid-19 di Indonesia per bulan April 2021 terkonfirmasi 743.191 kasus dengan angka kematian 22.135 orang.</p>  <p>Apa yang kamu ketahui tentang Covid-19 di Indonesia?</p> <p>Bagaimana kamu menyikapi penyakit Virus Covid-19 tersebut?</p>
4.	modelling	<p><b>3. Pemodelan</b></p> <p><b>SISTEMA PEREDARAN DARAH DI JANTUNG</b></p>  <p><b>PERBEDAAN</b></p>	<p><b>Ceritakan kembali pembagian pembuluh darah yang terdapat pada manusia beserta fungsinya!</b></p> <p><b>Ayo Mengamati</b></p> <p>Amati gambar di bawah ini!</p> <p>Labelkan semua pembuluh dan anatomi gambar di bawah ini dengan tekatan!</p>  <p>Arteri pulmonalis Atrium kanan Vena kava Ventrikel kanan Ventrikel kiri Atrium kiri Arteri aorta Vena pulmonalis</p> <p>Kaya karbon dioksida Kaya oksigen</p>

After being validated by 4 lecturers and 1 teacher. So that the results of the assessment are obtained as follows.

**Table 2. Results of Validation of Teaching Materials by the Validator**

No	Validators	Score	Category
1	Content/material I	82%	Valid
2	Content/material II	93%	Very valid
3	Content/material III	93%	Very valid
4	Appearance	86%	Valid
5	Language	93%	Very valid
Average		89.4 %	Valid

From content/material expert validators I (82%) and appearance (86%) with a valid category. While the validator Content/material II (93%), Content/material III (93%), and Language (93%) with very valid categories. Practicality data obtained by using a practicality test questionnaire which is briefly shown in table 3 below.

**Table 3. Results of the practicality of teaching materials by students**

No.	Statement	Amount	Practical Value	Criteria
1.	1	82		
2.	2	77		
3.	3	69		
4.	4	91		
5.	5	68	84.5 %	Practical
6.	6	85		
7.	7	76		
8.	8	76		
9.	9	77		
10.	10	77		

Based on the table above, you can see the results of the responses of 23 class V students at SDN 21 Lubuk Lintah to teaching materials using the CTL approach on theme 4 with an average practicality of the materials teach science 84.5% and practical category. The number of items made on the question sheet is 10 objective questions and 5 essay questions. The following is an analysis of its effectiveness in table 4.

**Table 4. Effectiveness Analysis**

No	Effectiveness Analysis	Amount	Average
1	Pre-test questions	1,236	41,2
2	Post test questions	2,370	79
<b>Average N-Gain</b>			<b>0.74</b>
<b>Criteria</b>			<b>Effective</b>

Based on table 4, it can be obtained an analysis of effectiveness using pre-test and post-test questions on science teaching materials using the CTL approach for class V SD with an average of 0.74 fulfilling the effective criteria, which means that the developed teaching materials are effective in integrated thematic learning in grade V Elementary School.

On sheet control there are 3 aspects of self that are assessed, namely, controlling behavior, controlling cognitive, and controlling decisions. As for the statements on the self-control sheet, there are 25 statements which include



positive and negative variables. The results of the self-control instrument can be seen in table 5 below.

**Table 5.** Analysis of Increased Self Control

No	Self Control Analysis	Amount	Average
1	Pre-test questions	1766	54%
2	Post test questions	2251	78%

From the results of the analysis of increasing student self-control, the pre-test questions got an average of 54% while the post-test questions got an average of 78%. So, it can be concluded that there was an increase in the self-control of fifth grade elementary school students in science teaching materials using the CTL approach.

## Discussion

Based on the results of the validation carried out with the validator, it shows that the science teaching materials that have been validated get valid results with an average of 89.4%. This figure is obtained from the average of the 5 scores from material experts, teachers, display experts, and linguists.

From the material expert validator, getting an average of 89.3% with the Valid category. There are 4 aspects that are assessed, namely aspects of text readability, straight forwardness, conformity with language rules, and the use of language effectively and efficiently. In the teaching materials the material has been adjusted to the readability aspect of the text where in the teaching materials the existing material has been adapted to the curriculum, with Basic Competencies and indicators to be achieved in science learning theme 4 (health is important).

It can be concluded that teaching materials are very well used in learning, this is due to the adjustment between teaching materials and the current situation and conditions of Covid-19. In addition, the selection of simple and clear sentences makes it easier for students to understand teaching materials. Daryus et al. (2021, 2023); Wulandari et al. (2022) state that by developing teaching materials, elementary school students can learn independently, more effectively and efficiently about the material presented and can apply it in everyday life.

The results of the practicality test by the fifth grade teacher at SDN 21 Lubuk Lintah showed that the science teaching materials using the CTL approach that had been developed were practical with a practicality percentage of 87.5%. This shows that the science teaching materials developed can make it easier for the teacher to explain the material and help the teacher's role as a facilitator. The results of the practicality test by fifth grade students at SDN 21 Lubuk Lintah show that integrated thematic teaching materials using a contextual approach to



theme 4 have been developed practically with a practicality percentage of 84.5%. this figure is obtained from the average of the ten practical aspects of teaching materials assessed by students.

The results of this study are in line with Abdi (2011) which concluded that the CTL approach would touch more on the affective aspects of students and motivate them to be able to actualize the values or concepts obtained from PAI teaching materials. And also supported by research conducted by Daryus et al. (2021), The practicality of the CTL-based science learning module on life cycle material for grade IV SD N 22 Kuranji that has been developed is declared practical with an average percentage of 83.83% by teachers and stated as practical with an average practical percentage of 82.26% by students .

The results of the effectiveness test by fifth grade students at SDN 21 Lubuk Lintah showed that science teaching materials using a contextual approach were developed to be quite effective with a value of 0.64 in the quite effective category using the percentage of N-gain. The results of the effectiveness test were carried out by 23 students by giving pre-test questions before learning and post-test questions after learning. This research is supported by (Daryus et al., 2021).

In the results of self-control analysis of fifth grade students at SDN 21 Lubuk Lintah towards the development of science teaching materials with the CTL approach, it can be seen that the results before using teaching materials and after using teaching materials increased by 24%. Science teaching materials using a contextual approach to improve self-control of fifth grade elementary school students are valid, practical and effective teaching materials used in the learning process.

According to Kurnia (2021), through self-control strategies in living a clean and healthy life and implementing health protocols within the framework of solidarity, togetherness and unity from all parties is the main key in dealing with and reducing the COVID-19 pandemic so that it will end soon. This can also be applied to elementary school students. Therefore it can be concluded that the use of science teaching materials using a contextual approach to increase the self-control of fifth grade elementary school students can help students in the teaching and learning process at SDN 21 Lubuk Lintah Padang and increase students' self-control against the spread of the Covid-19 virus.

## Conclusion

Based on the results of research on the development of science teaching materials using the CTL approach, it was concluded that the development of science teaching materials using the CTL approach was very appropriate for use as teaching materials for elementary school students, very practical to use, and also effective in increasing the self-control of SD 21 Lubuk Lintah students. Padang. With details of the results of the final validation score of 89.4% which

is in the valid category. The practicality of science materials using the CTL approach to increase student self-control in preventing Covid-19 has been developed to get an average percentage of 87.5% by teachers and 84.5% by students in the practical category. Effectiveness Science teaching materials using the CTL approach to increase student self-control in preventing Covid-19 with a percentage of 0.74 in the effective category. There is enhancement students' self-control of preventing the transmission of Covid-19 in class V SD Lubuk Lintah Padang.

## Acknowledgements

The author's thanks go to Dr. Firman, MS, Kons., Mrs. Dr. Darnis Arief, M.Pd, Dr. Desyandri, M.Pd, for suggestions and input on the results of this research, as well as support to the authors so that this research can be officially published in this journal. The authors also thank the Principal of SD N 21 Lubuk Lintah who has given permission to researchers to collect data for this study.

## References

- Abdi, MI (2011). Contextual Teaching And Learning (CTL) in PAI Learning. *Dynamics of Science*, 11(1).
- Afriani, A. (2018). Contextual Learning (Contextual Teaching and Learning) and Students' Understanding of Concepts. *Al Muta'aliyah STAI Darul Kamal NW Kembang Karang*, I(3), 80–88.
- Andriana, E., Ramadayanti, S., & Noviyanti, TE (2020). *Science Learning in Elementary Schools During the Covid 19 Period*. *Molecules*, 2(1), 1–12.
- Anggraini, D. (2017). Application of Contextual Learning in Early Childhood Education. *Yaa Bunayya : Journal of Early Childhood Education*, 1(1), 39–46.
- Avania, WF, & Sholikhah, N. (2021). Development of Audio Visual Learning Media with a Contextual Teaching Learning (CTL) Approach to Increase Student Learning Motivation. *Educative : Journal of Educational Sciences*, 3(5), 2531–2538.
- Daryus, M., Firman, & Desyandri. (2021). Development of Science Learning Module Based on Contextual Teaching and Learning for Grade IV in SD. *Journal of Elementary School Teacher Education*, V(1), 59–70.
- Daryus, M., Firman, & Mulya, J. (2023). Development of integrated thematic teaching materials using a contextual approach in increasing student self-control to prevent Covid-19 transmission in elementary schools. *International Journal of Applied Counseling and Social Sciences*, 04(02),

44–51.

- Dewi, WAF (2020). The Impact of Covid-19 on the Implementation of Online Learning in Elementary Schools. *Educative : Journal of Educational Sciences: Journal of Educational Sciences*, 2(1), 55–61.
- Fachrurrozi, Firman, & Ibrahim, I. (2018). The Relationship between Self-Control and Student Discipline in Learning. *Journal of Neo Counseling*, 1(1), 6.
- Jamila, & Mulyadi. (2020). The impact of online learning amid the COVID-19 pandemic on elementary school students. *Journal of STKIP PGRI Sumenep*, September, 13–18.
- Kurnia, R. (2021). Strategies to Improve Self-Control During the COVID-19 Pandemic. *Prophetic : Professional, Empathy, Islamic Counseling Journal*, 4(1), 59.
- Mulya, J., Leni, P., & Eliza. (2020). District Affected by the Covid-19 Pandemic: PKM Distributes Rice to Pila Tarok Communities in Kuranji Padang District Affected by the Covid-19 Pandemic. *Jlari.Org*, 1(1), 19–24.
- Pandjaitan, DJ (2018). Improving Understanding and Application of Concepts Through a Contextual Teaching and Learning Approach. *MathEducation Archipelago Journal*, 1(1), 52–59.
- Tien, DH, Amaya Rivas, AA, & Liao, YK (2019). Examining the influence of customer-to-customer electronic word-of-mouth on purchase intentions in social networking sites. *Asia Pacific Management Review*, 24(3), 238–249.
- Triastuti, A., & Sutoyo, A. (2020). The Relationship between Self-Control and Disciplinary Behavior of School Rules in High School Students. *Indonesian Journal of Guidance and Counseling: Theory and Application*, 9(1), 41–45.
- Wiradarma, KS, Suarni, NK, & Renda, NT (2021). Analysis of the Relationship between Learning Interest and Science Online Learning Outcomes for Class III Elementary School Students. *Undiksha PGSD MIMBAR*, 9(3), 408.