



SYSTEMATIC LITERATURE REVIEW: CONTEXTUAL TEACHING AND LEARNING (CTL)-BASED MATHEMATICS LEARNING MODULE ON EXPONENTIAL MATERIAL IN CLASS X HIGH SCHOOL

Patlan Putra Jaya¹, As Elly², Yufitri Yanto³

^{1,2,3} Universitas PGRI Silampari

patlanhw@gmail.com, aselystkip23@gmail.com, yufitri.yanto@gmail.com

Abstract

This study aims to conduct a literature review related to exponential learning using the Contextual Teaching and Learning (CTL) approach. The method used is Systematic Literature Review (SLR). The data used in this study is exponential learning information with the Contextual Teaching and Learning approach taken from selected articles. There were 10 articles used as data sources in this study with the following criteria: (1) the topic discussed was about exponential learning, (2) using the Contextual Teaching and Learning (CTL) approach, (3) the articles came from quality journals and were indexed by Sinta and Scopus.

Keywords: Contextual Teaching and Learning; Eksponen; Systematic Literature Review

INTRODUCTION

This research is based on the problems that educators often face during the learning process in understanding exponential material by using teaching materials that do not yet support learning in the context of daily life. It is also explained by Komalasari (2010) that learning that emphasizes students to understand the material by relating the learning material to the real-life context is said to be learning with a contextual approach. Likewise, as explained by Elly & Rosalina (2019), the context of the environment in which they are located can help them more easily recognize and apply it according to their desired needs without eliminating the characteristics of the context. Meanwhile, Suastika & Wahyuningtyas (2018) said that there is no shortage of mathematics books that support learning with a contextual approach.

There are several causes why students are easily bored and do not fully understand the material in the learning process, one of which is because students do not understand the meaning contained in each material conveyed by the teacher, therefore the teacher must determine the right learning method to achieve the desired learning goals. One way to achieve learning goals is to use the contextual teaching and learning method. According to Suprijono & Agus (2011), *Contextual Teaching and Learning learning* is one of the innovative learning that provides opportunities for students to progress in accordance with the potential of the students so that students are actively involved in the teaching and learning process.

In the opinion of Rofifah (2020), *Contextual Teaching and Learning* (CTL) is a learning method by applying the concept of learning between the knowledge that students already have and the real life of students so as to encourage students to better understand the meaning of the material presented. It is also emphasized by

Trianto (2010) that *Contextual Teaching and Learning* (CTL) is a learning concept where teachers present real-world situations into the classroom and encourage students to make connections between their knowledge and the application of their lives as family members and society. With this concept, the learning process that takes place will be more real in accordance with the problems that occur in the student environment.

Meanwhile, according to Nurhadi et al. (2009) also emphasizes that, through a contextual approach, students are expected to learn through 'experiencing', and not 'memorizing'. Through contextual learning, teaching not only transforms knowledge from a teacher to a student by memorizing a number of concepts that seem detached from real life, but more emphasis on facilitating students to seek the ability to live (life skills) in what they learn. Learning using *the Contextual Teaching and Learning* (CTL) approach can create fun learning that students want, so that students do not feel that the learning process they are undergoing is boring.

RESEARCH METHODS

This study uses the *systematic literature review* (SLR) method. Triandini et al. (2019) in their research stated that systematic literature review (SRL) is a term used to refer to the methodology of research or certain research or development carried out to blunt and evaluate research related to the focus of a certain topic. The chart of *systematic research literature review* (SLR) is as follows:



Figure 1. Systematic research chart of literature review (SLR)

The procedure for *systematic literature review* (SLR) research is as follows:

1. *The research question* in this study is how to design a mathematics learning module based on *Contextual Teaching and Learning* (CTL) on Exponential material.
2. *Selection criteria* are inclusion and exclusion, the inclusion in this study is an article using *the Contextual Teaching and Learning* (CTL) method and research using Exponential material, published between 2018 and 2022. Meanwhile, the exclusion of this study is articles that are not related to the research topic, publications before 2018.
3. *Strategy search* is a search for articles on the development of *Contextual Teaching and Learning* (CTL)-based mathematics learning modules on Exponential materials.
4. *Select studies* were carried out to examine the date, identity of the journal, year of publication, language, abstract and content.
5. *The quality of studies* is evaluating articles based on the quality of the article, and aims to analyze whether the article is in accordance with the

research objectives.

6. *Synthesis results* of the article are synthesized to answer the formulation of the problem in the research

RESULTS AND DISCUSSION

This research uses articles searched from Google Scholar, Sinta, and Scopus. The results of the research are 9 articles/journals that discuss *Contextual Teaching and Learning* (CTL) and discuss Exponents. The following are the results of the articles that have been researched, in the table below:

Table 1. *Description of Contextual Teaching and Learning Based Mathematics Learning Overview on Exponential Materials*

Researcher and Year	Journal	Research Results
(I Ketut Suastika and Amaylya Rahmawati, 2019)	Indonesian Journal of Mathematics Education <i>Education Studies</i>	With the availability of mathematics learning modules that are made in language that is easy to understand, interesting, and also contextual, it will be easier for students to understand the concepts contained in the material they are learning. Mathematics learning modules with a contextual approach are expected to make it easier for students to learn mathematics materials and also help make it easier for teachers to transform mathematics learning. That's why it is necessary to develop a mathematics learning module with a contextual approach that can help students to learn actively and independently.
(Martin, Syamsuri, Heni Pujiastuti, and Aan Hendrayana, 2021)	Derivative Journal	There are several causes of students experiencing boredom and not being able to understand the material fully, one of which is because students have not understood the meaning contained in the material presented, this is the background of research that uses the right method on problems in the field, namely by using <i>the Contextual Teaching and Learning</i> method. The learning steps of <i>Contextual Teaching and Learning</i> in this study are: Developing the concept that children will learn more meaningfully by working independently, Finding and constructing new knowledge and skills on their own, Carrying out as far as

		possible inquiry activities for all topics, developing students' curiosity by asking questions, Creating a learning community.
(Kesya Glory Sitompul, Sutarno, Dedi Hamdani, 2021)	Scientific Education Science	The teaching material that will be developed in this study is an E-module which contains an explanation of physics material related to daily life, (CTL) which is presented in the form of images, videos, animations, and graphic repetition in sound wave material and students are encouraged to understand the image first after which students can analyze from the image and determine the mathematics or formula then students can analyze the problem or the problem of the concept that has been analyzed or can work on problems young.
(Rahmawati, Nur Asriani, and Ledi, 2022)	Pedagogy	This type of research is <i>Research and Development</i> which includes the development of learning tools consisting of Student Books (BS), Student Worksheets (LKS), Learning Implementation Plans (RPP), and Learning Outcome Tests (THB), By asking contextual problems, students are gradually guided to master mathematical concepts. Furthermore, the teacher facilitates to raise the object in real life into the concept of mathematics, through question-and-answer, discussion, inquiry, so that students can construct the concept in their minds. The application of a contextual approach in mathematics learning in schools is expected to increase students' understanding and mastery of the material that has been given, because learning with a contextual approach can be initiated from solving problems in the student environment and based on the knowledge that students already have.
(Rezqy Ayu Devi, Cikal Citra Pratiwi and Isnandi, 2022)	Journal Of Mathematics Education and Learning	This research has the purpose of studying student books with book review instruments and providing recommendations as consideration in improving the mathematics student

		book specializing in high school class X curriculum 2013, precisely in the Exponential Function Chapter. The results obtained are active and creative student books Learning mathematics specialization for class X in accordance with the aspects and indicators of the study, this study also emphasizes one variable, namely the study of mathematics student books chapter exponential functions based on aspects of completeness of systematic components, normal requirements, legality, content, presentation, language and design.
(Sarifina Jenia, Lailatul Mubarakah and Risdiana Chandra Dhewy, 2022)	Educational Journal	The purpose of this research is to explore the activities carried out by teachers and students in CTL learning, and to find out the learning outcomes and responses of students. Mathematics is the science of calculating which is a mandatory subject because in our daily lives we carry out activities that often involve a lot of mathematics, therefore mathematics subjects are not only by providing information related to mathematical formulas but need to apply various different learning models, one of which is <i>Contextual Teaching and Learning</i> (CTL) learning.
(Jahinoma Gultom, 2021)	JGK (Our Teacher's Journal)	This research aims to improve students' skills by applying <i>the Contextual Teaching Learning Method</i> . The hypothesis proposed in this study is "By using the <i>Contextual Teaching Learning method</i> , students can improve students' skills in the basic competencies of Exponents in class X MIA-2 SMA Negeri 2 Lubuk Pakam. The subject improves the skill of Exponential basic competencies by using <i>the Contextual Teaching Learning method</i> in mathematics subjects. In teaching and learning activities, methods are very necessary for teachers and their use also varies according to the goals to be achieved after the end of learning.

(Feri Joko Susilo, 2022)	Progressive of Cognitive and Ability	This study has the goal of producing a mathematics module with <i>Contextual Teaching and Learning</i> (CTL) and describing the quality of mathematics modules reviewed from the quality of validity, practicality, and effectiveness. The results of this study can be concluded from several things, namely: Mathematics learning with valid contextual learning reviewed from the results of assessments from material experts and media experts. The mathematics learning module with practical problem-based learning was reviewed from the results of the student response questionnaire and the results of observation of learning implementation. Mathematics modules with problem-based learning are effectively reviewed from test scores and student learning outcomes.
(Francelia Ernias, Nopem K Sunitro, Yunis Sulistiorini, 2019)	LEPLANCE: Journal of Mathematics Education	This research is development research that has the objectives, among others, Describing the mathematics module in the set material for grade VII students using the <i>Contextual Teaching and Learning</i> (CTL) approach. Describing the validity and effectiveness of the mathematics module in the set material with the <i>Contextual Teaching and Learning</i> (CTL) for grade VII students.
(Prihatin Sulistyowati and Novita Martika Putri, 2018)	Journal of Education (Theory and Practice)	This research is the development of modules on theme 3 sub-theme 1 based on <i>contextual teaching and learning</i> (CTL) using a development research method that refers to the 4D model, and aims to develop products in the form of teaching materials for <i>contextual teaching and learning</i> (CTL)-based modules in class IV Theme 3 Subtheme 1.
(Rizki Nurhana Friantini, Rahma Winata & Jeliana Intan Permata, 2020)	Journal of Scholars: Journal of Mathematics Education	The purpose of this research is to develop a contextual-based mathematics learning module on social arithmetic material for grade VII junior high school students. The development of contextual-based modules is carried out so that students

		can understand and interpret learning independently.
(Riyas Takim Youth, 2021)	JTC-RE: Journal of Tropical Chemistri Research and Education	This research was conducted to develop a learning module with an experimental method that is associated in daily life using <i>the contextual teaching and learning</i> (CTL) approach. The purpose of this study is to develop a chemical bonding module based on <i>the contextual teaching and learning</i> (CTL) approach with an experimental method and analyze the quality of the chemical bonding module based on <i>contextual teaching and learning</i> (CTL) through an experimental method based on the assessment of material experts, media experts, high school/MA chemistry educators (riviewr) and students' responses to chemical bonding modules.

From the results of the research in the 12 articles above, it shows that by using teaching materials that are associated with daily life, the learning process will make it easier for educators to transform exponential material to students, so that learning does not feel boring. With teaching materials in the form of modules that use *the Contextual Teaching and Learning* (CTL) approach, it can make it easier for students to understand and use the modules independently. The *Contextual Teaching and Learning* (CTL) approach also has an important role in learning to make students fully involved in the learning process in order to relate the material learned to the situation in the student environment. This is in line with what Sanjaya (2006) said that *Contextual Teaching and Learning* (CTL) is a learning strategy that emphasizes the process of full student involvement to be able to find the material learned and connect it with real life situations so as to encourage students to be able to apply it in their lives so that the expected learning outcomes are more meaningful for students.

Table 2. *Contextual problems related to exponential matter*

Researcher & Year	Contextual Issues	Mathematical concepts
(Heri Sulaiman, and Dian Permata Putri 2016)	Growth of bacterial populations	Growth (Summation),
(Ati Lasmanawati, 2019)	Rabbit growth on an island	Growth (Summation)
(Nasrun Rozikin, Ketut Sarjana, Arjudin Arjudin, and	Population growth in a certain period of time.	Growth (Summation)

Nurul Hikma, 2021)		
(Kurniawan A, 2020)	Calculating a bacterium, Banking, Calculating population growth.	Growth (Summation)

CONCLUSION

Based on the results of the study of 12 related articles with the title, it was found that the use of the *Contextual Teaching and Learning* (CTL) learning model of Exponential materials can provide opportunities for students to take an active role in the learning process so that the learning process does not seem boring and students can relate the concept of Exponential learning to problems in the student environment, thus the learning carried out by students is more meaningful.

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