



## Infusion PCTS syntax in the implementation of the middle school Science curriculum

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### ABSTRACT

Curriculum implementation is an important stage in supporting the success of a curriculum designed by educational institutions. This research aims to apply the PCTS syntax in one of the science learning materials in junior high schools. PCTS is a learning model that focuses on improving students' critical thinking abilities through solving contextual problems. The method used in this research is a qualitative method using a descriptive approach. Data was collected through document study. Data analysis techniques through reduction, presentation, and conclusion. The findings obtained are that the PCTS model is quite easy to apply to science learning as a form of curriculum implementation, and is very supportive of improving students' critical thinking through the PCTS syntax, especially in the last two steps of the syntax. The conclusion is that the PCTS model is believed to support the implementation of the Merdeka Science Curriculum for Middle Schools in improving the critical thinking of individual students through the infusion of PCTS model syntax in science learning at the middle school level.

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### ABSTRAK

Implementasi kurikulum merupakan tahapan penting dalam menunjang keberhasilan suatu kurikulum yang dirancang oleh institusi pendidikan. Tujuan penelitian ini adalah untuk mengaplikasikan syntax PCTS dalam salah satu materi pembelajaran IPA di SMP. PCTS merupakan model pembelajaran yang berfokus pada peningkatan kemampuan berfikir kritis siswa melalui penyelesaian masalah kontekstual. Metode yang digunakan dalam penelitian ini yaitu metode kualitatif menggunakan pendekatan deskriptif. Data dikumpulkan melalui study dokumen. Teknik analisis data melalui reduksi, penyajian dan penarikan kesimpulan. Temuan yang didapat yaitu model PCTS ini cukup mudah diaplikasikan kedalam pembelajaran IPA sebagai bentuk implementasi kurikulum, dan sangat mendukung terhadap peningkatan critical thinking siswa melalui syntax PCTS, khususnya pada dua langkah terakhir syntax tersebut. Kesimpulannya bahwa Model PCTS ini diyakini akan mendukung implementasi Kurikulum Merdeka IPA SMP dalam meningkatkan critical thinking siswa secara individu melalui infusi syntax model PCTS dalam pembelajaran IPA tingkat SMP.

**Kata Kunci:** Critical thinking; implementasi kurikulum; model PCTS; pembelajaran IPA

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## INTRODUCTION

The success of the learning process in an educational institution cannot be separated from the curriculum. The heart of education is in the curriculum, therefore the implementation of education in an institution must pay attention to everything related to curriculum implementation, starting from the preparation, organizing, implementation, evaluation, and supervision stages (Angga et al., 2022; Hayati & Setiawan, 2022; Zulaiha et al., 2022). Institutions with well-regulated and established curricula will produce students who align with the objectives of the National Education program. A set of plans and agreements regarding the subject matter of instructional materials and the approaches utilized as benchmarks for teaching and learning activities make up the curriculum (Ngwenya, 2020). To accomplish educational objectives that call for innovation and development, the curriculum is viewed as an educational program created and put into place. As a result, the curriculum is constantly evolving and adjusting to the requirements of students and changes in the learning environment at the global, national, and educational unit levels (Rahayu, 2022).

As explained in the book Oliva, the curriculum is "What and the End," and learning is "How and Mean", so we can understand this to mean that curriculum and learning are two things that are closely related and support each other. The curriculum can be interpreted as what is to be achieved and the results or output of the education itself, while learning is how to achieve the goals that have been designed and give meaning to the results obtained at the end of the learning process (Bujuri & Baiti, 2018).

Through the Ministry of Education and Culture, the Indonesian government has just rolled out a new curriculum called the Kurikulum Merdeka, one of the characteristics of which is the element of decentralization. The decentralized aspect of the Kurikulum Merdeka allows teachers to create learning objectives, learning flow, material structure, and even the depth of material to be studied with students. In the Kurikulum Merdeka, through Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia, the government divides education levels into several phases and provides learning outcomes for each phase. Learning outcomes are a collection of skills students must master when the learning phase is complete (Magdalena et al., 2023).

Merdeka Belajar Program will be a step forward in learning that focuses on improving the quality of human resources, said the Minister of Education and Culture. It is intended to answer future challenges and provide new colors and ways for teaching and learning activities that encourage students to think and create more freely according to their characteristics. With the Merdeka Belajar program, considered a transformation in education, teachers will undoubtedly experience many changes and adjustments (Angga et al., 2022; Zulaiha et al., 2022).

One of the reasons behind the rollout of the Kurikulum Merdeka is considering the low level of students' critical thinking skills. This can be seen from the PISA and TIMSS scores, which have remained low in recent years. The achievement of school quality report cards, especially for critical reasoning competency at school, district/city, provincial, and national levels, is still in the low category based on kemdikbud.go.id. This shows that current learning is still not optimal enough in improving students' critical thinking abilities (Nuryanti et al., 2018; Saputra, 2020; Saraswati & Agustika, 2020).

Several learning models are believed to improve student's critical thinking abilities, such as problem-based learning (PBL), project-based learning (PJBL), discovery learning, and inquiry models. However, if you look at the learning outcomes that are still low, it can be assumed that the current learning models cannot focus on improving students' critical thinking skills (Ain & Huda, 2018). So, various innovations and breakthroughs in new learning models are needed to improve student learning outcomes, especially for students critical thinking competencies. One of the new learning models currently being developed is the problem-centered thinking skills (PCTS) model. This PCTS model is an alternative initiative that can bridge students' difficulties in improving their critical thinking skills. It is hoped that it can focus more on improving

students' critical thinking skills. through its syntax which includes a combination of collaborative and individual learning, which is intended to explore further students' tactical thinking abilities (Dewi et al., 2023; Saputro, 2021).

Based on the background explained above, the author is interested in conducting a study or research on the process of infusion or integration of PCTS model syntax into junior high school science learning as an effort to further improve the quality of implementation of the Kurikulum Merdeka, especially at the junior high school level, so the research title "Infusion of PCTS Syntax" was formulated. in the Implementation of the Middle School Science Curriculum".

## LITERATURE REVIEW

### Curriculum Implementation

Undang-Undang Sistem Pendidikan Nasional Nomor 20 Tahun 2003 defines the curriculum as "a set of plans and arrangements regarding objectives, content, and learning materials, as well as methods for implementing learning activities to achieve specific educational goals (see: [https://jdih.kemdikbud.go.id/sjdih/siperpu/dokumen/salinan/UU\\_tahun2003\\_nomor020.pdf](https://jdih.kemdikbud.go.id/sjdih/siperpu/dokumen/salinan/UU_tahun2003_nomor020.pdf)). Curriculum implementation management can be interpreted as a process of managing (managing) all educational resources, individuals, groups, and other resources that enable the process of delivering curriculum objectives and content into the learning process in schools (Nuraeni et al., 2020). Curriculum implementation can be seen as implementing ideas, ideas, goals, and the entire program contained in a curriculum. Curriculum implementation requires a solid and reasonable management process (Pak et al., 2020; Salabi, 2020). What curriculum implementation means is an effort to achieve educational goals, which are stated in the Peraturan Pemerintah Nomor 4 Tahun 2022 tentang Perubahan atas Peraturan Pemerintah Nomor 57 Tahun 2021 tentang Standar Nasional Pendidikan, of the eight existing SNPs, four standards are regulations and directly correlate with curriculum implementation at the education unit level: Graduation Standards, Content Standards, Process Standards, and Assessment Standards (see: [https://jdih.kemdikbud.go.id/detail\\_peraturan?main=2978](https://jdih.kemdikbud.go.id/detail_peraturan?main=2978)).

According to the book "*Manajemen Kurikulum*" by Syafaruddin and Amiruddin, and Molapo & Pillay, 2018 in their works, the following guidelines are used to apply the curriculum in each educational unit: 1) The curriculum is implemented based on the student's potential, growth, and readiness to learn skills that will benefit them personally. In this situation, children must obtain top-notch educational services and be given the chance to express themselves freely, vibrantly, and joyfully; 2) The five pillars of learning—namely, a) learning to believe in and be committed to the One God; b) learning to understand and appreciate; c) learning to be able to carry out and act effectively—are upheld in the curriculum's implementation.; d) learn to live together and be useful to others; e) learn to build and discover self-identity through active, creative, effective and fun learning; and f) the implementation of the curriculum allows students to receive services that are remedial, enriching and/or accelerated in accordance with the potential, stage of development and condition of students while still paying attention to the integration of students' personal development in the divine, individual, social and moral dimensions; 4) With the principles of *Tutwuri Handayani*, *Ing Mardia Mangun Karsa*, and *Ing Ngarsa Sung Tulada* (in the background providing power and strength, in the middle building enthusiasm and initiative, and in the front providing a role model), the curriculum is implemented in a relationship between students and educators that accepts and respects each other; 5) With the principle that nature is not a teacher, the curriculum is implemented using a variety of multi-strategy and multimedia approaches, adequate learning resources, and technology, as well as by utilizing the surrounding environment as a learning resource. The natural environment is used as a learning resource, example, and role model for everything that occurs in society and the immediate environment; 6) utilizing the environment as a learning resource, utilizing technology to support learning, and adhering

to the principle that nature is not a teacher (everything that occurs, occurs, and develops in society and the environment is used as a learning source, example, and role model); 7) An appropriate and acceptable balance, connection, and continuity between classes and types and levels of education is maintained in a curriculum that covers all components of academic competency, local content, and self-development.

## **Curriculum and Learning**

Curriculum definition Oliva in his book entitled "*Developing the Curriculum*", covers the "what" and "how" elements of curriculum in the context of theory and practice of curriculum development in schools. The relationship between the two, if studied in the context of theory and practice, is as follows:

- a. Definition of "What" Curriculum: What is meant by "what" curriculum is the scope of the materials or materials taught in the curriculum. This includes determining educational goals, skills, topics, ideas, and skills students must learn. This component shows the importance of choosing learning materials and content that suit educational needs and goals. Linkage to Praxis: This "what" component emerges when curriculum planning begins. At this stage, Suparman, in a book entitled "*Kurikulum dan Pembelajaran*" states that the curriculum development team will select appropriate topics and learning materials and determine the desired goals and competency standards. This includes selecting and organizing learning materials to be taught to students.

Linkage to Theory: From a theoretical perspective, the "what" elements of the curriculum reflect various theories and perspectives on what is considered essential to learning in education (Rahayu, 2022). These theories include philosophy, educational principles, and educational research and help determine what should be taught and learned (Weinshall et al., 2018).

- b. Definition of "How" of Curriculum: The term "how" of curriculum refers to the ways and methods used to teach and manage the learning process. According to Triwiyanto, in a book entitled "*Manajemen Kurikulum dan Pembelajaran*", this includes learning approaches, teaching strategies, class organization models, and assessment methods that will be implemented in the curriculum.

Linkage to Praxis: The "how" element appears at the curriculum implementation stage. Choosing an effective approach to delivering lessons to students, teachers, and education employees will implement appropriate teaching strategies. Assessment and feedback, classroom organization, and interactions between teachers and students also fall into this "how" component (Weinshall et al., 2018). Linkage to Theory: The "how" part of the curriculum also relates to the theories and learning methods applied in schools. Some examples of educational approaches are constructivist approaches, collaborative learning, or project-based learning. These theories provide effective methods for teaching and empowering students in the learning process (Langgeng et al., 2017).

According to Oliva in his book entitled "*Developing the Curriculum*," the link between the definition of "What" and "how" of the curriculum is very important to ensure that there is a relationship between what is taught (content) and the way it is taught (method). Curriculum content must support appropriate teaching methods so students can understand and achieve learning goals. Educational theory also provides the basis for a good curriculum (Julaeha, 2019).

## **Model Problem-centered Thinking Skills (PCTS) in Science Learning**

Science education is more than just providing students with scientific knowledge; it also teaches them how to conduct scientific research. Obtaining scientific information requires the use of scientific procedures and rationality. Teachers must teach students the scientific method at every level of the inquiry process that focuses on scientific inquiry. Thus, students who study science and practice their knowledge will be able to reason and argue about scientific problems (Saraswati & Agustika, 2020). Scientific education must be

taught not just as facts; students must be trained to cooperate with others. This will help students understand how the scientific community influences personal and professional growth. Teachers need various new skills considering students' diverse social, cultural, and personal backgrounds. One of the new skills needed by teachers is increasing critical thinking abilities.

Critical thinking became very popular in Indonesia after the 1998 Reformation Era when people sought greater freedom as citizens (Saputra, 2020). There is a need for more critical thinkers who can combine different ideas and find the best ways to help our country progress through transformation. Therefore, critical thinking skills are essential to educational programs in Indonesia. A critical thinker can convey their ideas both orally and in writing. To prepare the next generation of an internationally competitive nation, the government expects students to have many skills, including higher-order thinking skills (HOTS). Currently, skills such as creative thinking, innovation, and self-confidence are needed to succeed in the world of work, so the government has made a list of things that will be prioritized as 21st-century skills. To facilitate the growth of scientific knowledge, classroom activities in science learning must be communicative.

To improve high-level thinking skills, learning can begin by presenting problems related to the material that students will study. Problem-based activities should start with easy tasks and progress to more complex tasks for the next generation of the world's competitive nations so that students can customize their learning experience (Ellerton, 2003). The problem-based learning (PBL) model includes this type of learning model (Hastang, 2019).

The concept of oriented instructional design, which influences the student learning process, is the initial principle of teaching put forward by Merrill (2002). Merrill's concepts can be used in any learning system and have many practical applications. Students can learn well if actively involved in solving real problems related to their circumstances and situations. The problems presented start from simple to complex; don't forget to allow students to solve them in their own way until they are complete. According to Merrill (2002), learning is divided into several phases as follows:

- **Phase 1 (activation).** Students are invited to interact with the problems presented using their prior knowledge. In this phase, students examine the problem and call on their memory or initial knowledge to respond to the problem.
- **Phase 2 (demonstration).** In this phase, students show the results of their thinking in the activation phase with comments, arguments, or questions. The role of media is essential to help students build their knowledge.
- **Phase 3 (application).** Students begin to apply or bring problems into the real world. Consider possible solution plans based on the results of his thinking. Teacher assistance is essential to foster self-confidence and a sense of support in students.
- **Phase 4 (integration).** At this stage, students can choose an alternative plan. Based on considerations, media, teacher assistance, and results of peer discussions.

Between the two learning models mentioned above, namely Problem-Based Learning (PBL) and the instructional model proposed by Merrill, one learning model is initiated in the article by Dewi et al. (2023), which is called Problem-Centered Thinking Skills (PCTS). The birth of the Problem-Centered Thinking Skills (PCTS) learning model was inspired by the Problem-Based Learning (PBL) learning model and the instructional model created by Merrill because of the two things mentioned above. In the initial part, they both focused on contextual problems, but with various updates and modifications made in the effort to improve students' critical thinking abilities further.

In the article Dewi et al. (2023), PCTS is believed to be a learning model that can improve students' critical thinking abilities, especially in science learning at the basic education level. This PCTS model is a learning

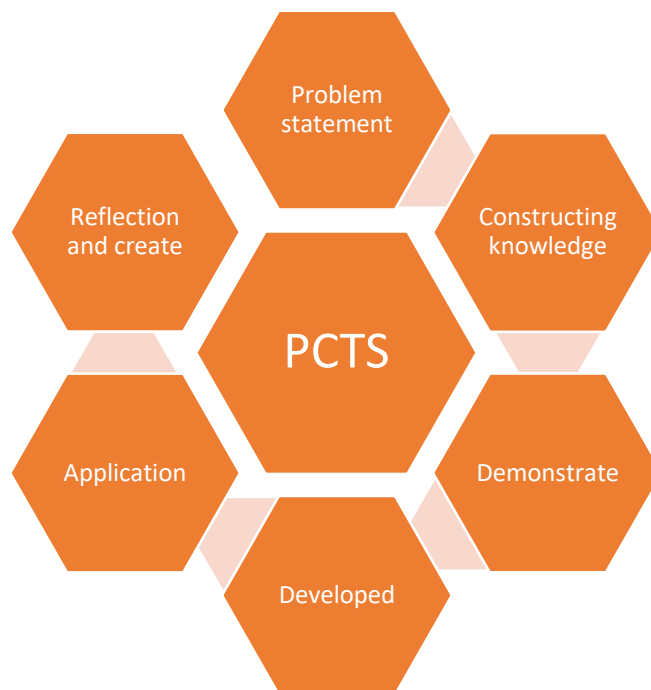
model that will explore the potential in facing problems, collaborating to solve these problems by constructing students' initial knowledge into new knowledge, communicating the results of their group work to get suggestions and corrections from other parties, developing new knowledge as the best solution for problems faced, and then apply this knowledge, reflect on it, and also try to create from this new knowledge individually. All stages in the PCTS model, especially the stages of applying, reflecting, and creating,

To be more precise regarding the syntax of the PCTS learning model, the author tries to illustrate it in **Table 1** and **Figure 1** below.

**Table 1.** PCTS Model Syntax

Syntax	Activity Description
Problem statement	<ul style="list-style-type: none"> <li>• Presenting problems as the center of learning activities</li> <li>• The problem presented is a contextual problem</li> <li>• Problems are presented at various levels according to student characteristics</li> </ul>
Constructing knowledge	At this point, students have the opportunity to combine new knowledge with knowledge they have learned previously to solve the problem at hand.
Demonstrate	Students communicate the results of group discussions
Developed	Students develop the knowledge gained referring to the final understanding of the results of class discussion input
Application	Students use their knowledge in problems related to everyday life.
Reflection and create	Students reflect and/or produce products/work

Source: *Dewi et al., 2023*



**Figure 1.** PCTS Syntax  
 Source: *Dewi et al., 2023*

Of the six steps in the PCTS syntax according **Table 1** and **Figure 1** above, the problem statement, constructing knowledge, demonstrating, and developing stages prioritize the principle of collaboration where students work in teams or groups to identify problems, form new knowledge based on old

knowledge that students have in an orientation to solve existing problems. presented, communicated, and ultimately developed new knowledge which was added to the results of class discussions at the demonstration stage. Meanwhile, for the following two stages, which are also the final two stages of PCTS syntax, students begin to work independently to apply and internalize the new knowledge they have acquired so that, in the end, they can reflect and even create.

## **Critical Thinking**

The simple definition of critical thinking is a variety of good thoughts. These criteria for good thinking need to be described more clearly, which, in this case can be viewed from a philosophical and psychological perspective (Nuryanti et al., 2018). From the psychological conception, which is descriptive, critical thinking is described as a process, procedure, and/or psychological skill considered necessary in the thinking process. In contrast to contemporary psychological explanations, philosophical critical thinking theorists agree that the concept is essentially normative. Therefore, characterizing thinking as "critical" means judging that the thinking is relevant, standard, or generally accepted as "good or good". Several philosophical notes about critical thinking; for example, Robert H. Ennis defines critical thinking as reasonable reflective thinking that focuses on deciding what to believe and do (Pratama et al., 2020). Siegel characterizes critical thinkers as people who are precisely moved by reasons (Saputra, 2020) and emphasizes critical thinkers' mastery of epistemic logic, the criteria that reasons must fulfill to be correctly assessed as good reasons, namely reasons that warrant beliefs, claims, and actions. Richard Paul also understands critical thinking in terms of the "ability/skill" and "disposition" to critically evaluate beliefs, the underlying assumptions, and the worldview in which these beliefs are embedded.

Beliefs, judgments, and actions are rational conceptions as long as the person has solid reasons for believing, judging, or acting. Therefore, having the ability to think critically requires the ability to ascertain the goodness of the reasons for behavior. Consequently, the primary task involved in educating critical thinking is cultivating students' ability to assess the evidentiary strength of reasons (Saraswati & Agustika, 2020). Nunnally explains that "disposition is conceived of as an attitude or attitudinal tendency". That is, a disposition is understood as an attitude or attitude tendency. According to Nuryanti et al. (2018), she stated many definitions of thinking critically based on other researchers' perspectives. Gavriel Salomon defines disposition as a collection of chosen attitudes with the ability to enable those chosen attitudes to emerge in a certain way. Meanwhile, according to Perkins, Jay, and Tishman, disposition "consists of a triad of interacting elements, these being: inclination, which is how a learner feels towards a task; sensitivity towards an occasion or the learner's alertness towards a task; and finally ability, this being the learner's ability to follow through and complete an actual task", meaning that the critical thinking disposition consists of a triad of elements that interact with each other, namely, tendencies, sensitivity, and abilities. The tendency is the student's attitude towards the task, sensitivity in question is the student's sensitivity to events or alertness in responding to the task, and finally, the ability is the student's ability to follow up and complete the actual task.

The definitions above show that disposition is a tendency or habit to behave towards a specific treatment. According to Nuryanti et al. (2018), researchers have many perspectives to describe it. Matthew Lipman defines critical thinking as thinking that facilitates judgment because it relies on self-correcting criteria and is sensitive to context. Critical thinking, according to Huitt and Ennis, is "the disciplined mentality of reflective thinking and reasonable of evaluating arguments or propositions on deciding what to believe or do", namely as a mental discipline activity for reflective thinking and entering reason in evaluating arguments or propositions in deciding what to believe or do. Ennis explains that critical thinking is also composed of a person's behavioral tendencies, such as high curiosity open thinking, and cognitive skills, such as analysis, inference, and evaluation. According to Fisher, critical thinking contains elements of estimating, evaluating, considering, classifying, hypothesizing, analyzing, and reasoning. Based on

several opinions above, critical thinking is a high-level thinking skill that goes beyond the limits of ordinary thinking so that it can make decisions that can be made based on analysis.

Based on the meaning and definition explained above, it can be concluded that the disposition to think critically is the tendency to behave towards specific patterns of critical thinking if given certain conditions or treatment.

## METHODS

This research uses a descriptive method, namely a method used to find out the picture, or situation, of something by describing it in as much detail as possible based on existing facts. Descriptive research can also be understood as a method useful for describing an existing phenomenon and carried out according to the actual research conditions. Thus, this method is helpful in seeing an overview of all research in detail. This research's secondary data collection method was carried out through library techniques. Library research can be defined as a data collection technique that involves sorting and collecting various information and data using library sources available in the library, both online and offline (Sari & Asmendri, 2020). The collection of various data and information was used as a reference for the author in making the PCTS model infusion syntax matriculation in one of the science learning materials in junior high school. The research stages carried out were: (1) literature review on problem-based learning models; (2) literature review of Merrill's instructional model; (3) review of the syntax of the PCTS model; (4) examination of science learning outcomes; and (5) integrating PCTS syntax into learning activities for one of the science materials.

## RESULT AND DISCUSSION

After conducting studies from various sources, the author then tried to design a form of PCTS syntax infusion in one of the science learning materials, namely in the Pollution Chapter in the class 7 science subject, phase D. The author packaged the results of the infusion in **Table 2** form as follows.

**Table 2.** PCTS Syntax Infusion in Middle School Science Learning

No	PCTS Syntax	Learning Activities	Part of the lesson plan	How to learn
1	Problem statement	<ul style="list-style-type: none"> <li>• The teacher shows several pictures/articles/videos related to various cases of environmental pollution that are currently occurring in the surrounding environment and on a national scale based on the latest information available on the internet.</li> <li>• Each group tries to identify problems related to the image/article/video that they are studying with their group.</li> </ul>	Core Activities	Group
2	Constructing knowledge	<ul style="list-style-type: none"> <li>• Each study group gets an LKPD to help explain discussion activities. first by the teacher regarding the work on the LKPD</li> <li>• Students collect relevant data in groups according to their learning style (process differentiation)</li> </ul>	Core Activities	Group
3	Demonstrate	<ul style="list-style-type: none"> <li>• Each group presents the results of their group work</li> <li>• Other groups respond and provide input</li> <li>• The teacher reinforces at the end of the discussion for each group.</li> </ul>	Core Activities	Group



No	PCTS Syntax	Learning Activities	Part of the lesson plan	How to learn
4	Developed	Each group can prepare a final report on their group discussion activities after making improvements or additions based on responses and input from other groups and the teacher.	Core Activities	Group
5	Application	Students individually make notes/essays consisting of 150-250 words regarding what they can do to prevent or overcome problems that are the subject of discussion in their respective groups.	Core Activities	Individual
6	Reflection and create	<ul style="list-style-type: none"> <li>• Students refill the "question corner" to answer or create follow-up questions.</li> <li>• Students are tasked with making posters/infographics/short videos/articles/items that can encourage other people or help overcome pollution problems in the surrounding environment (product differentiation).</li> </ul>	Closing	Individual

Source: *Teaching Module Systematics kemdikbud.go.id*

In the **Table 2** above, it is explained that in the initial part of the PCTS syntax, students are faced with a contextual problem in the form of images, articles, or videos, which are adapted to the student's learning style. The problems presented are packaged as links or barcodes that students can scan using their Android devices. To assist group discussion activities, students are also given Student Worksheets according to the group's learning style type (Content and process differentiation) (Wahyudi, 2021).

In the next step, students work in groups, collect data, interpret, and then create broadcast material for class discussions. In this section, students receive various suggestions and input from other students and from the teacher, and based on these suggestions and input, students build and perfect their knowledge regarding solving the problems presented and packaged in the form of activity reports (Burrow, 2018). For the last two steps in the PCTS syntax mentioned above, namely the application, reflection, and creation stages, students learn from groups to individuals. In these last two stages, when students learn individually, it is hoped that they will further train students' critical thinking skills. This way, teachers can more accurately map students' critical thinking abilities. They can more easily classify which students have developed critical thinking abilities and which students have not developed and need remedial learning (Taufik et al., 2018). The infusion of the PCTS model syntax in this science teaching module is implemented in the Kurikulum Merdeka in the science curriculum for grade 7 middle school on pollution as the influence of the interaction of living things on the quality of the ecosystem.

## Discussion

If we look carefully, the syntax of the Problem-centered Thinking Skills (PCTS) model is similar to the Problem-Based Learning (PBL) model; one of the visible things is that students are faced with a contextual problem at the beginning of learning. According to the article (Dewi et al., 2023), the creation of a learning model Problem-centered Thinking Skills (PCTS) is a combination of the Problem-Based Learning (PBL) learning model and also Merrill's Instructional Design (Merrill, 2002). The difference is in steps five and six of the syntax problem-centered Thinking Skills (PCTS), where students learn to apply, reflect, and create individually (Dewi et al., 2023). It is believed that through individual learning there are in the last two steps of the syntax model, Problem-centered Thinking Skills (PCTS) will focus more on training students' critical thinking skills, so it is hoped that they will be more effective in improving students' critical reasoning abilities. With scientific method steps and close ties with scientific reasoning activities, science learning is very suitable to infuse with this Problem-centered Thinking Skills (PCTS) learning model (Febrianti et al.,

2021; Sari & Asmendri, 2020). Critical thinking is an essential skill for a student, and to increase that skill, education has an essential role (Tommasi et al., 2023). Critical thinking skills are related to reading, which is why students need to understand problems. It is also stated in Ntshikila, et al. (2022) in their works about comprehension skills and the related to critical thinking.

## CONCLUSION

The conclusion that can be drawn from this study is that The Problem-centered Thinking Skills (PCTS) learning model is very likely to be applied in junior high school science learning as an effective curriculum implementation step in improving students' critical thinking abilities. The steps in the Problem-centered Thinking Skills (PCTS) syntax are in line with the steps of the scientific method in science learning, where the steps of the scientific method are intended to grow and train students' critical reasoning abilities, which are also one of the one-dimensional characters of the Profil Pelajar Pancasila in the Kurikulum Merdeka. As explained in the previous section, one of the reasons behind the rollout of the Kurikulum Merdeka is based on the achievement scores of PISA, TIMSS, and education quality reports, which are still low regarding students' critical reasoning abilities. Therefore, it is hoped that the infusion of the Problem-centered Thinking Skills (PCTS) model syntax into science learning can be one of the efforts to improve the quality of implementation of the Kurikulum Merdeka, which in the end is expected to improve students' critical reasoning character significantly.

Since this study was only conducted on science subjects, the author recommends that future researchers use the Problem-centered Thinking Skills (PCTS) model syntax in other subjects. Furthermore, because the Problem-centered Thinking Skills (PCTS) model is a newly developed learning model, the author would like to provide suggestions so that teachers can use this Problem-centered Thinking Skills (PCTS) model in collaboration with other teachers through lesson study. This is intended so that fellow teachers can give each other suggestions and correct things if there are things that are not quite right or need improvement in the classroom learning process.

## AUTHOR'S NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The author confirms that the data and content of the article are free from plagiarism.

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