



Analysis of Teaching Module in Merdeka Curriculum Used by Teacher in Chemistry Learning at SMAN 10 Pontianak

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Abstract

Teaching modules are learning tools in the merdeka curriculum. The aim of this research is to analyze the merdeka curriculum teaching modules used by educators in teaching chemistry. Quantitative descriptive methods were used in this research, and data collection techniques used measurement and documentation. The data collection tool is a learning tool review sheet that has been validated by two experts using the Gregory test. The object studied was the merdeka curriculum teaching module used by class X chemistry educators at SMAN 10 Pontianak in a total of six meetings. Data analysis was carried out based on scores on each component of the teaching module. Based on the data obtained from the analyzed teaching module components, it obtained a score of 88.3 and was included in the good category. Thus, it can be concluded that the components contained in the teaching module are in accordance with the merdeka curriculum learning and assessment guidelines, and the module is good for use in learning activities.

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INTRODUCTION

Education is essentially an effort to humanize humans to become humane. Through education, human potential will grow and develop into people with organized thought patterns, manifested in good attitudes and behaviors (Dhomiri et al., 2023). A curriculum is a design that contains a set of subjects and material that educators will study or teach to students (Zainuri, 2018). The curriculum can be interpreted as a component of educational planning that is prepared in accordance with the learning process, which is led directly by the school, which is shaded by the educational institution. Curriculum is a learning process planned by a school in terms of learning (Bahri, 2017). The independent learning curriculum is a curriculum with varied in-curricular activities (Darlis et al., 2022). An independent curriculum is a curriculum with extracurricular learning that is optimized for varied learning content, giving students enough time to explore knowledge concepts and strengthen their competencies (Shalehah et al., 2023). Educators have the freedom to choose various learning tools so that learning can be tailored to students' learning needs and interests. The Pancasila Student Strengthening Project was developed based on certain themes determined by the government. The project is not intended to achieve specific learning objectives, so it is not related to subject content (Kemendikbudristek, 2022).

The independent curriculum is different from the 2013 curriculum. The competencies targeted in the 2013 curriculum are Basic Competencies (KD) in the form of items and Core Competencies, which are prepared annually, while the competencies aimed at by the Independent Curriculum are learning achievements arranged per stage or phase. Learning

objectives are arranged in paragraph form. The next difference is that the 2013 curriculum regulates learning hours every week by providing regular time every week per semester, while the independent curriculum regulates learning hours per year and has two curriculum designs, namely the main learning method and the project to strengthen the Pancasila learning profile (P5) (Sari et al., 2023; Pratyca et al., 2023; Rohimajaya et al., 2022; Amiruddin et al., 2023; Mawardini et al., 2023).

The scientific approach is used in the 2013 curriculum in all subjects and focuses on intracurricular learning activities, while in the independent curriculum, learning activities utilize a differentiation approach that is adapted to students' abilities and implements P5 in the learning process (Rohimajaya et al., 2022). Another difference is that the 2013 curriculum assessment utilizes formative and summative assessments carried out by educators, optimizing authentic assessment in all subjects by dividing three types of assessment, namely assessment of skills, attitudes, and knowledge. Meanwhile, the Independent Curriculum assessment has a confirmation in formative assessment, and the results of the assessment are used to measure learning by adjusting student achievement and optimizing authentic assessment standards for P5, including assessments of attitudes, knowledge, and skills, and assessments that do not use KKM. (Sari et al., 2023; Pratyca et al., 2023; Rohimajaya et al., 2022; Amiruddin et al., 2023; Mawardini et al., 2023).

Educators in the digital era are increasingly required to be more active, critical, innovative, creative, and collaborative regarding developments in the technological era so that they are able to follow current teaching trends (Akrim, 2018). Educators act as teachers and facilitators who help students utilize various learning resources, including the use of technology as a learning medium (Sharma, 2018). A good understanding of technology makes teaching and learning activities more interesting and interactive. The use of technology makes it easier for students to deepen learning concepts and provides enthusiasm for learning for students because the material presented is more interesting (Kumala et al., 2023). Educators are required to be able to utilize technology in learning activities (Hairida et al., 2023). Provisions for the use of technology in education are regulated in Law No. 11 of 2019 concerning the national system of science and technology, which reviews the use of technology in education in Indonesia to simplify and optimize the learning process so that it takes place effectively and efficiently (Muhajjir et al., 2023).

Teaching modules are important teaching tools in the independent curriculum. According to Nurdyansyah (2018), teaching modules are learning tools based on teaching programs that are applied to obtain specified competency standards. Teaching modules are one of the learning media that contain learning implementation plans that can direct the learning process so that learning activities achieve learning outcomes (Siloto et al., 2018). Teaching modules and RPPs have differences in that the components of teaching modules are more complete than RPPs. The next difference is that, apart from making it easier for educators to carry out learning, the teaching module also supports the achievement of CP competencies and the Pancasila student profile at all stages of the development of a subject. The RPP aims to focus student learning on achieving basic competencies (KD).

Teaching modules refer to ATP, which is described through learning outcomes (CP), while RPP is only described by the learning syllabus and other indicators. KI in the 2013 Curriculum was changed to CP in the Independent Curriculum (Ardianti et al., 2022). The teaching module acts as guidance for educators to carry out teaching and learning activities, guides learning activities, supports educators to achieve CP, and becomes a learning evaluation tool. Kristanto (2020) expressed the view that teaching modules have a key function in helping educators plan learning. By compiling teaching modules, educators have planned all the interests and methods that will be implemented when carrying out learning

activities and can manage time appropriately so that they can achieve learning objectives (Amaliawati et al., 2022).

Teaching modules have at least three components, namely general information, core components, and attachments (Mandalika et al., 2024). General information contains module identity, initial competencies, Pancasila student profile, facilities and infrastructure, target students, and learning models (Tanti & Damiswara, 2023). The second component is the core component, which contains learning objectives, meaningful understanding, trigger questions, learning activities, assessment, enrichment, and remedial. The final component is an attachment containing LKPD, student and educator reading materials, a glossary, and a bibliography (Maulida, 2022; Salsabila et al., 2023). The minimum teaching module contains learning objectives, learning steps (including learning media), assessment (including assessment instruments and rubrics), information, and references (Purwanto, 2018).

The ability of educators to design independent curriculum teaching modules is still very low. Educators have difficulty analyzing the CP that will be achieved because it is made in phases, having difficulty formulating CP into ATP form, and having difficulty determining appropriate learning methods and strategies (Zulaiha et al., 2022). Apart from that, educators do not understand the elements that must be included in teaching modules, do not understand the directions for preparing independent curriculum teaching modules, are not able to write general information, are not able to compile core components, and are not competent in preparing attachments in independent curriculum teaching modules (Yuhaga, 2023).

Obstacles for educators when designing independent curriculum teaching modules include difficulty understanding CP, difficulty compiling learning objectives (TP) from existing CP, and a lack of ability to formulate ATP (learning objective flow) from TP (Putri et al., 2023). Educators need to develop teaching modules optimally, but in reality, many educators do not understand the techniques for compiling and developing independent curriculum teaching modules (Taufik et al., 2023). The Ministry of Education, Culture, Research, and Technology has released an independent teaching platform that provides independent curriculum teaching tools. Educators have the freedom to choose or modify teaching modules provided by the government to suit the characteristics of students. The independent teaching platform provides equal opportunities for educators in Indonesia to be able to learn and improve their competencies whenever and wherever they are (Arnes et al., 2023) because the learning features in the independent teaching platform provide various independent training facilities to obtain various quality training materials (Marisana et al., 2023).

Pontianak City has twelve State High Schools (SMA), and among the schools that have implemented the independent curriculum is SMAN 10 Pontianak. As a result of interviews conducted with chemistry educators at SMAN 9 Pontianak, direct training activities for creating independent curriculum teaching modules have never been carried out. But now, all educators can learn or train online at PMM (Merdeka Mengajar Platform) or webinars. Chemistry educators at SMA Negeri 10 Pontianak use teaching modules provided by the government on the independent teaching platform.

Based on the background, it is necessary to conduct research on the analysis of the independent curriculum teaching modules used by educators in teaching chemistry. Researchers want to analyze the independent curriculum teaching modules used by educators in teaching chemistry.

METHOD

Quantitative descriptives were used in this research. Research that uses statistics to describe, investigate, and explain a subject as it is and derives conclusions from phenomena that can be

seen is known as quantitative descriptive research (Listiani, 2017). The class X chemistry teacher at SMAN 10 Pontianak is the subject of this research, and the teaching module used by the chemistry teacher is the object of this research. This research was conducted at SMAN 10 Pontianak.

Data collection is carried out through measurement and documentation. Measurement is the process of giving points that represent a number of characteristics shown by the subject in a community. Measurement is the provision of assigning points to different topics so that the points replace the nature of the character shown (Winarno, 2013). The documentation in question is interview activities and teaching modules used by chemistry teachers.

Data collection tools in the form of learning tool review sheets were created before the research was carried out. The learning tool review sheet was then validated by two physics and chemistry subject matter experts. The validity test in this research used the *Gregory test*. Testing the validity of the independence curriculum teaching module analysis sheet instrument using the Gregory test by crossing the assessments from the validator. The formula used is:

$$V_i = \frac{D}{A+B+C+D}$$

(Hairida et al., 2021)

Information :

V_i = validity

A = the first and second experts say they disagree

B = the first expert says he agrees, while the second expert says he disagrees

C = the first expert says he disagrees, while the second expert says he agrees

D = the first and second experts say they agree

The results of the validity test show that the learning tool review sheet is valid with a validity value of 1 (including very high validity), so it is suitable for use. The analysis process is carried out according to the following chart:

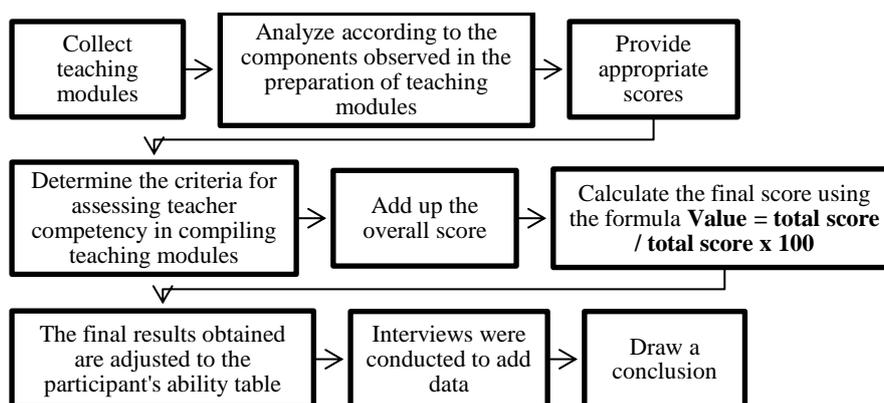


Figure 1. Teaching module analysis process

The analysis process in this research involved collecting teaching modules from chemistry teachers who were the subjects of this research. After the teaching modules are collected, they are reviewed based on the elements observed in the teaching module preparation guidelines. The rubric is used as a guide for data review. The study section in the guidelines for preparing teaching modules is given a score from 1 to 4. Each component analyzed is given a score based on the conditions and facts of the document. Among the documents analyzed, the maximum score is 4. If the component in question complies with the guidelines for preparing independent curriculum teaching modules, a score of 4 will be obtained. The

points for each component will be added up. The number of points obtained is then divided by the maximum total points and multiplied by 100 to obtain the final score. From the final grades obtained, it is known that the independent curriculum teaching modules used by teachers with learning and assessment guides are suitable. Interview activities were carried out to complete the existing data. The data that has been collected is then used to draw conclusions.

RESULTS AND DISCUSSION

This research aims to determine the suitability of the independent curriculum teaching modules used by chemistry teachers with learning and assessment guides. Subject Research is a class X chemistry teacher at SMAN 10 Pontianak. Data collection was carried out by collecting teaching modules used by class X chemistry teachers, and interviews were carried out to add data. One teaching module analyzed chemical calculation material and consisted of six meetings. Data was obtained from the analysis of teacher teaching modules and interview results. The results of the teaching module analysis are shown in Table 1.

Table 1. Results study device learning

Component Teaching Module	Score
Identity teaching module	BS (4)
Competence beginning	B (3)
Objective learning	
Suitability objective with achievements learning (CP) of the eye lesson chemistry	BS (4)
Formulation of learning objectives or indicators for achieving adaptive learning objectives	BS (4)
Pancasila Student Profile	BS (4)
Facilities and infrastructure	BS (4)
Target Students	BS (4)
Learning model	
The learning model used is in accordance with recommendations for implementing the independent curriculum with appropriate syntax	BS (4)
The learning model used is systematic and accommodates differentiation learning	B (3)
Differentiated learning	TB (1)
Meaningful understanding	BS (4)
Igniter question	BS (4)
Learning Activities	
Structured learning flow design based on previous learning experiences	BS (4)
The learning flow design uses a relevant approach	BS (4)
The learning flow design combines knowledge (teaching materials, pedagogy and information technology)	BS (4)
Assessment	
Assessment of student development	KB (2)
Design of assessment instruments	B (3)
Formative assessment	BS (4)
Summative assessment	B (3)
Reflections of students and educators	B (3)
Student worksheet	
The LKPD design is appropriate to student development	BS (4)
The LKPD design is based on information technology and concrete objects	B (3)
Design of learning media based on information technology and concrete objects	B (3)
Enrichment and remedial	BS (4)
Reading Material for Students and Educators	

Educator reading materials	
The structure of teaching materials in order to design learning	B (3)
Flow of teaching materials in order to design learning	B (3)
Student reading materials	
The structure of teaching materials as an alternative learning resource for students	BS (4)
The flow of teaching materials as an alternative learning resource for students to carry out their learning activities	BS (4)
Glossary	BS (4)
Bibliography	BS (4)
Total score	106

Description: BS = Very Good; B = Good; KB = Enough; TB = Not Good

The value of the analysis results of the teacher's teaching module is then calculated using the formula:

$$\text{Value} = \frac{\text{score acquisition}}{\text{total score}} \times 100$$

Thus, the final score for the teaching module used by the teacher is 88.3 and then adjusted to table 2.

Table 2. Category of teaching module study results

Category	Mark End
Good Once (BS)	90 < final value ≤ 100
Good (B)	80 < final value ≤ 90
Enough (C)	70 < final value ≤ 80
Less (K)	≤ 70

(Puspitasari et al., 2020)

Analysis findings the teaching modules that teachers use fall into the good category, according to an analysis of the resources utilized by educators. Overall, the teaching module contains all the components of the teaching module contained in the learning and assessment guide. Good and excellent results are found in the teaching module components, namely module identity, initial competencies, learning objectives, Pancasila student profile, facilities and infrastructure, target students, meaningful understanding, trigger questions, learning activities, reflections of students and educators, Participant Worksheets Education, enrichment and remedial, reading materials for students and educators, glossary and bibliography. Overall, there is a score that is still low compared to the others, namely the learning model component, especially differentiated learning and the assessment component, namely assessment of student development and instrument design evaluation.

The first component of the independent curriculum teaching module is the identity of the teaching module. There are more than five components to the identity of the teaching module: module author, phase, level, class, student estimates, learning model, and time allocation. The module author is written separately at the top. The name of the school is not written in the teaching module that educators use. Initial competencies contain the prerequisite knowledge that students must have before studying the material to be taught. This is proven by initial competencies being prepared based on previous learning experiences in the form of apperception and initial formative learning assessments. Learning objectives are in accordance with the high school chemistry CP section. Teaching modules generally provide learning objectives that are in accordance with predetermined learning outcomes (Mandalika et al., 2024).

The teaching modules analyzed include the Pancasila student profile (faith, devotion to God Almighty, and noble character; global diversity; independent; worked together; critical and creative reasoning) in accordance with the materials and methods used, namely critical

reasoning, independence and mutual cooperation. The facilities and infrastructure that will be used during learning activities are in accordance with the learning method. The student targets listed are in accordance with the material and in accordance with the environmental conditions in the class. The target students listed are regular students and students who have learning difficulties and are in accordance with the environmental conditions in the classroom.

The learning model/strategy is in accordance with the recommended learning model for implementing the independent curriculum and students' learning needs by generating syntax. The learning model used is Process Oriented Guided Learning (POGIL) which is an inquiry learning model that creates syntax, namely orientation, exploration, concept discovery, application and conclusion (Hainun et al., 2022). The second learning model used in this lesson is the take and give learning model which is an example of cooperative learning (student-centered learning). Furthermore, this learning uses the Discovery Learning learning model. The syntax that appears in the Discovery Learning learning model is stimulus, problem identification, data collection, proof and drawing conclusions (Sinambela, 2017). The teaching module also has a 7E learning cycle model (elaborate, engage, elicit, explore, explain, extend and evaluate).

Meaningful understanding is arranged systematically with sentences that are easy to understand. The trigger questions are arranged systematically with sentences that are easy to understand and are assisted by displaying pictures so that it is easier for students to understand them. Learning flow structured based on previous learning experiences in the form of apperception and initial formative assessment of learning. At each meeting, use apperception, remind you of previous material or carry out an initial formative assessment of learning. The learning flow is relevant to the 21st century learning approach and displays syntax that is appropriate to the approach used. The approach used is student center. The learning flow listed combines knowledge (teaching materials), pedagogy and information technology in a comprehensive manner. This learning flow combines teaching materials, teacher abilities in teaching and information technology in a complete and extensive manner and provides more insight.

Learning flow does not give rise to differentiated learning. Differentiated learning is not yet visible in the teaching module used by the class X chemistry teacher at SMAN 10 Pontianak. Differentiated learning is carried out in three ways, namely content differentiation, process differentiation and product differentiation. The independent curriculum has a close relationship with differentiated learning (Fauzia et al., 2023). Meeting the requirements of individual students can be achieved through the use of differentiated learning strategies. Through the teaching and learning process of differentiation, students receive instruction tailored to their needs, interests, and ability levels. Differentiated learning aspects are in the form of content (material taught by the teacher), process (learning activities), product (end result of learning) and learning environment (Wahyuningsari et al., 2022).

Content differentiated learning refers to differences in teaching materials given to students based on learning needs. Differentiation of processes related to learning activities undertaken by students can be done by providing varied activities for students that are tailored to their learning style, interests and learning readiness. Product redundancy refers to differences in student learning outcomes which can be in the form of essays, diagrams, posters, and so on (Komalasari, 2023). Before implementing differentiated learning, educators must map students' learning needs based on learning enjoyment, learning interests and students' learning profiles.

The assessment components are appropriate to student development but do not cover all domains of attitudes, knowledge and skills. The assessment plan listed is only an assessment

of knowledge and skills. Attitude plans are included in group discussions, not in all learning activities. In the module there are six meetings but at the fourth meeting there was no discussion so at this meeting no attitude assessment was carried out. Apart from that, in the group discussion assessment it is not stated what kind of attitudes will be assessed and there is no attitude assessment rubric. Instrument evaluation is in accordance with the learning objectives and indicators that have been set and is at the medium level (MOTS) and high level (HOTS) thinking.

The evaluation instrument is in accordance with the objectives and indicators of the learning objectives that have been determined, the questions are still included in C3 (applying) and C4 (analyzing) in Bloom's taxonomy. The assessment component in the use of HOTS questions in assessment has been used in the teaching module being analyzed. Teachers and students must acquire HOTS skills in order to follow the independent curriculum. High Order Thinking Skills (HOTS) are advanced cognitive abilities that demand for the critical, imaginative, and analytical examination of information and data in order to solve issues (Jannah et al., 2022). HOTS operates at the C4 (analyzing), C5 (evaluating), and C6 (creating) cognitive levels.

HOTS-based evaluation questions have the characteristics of questions being presented in the form of discourse or tables. In the teaching module analyzed, the evaluation questions are still at level C3 (applying). The assessment gives rise to formative assessment, namely at the first meeting the teacher gives an assignment, at the second meeting they give a presentation, at the third meeting they give an assignment, at the fourth meeting they give a project on alternative learning, at the fifth meeting they give a presentation and at the sixth meeting they give an assignment. Assessment gives rise to summative assessments in learning according to the material and objectives to be achieved.

The teaching module displays reflections for students and educators that vary according to the learning process without using technology. The reflections carried out still do not use technology, this is shown by the absence of a link that can access the reflections that students will carry out. LKPD is appropriate to student development, covering all domains of attitudes, knowledge and skills and triggering communication and collaboration between students. In the teaching module there is a draft LKPD for practicum and provides several example practice based possible environment used. LKPD is based on information technology and concrete objects, but the platform is not yet varied, only typed from word and printed.

Enrichment and remedial according to student development and material. The reading materials for students and educators are good because they are prepared systematically as alternative learning resources for students in accordance with the objectives and indicators of deep, meaningful and relevant learning based on the environment around students and in accordance with the level of depth of the material. The glossary displays all the meanings of the terms contained in the teaching materials correctly and in alphabetical order. A bibliography that includes more than five relevant sources and is written according to the bibliography writing format.

The minimum components of a teaching module are learning objectives, learning activities, initial assessment design and the end of learning which is equipped with assessment instruments and rubrics, and learning media (Kemendikbudristek, 2022). The teaching module analyzed contains minimal elements, namely learning objectives, learning activities and learning media (in the form of activity sheets, websites and student reading materials) are complete, but the assessment plan is incomplete. The assessment plan listed is only a formative assessment plan without an assessment rubric and scoring guidelines. For

assessment of discussions and practicums, instruments and rubrics are complete. Attitude assessments are not included in the assessment rubric and scoring guidelines.

CONCLUSION

The teacher's usage of an autonomous curricular teaching module was deemed to fall under the good category based on the findings and discussion, as the teaching module in question achieved a final score of 88.3. These findings show that the autonomous curriculum's learning and assessment standards are followed by the teaching module. Module identity, initial competencies, learning objectives, Pancasila student profile, facilities and infrastructure, target students, meaningful understanding, trigger questions, learning activities, educator and student reflections, student worksheets, enrichment and remedial reading materials for students and educators, glossary and bibliography are components that yield good and excellent results. Results that were not optimal were found in the learning model components, especially differentiated learning and the assessment component, namely assessing student development.

RECOMMENDATIONS

Based on the conclusions the researcher can recommend, it is hoped that teachers will continue to develop their own abilities in creating learning tools based on the independent curriculum, teachers must create their own teaching modules so that they can carry out learning in accordance with the independent curriculum.

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