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# Teachers' Ability to Develop Mathematics Teaching Modules: Study of the Implementation of the Independent Curriculum in Pontianak City

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## Abstrak

Penelitian ini bertujuan untuk mengukur kemampuan guru matematika SMP/SMA/SMK di Pontianak dalam mengembangkan perangkat pembelajaran berdasarkan Kurikulum Merdeka. Tujuan spesifiknya adalah: 1) mendeskripsikan kemampuan guru dalam menjabarkan kriteria perangkat pembelajaran Kurikulum Merdeka, dan 2) mendeskripsikan kemampuan guru dalam menjabarkan komponen perangkat pembelajaran Kurikulum Merdeka. Penelitian ini mencakup beberapa tahap: analisis teori kemampuan guru, eksplorasi karakteristik perangkat pembelajaran, identifikasi masalah, kajian perangkat pembelajaran hasil pengembangan guru, serta pengumpulan data melalui angket, wawancara, dan observasi. Metode yang digunakan adalah metode deskriptif dengan analisis data kualitatif dan kuantitatif. Hasil penelitian menunjukkan bahwa kemampuan guru dalam mengembangkan perangkat pembelajaran, khususnya dalam menjabarkan tiga komponen dan empat kriteria perangkat pembelajaran Kurikulum Merdeka, berada pada kategori baik. Namun, kemampuan dalam menjabarkan item setiap komponen dan kriteria perangkat pembelajaran berada pada kategori cukup baik.
**Kata Kunci**: Kemampuan guru; Perangkat Pembelajaran; Kurikulum Merdeka.

## Abstract

This study aims to assess the abilities of junior high, senior high, and vocational school mathematics teachers in Pontianak in developing learning tools based on the Merdeka Curriculum. Specifically, it seeks to: 1) describe teachers' abilities in detailing the criteria for Merdeka Curriculum learning tools, and 2) describe teachers' abilities in detailing the components of Merdeka Curriculum learning tools. The study includes several stages: theoretical analysis of teachers' abilities, exploration of learning tool characteristics, problem identification, review of learning tools developed by teachers, and data collection through questionnaires, interviews, and observations. The research employs a descriptive method with both qualitative and quantitative data analysis. Results indicate that teachers' abilities in developing learning tools, particularly in detailing three components and four criteria of the Merdeka Curriculum learning tools, are categorized as good. However, their ability to detail each item of the components and criteria is categorized as fair good.
**Keywords**: Teacher Capabilities; Learning Tools; Independent Curriculum.

## I. INTRODUCTION

The curriculum in Indonesia has changed approximately 10 times, starting from 1947 to 2022. Curriculum changes are a common thing, because changing the curriculum has the effect of changing with the aim of improving the previous curriculum (Dilekçi & Karatay, 2023). It is very important to change the curriculum in a country according to the demands of the times, developments in science and technology, the level of intelligence of learners, culture, value systems and community needs (Hidayah et al., 2022) and guides instruction to ensure a structured learning process with clearly defined learning outcomes (Ross, 2024). The previous Curriculum 13, with its emphasis on formative assessment, was found to be insufficient in supporting teachers in developing students' literacy and numeracy skills. Consequently, a groundbreaking approach was adopted in the latest curriculum revision (Puad & Ashton, 2023), The latest curriculum changes to date, launched by the Ministry of Research, Technology and Higher Education, is precisely in February 2022, namely the Merdeka Curriculum or Independent Curriculum under the policy of independent learning and the strengthening of literacy and numeracy skills (Sundari et al., 2023; Krisma, Muqtada, & Khasanah, 2024).

The advantages of Independent Curriculum (Robingun Suyud El Syam et al., 2023; Almarisi, 2023) including; 1) the curriculum is simpler, but quite in-depth; 2) the curriculum focuses more on essential knowledge and student development based on stages and processes; 3) learning is more meaningful and more enjoyable; 4) students are more independent, for example high school students can determine the subjects they are interested in according to their talents and aspirations (Sundari et al., 2023); 5) for teachers is that during teaching and learning activities teachers can carry out teaching according to an assessment of the level of achievement and development of students, and teachers are given the freedom to determine teaching materials. In line with the findings of Afifah et al., (2024) and Nurphi, (2024), the Merdeka Curriculum excels in providing students with the freedom to explore learning experiences that cater to their individual needs, potential, and learning styles. Moreover, it fosters creativity and independence among learners. However, this does not imply that the curriculum is without boundaries or that it deviates from its intended objectives. A significant challenge faced by educators is the difficulty in developing teaching materials, including assessments, instructional designs aligned with the concept of independent learning, and innovative modules.

The Independent Curriculum is a policy program of the Indonesian Ministry of Education and Culture launched by the Minister of Education and Culture Nadiem Anwar Makarim. The reasons for his policy, among others, were based on observing the results of the 2019 Program for International Student Assessment (PISA) research which showed that the results of the assessment, in the fields of mathematics and literacy, respectively, Indonesian students were in 74th position out of 79 countries or 6th from the bottom

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(Schleicher, 2018; Masfufah & Afriansyah, 2021). The launch of the Independent Curriculum launched by the Ministry of Education and Culture serves to catch up with Indonesian education in terms of literacy and numeracy. Furthermore, according to him, the launch of the concept of independent learning is: 1) the concept of independent learning is the answer to the problems faced by teachers in educational practice; 2) teachers have a reduced burden in carrying out their profession, such as: free freedom in assessing student learning with various types of instruments, freedom from burdensome administration; and freedom from pressure and politicization of teachers; 3) open your eyes to find out more about the obstacles faced by teachers in learning tasks at school; and 4) teachers as the front guard in shaping the future of the nation through the learning process, it is important to create a happier learning atmosphere in the classroom (Schleicher, 2018). Thus, professional teacher competence is very necessary, especially pedagogical, and professional abilities to implement the independent curriculum (Kiram, 2012; Ockta & Mardesia, 2023). One of the four essential competencies for professional teachers is pedagogy. Consequently, a pedagogically proficient teacher will naturally create instructional materials that align with the curriculum (Meldi & T, 2022). To facilitate the attainment of professional teacher competencies in understanding and implementing the curriculum, a comprehensive understanding of the differences between the Merdeka Curriculum and its predecessors is necessary, along with the implications of these differences based on empirical findings. (Robingun Suyud El Syam et al., 2023).

Table 1.
Equality and Difference of Curriculum 13 and Curriculum Merdeka

| Equality | Difference | |
|---|---|---|
| | Curriculum 13 | Curriculum Merdeka |
| Competency Based | Integrated thematic learning | Learning every lesson |
| Active learning-based learning | KI KD per grade T level | TP is developed from CP according to the needs of the educational unit |
| Developing HOTS | Science and Social Studies are separate | Science and Social Studies are united, English becomes an elective subject in elementary school |
| There are study groups | Class levels starting from class 1-6 | There is phase A for classes 1 and 2, phase B for classes 3 and 4, phase C for classes 5 and 6. |
| Developing the 4C | English is not recommended in elementary school | English becomes an elective subject in elementary school |
| Developing innovative learning models | Projects are only done in intracurricular activities | Project carried out on the development of P-5 |
| Conducting authentic | Separate | Formative and |

| Equality | Difference | |
|---|---|---|
| | Curriculum 13 | Curriculum Merdeka |
| assessments | Assessment (KI1 - KI2 - KI3 - KI4) | Summative Assessment |

The results of interviews conducted by Marianus Hengki (Research Team) regarding the use of the Merdeka Curriculum on March 14th 2023 with three teachers, namely: 1) Eli, S.Pd teacher at Bruder Pontianak Middle School, revealed that he experience difficulties or obstacles because the Merdeka Curriculum was new at apply it in the 2022/2023 school year so that it seems a little harder and you are not able to master the curriculum; 2) Fortun Joseceline, S.Pd. from St. Paul Pontianak High School teacher: during the learning process, he tries to adapt the Merdeka Curriculum, because K-13 has been well mastered. From the administrative system, we are still confused as a whole about what should be done, but we are still trying to learn what the school and government are currently asking to do in order to improve the education system in Indonesia (Afgany et al., 2023); 3) Eka Pratiwi, S.Pd. from St. Paul Pontianak High School teacher; revealing that the current obstacle is still a lack of understanding of the assessment system and its relationship to what is in the government book and the CP is quite different in it (Bulan & Pratama, 2024). There is also more material being taught, so the question arises, are students capable? If you are able to achieve it, it will be easy to continue, but if you are not? Is it possible to continue with material that must be repeated because you have not mastered the material? If you choose K-13 and the Independent Curriculum, currently you still have a K-13 perspective that does not fully implement the Independent Curriculum when learning.

As a result of the interview above, the responses to the implementation of the Independent Curriculum were very varied. The teachers' responses were more dominant towards implementation in their learning activities, meaning that the teachers were indicated to be ready with their learning plans which were outlined in the learning tools (Culture, 2024). The learning tools implemented in the independent curriculum are in the form of teaching modules. Teaching modules are similar to learning implementation plans (RPP), but teaching modules have more complete components. Meanwhile, teachers are used to developing lesson plans according to K-13. The problem that arises is whether teachers in implementing learning at the start lack the skills to develop learning tools according to the independent curriculum or something else (Clifton, 2023). This indicates that teachers do not fully understand the Independent Curriculum. Meanwhile, teachers are used to developing learning tools according to K-13.

Other facts come from the researcher's experience as a teacher or lecturer in online or online Daljab Professional Teacher Education (PPG) in 2022 in the material on Learning Tool Development, 1st Field Experience Practice, and 2nd Field Experience Practice. Problems that arise and cause attention include: 1) teachers still have not mastered well how to design lesson plans according to K-13; 2) synchronize the elements contained in the

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RPP, such as formulating objectives that contain ABCD elements (Audience, Behavior, Condition, Degree) which are still not appropriate; there is a lack of harmony when combining the use of learning models, scientific approaches, TPACK, 4C in the description of core learning activities. These revealed facts certainly give rise to new problems, such as; K-13 has not been mastered well, we must try to adapt it to the use of the independent curriculum. Then, there is an indication of disbelief in how well teachers will quickly adapt, whether it will have a positive or negative impact overall (Clifton, 2023). Apart from that, the current demands of teachers must be creative in packaging learning based on high level thinking, literacy, numeracy with modules, models, methods, media, etc. based on learning theory which is packaged into learning tools (Muhlis et al., 2024).

The learning tools applied to students to guide the learning flow are modules. This means that in learning, modules have been packaged holistically and systematically to guide, facilitate, reference and framework that teachers have integrated into learning to support the achievement of competency in Pancasila learning outcomes and student profiles (Kemendikbud Ristek, 2021). Thus, the module is one of the most important aspects in implementing the independent curriculum at the secondary school level (Dwikoranto et al., 2023). Of course, the characteristics of the teaching modules used in K13 and the independent curriculum are different, right? However, during this transition period, most of the modules used are still not appropriate to what students need and want to achieve (Meldi et al., 2023). The inability of teachers, as the driving force behind curriculum implementation, to create modules, learning resources, and deliver instruction in accordance with the Merdeka Curriculum's standards will inevitably hinder the attainment of the curriculum's objective (Malikah et al., 2022). It is felt that there is a need to make efforts to study, observe or explore teachers' abilities in designing learning tools based on the independent curriculum. This is important to try to obtain valid information regarding this matter. In this research, the general problem formulation is: "How to analyze the abilities of middle school/high school/vocational school teachers in developing mathematics learning tools based on the Independent Curriculum?" With the following sub-problem formulation: a) Does the teaching module developed by the teacher contain the four teaching module criteria based on the independent curriculum?; b) Does the teaching module developed by the teacher contain the four components of the teaching module based on the independent curriculum?; c) How is the teacher's ability to describe each teaching module criteria based on the independent curriculum that was developed?; and d) How is the teacher's ability to explain each component of the teaching module based on the independent curriculum that has been developed?

This research aims to describe abilities through analyzing mathematics learning tools based on the independent curriculum in the form of mathematics teaching

modules resulting from its development. Obtaining an overview of the teacher's abilities through a detailed assessment of the teaching modules he developed. Specifically, the objectives of this research are: 1) to describe the teacher's ability to describe the criteria that fulfill the teaching module based on the independent curriculum that was developed; and 2) describe the teacher's ability to describe the components that fulfill the teaching module based on the independent curriculum that was developed. In particular, the mathematics teaching module developed in the secondary education unit in Pontianak.

In connection with the application of technology, disclosing or exploring teachers' abilities through analyzing mathematics learning tools based on the independent curriculum in the form of mathematics teaching modules resulting from its development, becomes the basis for providing students with life in society. Likewise, regarding the character-based education movement which is a national movement, it is necessary to prepare the Indonesian generation in 2045, namely when we welcome 100 years of Indonesian independence. Leadership with character is very important for students because it is an important key to the quality of life now and in the future (Chairif, 2012).

Research carried out in Pontianak, with the subjects being middle school or high school/vocational school mathematics teachers, has the potential to influence improving the quality of students, staff, teachers, or lecturers through creating a conducive academic climate. This climate can be seen from the activities carried out, where each stage of research often involves joint scientific activities (discussions, studies, and seminars).

It is hoped that the results of this research can be input for mathematics teachers in the Secondary Education Unit in Pontianak, as well as for lecturers who teach in the Mathematics Education Study Program. In particular, to motivate students to have a positive attitude towards mathematics in general, and ultimately strengthen their learning gains. By knowing that there is a positive attitude towards mathematics, it can be used as an illustration of the student's attitude towards other materials (Soedjadi, 2004).

## II. METHOD

This research is an activity to explore teachers' abilities in developing mathematics learning tools based on the independent curriculum. The research method used in this research is a descriptive method. The descriptive method is a problem-solving procedure that is investigated by describing or depicting the condition of the subject or object of research (a person, institution, society, etc.) at the time the research takes place based on visible facts or as they are (Nawawi, 2005). A descriptive method was chosen in this study to obtain comprehensive data explaining how teachers endeavored to fulfill the criteria, components, content, and concepts of independent learning as outlined in the Merdeka Learning modules. By adopting this approach, the study aimed to gather valid data that could inform subsequent interventions to enhance teachers'

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competencies in developing standardized instructional modules. (Yuliani et al., 1967).

The research was carried out in Pontianak. With the subject being middle school or high school/vocational school mathematics teachers. The technique for taking subjects in this research used purposive sampling. Networking and data collection was carried out through: documentation, questionnaires, and interviews. Meanwhile, the data analysis techniques used are carried out qualitatively and quantitatively to complement each other.

This research was planned to be carried out and implemented by adapting a model that had been developed by the Research Team (Jamiah, 2020). The details of the stages are described below. 1) analyze theories about teacher abilities and theories related to the development of learning tools based on the independent curriculum; 2) explore the characteristics or characteristics contained in learning tools based on the independent curriculum, especially in junior high school or high school/vocational school mathematics subjects; 3) identify and examine the problems found in step 2 and review them from the aspect of balance between teacher attitudes, skills and knowledge; as well as the use of learning tools based on the independent curriculum; 4) reviewing learning tools based on the independent curriculum developed by teachers that are already available (documents collected from research subjects), and compiling instruments in the form of questionnaires; 5) provide questionnaires and conduct interviews which are further intended as material for comprehensively analyzing teacher abilities. and 6) analyze the data and prepare a final report.

## III. RESULT AND DISCUSSION

After the research process was carried out, several results and findings in this research were explained in detail as follows:

### A. Fulfillment of Teaching Module Criteria

The application of the Merdeka curriculum is certainly familiar with the term "Teaching Module" which has the meaning of a type of learning tool that is designed completely and systematically as a reference or guide and guidelines for educators in carrying out learning activities. This learning tool is a form of implementing the flow of learning objectives, abbreviated as ATP, which is developed from learning outcomes, abbreviated as CP, and is equipped with learning steps, assessment plans (diagnostic, formative and summative) and the necessary facilities, so that learning can be realized. organized.

According to (Culture, 2022a) the development of learning tools in the form of teaching modules meets four criteria, namely; 1) Essential: Understanding the concepts of each subject through learning experiences and across disciplines; 2) Interesting, meaningful and challenging: Foster interest in learning and actively involve students in the learning process. Connects with previous knowledge and experience, so it is not too complex, but also not too easy for the age stage; 3) Relevant and contextual: Related to previous knowledge and experience, and

appropriate to the context of the time and place where students are located; and 4) Continuous: Linking the flow of learning activities according to the student's learning phase.

Learning tools in the independent curriculum are known as "teaching modules". The naming of this term should not be something foreign or new for educators who understand the learning tools well in the previous curriculum. The learning tools (teaching modules) in the independent curriculum, if combined with the learning tools in the 2013 curriculum, are called RPP plus. The teaching module contains the elements: RPP, Teaching Materials, LKPD, Learning Media, and Assessment (N.A. of Pducational, 2003; N.A. of Educational,2000). Meanwhile, the learning tools in the 2013 curriculum also contain the same elements in the teaching modules. This means that there is no reason why educators/teachers say they cannot compile or develop learning tools.

Teaching modules in the independent curriculum must meet four criteria, namely; 1) Essential: Understanding the concepts of each subject through learning experiences and across disciplines; 2) Interesting, meaningful, and challenging: Foster interest in learning and actively involve students in the learning process. Connects with previous knowledge and experience, so it is not too complex, but also not too easy for the age stage; 3) Relevant and contextual: Related to previous knowledge and experience, and appropriate to the context of the time and place where students are located; and 4) Continuous: Linking the flow of learning activities according to students' learning phases (Culture, 2022b) Based on the results of the analysis of 10 educators in understanding or presenting the Essential criteria, namely understanding the concepts of each subject through learning experiences and across disciplines; It was found that 90% understood the facts well. This means that the first criterion in developing teaching modules has been well mastered. For the second criterion, namely interesting, meaningful, and challenging to foster interest in learning and provide opportunities for students to be actively involved in learning activities, based on data analysis, it was revealed that the dominant presentation indicated meaningful and challenging. The second criterion was also explored through questions in the questionnaire, with the question "Is a teacher, before carrying out learning process activities, required to design teaching modules that are interesting, meaningful and challenging according to the criteria for developing teaching modules, with the hope of fostering interest and involving students in learning effectively?" active in the learning process?" the answer; eight educators said yes and two educators said they were unsure. This means that the second criterion is generally not a problem, but the issue of attractiveness is a separate note, because the assessment is very relative, depending on the point of view, it can come from the explanation of the teaching module, it can also come from the presentation of the explanation of the material and it can even bring or arouse curiosity. learners. For the third criterion, namely relevant and contextual, which relates to the knowledge and experience

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that students have before, and in accordance with the context of their existence, based on data analysis, it is revealed that 80% of educators have explained the presentation of the material well and fulfilled the relevant criteria and 70% has also explained that the presentation of the material meets contextual criteria. This means that educators have considered that the presentation of teaching material must be adapted to the characteristics, level of difficulty, abilities, and environment of the students. Furthermore, for the fourth criterion, namely continuity, which means the relationship between the flow of learning activities and the student's learning phase, based on data analysis, it is revealed that 70% of educators explain the criteria for continuity well and 30% explain the criteria for continuity quite well, which means that In general, educators have outlined material descriptions according to the specified phases, so that learning outcomes can be met properly.

Based on the discussion regarding the fulfillment of the four teaching module criteria, namely: 1) Essential: 2) Interesting, meaningful, and challenging: 3) Relevant and contextual: and 4) Sustainable (Irmaliya et al., 2009; Faridahtul Jannah & Thooriq Irtifa' Fathuddi, 2023; Rismawanda & Mustika, 2024), it can be concluded that the four teaching module criteria have not been fully fulfilled. Because the teaching modules developed by each teacher still contain criteria that do not or do not meet the classification of teaching module criteria, this means that the teacher's ability to develop teaching modules based on the independent curriculum is not yet optimal.

**B. Fulfillment of Teaching Module Components**

According to (Culture, 2022b), the development of learning tools in the form of teaching modules fulfills three components, namely: 1) General Information; a) Identity of the module author, b) Initial competencies, c) Pancasila Student Profile, d) Facilities and Infrastructure, e) Target students, and f) Learning Model used; 2) Core Components, namely: a) Learning Objectives, b) Assessment, c) Meaningful understanding, d) Sparking questions, e) Learning activities, and f) Reflections of students and educators; and 3) Attachments, consisting of: a) Student worksheets (LKPD), b) Enrichment and remediation, c) Educator and student reading materials, d) Glossary, and e) Bibliography.

It was revealed that the first component in the teaching module consisting of six items was predominantly fulfilled, only one respondent did not fulfill the items, e) target students, and f) learning model used. For the second component in the teaching module which consists of six items, it was also predominantly fulfilled, however there were two respondents who did not fulfill the assessment items. And for the third component in the teaching module which consists of five items, variations in fulfillment are presented, such as items a) Student worksheets (LKPD), c) reading materials for educators and students, which were fulfilled by all respondents. For item b) enrichment and

remediation, four respondents (40%) fulfilled it. For item d) Glossary, 80% fulfilled (8 out of 10 respondents); and for item e) The bibliography is 90% fulfilled.

Based on the results of data analysis, it is stated that teachers/educators can develop learning tools or teaching modules that are in accordance with the independent curriculum, especially the requirements for fulfilling three general components, namely: general information, core components, and attachments. This teacher/educator's ability should be like that, because this teacher already has experience in preparing these tools. This is because the components of this teaching module are also contained in the elements of learning tools according to the 2013 curriculum, so teachers do not experience significant difficulties in expressing the components of the teaching module. Although, for each component item of the three components of the teaching module it is still not fully fulfilled. This is not a problem because the development of learning tools that contain these three general components is determined by educators based on their needs. This means that not all these components must be included in the teaching module being developed. This means that educators are given the freedom to develop components in teaching modules according to the environmental context and students' learning needs (Culture, 2022b).

### C. Description of Items in Teaching Module Components

Based on the study and data analysis results, it is revealed that 100% of teachers include the first component of the teaching module, especially the Pancasila profile, and the rest are the second component of the teaching module. Formulating goals is not an obstacle, because teachers are used to formulating goals in learning tools according to the 2013 Curriculum (Kurtilas). As a reference for lesson planning, the Independent Curriculum (Kumer) uses the term ATP (Learning Objective Flow) which has the same function as the Syllabus in Kurtilas. The term CP (Learning Outcomes) in Kumer is the same as the terms KI (Core Competencies) and KD (Basic Competencies) in Kurtilas, the difference is that the CP format in Kumer no longer differentiates between cognitive aspects, psychological aspects, and affective aspects as in KI and KD.

Furthermore, related to the issue of assessment, assessment should no longer be an obstacle because teachers when designing learning tools according to Kurtilas also formulate assessments. However, in fact, assessment is an obstacle in developing learning tools. The indication is that teachers do not properly understand what is meant by assessment. Assessment has meaning or is a process of collecting and processing information for students' learning needs, development, and achievement of results, which are then used as material for reflection and a basis for improving the quality of learning.

The results of data analysis showed that 100% of teachers did not reveal content differentiation learning designs or product differentiation learning designs. 90% of teachers did not reveal the process differentiation learning design, 10% of teachers revealed the process differentiation learning design. The

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indications are that teachers are still designing patterned learning activities such as designing learning tools according to Kurtilas. In fact, the stages required to design or design teaching and learning activities in both Kumer and Kurtilas are similar. The preparatory steps that need to be taken so that differentiated learning can run effectively include: 1) determining learning objectives; 2) map students' learning needs (learning readiness, interests, learning profile; 3) determine the strategies and assessment tools that will be used; and 4) determine the differentiated learning activities that will be carried out (content, process, product).

Furthermore, the results of data analysis showed that 30% of teachers included a complete learning model with a description of its syntax; as many as 30% of teachers include learning models but do not include an explanation of the syntax; and as many as 40% did not include learning models. This means that 70% of teachers cannot explain the syntax or stages of learning activities according to the model they choose. This should not have happened, because teachers already have experience in developing learning tools according to Kurtilas. This case seems to be a matter of concern to pay attention to, because by involving a learning model you must understand the meaning of the model. The results of Novi's research (2022) are obstacles for teachers to prepare learning plans, such as: 1) lack of understanding of how to derive/translate CP into learning objectives; 2) lack of reference learning models; 4) limited facilities and infrastructure at the school; 4) limited initial knowledge and subject matter.

## D. Teacher Response to Teaching Module Development

Research data to explore teacher responses requires a data collection tool called a questionnaire. Because questionnaires according to (Sugiyono, 2018) state that questionnaires are a data collection technique which is carried out by giving a set of questions or written statements to respondents to answer. The purpose of giving a questionnaire is of course adjusted to the needs of the research problem being carried out. Below is a recap of the responses of 10 middle school or high school teachers to the development of teaching modules referring to the independent curriculum.

The results of the questionnaire analysis per statement item are as follows:

As many as 100% of teachers agree, if teachers design appropriate learning tools, it will be easier for students to understand the concepts being taught.

As many as 90% of teachers agree that the operational curriculum of educational units and the flow of learning objectives (ATP) have the same function as the syllabus, namely as a reference for learning planning. As many as 10% expressed doubts about this statement.

As many as 90% of teachers agree that the development of learning tools in the form of teaching modules must/must contain four criteria, namely: 1) Essential; 2) Interesting, meaningful, and challenging; 3) Relevant and contextual; and 4) Sustainable (Ali & Susilawati, 2024;

Lidyasari et al., 2023). As many as 10% expressed doubts about this statement.

As many as 100% of teachers agree that the development of learning tools in the form of teaching modules must/must contain three general components, namely: general information, core components, and attachments.

As many as 70% of teachers agreed with the statement "Based on the independent curriculum (KM) that the 'teaching module' matched in the 2013 curriculum (K-13) is RPP-Plus (RPP+)". As many as 10% disagreed and 20% were doubtful about this statement.

As many as 20% of teachers agreed with the statement "The formulation of learning objectives, using the Independent Curriculum (KM) is the same as using the 2013 Curriculum (K-13)". As many as 70% disagreed and 10% were doubtful about this statement.

Giving questionnaires to respondents certainly has a purpose that is tailored to the needs of the research problem. The aim is to seek complete information from respondents and that respondents do not feel worried or intimidated when providing their information. By paying attention to the results of data analysis, especially statements number 1 to number 3 (results of analysis of points a, b, c) and statements number 5 and number 6, it can be stated that teachers or educators have understood the use of an independent curriculum to develop learning tools. However, if we examine again according to statement 4, it raises doubts about concluding that educators understand well the use of the independent curriculum which is used as the basis for developing learning tools (teaching modules). Because the fourth statement, namely "The development of learning tools in the form of teaching modules must/must contain three general components, namely: general information, core components, and attachments" was answered by all teachers in the research as mandatory. While the answer to this question is not mandatory.

According to (Learning and Assessment Guide for Primary and Secondary Education Levels (SD/MI, SMP/MTs, SMA/SMK/MA), 2022) the development of learning tools in the form of teaching modules aims to guide educators to carry out the learning process. The development contains three general components, namely: general information, core components, and attachments. The components can be determined by educators based on their needs. This means that not all of these components must be included in the teaching module being developed. The further meaning is that educators are given the freedom to develop components in teaching modules according to the environmental context and students' learning needs.

To be more convincing about the answers or information provided by educators, researchers conducted interviews with educators represented by respondent number 2 regarding question number 2 with hesitant answers. As for the information: "My answer is doubtful because in my opinion what is used as a reference for learning plans are learning outcomes (CP). However, I feel uncertain because I feel like I don't know for sure, and I'm also hesitant because I understand that ATP is a learning reference." The interview continued with educators

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represented by respondent number 8 regarding question number 3 with a hesitant answer. As for the information: "The answer to why I chose 'Doubtful', is because there are 4 criteria that must be developed in the teaching module. Of these 4 criteria, perhaps not all teaching modules can be implemented with these 4 criteria. "Because each teaching module has its advantages and disadvantages, what's more, the implementation of the Independent Curriculum for education is very new, in fact there are still many schools that have not implemented it." This means that the information from the interview results raises doubts about concluding that educators understand well the use of the independent curriculum which is used as the basis for developing learning tools (teaching modules).

Teacher response to the development of mathematics learning tools or mathematics teaching modules. Complete information on answers to the questionnaire using a checklist and the reasons is attached in the attachment. The results of the questionnaire analysis per question item are as follows.

As many as 100% of teachers answered "yes", meaning that teachers agreed that every time they formulate learning objectives using the Independent Curriculum (KM) or using the 2013 Curriculum (K-13) they still contain ABCD elements, namely: Audience (participants), Behavior, Conditions, and Degree (level).

As many as 20% of teachers answered "yes" meaning that these teachers stated that implementing an independent curriculum in the mathematics learning process was burdensome; As many as 50% of teachers answered "no" meaning that these teachers stated that implementing an independent curriculum in the mathematics learning process was not burdensome; and as many as 30% answered "undecided" meaning that this teacher is not used to stating exactly whether implementing an independent curriculum in the mathematics learning process is burdensome or not burdensome.

As many as 20% of teachers stated that preparing mathematics learning tools based on the Independent Curriculum was easier; as many as 60% of teachers stated that preparing mathematics learning tools based on the 2013 Curriculum or Kurtilas (K-13) was easier; and as many as 20% of teachers stated that preparing mathematics learning tools based on the Independent Curriculum or based on the 2013 Curriculum or Kurtilas (K-13) was equally easy.

As many as 80% of teachers stated that before carrying out learning process activities, they were required to design teaching modules that were interesting, meaningful, and challenging according to the criteria for developing teaching modules, with the hope of fostering interest and involving students to learn actively in their learning process; and as many as 20% expressed doubts about this statement.

The questionnaire presented and answered by respondents consisted of six statements and four questions. Based on the results of data analysis, for question number one and the answers indicate 100% that in formulating learning

objectives in the 2013 Curriculum (Kurtilas) and the Merdeka Curriculum (Kumer) are the same. This can be understood because formulating learning objectives generally has the meaning of describing achievements that contain three aspects of competence, such as cognitive aspects (knowledge), psychological aspects (skills), and affective aspects (attitudes) obtained by students in one or more activities. learning. Apart from that, changes in the curriculum have an impact or there are changes in the terms used but they have the same meaning, for example: As a reference for learning planning, in Kumer the term ATP (Learning Objective Flow) has the same function as the Syllabus in Kurtilas. The term CP (Learning Outcomes) in Kumer is the same as the terms KI (Core Competencies) and KD (Basic Competencies) in Kurtilas, the difference is that the CP format in Kumer no longer differentiates between cognitive aspects, psychological aspects, and affective aspects as in Kal. KI and KD.

The teacher's response to the preparation and application of appropriate learning tools in the independent curriculum is explored through questions number two and number three. Based on the results of data analysis, it can be stated that the teacher/educator response was less consistent in responding to the change in curriculum from Kurtilas to Kumer, especially in the preparation and application of learning tools. This was revealed by the 10 educators, two educators stated that it was easy to prepare learning tools according to Kumer; six educators stated that it was easy to prepare learning tools according to Kurtilas; and two educators said it was equally easy to set up learning tools. In its application: two educators stated that it was burdensome to apply learning tools according to Kumer; five educators stated that it was not burdensome to apply learning tools according to Kumer.

## IV. CONCLUSION

The teaching modules developed by teachers generally contain three components, namely: General Information; Core Components; and Attachments. These three components are fulfilled, because the teacher already has experience in preparing these tools, in other words, because the components of this teaching module are also contained in the elements of the learning tools according to the 2013 Curriculum, so the teacher does not experience significant difficulties in expressing the components of the teaching module. Although, for each component item of the three components of the teaching module it is still not fully fulfilled. This is not a problem because the development of learning tools that contain these three general components is determined by educators based on their needs.

The teaching modules developed by teachers generally contain four criteria, namely: Essence; Interesting, meaningful, and challenging; Relevant and contextual; and Continuous Flowering. Based on data analysis and discussion, it can be concluded that the four teaching module criteria have not been fully met. Because the teaching modules developed by each teacher still contain criteria that do not or do not meet the classification of teaching module

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criteria, this means that, in general, it means that the teacher's ability to develop teaching modules based on the independent curriculum is not yet good or considered good enough.

The development of learning tools in the form of teaching modules fulfills three components, namely: General Information which consists of six items; The Core Component consists of six items; and the Appendix consists of five items. Teaching module developers do not have to list each component item. This means that educators are given the freedom to determine component items in teaching modules according to the environmental context and students' learning needs. The results of the analysis and discussion of several component items in the teaching module, such as: a) Diagnostic and formative assessment items, revealed that 50% teachers out of ten teachers could not explain the purpose of the assessment, and 70% teachers could not even explain the purpose: summative assessment; b) for the item "Learning model used" it was revealed that 30% teachers included a complete learning model with a description of its syntax; and 30% teachers included the learning model but did not provide an explanation of the syntax; certs as many as 40% teachers did not include both. This means that the completeness and main components of the teaching module are not fulfilled properly. In other words, based on the criteria, the average quality is quite good. So, it can be concluded that in general the teacher's ability is quite good in describing the components of teaching modules based on the independent curriculum.

This study provides comprehensive information regarding teachers' capabilities in developing instructional modules for the Merdeka Curriculum. The findings of this research can serve as a reflective tool for the government and other stakeholders to intensify efforts in enhancing teachers' competencies. This is crucial as teachers play a pivotal role in implementing the curriculum and ensuring that its objectives are met.

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