

# Analysis of Mathematics Learning Based on Minimum Competency Assessment in the 2013 Curriculum at SMP Muhammadiyah 1 Malang

Rani Oktaviana<sup>1</sup>, Moh. Mahfud Effendi<sup>2\*</sup>, Alfiani Athma Putri Rosyadi<sup>3</sup>

Mathematics Education Program, Universitas Muhammadiyah Malang  
Jalan Raya Tlogomas No. 246 Tegalondo, Malang, East Java, Indonesia  
<sup>1</sup>ranioktaviana20@gmail.com; <sup>2\*</sup>mahfud@umm.ac.id; <sup>3</sup>alfi\_rosyadi@umm.ac.id

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## Abstrak

Kementerian Pendidikan dan Kebudayaan menciptakan Asesmen Kompetensi Minimum (AKM) sebagai pengganti Ujian Nasional. Dengan adanya AKM diharapkan siswa mampu mewujudkan kemampuan pemecahan masalah dan berpikir kritis. Penelitian ini menganalisis kesesuaian pembelajaran matematika berbasis AKM di SMP Muhammadiyah 1 Malang. SMP Muhammadiyah 1 Malang menggunakan kurikulum 2013 yang selaras dengan AKM. Penelitian ini menggunakan metode deskriptif dengan pendekatan kualitatif, dengan metode pengumpulan data yaitu dokumen, observasi, dan wawancara. Dengan tujuan penelitian ini maka hasil yang diperoleh dari penelitian ini adalah pembelajaran matematika di SMP Muhammadiyah 1 Malang sudah mengikuti AKM literasi dan numerasi, dilihat dari perangkat pembelajaran yaitu RPP, RPS, buku media pembelajaran, dan website AKM, dan metode pembelajaran. Populasi yang digunakan adalah siswa kelas VII SMP Muhammadiyah 1 Malang. Sampel yang digunakan adalah 30 siswa kelas VIII. Penelitian ini menggunakan instrumen wawancara dan observasi.

Kata Kunci: Pembelajaran; Matematika; AKM; Kurikulum 2013.

## Abstract

The Ministry of Education and Culture created the Minimum Competency Assessment (AKM) as a substitute for the National Examination. With the existence of AKM, it is hoped that students will be able to realize their problem-solving and critical-thinking skills. This research analyzes the suitability of AKM-based mathematics learning at SMP Muhammadiyah 1 Malang. Muhammadiyah 1 Middle School Malang uses the 2013 curriculum, which aligns with AKM. This research uses a descriptive method with a qualitative approach, with data collection methods, namely documents, observations, and interviews. With the aim of this research the results obtained from this research are that mathematics learning at SMP Muhammadiyah 1 Malang is following AKM literacy and numeracy, which is viewed from learning tools, namely RPP, RPS, learning media books, and AKM websites, and learning methods. The population used was class VII students of SMP Muhammadiyah 1 Malang. The sample used was 30 class VIII students. This research uses interview and observation instruments.

Keywords: Learning; Mathematics; AKM; Curriculum 2013.

## I. INTRODUCTION

Human resources are required to be of higher quality than before. In the current era of change, individuals must be capable of meeting the demands for skills, communication, creativity, collaboration, and critical thinking, enabling them to respond, process, and create. Purnomo & Sari (2021) assert that the education sector must transform to confront significant changes in the realm of scientific revolution. According to Suryabrata, as cited in Fadholi & Waluya (2015), education should assist students in achieving appropriate and reasonable development to cultivate inner peace and problem-solving abilities. Syamsuar & Reflianto (2018) state that the education system needs to establish a strong foundation by stimulating knowledge and skills, reinforcing the capacity, and motivating young adults to continue learning after graduation. Education serves as a vessel for preparing competent human resources. Building on this, Muslimin et al. (2017) state that participants need essential life skills, namely the ability and courage to face life problems actively and creatively find solutions.

Schools must provide education that fosters students' critical thinking, creativity, communication, and collaboration skills to enable adaptation to the 21st century (Setiana & Purwoko, 2021). According to Widyastuti et al. (2018), mathematics, as a mandatory

school subject, possesses abstract, logical, and systematic characteristics. Rizky et al. (2015) argue that logical ability is a differentiator in studying Mathematical Sciences. Nila (2018) emphasizes the importance of mathematics learning due to its connection with instilling concepts in students. The current application of mathematics learning varies widely in terms of methods, models, and instructional media teachers use to address math problems perceived as complex by students. Rosyidi (2021) states that mathematics learning aims to equip students with mathematical skills to solve everyday problems.

Therefore, the Minimum Competency Assessment (AKM) is expected to realize problem-solving and critical thinking skills (Andiani et al., 2020). Andiani et al. (2020) argue that the government-established Minimum Competency Assessment (AKM) should be part of the government's goal to prepare students for the 21st century with various skills that must be achieved. Modern learning methods encourage students to be more creative in their education. AKM is divided into two components: literacy and numeracy. Literacy involves reading and writing activities, while numeracy focuses on numerical concepts and arithmetic operations. Asrijanty (2020) states that AKM assesses essential competencies all students need to develop their abilities and positively contribute to society. The use of context in AKM Numeracy is

employed to identify the role of mathematics in daily life.

Assessing the minimum qualifications set by the government is part of the government's goal to prepare 21st-century students with various critical thinking and problem-solving skills that must be achieved as learning requirements in the classroom (Rahadyan, 2021; Effendi, Ummah, & Cahyono, 2023). AKM is a step toward empowering students. In line with this opinion, Erni Murniati (2022) states that AKM is designed to measure students' thinking or reasoning competencies when interpreting data, reading texts, and facing problems requiring mathematical knowledge. According to Rohim et al. (2022), AKM encourages innovative, reasoning-oriented learning that does not focus on memorization. This is because AKM aims to generate information that triggers improvements in the quality of teaching and learning, ultimately enhancing students' learning outcomes.

Pradiarti & Subanji (2022) state that in every math lesson, students must be able to solve problems, aligning with the goals of AKM. Andiani (2020) asserts that AKM is expected to help and support schools' teaching and learning process. Therefore, there is a need for actions that can train students' literacy skills to understand contexts and turn them into mathematical problems (Saputri, 2020). Endayati et al. (2019) state that the curriculum serves as a guide for teachers in planning the learning process as it includes learning

objectives, teaching materials, and strategies used in the learning process.

Indonesia has undergone various curriculum changes from year to year (Murniati, Roza, & Maimunah, 2021; Pusporini et al., 2023). The last curriculum change occurred in 2013 when Indonesia adopted the 2013 curriculum or K13, replacing the previous School-Based Curriculum (KTSP). The school used for this research implements the K13 curriculum alongside the implementation of AKM. Prasetyowati (2016) emphasizes that using a scientific approach, the 2013 curriculum focuses on the pedagogical aspect of contemporary learning. Implementing the 2013 curriculum involves assessing the feasibility of infrastructure purchases and processing book materials, which must first reach the teachers. The teachers aim to prepare media and educational aids for students to understand the material in line with AKM learning.

AKM is needed to assist students' learning activities. The 2013 curriculum serves as a tool for carrying out the learning process. In Indonesia, many schools still use the 2013 curriculum and implement the AKM model in learning. Gais & Afriansyah (2017) state that the 2013 curriculum adapts many international standard assessment models that help students solve AKM-based problems. One school implementing the 2013 curriculum and AKM is SMP Muhammadiyah 1 Malang. Aisyah & Astuti (2021) express that with AKM, it is

expected to help students solve problems. Using the 2013 curriculum should be an exciting discussion to identify the positive and negative values of its implementation. Nurhasanah et al. (2022) explain that, in its implementation, the 2013 curriculum includes many active student activities to allow them to explore and build competencies by exploring their different talents.

Therefore, this research aims to analyze the adaptation of AKM-based mathematics learning in schools implementing the 2013 curriculum, examining the methods, models, and instructional media. This study is conducted to revisit AKM with the 2013 curriculum to determine whether AKM-based learning aligns with the 2013 curriculum used in the school population. The urgency of this research is to see how AKM can facilitate students in the future.

This study differs from previous research as it is based on AKM in the 2013 curriculum, while previous studies used outdated curricula and assessment forms like HOTS or PISA. This research employs a qualitative descriptive approach. The object and population used in this study differ significantly from other research, as it focuses on SMP Muhammadiyah 1 Malang and its eighth-grade students. The aim is to understand the compatibility of AKM learning with Mathematics in SMP Muhammadiyah 1 Malang.

## II. METHOD

This study employs a descriptive method with a qualitative approach. According to Fadli (2021), the qualitative descriptive method is rooted in the philosophy of postpositivism and is utilized to investigate the conditions of natural objects (in contrast to experiments), with the researcher serving as the key instrument. The data collection technique involves triangulation, the analysis is inductive/qualitative, and the results of qualitative research emphasize meaning rather than generalization. Descriptive research with a qualitative approach aims to assess the alignment of mathematics learning with the Minimum Competency Assessment (AKM). AKM indicators encompass various aspects, including reading literacy and numeracy as cognitive learning outcomes, character survey indicators measuring attitudes, habits, and values as non-cognitive learning outcomes, and learning environment survey indicators gauging the quality of learning and the school climate supporting learning. These aspects will be analyzed in the context of mathematics learning at SMP Muhammadiyah 1 Malang.

The qualitative data source for this research consists of an AKM adjustment instrument sheet related to mathematics learning at the school. The research procedures include:

### 1. Documentation

In addition to interviews and observations, information can be obtained

from stored facts such as letters, diaries, photo archives, meeting results, souvenirs, and activity journals. Documents used in data collection include lesson plans (RPP), syllabi (RPS), and other learning tools. Documentation techniques are also integrated into interview and observation methods. The researcher verifies the teacher's learning device data, including lesson plans and other materials. AKM learning is evaluated against the indicators outlined in the AKM questions.

## 2. Observation

Direct observation is conducted to gain a detailed understanding of activities. Observation is considered a crucial component of data collection. It involves collecting data directly from the field. The purpose of observation is to provide a descriptive account, generate theories and hypotheses (in qualitative research), or test theories and hypotheses (in

quantitative research). Observations take place in the classroom during learning activities, allowing the author to analyze the design of AKM-based learning. The observations involve entering the class to observe how mathematics learning aligns with AKM.

## 3. Interview

Interviews are employed as a technique to collect research data. These sessions involve direct questioning and answering to gather information from the participants. Teachers and 30 class VII students at SMP Muhammadiyah 1 Malang are the research subjects for interviews. The aim is to capture opinions, feelings, emotions, and other relevant aspects related to individuals in the organization. Both teachers and students are interviewed to understand how mathematics learning is conducted in line with AKM in the classroom.

Table 1.  
Components of AKM Indicators

AKM Components	Numeracy	Literacy
Content	Numbers include representation, sequence properties, and operations on various numbers (whole, whole, fractional, long). Measurement and geometry, including recognizing flat shapes to using volume and surface area in everyday life. Also, assess students' understanding of measuring length, weight, time, volume, discharge, and area units using standard units. Data and uncertainty, including knowledge, interpreting, and presenting data and opportunities. Algebra includes equations and inequalities, relations and functions (including number patterns), ratios, and proportions.	Informational text aims to provide facts, data, and information in the context of developing insight and scientific knowledge. Fiction texts aim to provide readers with the experience of getting entertainment, enjoying stories, and reflecting.

AKM Components	Numeracy	Literacy
Cognitive Process	This process includes comprehending facts and procedures, applying mathematical tools and concepts in real, routine situations, and reasoning with mathematical concepts to solve non-routine problems.	This process comprises searching, accessing, finding explicit information from discourse, interpreting and integrating, understanding explicit and implied information, and combining interpretations between text parts to produce inferences. Evaluation and reflection, assessing the credibility, suitability, and trustworthiness of the text and being able to relate the content of the text to other things outside the text.

(Bintang, 2022)

In this study, the concept of the suitability level category serves as a pivotal criterion for evaluating the appropriateness of mathematics learning based on the Minimum Competency Assessment (AKM). The suitability level category is intricately connected to the observation sheet designed for assessing the appropriateness of AKM-based mathematics learning. The observation sheet comprises 8 questions, and the percentage of correct responses is used to indicate suitability level. Specifically, if 2 questions are answered correctly, the corresponding percentage is 25%. Likewise, if 4 questions are answered correctly, the percentage is 50%. For 6 correct answers, the percentage is 75%, and achieving correctness in all 8 questions corresponds to a perfect score of 100%. This categorization based on the percentage of correct responses enables a comprehensive evaluation of the suitability of AKM-based mathematics learning.

Table 2.  
Suitability Level Category

No.	Scale (%)	Category
1.	$0 < x \leq 25$	Very inappropriate (VI)
2.	$25 < x \leq 50$	Inappropriate (I)
3.	$50 < x \leq 75$	Appropriate (A)
4.	$75 < x \leq 100$	Very Appropriate (VA)

(Effendi, 2017)

$x$  = suitability level

### III. RESULT AND DISCUSSION

This study commenced with an examination of teacher documents utilized as instructional tools. The scrutinized documents included Lesson Plans (RPP), Syllabi (RPS), books, and instructional media employed by mathematics teachers at SMP Muhammadiyah 1 Malang. Observations were conducted during classroom instruction, complemented by post-learning interviews with teachers and eighth-grade students at SMP Muhammadiyah 1 Malang. The alignment between mathematics learning and the Minimum Competency Assessment (AKM) was evaluated using a suitability scale.

### 1. Lesson Plan (RPP)

The AKM indicators encompass numbers, geometry, data and uncertainty, and algebra. The Lesson Plans (RPP) employed by mathematics teachers at SMP Muhammadiyah 1 Malang contain these content areas. Following AKM indicators, the RPP devised by teachers incorporates AKM-based exercises and questions. An illustrative example is the lesson plan focusing on numerical content. The RPP content correlates with AKM-based questions, featuring diverse practice questions, including true and false, matching, completion, fill-in-the-blank, and multiple-choice formats. Employing the discovery learning method, teachers organize students into groups, presenting them with AKM questions. Subsequently, these groups engage in discussions, enhancing students' activity, critical thinking, and problem-solving skills. Regarding the suitability level category, the results indicate a 100% match between the RPP and AKM, indicating a highly suitable alignment.

### 2. Syllabus (RPS)

Similar to the Lesson Plan, the Semester Learning Plan (RPS) is crafted and utilized by mathematics teachers at SMP Muhammadiyah 1 Malang during teaching and learning activities. The RPS is formulated based on AKM indicators of content, cognitive processes, and context. At SMP Muhammadiyah 1 Malang, AKM will be implemented from September to December 2022. The RPS is meticulously

designed to align with AKM content, incorporating cognitive processes for comprehending facts and delineating steps to tackle AKM questions. Observations, particularly in the context of the discovery learning method, reveal that discussion groups delve into AKM questions by first understanding the conceptual aspects and subsequently devising problem-solving strategies. In concordance with document observations and classroom assessments, all 8 observation questions were answered correctly, categorizing the RPS as highly suitable for AKM-based instruction.

### 3. Book as Learning Media

The instructional materials employed by teachers in the classroom, specifically books, adhere to the standards set by the Minimum Competency Assessment (AKM). In addition to conventional mathematics subject books, AKM has its dedicated books, containing concise content derived from AKM indicators and predominantly featuring AKM-formatted questions. Each student possesses an AKM book, and during the implementation of AKM from September to December 2022, students engage with AKM questions in the book. These questions align with the content areas of numbers, geometry, data and uncertainty, and algebra.

In accordance with the suitability scale and the outcomes of observations, all 8 questions presented were answered correctly. This unequivocally demonstrates that the books teachers utilize in teaching

and learning activities exhibit a perfect alignment of 100% or very high accordance with AKM standards.

#### 4. Website as Learning Media

Teachers employ supplementary learning media, specifically the AKM website, which comprehensively addresses all aspects related to AKM. The website explains AKM's nature, examples of AKM questions, and practice questions for direct student engagement. According to the suitability scale and the outcomes of observations, the responses to all 8 questions were accurate. This substantiates that the instructional media the teacher utilizes is in complete alignment, scoring 100% or demonstrating a very high degree of accordance with AKM standards.

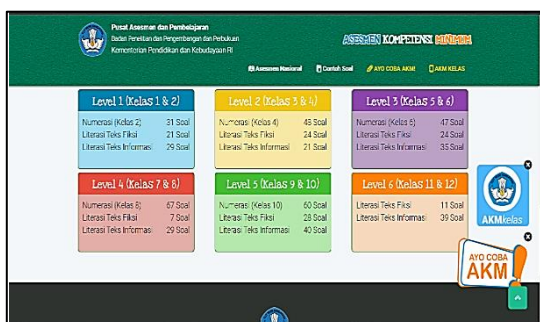


Figure 1. Website AKM

Based on the presented findings, the reinforcement of observations conducted during teaching and learning activities for eighth-grade students at SMP Muhammadiyah 1 Malang, coupled with interviews with teachers and students, reveals the successful implementation of the Minimum Competency Assessment (AKM) in mathematics lessons from

September to December 2022. The learning approaches align with AKM indicators, encompassing content, cognitive processes, and context, and are deemed highly suitable for the existing mathematics curriculum at the school.

Teacher interviews indicate that the school employs the discovery learning method with AKM, which is well-suited for this class. Questions posed by the teacher are consistent with AKM standards, and students are provided opportunities to seek clarification when faced with difficulties. The instructional media used, including AKM books and websites, is deemed appropriate for AKM-based mathematics learning within the 2013 Curriculum.

In light of the discussions and the outcomes from the AKM-based mathematics learning suitability observation sheet, it is evident that mathematics learning at SMP Muhammadiyah 1 Malang aligns remarkably well with AKM standards, scoring within the range of 75%-100% or classified as "Very Suitable" (SS). This outcome aligns with the research objective, which aims to analyze the suitability of AKM-based mathematics learning.

A noteworthy finding from this research is identifying schools actively implementing AKM in their learning processes. The learning methods employed by mathematics teachers at SMP Muhammadiyah 1 Malang are highly



aligned with AKM indicators. The study also underscores the efficacy of the discovery learning method combined with appropriate learning media in AKM-based learning within the 2013 curriculum.

This research diverges from other studies, such as Pujana's (2022) findings, which highlight the suitability of teaching materials for science learning to enhance scientific literacy under AKM. Additionally, Imron's research (2021) emphasizes the effectiveness of multimodal research projects, fostering critical and creative thinking in students. Conversely, Baharuddin's research (2021) underscores the success of project-based learning in improving AKM for VA class students. Sandy's research (2022) reveals positive responses to flipbook learning media, demonstrating its practicality with a 79% practicality test result.

In conclusion, these findings contribute valuable insights to the discourse on AKM implementation, shedding light on effective instructional methods and media within the mathematics education landscape.

#### IV. CONCLUSION

In conclusion, the research findings indicate that mathematics learning at SMP Muhammadiyah 1 Malang, based on the Minimum Competency Assessment (AKM), aligns harmoniously with the instructional activities conducted in the classroom. This alignment is evident in the various learning tools utilized, including Lesson Plans (RPP),

Syllabi (RPS), textbooks, and the AKM website. The students actively engage and demonstrate development in the context of AKM-based mathematics learning.

The outcomes of this research can serve as valuable recommendations for future researchers aiming to develop methods and instructional media for AKM-based mathematics learning further. This study contributes to the ongoing discourse on effective teaching strategies and tools within the realm of mathematics education, specifically in the context of AKM implementation.

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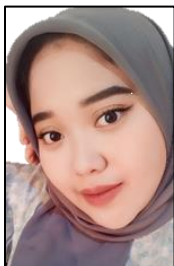
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## AUTHOR'S BIOGRAPHY

### Rani Oktaviana.



Born in Berau, October 20, 2002. Undergraduate studies in Mathematics Education at Muhammadiyah University of Malang.

### Dr. Moh. Mahfud Effendi, M.M.



Born in Probolinggo on July 16, 1967. He is a lecturer in the Mathematics Education Study Program at the Faculty of Teacher Training and Education, the Master's Program in Mathematics Education, and the Master's Program in Pedagogy at Muhammadiyah University of Malang. He completed his primary and secondary education in his hometown,

Probolinggo. He obtained his Bachelor's degree in Mathematics Education from Muhammadiyah University of Malang in 1991, his Master's degree in Management from Muhammadiyah University of Malang in 1997, and his Doctorate in Curriculum Development from the Indonesia University of Education in Bandung in 2013.

### Dr. Alfiani Athma Putri Rosyadi, S.Pd., M.Pd.



Born in Sidoarjo on December 20, 1985. Teaching staff in the Mathematics Education study program at Muhammadiyah University of Malang. Completed a Bachelor's degree in Mathematics Education at Malang State University, Malang, graduating in 2008; a Master's degree in Mathematics Education at Malang State University, Malang, graduating in 2010; and a Doctorate in Mathematics Education at Malang State University, Malang, graduating in 2022.