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Exploring strategies and challenges faced by novice teachers in preparing students for the minimum competency assessment: a case study in Indonesia

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Abstract

Indonesia has reformed its assessment system from a national examination to a minimum competency assessment (AKM), focusing on literacy and numeracy skills. Such a change might significantly affect how teachers teach, especially novice ones. Hence, this study explores the strategies and challenges of six novice mathematics teachers as they prepare their students for the AKM. In this qualitative case study research, participants who were mathematics teachers, with no more than five years of teaching experience, were recruited through purposive sampling to engage in semi-structured interviews. Moreover, six lesson plans, before and after the announcement of the AKM, were collected to get a picture of how they modified their teaching and planning. The data from interviews and lesson plans were analysed through the thematic-analysis method to get two main findings. Initially, the novice teachers undertook proactive measures to prepare their students for the assessment. They employed a responsive teaching approach, adapted lesson plans, participated in professional development programmes, and conducted AKM courses. Nevertheless, their efforts were hindered by their limited teaching experience and inadequate professional development opportunities in numeracy instruction. These findings serve to enlighten educators, school administrators, and other stakeholders about the perceptions and challenges faced by teachers in light of assessment reform.

Keywords: assessment, numeracy, responses, challenges

Introduction

Numeracy assessment has emerged as a global phenomenon, largely influenced by large-scale assessments. Many nations worldwide, including ASEAN countries, compete for commendable standings in literacy and numeracy-based evaluations, such as Programme for International Student Assessment (PISA), which serve as benchmarks for assessing the quality of education systems. For instance, Singapore, topping the charts in the 2023 edition of PISA, attributes its success to the strategic implementation of inquiry-based pedagogies and emphasising on fostering students' higher-order thinking skills (Ng et al., 2020). Additionally, Malaysia has reformed its evaluation system, transitioning towards a school-based assessment (Chin et al., 2019). In summary, large-scale assessments, particularly those emphasizing literacy and numeracy, serve as valuable tools for evaluating educational policies aimed at enhancing overall quality.

Similarly, Indonesia also regularly assesses its education quality based on the result of international assessments. In PISA, which evaluates students' literacy and numeracy skills, Indonesia achieved a relatively low score in 2018. The score of reading, mathematics, and science were below international averages (OECD, 2019). Likewise, in 2023, Indonesia scored 359 in reading, with an international average of 476; 366 in mathematics compared to the

international average of 472; and 383 in science, compared to the international average of 485 (OECD, 2023). This poor performance has encouraged some reform in education, including the assessment system.

Due to the aforementioned reason, the Ministry of Education and Culture of Indonesia (MOEC) announced a new assessment system called national assessment, in which one of the components is minimum competency assessment (AKM). Indonesian students used to write a national examination to determine their graduation by answering multiple-choice questions. Such an examination was considered ineffective in measuring the educational progress because in most of the schools learning heavily directed to master tricks to answer questions instead of understanding the essence of materials students learnt (Effendi & Suyudi, 2017).

In contrast, the AKM is low-stakes evaluation which is similar to PISA. This assessment is focus on students' literacy and numeracy skills which is significance for students to face the 21st century challenges (Deda et al., 2023). The output of this programme is an educational report or *rapor pendidikan*, which consists of data regarding the quality of education and areas requiring enhancement in individual schools (Shintia et al., 2023). The result provides guidance to teachers, principals, and educational authorities on how to enhance the quality of education in schools. Once improvements are made at school level, there is an expectation of an uplift in the quality of education across Indonesia.

The AKM questions includes specific contents, cognitive levels, and contexts (MOEC, 2021). The content in literacy tests consists of informational texts and fiction, while in numeracy test, it comprises numbers, geometry, data and uncertainty, as well as algebra. Moreover, the AKM assesses students' level cognitive which are knowing, applying, and reasoning. The context in AKM questions is divided into personal, socio-cultural, and scientific categories. Additionally, the type of questions presented are more diverse, including multiple choice, complex multiple choice, matching, short answer, and essay. The features explains that this assessment is more complex than the national examination. This assessment covers both literacy and numeracy; however, this study specifically focuses on numeracy.

Numeracy or mathematical literacy is an ability to apply formal mathematics in a range of real-world contexts and make predictions (Dion, 2014; Estrada-Mejia et al., 2016; Geiger et al., 2020; Goos et al., 2014; Liljedahl, 2015; MOEC, 2020). Moreover, in terms of numeracy teaching and learning practice, Goos et al. (2014) introduced a rich model of numeracy which focuses on real-life contexts; the application of mathematics; the use of representational, physical, and digital tools; and positive dispositions towards mathematics. They added that the foundation of this theory is the critical orientation which enables students to evaluate and challenge their arguments. In brief, numeracy is the ability to select essential information and mathematical knowledge to solve real-world problems and make predictions to better contribute to the society and the workplace. Due to the importance of numeracy skills, it is essential to be taught at school.

Teaching numeracy as a consequence of assessment reform is a challenge that teachers should overcome. It is evidenced from several researches that the change in education, including assessment system affects the way teachers teach (Adu, 2014). Ultimately, the teachers need to familiarise themselves toward the change to be able to modify their teaching and planning. Thus, experiences in designing numeracy learning and task influence the effectiveness of their own mathematics teaching practice (Geiger et al., 2014; Liljedahl, 2015).

In regards with the importance of experiences, experienced teachers might be more resilient with such a change compared to the novice teachers. As asserted by Sözen (2018), novice teachers may encounter increased challenges in adapting their teaching methodologies to facilitate students in attaining the requisite numeracy skills.

Teaching that is focused on numeracy has specific approaches. Askew (2002) identified three main approaches to teaching numeracy. Firstly, the connectionist approach encourages teachers to introduce and make the connection between mathematics concepts to solve numeracy questions. Secondly, the transmission approach instructs teachers to elucidate common mathematical procedures, including presenting a problem, transforming it into a mathematical equation, and subsequently solving it using mathematical principles. Additionally, a research by Bruce and Martin (2002) has demonstrated that a responsive approach, the amalgamation of the three approaches, is the most impactful.

Recently, a series of empirical studies have been undertaken regarding the implementation of the AKM. However, the predominant focus of these investigations has been on exploring the perceptions and preparedness of students or educators to confront the AKM (Aunnurahman, 2020; Bioto et al., 2022; Fauziah et al., 2021; Handayani et al., 2021; Herman et al., 2022; Rokhim et al., 2021; Yamtinah et al., 2022). Some scholars have also analysed and developed AKM question types (Machromah et al., 2021; Novita et al., 2022; Purnomo et al., 2022; Ulyah et al., 2021). Furthermore, research pertinent to the implementation of the AKM policy in a primary school has been conducted by Astuti et al. (2023) and Iman et al. (2021). Nevertheless, a noticeable research gap exists concerning the examination of mathematics teachers' strategies and obstacles in preparing students for the AKM. This realm of inquiry is crucial given that assessment reforms profoundly influence pedagogical approaches, potentially causing confusion among teachers, especially the novice ones (Kozikoglu, 2017). The success of this assessment may indeed be influenced by the strategies employed by teachers and their ability to tackle challenges. Consequently, this study endeavours to bridge this research gap and address the associated issues.

According to the rationale above, this research aims to investigate the strategies employed and challenges encountered by novice teachers in preparing their students for the AKM. The findings from this study contribute to understanding the actual implementation of the AKM policy and provide recommendations to enhance teaching practices.

Methods

To examine strategies and challenges faced by novice mathematics teachers in preparing their students for the AKM, this investigation utilised a qualitative research approach employing the case study method. The qualitative design was chosen to facilitate a comprehensive exploration of individual experiences and perspectives (Hennink et al., 2020). Additionally, the case study method enables one to investigate in detail a single case or a small number of cases to formulate a generalization (Matthews & Ross, 2014). Based on that research design, mathematics teachers were recruited to explain their experiences with the new assessment system.

Participants

The research participants were purposively sampled based on predetermined criteria: they were novice mathematics teachers in Indonesia teaching 7th and 8th-grade students (aged 13 to 14 years old). These novice teachers, who were the focus of this study, were in-service teachers with five years or less of teaching experience. Six novice teachers participated in this research, four of whom had three years of teaching experience, while the remaining two had been teaching for two years. Regarding training, only half of the participants had undergone AKM or numeracy training. For confidentiality purposes, pseudonyms were used in place of participants' actual names within this paper.

Data Collection

The researcher provided an information sheet containing an overview of the project and a consent form. It clearly stated that novice teachers willing to participate in the project were required to undergo an interview and submit their lesson plans both before and after the announcement of the AKM. Subsequently, participants were invited to a virtual semi-structured interview conducted in Bahasa Indonesia, lasting approximately 30 to 60 minutes via Zoom and recorded for accuracy. The primary focus of the interview was to delve into the participants, encompassing their teaching methodologies, learning tools, and other strategies employed in preparing their students for the AKM. Additionally, the researcher sought clarification on the lesson plans and any modifications made to their teaching approach. The interviews also addressed the challenges faced by novice teachers, stemming from both internal and external factors. Consequently, this study involved transcribing six recorded interviews and analysing data extracted from twelve lesson plans.

Data Analysis

The data from lesson plans and interview transcripts were analysed through Thematic Analysis (TA) to identify themes connected to the research questions. Clarke and Braun (2014) define TA as a technique to identify and examine themes (patterns of meaning) in qualitative data. This approach enables researchers to examine various forms of data, including written material such as lesson plans, existing data sources, and interactive data such as interview transcriptions (Braun & Clarke, 2022). In this case, TA was employed to generate themes related to strategies and challenges novice mathematics teachers encountered while preparing their students for the AKM.

The analysis process was finalised by carrying out a sequence of actions, according to Clarke and Braun (2014). Before coding the data using N-Vivo, the researcher familiarised herself with the collected data. Subsequently, a thorough coding was conducted, wherein each sentence of the interview transcript and lesson plan was carefully examined, identifying 143 initial codes. Afterward, the codes were reviewed, refined, and consolidated to reduce the possibility of overlap. Ultimately, 22 codes under 9 themes were identified and connected to generating conclusions. The themes will be further discussed in the following sections.

Results and Discussion

The results and discussions derived from both interview transcripts and lesson plans will be structured into two subsections, each directly addressing the corresponding research questions.

This study endeavours to investigate the strategies employed by novice mathematics teachers and challenges encountered by them in preparing their students for the AKM.

Novice Mathematics Teachers' Strategies to Prepare Students for the AKM

This study investigates the strategies employed by teachers to prepare their students for the AKM, encompassing four discernible themes. To elucidate these themes, interviews were conducted with six teachers whose identities were anonymised with pseudonyms: Sophia, Alex, Anne, Clara, Sarah, and Ellie. They were asked about their teaching approaches and which one was most suitable for numeracy teaching, supplemented with inquiries pertaining to their responses. The data on teaching approaches utilised by the teachers were corroborated by their lesson plans following the announcements of this numeracy-based assessment.

In terms of teaching approaches, teachers endeavoured to establish connections within mathematical concepts at the beginning of their lessons. Upon analysing their lesson plans, it became evident that all teachers employed apperception at the outset of their lessons to reinforce previously learned mathematical concepts. For instance, Anne's lesson plan indicated:

> "*The apperception: students are asked to identify the samples and non-samples of integers, and reminded about a set of integers and fractions using a learning video (YouTube) embedded within Microsoft Office 365 forms."*

Given that the learning objective was to comprehend integer and fraction comparison, the teacher endeavoured to link it with fundamental concepts of integers and fractions. Additionally, digital learning tools such as YouTube videos and Microsoft 365 were incorporated. Furthermore, during interviews, the rest teachers confirmed the utilisation of various learning tools, including Google Forms, Google Classroom, and GeoGebra. The heightened use of digital learning tools was particularly notable during the COVID-19 pandemic when learning shifted online. Consequently, teachers acquainted themselves with diverse leaning tools to facilitate lesson delivery and assess student performance.

Since all participants mentioned the apperceptions and utilisation of learning tools in interviews and lesson plans, hence all participants implemented the connectionist approach according to Askew et al. (2022). This approach emphasises the interconnection among mathematical concepts.

Furthermore, all participants revealed their efforts to familiarise students with numeracy exercises. Notably, Clara underscored the importance of assigning ample AKM tasks to students:

> *"I believe the most effective approach is to engage students in practicing mathematical problem-solving. Numeracy questions often involve extensive readings, diagrams, and graphs; without adequate exposure and practice, students may struggle. While they may recognise familiar formats like number patterns or Venn diagrams, encountering variations can lead to confusion."*

In addition to emphasising the significance of exercises, all participants were interviewed regarding the level of support provided during the learning process. The majority indicated

minimal intervention, opting to allow students to work through challenges independently. However, Elly mentioned her practice of offering detailed explanations for novel and complex tasks. In line with Askew et al. (2022), the incorporation of exercises and comprehensive explanations suggests the adaptation of the transmission approach. He disclosed that teachers frequently guide students gradually through numeracy tasks using routine mathematics procedures such as introducing a problem, translating it to a mathematical problem, and then solving it using mathematical concepts.

The lesson plans were also dominated by students' activities which indicated the discovery approach. Most of them implemented problem-based learning and inquiry-based methods. Following is an example of Sophia's lesson plan activities.

Main activities	
Organising students into problems	Students observe the problems presented in the worksheet.
Organising students to learn	- Students are grouped. - Students analyse the given problems.
Assisting independent and group investigation	Students discuss to solve the given problems in the worksheet. The teacher guides the group discussion to solve problems related to gross, net, and tare.
Developing and presenting works and exhibitions	Group representatives present the result of their discussion.
Analise and evaluate the problem-solving process	- The teacher clarifies the results of the discussion obtained from each group. - The teacher provides reinforcement of the concept of the relationship between gross, net, and tare.

Figure 1. The main activities in Sophia's lesson plan (translated from the original).

Figure 1 shows that students were encouraged to learn actively to find the solution and grasping mathematical concepts. Alex elaborated that he only provided explanations for approximately 30% of the learning process. Furthermore, four out of six participants incorporated a specific section for critical thinking activities into their lesson plans, reinforcing the evidence of the discovery approach as outlined by Askew et al. (2022).

It is noteworthy that all participating teachers integrated the three approaches. Four novice teachers disclosed that their selection of teaching approach was based on the characteristics and complexity of mathematical concepts. Others mentioned that they also took into account the characteristics of their students, leading them to implement the responsive approach. They argued that combining all numeracy teaching approaches is essential to accommodate students' needs effectively.

Initially, emphasising the connection among mathematical concepts is crucial, as mastery of certain concepts is often prerequisite to understanding others. Moreover, tailoring instruction to meet individual student needs is the key to teaching success, as some students require more explanation and guidance while others may be more independent. Additionally, consideration

was given to teaching methods, aiming to engage students actively in discovering mathematical concepts and solving problems autonomously.

This finding aligns with the perspective of Bruce and Martin (2002), who advocated for the responsive approach as the most impactful in numeracy teaching. They endorse this approach for its ability to accommodate the diverse characteristics of both students and mathematical materials. By facilitating students' comprehension of mathematics and enhancing their numeracy skills, the responsive approach can be better to prepare them for success in the numeracy-focused assessment.

The second notable discovery was that novice teachers made slight adjustments to their lesson plans to suit the requirements of numeracy teaching. According to the interviews, all participants noted that familiarising students with numeracy-type questions proved to be highly beneficial. Additionally, teachers disclosed that they increased the frequency of presenting real-world problems, particularly at the commencement of their teaching. They also tailored the problems to align with the types of questions featured in the AKM. Alex, Sarah, and Anne acknowledged that they typically presented straightforward contextual questions, necessitating specific modifications to align with the AKM. Anne elaborated:

> *"Sure. The AKM really requires very complex skills there, while the questions we usually give are simpler. In common questions that I gave before the announcement of the AKM, students can do it once and then find the result, which means it is finished. For the AKM, one question is integrated with others…"*

Anne's emphasis on the alteration of question types, as demonstrated through her lesson plan, underscores a notable shift precipitated by the introduction of the AKM. Moreover, a discernible adjustment observed across all teachers' lesson plans was the incorporation of literacy-numeracy activities within a designated column. Notably absent in their pre-AKM lesson plans, this inclusion suggests a concerted effort to align teaching practices with the demands of the AKM. Below exemplifies one such modified lesson plan.

Main activities	
Literacy numeracy	Learners are given a stimulus to focus their attention on the material of integers with a scientific approach (observing, questioning, gathering information/experimenting, associating, and communicating). **Observing** Learners, together with the teacher, make observations of the displayed problems. **Integers**  Puncak Jayawijaya is the highest mountain in Indonesia. This mountain is located in Papua. This mountain is a gift from Allah SWT due to its beauty. At the top of the hill, there is eternal snow. Normally, the temperature at 0 m above sea level (MAMSL) is 37°C. Puncak Jayawijaya has an altitude of 4,884 MAMSL. Based on the records of the Meteorology, Climatology, and Geophysics Agency on 6 November 2017, the air temperature at the top of Jayawijaya in the morning was -80°C, the temperature in the afternoon to evening was -70°C, and the temperature at night was -90°C. Do you know what the number -90°C means? Based on the illustration, when is the coldest temperature at the top of Puncak Jayawijaya?

Figure 2. Example of numeracy-based activity (translated from the original).

The Figure 2 depicts a particular numeracy activity wherein students were prompted to engage with a real-world contextual illustration. The text pertained to Puncak Jayawijaya, the highest mountain in Indonesia. Subsequently, students were guided through a process of critical thinking to address accompanying questions and explore the concept of integers.

This finding illustrates that novice teachers implemented the 21st-century numeracy framework proposed by Goos et al. (2014). According to this framework, numeracy learning encompasses various components, including mathematical knowledge, contexts, tools, dispositions, and critical orientations. These elements were discernible in the majority of the lesson plans. For instance, the focus on mathematical knowledge was evident in the exploration of integers, while the context was provided through a discussion of the air temperature surrounding a mountain. In aligning the features of AKM questions outlined by the MOEC (2021), which emphasise specific content, cognitive levels, and contexts, teachers endeavoured to adjust their instructional approach accordingly. The MOEC advocates for a diverse range of contexts, including personal, socio-cultural, and scientific. The lesson plan above shows a scientific context.

Furthermore, teachers utilised a variety of tools such as videos, gadgets, and GeoGebra to enhance the learning experience. As observed in the lesson plans, teachers also guided students to think critically, presented real-world mathematics scenarios to engage students' interest and encourage them to develop confidence in their mathematical abilities. This proactive approach by teachers highlights the significance of incorporating the components of the 21st-century numeracy definition into numeracy teaching and learning practices.

The third finding pertaining to strategy revealed that the novice teachers enhanced their comprehension and proficiency regarding the implementation of the AKM. Specifically,

participants Clara, Sophia, and Anne disclosed their involvement in a professional development programme. Clara elaborated:

> *"I've also been to training sessions on creating AKM numeracy questions and fostering creative learning during the pandemic. So, the approach to teaching involves making a concerted effort to introduce students to numeracy questions, engage in practice exercises, conduct online lessons and so on."*

In reality, there was inequality in the opportunity to participate in training sessions related to the implementation of the AKM or numeracy teaching. Participants who were not invited for training endeavoured to acquire knowledge about the AKM through online resources. It is worth noting that experiences in designing numeracy learning activities and tasks significantly influence the effectiveness of individuals' instructional practices in mathematics (Geiger et al., 2014; Liljedahl, 2015). One means to gain such experience is by participating in professional development programmes. Therefore, it is imperative for school administrators, education authorities, and government bodies to ensure equitable access to training programmes for teachers.

Furthermore, novice teachers endeavoured to direct their students' focus towards numeracy and AKM questions exercises. Two other teachers mentioned no specific preparation for the AKM, indicating a diverse range of approaches among novice teachers in preparing their students for the assessment. However, four teachers motivated their students by illustrating the practical relevance of mastering certain mathematical concepts and numeracy skills in their daily lives. They believed that instilling such intrinsic motivation would encourage students to invest more effort and achieve success. They also mentioned that his school organised an after-school AKM course, where students exclusively learned techniques to solve AKM-type questions. This finding aligns with the research conducted by Imam et al. (2021). According to this research, the principal believed that increasing students' learning hours desiccated to the AKM-related content was crucial for preparation. This approach resembled the traditional method of preparing students for the former national examination, characterised by intensive exercises and mastering strategies to solve questions. However, according to the MOEC guidelines (2020), such practices are not recommended. Teachers are advised against drilling students with AKM questions solely to reinforce their skills. Instead, numeracy concepts should be integrated into daily lessons to foster students' competencies naturally.

In summary, this research demonstrates that novice teachers employed various strategies in implementing the numeracy-focused assessment policy. To ensure students' success in participating the AKM, the beginning teachers utilised a responsive teaching approach, adapting lesson plans, engaging in training programmes, and facilitating additional practice sessions. However, teachers encountered some challenges during this stage, which will be further discussed in the following section.

Challenges Novice Teachers Encountered

Two primary themes emerged from the interviews regarding the challenges novice teachers encounter in preparing students for the AKM. These themes include "lack of teaching experience" and "insufficient training on the AKM", which are interconnected.

The first theme, "lack of teaching experience," was observed across all participants. They acknowledged their limited teaching experience, which posed difficulties in effectively communicating with students. This is supported by their acknowledgment that, although they could solve numeracy questions themselves, they struggled to communicate and assist students in completing similar tasks. This finding aligns with research conducted by Sözen (2018), which indicated that beginning teachers often encounter communication issues with their students during teaching.

Additionally, novice teachers faced another obstacle associated with their limited teaching experience: they encountered challenges in devising numeracy problems across diverse contexts. Ellie noted:

> "*Basically, creating diverse contexts for the numeracy questions can be a bit tricky, so we end up using similar contexts for some questions, like book prices, shoes prices, discounts, and things like that."*

She further expressed that the difficulty lay in finding straightforward, realistic contexts suitable for students. Occasionally, online sources provided realistic data, but it proved too complex for junior high school students. Nevertheless, the MOEC (2021) mandates that students possess the ability to tackle numeracy problems within three contexts: scientific, socio-cultural, and personal.

Consequently, they anticipated training programmes focused on numeracy. Professional development programmes encompassing classroom management strategies, pedagogy for delivering numeracy-based instruction, and designing numeracy tasks were deemed crucial. However, only half of the participants were provided with opportunities to engage in professional development programmes. The remainder indicated a lack of sufficient guide in preparing students for the AKM. Furthermore, Ellie and Alex elucidated that while training programmes existed, regrettably, not all teachers were invited. Alex remarked:

> *"Yeah, so there was this training from the government, but it wasn't open to everyone. Only representatives, senior teachers, or those who were really active in teachers' associations got invited. The thing is, after the training, they didn't share the results or what they learned with the rest of us, teachers."*

This suggests that, despite the novice teachers' need for more experience, not all had an equal opportunity to participate in professional development. In fact, they required additional guidance on how to teach to meet the demands of this assessment reform. Indeed, teacher training has been conducted in certain locations, particularly in the design of numeracy or AKM tasks (Novita et al., 2022; Ulyah et al., 2021). However, the chance to be invited to training was uneven. Indeed, the experiences in creating numeracy tasks significantly impact the effectiveness of teaching practices. According to McLure and Aldridge (2023), teachers need assistance in gaining a comprehensive understanding of the reform in practical terms and identifying actionable steps for its implementation. Therefore, training related to numeracy-based teaching needs to be taken into consideration when implementing the AKM policy.

This research provides insights into the actual practices of certain teachers in preparing their students for the AKM. Various strategies have been elucidated, including the adoption of a responsive approach, conducting AKM courses, modifying teaching methods and planning, and enhancing teachers' skills through professional development programmes. These findings serve as inspiration for other educators seeking to prepare their students for the AKM. Nonetheless, novice teachers continue to face challenges, which can inform recommendations for both teachers and stakeholders.

Firstly, there is a need for more professional development programmes focused on numeracy teaching and planning, as participants reported insufficient teaching experience and lack of knowledge about the AKM. To ensure equal opportunities for all teachers (including the novice ones), school principals can organise training sessions at schools and ensure the participation of all teachers. Additionally, teachers can proactively seek information about training opportunities, whether provided online or offline, and participate independently.

Moreover, through the AKM, schools will receive education report, which can serve as a basis for identifying areas in teaching and learning that require improvement. Subsequently, all members of the school community, including parents, can collaborate to address these areas. This initiative will indeed alleviate the burden on novice teachers, making it easier for them to effectively prepare their students.

Finally, it is imperative for both school principals and education authorities to conduct a comprehensive evaluation of the policy's implementation in alignment with the guidance provided by the MOEC. For instance, addressing misinterpretations such as relying solely on AKM courses for AKM preparation instead of integrating numeracy into teaching and learning practices. Therefore, collaborative efforts between stakeholders are essential to enhance the quality of education.

Conclusion

Indonesia's education system has transitioned from a reliance on national examinations to the AKM. This shift has significantly impacted teachers' approaches to teaching and planning, particularly those who new to the profession. Consequently, this study aims to investigate the strategies and challenges encountered by novice teachers in preparing their students for the AKM. The findings revealed that teachers implemented the responsive teaching approach, adjusted lesson plans, improved their understanding of numeracy teaching, and conducted AKM-focused courses to prepare students effectively. However, they encountered obstacles stemming from limited teaching experience and lack of opportunities to engage in professional development programmes related to the AKM and numeracy-focused teaching. These insights can serve to guide teachers in their preparation efforts for the AKM, while also prompting principals and education authorities to provide professional development opportunities for novice teachers and enhance the overall quality of education. Additionally, stakeholders are encouraged to conduct regular evaluations of the assessment policy implementation to mitigate potential misconceptions.

Given the small-scale nature of this study, further research on a larger scale is warranted to gain deeper insight into teachers' strategies and challenges regarding the AKM implementation. Furthermore, exploring students' difficulties in answering the AKM questions could offer

valuable insights into how teachers can effectively support students to improve their performance.

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