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Literacy and Numeracy Questions Based on Minimum Competency Assessments to Improve the Competency of Private High School Teachers

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ABSTRAK

Guru di salah satu SMA swasta belum terampil dalam menyusun soal literasi dan numerasi berbasis AKM. Penelitian ini bertujuan untuk menguji kelayakan dan efektivitas pengembangan soal literasi dan numerasi berbasis AKM. Uji kelayakan menggunakan validasi ahli evaluasi, bahan ajar, dan bahasa, sedangkan uji keefektifan menggunakan uji-t nilai rata-rata pretes dan postes. Subyek penelitian adalah guru SMA Swasta se Surakarta yang berjumlah 80 orang. Desain eksperimen dalam penelitian ini menggunakan Pre-Eksperimental design dengan model design Pretest Posttest One Group Design. Metode pengumpulan data menggunakan observasi, wawancara, angket dan tes. Penelitian ini menggunakan model tambahkan. Teknik analisis data dilakukan secara deskriptif kualitatif berdasarkan pada saran validator. Analisis data menggunakan SPSS. Hasil validasi uji kelayakan menunjukan terdapat perbedaan yang signifikan antara rata-rata nilai pretes dan postes untuk literasi, dan numerasi. Kesimpulan dari penelitian ini adalah pengembangan butir soal berbasis AKM terbukti layak dan efektif dalam meningkatkan kompetensi guru SMA Swasta di Surakarta. Implikasi penelitian ini adalah meningkatnya kompetensi guru dalam mengembangkan soal berbasis literasi dan numerasi. Implikasi penelitian ini adalah asesmen ini memberikan panduan yang jelas mengenai area yang membutuhkan perhatian khusus, sehingga pelatihan dan pengembangan profesional dapat difokuskan untuk mengatasi kekurangan.

ABSTRACT

Teachers at one of the private high schools are not yet skilled in preparing AKM-based literacy and numeracy questions. This research aims to test the feasibility and effectiveness of developing AKM-based literacy and numeracy questions. The feasibility test uses validation from evaluation experts, teaching materials and language, while the effectiveness test uses the t-test of the average pre-test and post-test scores. The research subjects were 80 private high school teachers in Surakarta. The experimental design in this research uses a Pre-Experimental design with a Pretest Posttest One Group Design design model. Data collection methods use observation, interviews, questionnaires and tests. This research uses an additive model. The data analysis technique was carried out descriptively qualitatively based on the validator's suggestions. Data analysis using SPSS. The results of the feasibility test validation show that there is a significant difference between the average pretest and posttest scores for literacy and numeracy. The conclusion of this research is that the development of AKM-based questions has proven to be feasible and effective in improving the competence of private high school teachers in Surakarta. The implication of this research is increasing teacher competence in developing literacy and numeracy-based questions. The implications of this research are This assessment provides clear guidance on areas that require special attention, so that training and professional development can be focused on addressing deficiencies.

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1. INTRODUCTION

Learning evaluation is an important component in the learning process, so appropriate measurement instruments are needed to achieve this. The practice of collecting data regarding student learning progress is known as assessment. Assessment can be interpreted as an evaluation of student learning processes, developments and outcomes. Therefore, assessment is the appropriate term to measure student learning processes (Hasanah & Hakim, 2021; Linanda & Hendriawan, 2020). Assessments are carried out to collect information regarding student performance and achievements in relation to expected competencies (Jannati et al., 2022; Rahmawati & Hardini, 2020; Yolanda & Wahyuni, 2021). One of the weaknesses faced by students in society is anxiety when facing national exams. In this case, students must be motivated to overcome their anxiety before taking the national exam. Students' enthusiasm for learning can also reduce the possibility of them cheating when working on National Examination questions. National Examinations stopped; The national exam was replaced with the Minimum Competency Assessment (AKM) which is under the auspices of the National Assessment (Dani Adelia & Alan Deta, 2020; Jannati et al., 2022). The two basic competencies assessed in AKM are improving reasoning through language (literacy); and improved reasoning through mathematics (numeracy)(Ahmad et al., 2021; Meriana & Murniarti, 2021). The importance of mastering AKM lies in understanding the literacy and numeracy competencies that will be assessed. This assessment is mainly related to mapping and improving the quality of education as a whole. If used as a substitute for the National Standard School Examination (USBN), the Minimum Competency Assessment has the advantage of being in line with current developments (Rokhim et al., 2021; Sari & Rosa, 2022). This is demonstrated by instrumental abilities which are measured through literacy and numeracy abilities. There are two basic abilities needed by Indonesia's young generation in the future. Previous research shows that government policy, namely AKM, can be taken as a substitute for national exams by all parties, including school principals, students and teachers. The implementation of AKM is not based on the ability to master curriculum material as in national exams, but rather on improving the overall quality of education. The AKM policy is a policy created by the government with the aim of achieving changes to the education assessment system in Indonesia by eliminating national exams (Hasanah & Hakim, 2021; Hesti et al., 2020; Novianti, 2021).

AKM results are used as markers of teacher performance achievements in implementing the learning process, as well as the success of the school principal as a top manager in the education unit (Aisah et al., 2020; Irwandi et al., 2022; Meriana & Murniarti, 2021). The development of AKM questions is based on collaboration between the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS). PISA is an international survey conducted by the Organization for Economic Co-Operation and Development (OECD) to assess students' basic literacy levels (reading, mathematics and science) at the age of 15 years. The results of the PISA survey in Indonesia do not show a significant increase in the last 10-15 years. These results place Indonesia as one of the countries with a consistently low ranking in the PISA survey results. This shows that Indonesian students do not fully understand and use the scientific concepts and procedures learned in everyday life (Isnawan, 2020; Rahman et al., 2020). Based on this, the Ministry of Education and Culture (Kemendikbud) officially implemented the 2021 National Assessment, and did not carry out the National Examination. National Examinations and National Assessments are two different assessments. The purpose of implementing the National Assessment is different from the UN, this can be seen from the fact that the UN only measures students' cognitive abilities, while the National Assessment assesses and maps learning input, processes and products. (Syamsi et al., 2020; Winata et al., 2020). The Ministry of Education and Culture manages PISA standard questions so as to produce questions that can be answered by students at all levels. The Ministry of Education and Culture will create derivative questions that can be used by elementary and middle school students. & SMA/SMK The Minimum Competency Assessment (AKM) is a basic skills test required by all educators in order to be able to build their own abilities and play an active role in society. In addition, AKM can capture the basic abilities needed to succeed in various fields (Andini & Mukhlis, 2022; Nurhalisa et al., 2021). AKM was created and implemented with the aim of changing the educational evaluation paradigm in Indonesia. The Minimum Competency Assessment presents tasks in various situations that students must complete using reading and numerical literacy skills (Cahyanovianty, 2020; Deviana & Aini, 2021; Elviana, 2019) Literacy and numeracy are two important competencies included in AKM (Krut, 2020; Mappalesye et al., 2020). Literacy and numeracy assessments in AKM can be evaluated through three dimensions (aspects), namely content, cognitive processes and context (Palimbong et al., 2021; Pramana et al., 2020). The Minimum Competency Assessment is intended to show the focus of the school's main objectives, namely the development of student competence and character. Minimum Competency Assessment is a measuring tool that is able to comprehensively map the quality of education with minimum competencies that are very good and important to be implemented in schools.

The aim of AKM is to produce information that leads to changes in the quality of teaching and learning, which can then lead to better student learning outcomes. AKM is expected to provide results that provide information about students' true talents. These findings will then be used as guidelines by teachers in designing and planning more effective learning strategies, especially learning that is tailored to students' achievement levels. The process of implementing the AKM model requires comprehensive preparation, including policies designed by the school, teacher learning methodology, and how to prepare students to follow the AKM model (Pangestu & Agustini, 2020; Siregar, 2020). AKM consisting of reading literacy and numeracy was introduced in 2021 to encourage the development of reading and numeracy literacy. Literacy skills according to the National Institute for Literacy include the ability to read, write, speak and solve problems at various levels of education. Meanwhile, numeracy refers to the ability to apply numeracy concepts both in abstract and real world contexts. Literacy and numeracy are 21st century skills that require students to be able to keep up with the progress and developments of the times. AKM is intended to assess skills in depth, not just subject knowledge (Nuh, 2020; Nurhayati et al., 2021; Sukarman et al., 2020). Receptive language skills include reading and listening, while active language skills include speaking and writing. The Minimum Competency Assessment for the numeracy literacy element is contextual, tests problem-solving competence, and encourages students to think critically. Teachers and students must be able to think critically (Oktavia & Prasasty, 2023; Prameswari & Rahayu, 2020). The ability to see, understand, and apply mathematical concepts in understanding surrounding situations, developing oneself, and resolving or overcoming various kinds of difficulties in everyday life is called numeracy (Sihotang & Sibuea, 2019; Utomo, 2023). Numerical literacy is described as a person's ability to use reasoning (Putri & Sari, 2019; Sugiyono, 2020). Reasoning includes learning and understanding propositions by manipulating mathematical symbols or language available in everyday life and articulating statements in writing or orally. Literacy and numeracy are very important in solving everyday problems; AKM is one of the government's efforts to assess students' numeracy literacy (Nurzannati, 2019; Purnamasari, 2020)

Literacy and numeracy are two abilities that teachers must have to face problems in the future. To overcome future difficulties, 21st century talent is needed. This capability is needed to compete and survive in an era full of advances based on knowledge, data and technology (Amalia et al., 2020; Patriana et al., 2020) Literacy skills are developed for 21st century life skills through integrated education in the family, school and community. Literacy and numeracy skills are very important for all teachers. To answer general problems using mathematical knowledge, both symbols and numbers, calculation skills are needed. Numeracy requires logical thinking in order for a person to understand mathematics, and having a numerical aptitude will help a person learn information, assess problems, and solve challenges (Arif et al., 2020; Ekowati et al., 2021) The current problem is related to conditions on the ground; Many teachers experience difficulties in evaluating AKM-based results, processes and assessments. There are several factors causing this, namely that AKM is a new assessment for teachers, so it takes time to understand and integrate it into learning; teachers are accustomed to using assessment questions from textbooks or other questions obtained from the internet; and teachers are not used to compiling their own questions so teachers do not understand the format of AKM questions; Teachers' difficulties in compiling evaluation questions are exacerbated by the lack of training or assistance in compiling AKM-based literacy and numeracy questions (Arisa et al., 2023; Ernawati, 2020).

The implication is that students' literacy and numeracy achievements are below standard. Based on the national numeracy literacy ability data obtained, students' literacy ability is still relatively low. Students' difficulties in using various kinds of numbers and symbols related to basic mathematics, solving problems in various contexts of daily life, analyzing information displayed in various forms such as graphs, pictures, tables, diagrams, charts, and so on cause low results. numeracy literacy, and students have difficulty interpreting analysis results to predict and make decisions. This is caused by teachers' challenges in facilitating learning that prioritizes AKM. Gap analysis occurs between expectations and reality. The hope is that in the current educational era, the need for instructors who are able to produce AKM-based questions such as literacy and numeracy questions will become increasingly urgent. However, even though there has been outreach and training to teachers, teacher competence in designing AKM-based literacy and numeracy questions is still low. The results of the research are that there are still many teachers who do not understand the instruments or techniques used in carrying out national assessments. This is in line with several research findings which show that physically teachers really support the implementation of AKM, but cognitively, understanding, utilization of learning resources, learning processes, learning assessment, and readiness of facilities and infrastructure are still very lacking, and some teachers are still not motivated to do that activity. The results of other research show that composing AKM questions is something that teachers have only just understood; teachers still face many challenges in understanding AKM questions, especially arithmetic questions; and special training is

needed for teachers in preparing AKM numeracy questions because teachers' understanding in composing AKM numeracy questions is still low.

Based on the results of the interview, teachers experienced difficulties in understanding the AKM numeracy questions, so there was a need for additional variations in the AKM question models, especially literacy and numeracy, to be introduced to educators. Teachers have made optimal preparations at the teacher preparation stage for carrying out national assessments, namely AKM, but the difficulty is that teachers still don't know the expected achievement indicators. Apart from that, schools and teachers must be prepared to increase the number of AKM practice questions with a greater variety of questions. Teacher, apart from that, schools and teachers must also be prepared to increase the number of AKM practice questions with a greater variety of questions The urgency of this research is because private high school teachers still experience challenges when creating AKM literacy and numeracy questions, especially in terms of preparing questions in terms of content and context. Literacy and numeracy skills continue to achieve below average results. Competent teachers and school facilities are the main sources that support students' success in improving their reading and numeracy skills. The more often teachers are trained to compose AKM-based questions, the more experience and ability the teacher will have in managing time when creating AKM questions. Therefore, teachers must practice making AKM questions, including AKM literacy and AKM numeracy questions. There is a need to convey AKM knowledge to teachers and students to increase awareness of AKM. Teachers must innovate so that mathematical ideas become more interesting and easier for students to understand and remember. Teachers and students must practice story questions or reading questions in everyday contexts to train students' cognitive processes, and teachers must train students' numeracy skills in understanding, application and reasoning to better prepare students in facing AKM questions The novelty of this research is because there has been no previous research that has developed literacy and numeracy questions and implemented them for private high school teachers. Socialization is only carried out by the Ministry of Education and Culture, Research and Technology, is limited to model schools, and does not include ways to develop literacy and numeracy. Education units are required to implement a policy of socializing the implementation of national exams in accordance with the policies established by the Minister of Education, Culture, Research and Technology. This stage is integrated into preparation by holding a tryout with questions from the AKM grid. Teachers and students should actively encourage practice with narrative questions or reading in everyday situations to train students' cognitive processes. Teachers must more regularly train students' reading and writing literacy skills, including giving questions with various types of high-level abilities and getting students used to working on questions such as AKM. The aim of this research is to determine the feasibility and effectiveness of creating AKM-based literacy and numeracy questions. The validation process from a team of learning evaluation experts, teaching materials experts, and language experts, as well as individual and small group trials were used to demonstrate feasibility, while statistical data processing using the paired sample t test was used to assess learning effectiveness. AKM-based item development.

2. METHOD

This research is development research with a quantitative approach to produce products that are feasible and effective for use (Raini et al., 2020; Rohmah et al., 2023). For the purposes of testing the suitability of AKM question items, research subjects for validation are needed, namely: learning evaluation experts, teaching materials experts, and language experts. Individual product trials require 3 teachers, and for small group trials 6 teachers are required. The research subjects were 80 private high school teachers in Surakarta. The type of data used is primary data, namely data obtained directly from private high school teachers in the form of pretest and posttest answers. quantitative descriptive data analysis with the help of SPSS. Quantitative analysis techniques were applied to assess the suitability of AKM question items. AKM question items are first validated by experts (expert judgment) from evaluation experts, teaching materials and language experts. Data collection methods use observation, interviews and questionnaires; observations were made on private high school teachers in Surakarta as research objects; The interview method is data collection through systematic question and answer, and the results are documented. The interview method is to make a list of questions to the teacher who will be researched. Interviews were conducted with teachers who taught the course; questionnaire, namely the researcher creates a list of questions that are assessed by learning evaluation experts, teaching materials experts, and language experts with the aim of measuring the appropriateness of the AKM question items. (Septina Carolina et al., 2020; Simatupang, 2021). The questionnaire method is used to obtain accurate data from the questions contained in the questionnaire. The development model uses ADDIE (Analysis, Design, Development, Implementation, Evaluation) (Perdana & Suswandari, 2020; Wardani, 2019). Consideration

of using the ADDIE model because; can be adapted in product development, product improvements can be made at every step, a simple, systematic and practical development flow. Researchers use the ADDIE model on the grounds that this model is used to develop learning product designs The ADDIE stages are: analysis stage: applying analysis between expectations and reality in the learning process at school. Needs analysis is carried out by giving questionnaires to teachers and identifying needs (Susilo & Ernawati, 2020; Syamsi et al., 2019). This stage uses questionnaires, interviews and observation methods, the design stage will produce a design or create a product design that will be developed, The development stage is carried out by experts and revised. The design is in real form according to the design that has been made previously, the implementation stage is carried out by testing the product that has been created. The product is validated by learning evaluation experts, teaching materials experts, and language experts. Once deemed feasible, the product will be tested on subject teachers individually and in small groups, evaluation stage: evaluation has actually been carried out at each stage. Feasibility tests are carried out by learning evaluation experts, teaching materials experts and language experts, before the AKM questions are developed and implemented. The feasibility test uses several questionnaires, aiming to find out whether the AKM questions being developed are suitable for implementation or not. Table 1 presents a grid of expert learning evaluation instruments. This instrument is used to determine the quality of the AKM questions developed in terms of learning media. Table 2 presents a grid of teaching materials experts. This instrument is used to determine the quality of AKM questions developed in terms of language. Table 3 presents a grid of linguists. Use of instruments to determine teacher responses regarding the AKM questions being developed. Table 4 presents a grid of individual and small group instruments.

Table 1. Grid of Learning Evaluation Experts

NO	Aspect		Indicator
1	Indicators and learning objectives	A	Correspondence between achievement indicators and question items
		B	Development of AKM-based literacy and numeracy questions
		C	Conformity of indicators to Basic Competencies
2	lesson plan	A	The question is easy to understand
		B	Suitability of questions according to learning objectives
3	Question items	A	The story questions are arranged coherently
		B	The questions use language that is easy to understand
		C	The questions are arranged based on KD and learning indicators
4	Evaluation	A	There are questions about the problem
		B	Conformity of evaluation to the material

Source: (Salsabila et al., 2021)

Table 2. Teaching Material Grid

NO	Aspect		Indicator
1	Aspects of learning material	A	Suitability of the formulation of learning objectives
2		B	Selection of teaching materials
3		C	Organizing teaching materials
4		D	Steps to learning activities
5	Strategy	A	Systematic in delivering material
6		B	Teachers are motivated
7		C	Provide opportunities for teachers to learn independently
8		D	Provide opportunities for teachers to access material via the internet
9	Evaluation	A	Questions according to indicators
10		B	These questions are accompanied by work instructions

(Arisa et al., 2023) has been modified

Table 3. Linguistic Grid

NO	Aspect		Indicator
1	Language	A	The language used is communicative and simple.
2		B	Conformity of sentences with EYD
3		C	The use of language is appropriate to the teacher's level of cognitive development
4		D	The sentences in the questions are clear and easy to understand
5		Yes	Accuracy in constructing sentence structures
6		F	Terms that are difficult or not understood are explained

Source: (Yolanda & Wahyuni, 2021)

Table 4. Experimental Grid Per Individual and Small Group

NO	Aspect	Indicator	
1	Readability of question items	A	Literacy and numeracy issues are easy to understand
		B	Navigation menu compatibility
2	Cognition	A	These questions make it easier for teachers to learn
		B	The questions asked are in accordance with the content of the material
		C	The placement of the image in the question is correct
		D	AKM questions are appropriate to students' abilities
		Yes	The text can be read clearly

The next step is to test the validity of the instrument. Experts validate the instrument items, the assessment results are in accordance with the feasibility category. Data analysis uses qualitative and quantitative descriptive data analysis methods. This method is used to process data in the form of input, criticism and suggestions in improving AKM question development products which come from the validation results of learning evaluation experts, teaching materials and language experts, individual and small group test subjects. Table 5 shows the eligibility criteria for AKM scale 5 questions.

Table 5. Eligibility Criteria for AKM Scale 5 Questions

Score	Criteria	Information
81% - 100%	Very good	Very good, no revision needed
61% - 80%	Good	Not bad, no need for revision
41% - 60%	Enough	Not suitable, needs revision
21% - 40%	Not enough	Not suitable, needs revision
0% - 20%	Very less	Very inappropriate, needs revision

Source (Rusnilawati & Gustiana, 2020; Salsabila et al., 2022)

This type of research uses a quantitative approach. The research subjects were 80 private high school teachers in Surakarta. Data collection methods use interviews, observation, documentation and tests. This research is experimental research which aims to determine the causal effect of treatment on a variable. The experimental design in this research uses a Pre-Experimental design with a Pretest Posttest One Group Design design model. Therefore, researchers only want to know the differences in teacher competence before (pretest) and after (posttest) after being given treatment. Data analysis uses descriptive statistics using SPSS. The test instrument used is a test instrument consisting of 30 questions which includes literacy and numeracy material. Pretest and posttest data will be tested using the t-test. The t test is a test to determine the effectiveness of learning. The type of t test used is the paired sample t test. The characteristics of the paired sample t test are that the same individual receives 2 different treatments, namely pretest and posttest. Paired sample t test to compare the means of two variables in one group where the two variables are related to each other. The paired samples t test aims to determine whether there is a significant difference in the averages of two paired or related samples Before carrying out the paired sample t test, the researcher carried out prerequisite tests, namely normality and homogeneity tests. Normality, homogeneity and paired sample t tests were carried out using the SPSS 20 statistical test. This was done to find descriptive statistical results. This development research uses validity and reliability tests. Question item validity is used to determine whether or not the question items used are valid. The Kuder Richardson reliability test (KR -20) in this research is used to measure the level of confidence or reliability of a test result.

3. RESULT AND DISCUSSION

Result

The research analyzed two things, namely: analyzing the feasibility of preparing AKM questions; and analyze the effectiveness of preparing AKM questions. Below, we will review two such analyses. Observation and interview methods were carried out at this stage so that the product developed, namely AKM questions, could improve teacher competence, learning objectives, materials and learning environment. Interviews were conducted with subject teachers, and observations were made during classroom learning. From the results of interviews and observations, data was obtained that there were gaps, including: a) teachers did not understand AKM-based question development techniques; b) teachers develop questions that are not based on literacy and numeracy, so that school achievement decreases; and

c) teachers have not utilized AKM-based questions. . At this stage, problems arise that become the basis for learning in the classroom: teacher characteristics to determine the diversity of students' abilities; identify material that is appropriate to the development of AKM questions as a determinant of teacher competency. The application of the design stage is: selecting teaching materials and designing AKM question items to be developed. Researchers prepare the materials needed for expert validation and teacher testing,; create a workflow to describe the product as a whole including scheduling AKM question development, planning test specifications; etc create guidelines for developing questions and material input, developing question items based on a grid, reviewing and revising the questions developed so that they are declared suitable for learning. At the AKM-based question development stage, researchers will include material and develop questions in the form of literacy and numeracy; assemble assessment instruments, test questions and create lesson plans related to the curriculum. The AKM question product that will be designed must be in accordance with the RPP. The RPP contains KD, indicators, learning objectives, material presentation, learning activities, as well as rubrics and evaluation sheets. The development stages carried out are development of AKM-based questions such as material, syllabus, text, images, development of AKM-based questions such as material input and design development in the form of text or images. The following displays the AKM-based questions.

Activities in this phase include: product testing through several scientific stages. This is done so that the product is valid, reliable, and the results can be measured and tested by involving experts. Some of these experts include learning evaluation experts, teaching materials experts, and language experts. At this stage the learning evaluation expert will assess the material presented in developing the question items. Then researchers will get constructive input, suggestions and responses, including from teaching materials experts and language experts. After that, improvements are made according to the experts' notes so that the resulting question items meet the standards and meet the teacher's needs. Experts validate the AKM question items, followed by conducting trials. Product trials consisting of individual group trials with 3 teachers and small group trials consisting of 6 teachers were obtained with various low, medium and high abilities. After the trial was carried out, six teachers were asked to provide responses or opinions on the questions that were developed as a form of evaluation to minimize errors. The assessment carried out by several experts and product trials was intended to determine the feasibility of the AKM question items that had been developed. Content validation, design validation, media validation, and learning product trial validation are presented in Table 6.

Table 6. Eligibility Criteria for AKM Scale 5 Questions

Test Subjects	Respondent	Validity Results	Information
Test learning materials	1	91%	Very worthy
Test teaching materials	1	90%	Very worthy
Language test	1	90%	Very worthy
Individual trials	3	80%	Very worthy
Small group trials	6	83%	Very worthy

Feasibility test using Calculation of All Aspects (PSA) using a scale 5 questionnaire. Learning evaluation test results: 91% (very feasible), teaching material test results: 90% (very feasible), language test results: 90% (very feasible), individual trial results: 80% (very feasible), small group trial scores: 83% (very feasible). The final stage is an evaluation of the question item instrument product. The evaluation carried out in this development research is based on a feasibility test. Feasibility testing is evaluated based on expert validation and product trials. The evaluation results are revised according to the evaluation results. Evaluation of the development of AKM questions aims to change attitudes towards positive and better learning activities; increasing teacher capabilities; institutional profits due to increased teacher competency The results of the item validity test show that all question items can be said to be valid at a significance level of 5% (rcount > rtable) with N= 40. The results of the reliability test using the KR-20 are said to be reliable with a test reliability coefficient = 0.82. The test instrument is said to be reliable if the reliability value of the calculation results is > 0.7. Before carrying out a paired sample t test, there are two conditions, namely the data must be normally distributed and homogeneous. Based on data analysis, the signs. for literacy of 0.129 and sig. to calculate 0.097. Because of the sign value. for both groups > 0.05, it can be concluded that the literacy and numeracy pre-test data are normally distributed. Based on data analysis shows the signs. for literacy of 0.116 and sig. to calculate 0.102. Because of the sign value. for both groups > 0.05, it can be concluded that the literacy pre-test data is normally distributed. The pretest significance value (Sig.) of 0.940. because the Sig value. 0.940 > 0.05 so it can be concluded that the pretest variance is homogeneous. The pretest significance value (Sig.) of 0.620. Because the Sig value. 0.620 > 0.05

so it can be concluded that the post-test variance is homogeneous. To make it easier to observe, a table was created comparing the average pretest scores on literacy and numeracy questions. The average post-test score on literacy questions is 70.88 and numeracy is 73.87. To determine whether there is a significant difference in the average literacy pretest and literacy posttest scores, as well as the average numeracy pretest and numeracy posttest scores, a paired sample t test is used. The results of the paired sample test (literacy) and the results of the paired sample t test (numeracy). Based on data analysis, shows that Sig. (2 tailed) of 0.000 < 0.05, which means there is a significant difference in average literacy between the literacy pretest and the literacy posttest. Therefore, it can be concluded that the competence of private high school teachers in Surakarta increased after receiving AKM-based literacy treatment. Based on data analysis, shows that Sig. (2 tailed) of 0.000 < 0.05, which means there is a significant average difference between the numeracy pretest and numeracy posttest. Therefore, it can be concluded that the competence of teachers at private high schools in Surakarta increased after receiving AKM-based numeracy treatment.

Discussion

In conducting learning assessments, a researcher carries out assessments using tests. The preparation of the AKM questions that are developed must be of high quality so that the test must be valid and reliable (Miftah & Setyaningsih, 2023; Sari et al., 2020). To compose quality questions, item analysis is required. The correct preparation of AKM questions must go through the correct procedures so as to produce a good measuring instrument. Developing quality AKM questions that are suitable for use is only possible if they are based on applicable test development principles. Teachers in evaluating student learning outcomes rarely analyze quantitatively (empirically) (K. P. Kebudayaan, 2020; Klarita & Syafi'ah, 2020). The development of good AM test questions must meet the requirements, including: medium difficulty of questions, ability to differentiate questions, distractions, good validity and high reliability. This research has excellent qualifying results; this is proven by: ease of developing AKM-based questions; clarity of presentation of material and examples; can motivate teachers to learn. This is in accordance with Afisa's research on Denis which states that there are several aspects that teachers must have in making AKM: psychological aspects, namely interest and motivation.

The results of the learning evaluation feasibility test were obtained at 91%, learning materials at 90%, linguistics at 90%, individual trials at 80% and small groups at 83%, each categorized as very suitable for learning. The effectiveness test based on the paired sample t test shows that the pretest and posttest are significantly different; This is proven by the t test which shows the Sig value. (2-tailed) < 0.05 then Ho is rejected and Ha is accepted. This proves that the development of AKM-based questions is effective in increasing teacher competency. Teachers as educators have a big role and responsibility for the effectiveness of implementing AKM. Research into the development of a reading literacy minimum competency assessment (AKM) instrument has high validity and reliability results, thus demonstrating the feasibility and effectiveness of the instrument. (Iskandar & Rizal, 2020; jdihkemdikbudgoid, 2020). Based on the results of expert validation and paired sample t tests on teachers, it can be concluded that AKM can be used as a tool for evaluating literacy and numeracy skills and can help teachers determine student achievement in fulfilling learning competencies. The results of AKM development can be used as a guide for teachers in designing and planning more effective learning strategies. Research on AKM can make learning more effective in schools. The research results also stated that students were not able to describe their numeracy skills when solving AKM questions (Dwiqi et al., 2020; Fauziah et al., 2019). This is in accordance with Linanda's research which states that students are unable to solve AKM-based questions. Research entitled Teachers' Ability in AKM Determines Students' Literacy and Numeracy Abilities states that students are not yet familiar with AKM-based questions and must be trained continuously. AKM-based question development research is said to be feasible if the expert validity results are at least in the good category. AKM questions are said to be effective if there is an increase in the pretest and posttest; there is an increase in the KKM value; there is an increase in teacher competence and a positive attitude towards learning evaluation. This is proven by the teacher's readiness, ability to develop AKM-based questions, and the benefits obtained.

The research results show that AKM needs to be socialized to students and trained teachers. AKM results can show the most basic competencies, namely reading literacy and numeracy literacy. These results can be used by teachers to improve the quality of learning in the classroom. The Minimum Competency Assessment (AKM) is a measure of literacy and numeracy achievements used to map the quality of education in Indonesia according to international standards. Research on literacy and numeracy based on the Minimum Competency Assessment (AKM) has significant implications in improving teacher competency in private high schools. By utilizing data from AKM, teachers can identify students' weaknesses and strengths in literacy and numeracy more precisely. The results of this assessment provide

clear guidance on areas that require special attention, so that training and professional development can be focused on addressing these deficiencies. In addition, through AKM data analysis, schools can design intervention programs that are more effective and appropriate to student needs. Another implication is the need to develop a curriculum that is more adaptive and responsive to assessment results, so that the learning process can run more efficiently and relevantly. Thus, increasing teacher competency through a deep understanding of literacy and numeracy will have a direct impact on improving the quality of education in private high schools, preparing students to better face academic and real-life challenges. The limitations of research on literacy and numeracy based on the Minimum Competency Assessment (AKM) to improve teacher competency in private high schools include several aspects. First, the limitations of AKM data which only covers certain samples may not reflect the conditions of the entire student population, so the generalization of research results may be limited. Second, implementing research results requires full commitment and support from the school, which is sometimes difficult to achieve due to various administrative and financial constraints. Third, limited time and resources in training teachers according to research findings can be an obstacle in achieving optimal results. As a recommendation, this research suggests that schools collect more comprehensive and representative data to get a more accurate picture of students' literacy and numeracy competencies. In addition, it is important to build close collaboration between the government, schools and communities to ensure full support for the implementation of teacher competency improvement programs. Schools should also allocate adequate time and resources for ongoing teacher training, so that they can continually improve their skills and teaching methodologies based on the latest findings from research. Finally, the development of digital platforms to support technology-based training and assessment could be an innovative solution to overcome resource limitations and expand access to teacher competency improvement programs. The aim of this research is that the teachers who are the target of this research are only 80 private high school teachers in Surakarta, and these teachers only represent a few subjects. However, researchers have gotten enough of an idea from the results of research into the development of AKM-based questions.

4. CONCLUSION

The development of AKM-based literacy and numeracy questions using the ADDIE development model is suitable for use as evaluation material. This is proven by the assessment of expert and teacher validation results. The development of AKM-based literacy and numeracy questions has proven effective in increasing the competence of private high school teachers in Surakarta, as evidenced by the statistical results of the t test. Based on the findings above, the researcher's recommendation is as follows: teachers can utilize the results of developing AKM questions in the learning evaluation process. Teachers use AKM questions as evaluation of learning outcomes; Teachers must remain at the forefront in overcoming all learning challenges in the classroom. Developing AKM questions does not require an Android smartphone device. What is needed is motivation. Further research with different material presented in a more interesting way can increase the competency of subject teachers.

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