

Vulnerability Reading and the Importance of AKM Class: Early Intervention Efforts for Literacy Sustainable

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Abstract

Reading vulnerability remains a latent issue in primary school learning. This phenomenon not only hinders students' comprehension of learning materials but also contributes to disparities in literacy assessment outcomes at both classroom and national levels. Based on the 2024 Education Report (*Rapor Pendidikan*) and teacher identification in the Dwarawati Cluster, 7.06% of upper-grade students were identified as reading-vulnerable. This study aims to describe the condition of reading vulnerability and evaluate the implementation of voice-assisted *Minimum Competency Assessment* (AKM Kelas) as an adaptive formative assessment solution. A descriptive qualitative approach was employed, with data collected through documentation, observation, and informal interviews. The assessment product was developed in a digital format (Google Form) equipped with audio (*reading aloud*) features to provide access for students with reading difficulties. The findings indicate that this assessment model enhances students' reading comprehension, strengthens learning engagement, and serves as an effective early identification tool. Teachers also demonstrated pedagogical reflection and improved competence in designing contextual and inclusive assessment instruments. The novelty of this study lies in the integration of auditory stimuli into classroom-based AKM designed and tested by teachers, bridging literacy needs within real classroom settings. The study concludes that voice-assisted AKM Kelas can serve as an inclusive, practical, and scalable model of formative assessment to support basic literacy reinforcement programs.

1. Introduction

Ability literacy read is foundation essential in development cognitive and success academic students at the level school base. Digital literacy refers to the ability understand, evaluate, and utilize information from digital media in a way critical and wise (Salsabila et al., 2024). In the 21st century era which is marked by digitalization and globalization, the ability literacy become aspect essential in access, understand, and process information in a way critical (Fajriati et al., 2024). Literacy No only functioning as tool communication, but rather as thinking capital critical that allows student understand information, reasoning, and building meaning in context learning (Fitria & Muthi, 2024). Therefore that, the delay mastery ability read since early potential cause impact term long to performance student in a way general. According to Jannah et al. (2024) and Belvar et al. (2024) read is skills receptive because through activity this, reader get information and knowledge new from text. This is prove that urgency reading is very important.

Problems literacy read has become issue urgent national for responded to seriously by the Indonesian government. In practice, the skills read is aspect essential in speaking a language that is not can ignored by participants educated. UNESCO data records that index reading in Indonesia only reached 0.001, indicating level very low literacy (Rohmah & Nugroho, 2024). Survey The 2019 *Program for International Student Assessment* (PISA) also placed Indonesia at 62nd out of 70 countries in matter interest read, mark that culture reading among public Still worrying (Ramdayani et al., 2024). Released by the Ministry of Education, Culture, Research and Technology (2022), Indonesia experienced improvement six ranking in results PISA survey compared year previously, although Still be at eight position bottom from 70 countries in aspect literacy as assessed by *the Organization for Economic Cooperation and Development* (OECD) in 2022 (Islami et al., 2024). In reality, until now, still found case student class tall school the basis that has not been capable read in a way smooth, even in the environment school with accreditation status good. Phenomenon This known as vulnerability reading, namely condition when a student Not yet reach standard proper literacy mastered in the phase Study certain. Vulnerability This No only hinder understanding text, but also has an impact to ability understand other lessons, interact social, and trust self.

Literacy base covers ability understand information written in a way simple However essential, such as read instructions, answers about, until understand text narrative short. Implementation, literacy base consists of from three stages namely literacy habituation, literacy development, and literacy learning (Afifah et al., 2025). Ability This become foundation for development literacy continued, including digital literacy, numeracy, and science. Therefore that, building skills literacy base in a way strong since early become not quite enough answer important in the learning process at school base (Hisanah & Fradana, 2024). Literacy base play a role in help individual understand, manage, and communicate information in a way efficient (Theresia et al., 2024). Although literacy base become foundation important in success learning at the level next, the reality is still lots students who have not control skills the in a way adequate. Insufficient learning process responsive to difficulty read often make student experience obstacle in understand information written. As a result, it happened gap between demands curriculum with ability current participant educate in access content reading. This condition cause potential vulnerability reading that is often not detected in assessment scale wide.

Vulnerability reading is also reflected in a way explicit in the 2024 Education Report data. Several schools in the Dwarawati Cluster, Semarang experience decline mark literacy based on results National Assessment Based Computer (ANBK), especially in the aspect literary text, ability conclude and understand information written. Although achievements average between school in a word moderate, internal conditions of students No can equalized so just with mark aggregate. This is where importance data reading reflective by unit education.

Reading Vulnerability Data Class IV Dwarawati Cluster

No	Name of Elementary School (SD)	Number of Students	Students at Risk of Reading
1	SD 1	54	2 (3.70%)
2	SD 2	27	0 (0%)
3	Elementary School 3	27	6 (22.22%)
4	SD 4	56	1 (1.79%)
5	SD 5	22	2 (9.09%)
6	SD 6	16	7 (43.75%)
7	SD 7	8	0 (0%)
8	SD 8	45	0 (0%)
		255	18 (7.06%)

Based on the collected field data, it was found that of 255 students class In eight elementary schools in the Dwarawati Cluster, there are 18 students vulnerable reading (7.06%). Total This show that vulnerability read No nature sporadic, but rather systemic. Even in schools with average literacy high, still found students who have not reach competence base reading, especially in elementary school 6 and elementary school 3. This fact confirm that repair quality literacy must done in a way comprehensive, with appropriate intervention target. This also takes into account that shrimp paste is mandatory fundamental competencies owned by each student since level school base (Gea et al., 2024) .

This phenomenon cannot be separated from the broader consequences of the Merdeka Curriculum implementation. Unit flexibility education in set increase class often leads to an increase student although Not yet complete in a way literacy. Learning reading at school focused on development ability understand, absorb, and catch message or idea written in text (Zhalzabilah et al., 2024). However, in reality, it is still often found students who are still own level read low. In this Independent Curriculum, students who have not Can read still drive to class above and finally become ANBK participants in general random. When literacy they tested at the level more competence height, gap achievements become not unavoidable. This condition describe irony education, where the system assessment no always is harmony with readiness study student.

Vulnerability read influenced by many factors, both internal and external external. Internal factors such as dyslexia, learning disabilities cognitive, and lack of motivation often overlooked Because No detected since early. Meanwhile that, factor external like lack of access material reading, method lack of learning varied, up to limitations the role of parents in accompany child participate strengthen condition such as in the research Aini et al. (2024) that some parents not enough show not quite enough answer in guide child Study reading at home, and tend to deliver fully learning process to party school. As a

result, the activities Study student limited only moment be in the environment school. This matter become a very possible external factor level read student become low. Therefore that 's the solution on vulnerability read must designed in a way holistic, contextual, and based need.

Learning in the digital era demands existence approach innovative and capable increase ability understanding read student (Nabila & Fradana, 2024). One of form solutions that start developed is Assessment Minimum Competencies (AKM) for Classes are compiled by teachers. Teachers have role central in guide student during the learning process, especially in develop potential cognitive, psychomotor, and affective participant educate (Andayani et al., 2024). Instrument This nature formative, flexible, and customized with characteristics participant educate. AKM Class allows teachers to assess achievement literacy student in real-time and provide intervention data- based, not only just fulfil demands administrative.

Approach innovative in assessment introduced through AKM Class assisted voice (*reading aloud*). Supported by research Wardini et al. (2024) that implementation method *reading aloud* proven contribute positive to improvement skills read student school basic. Assessment This designed For students who experience difficulty in read text written, so that they still Can understand content question through feature sound. This is in tune with study Nurmalasari (2024) that teachers are required For designing innovative and adaptive learning strategies to characteristics as well as need Study participant educate. In this case This, AKM Class assisted voice can give impact learn more good, especially in reading. The 21st century is marked by with the digital era demanding utilization technology in almost all over aspect life (Monalisa et al., 2024).

Principle *facilitating reading aloud* integrated to in digital instruments. Because, in the current digital era this, digital literacy becomes aspect crucial that also support improvement skills reading, especially at the elementary level school base (Hisanah & Fradana, 2024). Principles *facilitating reading aloud* innovated using Google Forms and Google Drive, so text reading can heard before answered. Approach This in line with principle *Universal Design for Learning* (UDL), namely provide track access alternative in the learning process. Supported by research Widyasari et al. (2025) that UDL approach encourages provision various form representation, expression, and engagement that enable every student including those who have obstacle literacy For access and understand material optimally.

Implementation of Class AKM assisted voice has done in a way limited to the Dwarawati Cluster, in particular For student indicated classes IV and V vulnerable reading. The teacher composes question equipped digital assessment with audio, audio is made use *Artificial Intelligence* (AI), with text system become sound. In tune with study that (Sarif & AR, 2024) that utilization intelligence *Artificial Intelligence* (AI) has give impact big in various fields, including education. One of the growing AI applications rapidly is *Text-to-Speech* (TTS), namely technology that changes text written become Student 's voice given chance For listening text before answer question. Initial results show that student more helped in understand the reading stimulus and tend to it more believe self in answer about this innovation become milestone important in build culture inclusive and adaptive assessment to diversity participant educate.

This study aims to describe the reading vulnerability of students in the Dwarawati Cluster and to examine the implementation of voice-assisted Classroom Minimum Competency Assessment (AKM Kelas) as an alternative solution for literacy-based assessment. Research previously related *reading aloud* by Wardini et al. (2024), Mandira & Mardiah, (2025), Nurmaya & Adawiyah (2025), Sholeha, (2025) that reading aloud effective For improvement literacy. However, research the generally focus on practice *reading aloud* in context learning, not on its integration in design assessment formative development directly by the teacher in class. Novelty in study This lies in the development of AKM Class assisted adaptive sound method *reading aloud* to in form audio- based digital assessment. This innovation No only put student as subject literacy, but also strengthening the role of teachers as designer responsive and contextual assessment. Findings this expected can become recommendation practice good for school basic, at the same time give input to policy assessment and strengthening literacy at the level national research it also offers approach assessment adaptive formative to need student with obstacle reading, through utilization technology simple audio based.

2. Method

Study this use approach qualitative descriptive with objective For describe vulnerability read student as well as study implementation assessment literacy AKM Class based with help sound (*reading aloud*) developed by teachers in the Dwarawati Cluster, Semarang City, Indonesia. The approach This chosen Because in accordance For describe phenomenon in a way in-depth and contextual based on the

data collected direct from field practice. Subject in study this are class teachers tall from eight school combined base in the Dwarawati Cluster. Election subject done in a way purposive based on involvement they in activity compilation assessment and reporting results literacy in units their respective education. The research also involved identified students vulnerable reading, with total number of 18 students of 255 students classes IV to VI, as recorded in strengthening program documentation literacy program which will be implemented from April to June 2024.

Primary data source in study This consists of from: (1) documentation Unit Education Report education in the Dwarawati Cluster 2024 ; (2) data results identification student vulnerable reading by teacher; (3) product AKM Class Assessment assisted developed and tested sounds in a way limited ; and (4) results teacher observations and responses as well student to implementation assessment. All data obtained during implementation of literacy programs in series activity devotion society. In line with study (Aini et al., 2024) that activity devotion public own role important in effort improvement quality life and empowerment community. Data collection techniques are carried out through studies documentation, observation participatory and informal interviews. Documentation study used For get description beginning about achievements literacy and distribution vulnerability read based on Education Report and Teacher Recap. Observation done moment implementation AKM Class Assessment assisted voice For see involvement students, level understanding questions, and effectiveness in-ear audio features support the reading process. Informal interviews were conducted For dig teacher reflection on use instrument assessment This.

Data collected analyzed using analysis models Miles and Huberman's interactive which includes three stages: data reduction, data presentation, and drawing conclusions (Noa et al., 2025). Data reduction is carried out with sorting relevant information with focus research, data presentation is carried out in form narrative and visualization tables, and withdrawals conclusion done in a way reflective based on pattern findings and trial results. For ensure data validity, carried out triangulation sources and techniques. Cross validation between documentation data, results observation, and teacher responses are used For strengthen interpretation and avoid researcher bias. In addition, researchers also conducted confirmation results temporary to some teachers to test accuracy interpretation of data on experience the actual field.

3. Results and Discussion

Problem vulnerability reading at the level school base Still become challenge big in context implementation education based literacy in Indonesia. Findings field in study this indicates that existence students who have not control skills read base No can considered as case incidental, but rather as phenomenon systemic needs intervention comprehensive. Vulnerability read defined in context this as condition students who have not reach competence read according to class level, good in aspect accuracy, understanding, and skills reflective to text. This condition often not detected in a way comprehensive through assessment scale big Because student still capable follow learning in a way administrative, but experience stagnation in aspect cognitive literacy. In addition, limitations instrument assessment formative in class participate make things worse condition This because the teacher doesn't have sufficient data For perform early diagnosis and provide action the right continuation. Inequality This show the need compilation instrument assessment based context class that is not only nature cognitive, but also providing room fair access for student with limitations reading. In context This is the development of AKM Class assisted voice expected can become alternative innovative For accommodate need diverse learning. Form

Distribution student vulnerable read found in seven from eight school in the Dwarawati Cluster. Of the total of 255 students classes IV to VI, there are 18 students who are categorized as vulnerable reading (7.06%). School with number highest own ratio of 7 out of 16 students (43.75%) in condition vulnerable reading, marking that existence student with obstacle literacy can be very dominant in the space class certain. This fact displayed in Table 1 and illustrates that vulnerability No always correlated with achievements literacy average school. Even school with accreditation good and high ANBK value still show similar symptoms, which means approach learning and assessment need changed in a way more adaptive.

Table 2. Literacy Skill Achievements Dwarawati Cluster Education Report

No.	Dwarawati Group	Average Literacy (A1)	Literacy Value Status	Reading Vulnerability
1	Tinjomoyo Elementary School	01 65,637	Down: literary text, L1	There is

2	Tinjomoyo Elementary School	02	60,514	Down: literary text, L2	There is
3	Tinjomoyo Elementary School	03	60,768	Down: Literary Text, L1, L2	There is
4	SDN Ngesrep 01		76,262	Go on	There is
5	SDN Ngesrep 02		69,314	Go on	There is
6	SDN Ngesrep 03		61,176	Down:Literary Text, L1, L2	There is
7	Bina Bangsa Elementary School		59,058	Down: L1, L3	There is
8	Permata Bangsa Elementary School		58,582	Down: L1, L2, L3	There is
Average			63,913		

Disparity This in harmony with the 2024 Education Report data, where five of eight school in the Dwarawati Cluster show decline mark literacy compared to year previously. The most prominent decline contained in the L1 indicator (understanding information written), L2 (conclude content reading), and L3 (reflecting content reading). This data signify that No only ability base weak reading, but also ability think level high built through activity literacy. This is show that obstacle read No only dwelling on aspects phonological and literal comprehension, but also touches on dimensions think critical and reflective students who actually become the main target in assessment national based literacy. Inability student in access meaning implied and connecting information cross paragraph indicates existence gap in learning literacy that has not been responsive to need real participant educate. So, it is necessary approach more assessment adaptive and differentiated to ensure that every student can show his abilities in a way authentic and equivalent, as recommended in framework *Universal Design for Learning* (UDL).

Findings This indicates that the assessment model used during This Not yet fully capable detect and handle student with difficulty reading. In the system assessment national like ANBK, all student assessed with uniform instrument, without take into account diversity ability cognitive and background behind learning. Even though according to principle *Universal Design for Learning* (UDL), assessment should give track access different For ensure every participant educate get fair chance For show capabilities. *Universal Design for Learning* (UDL) is approach learning that emphasizes provision various method for student For demonstrate knowledge and skills they (Dirman et al., 2025) . Principles This aim For accommodate diversity characteristics participant educate, so that every student own equal opportunity For reach objective learning through appropriate path with need they. In the context assessment, implementation UDL principles allow existence variation in stimulus form, time workmanship, as well as method student respond question. With Thus, the assessment No only become tool measure, but also as means empowerment that values potential unique every participant educate. Responding situation said, the teachers in the Dwarawati Cluster together team lecturer community service program partners designing Class AKM assisted voice (*Reading Aloud-Based Classroom Assessment*) as response to need will assessment more formative adaptive and fair. This AKM designed in digital format using Google Form and Google Drive, equipped with with audio features for each reading stimulus.

Product assessment This consists of from series question based text that can listened to by students before answer. Reading text developed with notice context local and experience daily life students, such as activities at home, environment school, and interaction social simple. Audio is read by voice *Artificial Intelligence* (AI) which can also modified with teacher's voice with intonation clear and optimal duration so that students can understand content before move to part question. All instrument has executed in trial field limited to three school, with teachers monitoring response student through report automatically generated Google Form for analysis fast. Feedback from student show increased sense of confidence self and understanding context reading, while the teacher takes notes that pattern error student become more focused so that make things easier determination of remedial strategies. In the future, the results data assessment will also be used For compile module training greater literacy directed and supports individual mentoring programs for students who are still need help addition.

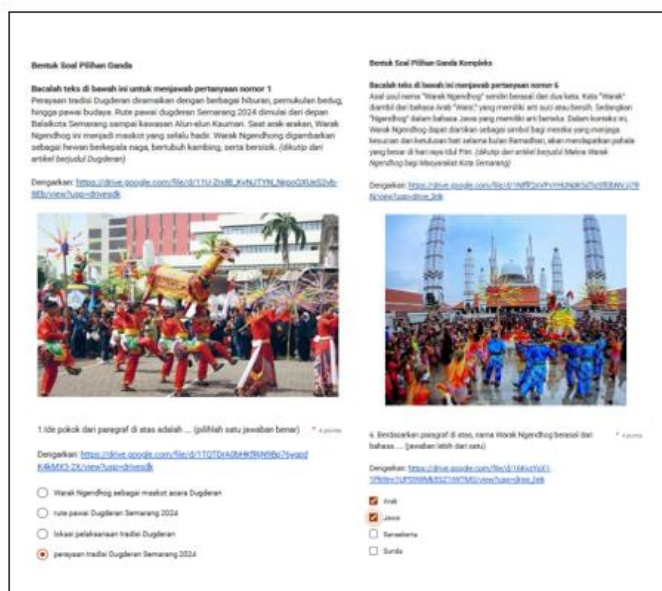


Figure 1. Example AKM Class Display Voice Assisted

Trials limited implemented in three schools that have amount student vulnerable read the most. Students who participated assessment assisted voice show improvement understanding to text. Based on notes teacher and student observations become more focus, show improvement participation, and appearance No nervous when requested read in a way independent. Even a number of previous students tend passive start active respond reading and discussion with Friend peers. Providing sound stimulation proven help student in build mental representation of content text before answer questions. Activities listening also makes it easier student with obstacle phonological For still can access information in a way intact. This is show that multimodal assessment can become solution concrete in create environment learn more inclusive and equitable.

Impact the teacher also felt positive. In session reflection, the teacher acknowledged that through preparation of Class AKM this, they become more aware to importance build contextual and accessible questions. This process open inter-teacher dialogue space cross school and improve competence they in utilise technology simple For objective pedagogical. Implementation assessment this also encourages birth practice collaborative, such as share question banks and share experience audio design. Activities this also strengthens the role of teachers as designer assessment, not just implementer curriculum. Happened increased sense of ownership towards developed instruments Because customized direct with character students of each school. In addition, it was created culture reflective that encourages teachers to Keep going do repair data- based results assessment.

AKM Class approach assisted voice No only answer need assessment, but at a time become tool intervention For increase literacy. Ability literacy own role crucial in life participant educate Because skills reading, writing, and speaking become base For understand information and participation active in various situation. Therefore that, innovation in learning literacy is very necessary to develop competence literacy student in a way sustainable (Putra et al., 2024). In practice, some teachers start apply this model in a way periodically as a training strategy literacy listening and reading integrated activities this also encourages parental involvement that helps child train listening at home through gadgets. Activities This show that literacy No only at school, but also at home. In line with study Ambarita & Coal (2024) that activity literacy can developed through role as well as environment family, society, and unit education.

Implementation of Class AKM assisted voice No only functioning as instrument assessment, but also as form intervention pedagogical approach that is in favor of needs real students. Approach This shift paradigm assessment from just tool gauge become bridge understanding between teachers and participants educate. In perspective theoretical, assessment This strengthen argumentation that success literacy No can measured in a way single through exam write. Literacy is an evolving multimodal process through involvement sensory and social. With combine text and voice, students given room For build meaning in a way gradual and appropriate with capacity cognitive they. This is also in line with findings previously (Misra et al., 2022) that student with visual impairment or processing phonological get benefit big from assessment audio based.

Assisted AKM voice give opportunity integration with approach *differentiated instruction*, where students can given stimulus and form appropriate questions with level development. The teacher does not need wait ANBK report or results test end For intervene ; they Can direct read pattern error from answer students and use it as base planning learning next. However Thus, the implementation assessment This still face a number of challenges. Teachers need to adapt with skills technical, such as upload audio, set navigation questions on Google Forms, as well as manage response student online. On the side students, still found obstacle devices, especially for student from family economy medium to below. Therefore that, sustainability from innovation it really depends on support infrastructure and training sustainable. Findings This prove that assessment designed by teachers based on reality class capable become tool identification and intervention effective literacy. When teachers are given room For creative and equipped support technical, assessment No only become tool judgment, but also becoming part from learning strategies active and reflective. AKM Assisted Class sound developed in the Dwarawati Cluster is example practice good that can replicated, modified, and improved the scale For support education greater literacy inclusive and humane.

3.1 Conclusion

This study reveals that reading vulnerability in primary schools is a real and widespread issue, including in educational institutions that have received good accreditation and report high average literacy scores. Based on findings in the Dwarawati Cluster, 7.06% of upper-grade students were identified as being at risk in reading. This figure reflects internal disparities in students' literacy achievement that cannot be captured solely through the average scores of national assessments such as ANBK. The decline in literacy outcomes recorded in the Education Report (*Rapor Pendidikan*), particularly in the aspects of understanding and summarizing texts, underscores the importance of class-based and contextual assessment interventions. The development of voice-assisted Classroom Minimum Competency Assessments (AKM Kelas) by teachers in the Dwarawati Cluster has proven to be not only an adaptive and learner-friendly strategy for students with reading difficulties but also pedagogically transformative. Through the provision of audio stimuli, this assessment allows students with reading barriers to comprehend the content and respond to questions with greater confidence. The positive impact is reflected not only in the improvement of students' comprehension but also in the emergence of teacher reflection on question design, the integration of technology, and the significance of a contextual formative assessment approach.

The voice-assisted Classroom Minimum Competency Assessment (AKM Kelas) serves as an example of an assessment practice that aligns with the principles of Universal Design for Learning (UDL) and supports differentiated instruction. Through its multimodal and flexible design, this assessment bridges the gap in students' reading skills while also activating the teacher's role as both assessment designer and learning facilitator. The findings of this study affirm that assessments developed from the actual needs of students and implemented regularly within classroom contexts can function as effective tools for early detection and literacy intervention. Accordingly, the design and implementation of voice-assisted AKM Kelas can serve as a model for formative assessment that is inclusive, reflective, and sustainable, particularly in primary education settings. This innovation not only offers a solution to reading vulnerability but also lays a crucial foundation for strengthening a culture of assessment as an integral part of a learning process that is humane, equitable, and student-centered.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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