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Research Article

STRATEGIES FOR IMPROVING LITERACY AND NUMERACY IN COMPUTER-BASED NATIONAL ASSESSMENT AT MADRASAH IBTIDAIYAH

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Abstract
This study aims to identify and analyze strategies for improving literacy and numeracy in response to the Computer-Based National Assessment (ANBK) at Madrasah Ibtidaiyah Negeri 9 Pesanggrahan and Madrasah Ibtidaiyah Pembangunan Universitas Indonesia, Jakarta. National assessment results show that students' literacy and numeracy skills still require improvement to meet established standards. The research investigates strategies employed by madrasahs through intracurricular and extracurricular activities, along with the use of technological infrastructure to enhance students' literacy and numeracy outcomes. A descriptive approach with qualitative data analysis was used, involving observation, interviews, and documentation. Findings reveal strategies such as integrating literacy into learning, applying problem-based learning, and utilizing technology in assessments. Extracurricular activities like school literacy movements and technology-based numeracy training also contribute to better performance in the Computer-Based National Assessment. The study concludes that strengthening literacy and numeracy-focused learning strategies can boost students' competencies in understanding and applying academic concepts. Effective collaboration among teachers, students, and policymakers is crucial for optimizing literacy and numeracy improvement strategies, creating a Smart Madrasah with Smart Learning & Assessment and a Digital Ecosystem that fosters innovative, inclusive educational environments.

Keywords: Computer-Based National Assessment, Literacy, Numeracy, Technology-Based Learning

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INTRODUCTION

Education is one of the important aspects in the development of a country. One indicator of the success of education is the level of literacy, both reading literacy, numeracy literacy, and science and socio-cultural literacy (Reddy, 2023; C. Wang, 2022). However, the results of the national assessment show that the literacy skills of Indonesian students are still low, including in Madrasah Ibtidaiyah. Therefore, a strategy is needed to improve literacy and numeracy in the context of Islamic education in Madrasah Ibtidaiyah.

A paradigm shift in the world of education that emphasizes the importance of literacy and numeracy as skills that are really needed in everyday life and in facing global challenges (Moore, 2022; Peng, 2022). Literacy and numeracy are no longer just academic goals, but are also the key to individual success in facing an increasingly complex and rapidly changing world.

The policy of the Ministry of Education and Culture (Kemendikbud) to eliminate the National Examination (UN) and replace it with the National Assessment is claimed to be the right policy for the current conditions and needs of the world of work (Kafai, 2022; Tinmaz, 2022). This policy will have a greater impact on schools and students. Islamic education in Indonesia has an important role in building character and student literacy, especially in the context of changes in education policy, such as the elimination of the national exam by the Ministry of Education and Culture. This decision reflects an effort to shift the focus from single-exam-based assessments to a more holistic approach in assessing student progress. In this case, Islamic education plays a strategic role by emphasizing aspects of student character and competence.

The importance of literacy and numeracy in the context of modern education cannot be ignored. Literacy is not only related to the ability to read and write, but also the ability to think critically, understand complex information, and communicate ideas effectively (Knoth, 2024; Taba, 2022). Meanwhile, numeracy involves mathematical skills that include understanding concepts, applying them in real situations, and solving problems. In facing the Computer-Based National Assessment (ANBK) which increasingly demands high literacy and numeracy skills, madrasahs need to develop appropriate strategies to ensure that students can achieve the expected standards in the exam.

One of the efforts to improve student literacy is to develop a strategy based on the results of a computer-based national assessment. The National Assessment (AN) is predicted to be a new hope for improving the literacy culture of Indonesian students (Casal-Otero, 2023; Potter, 2022). In the context of Islamic education, the Ministry of Religious Affairs (Kemenag) also supports strengthening literacy through programs that integrate Islamic values with reading and writing skills (Busse, 2022; Su, 2023). Kemenag emphasizes the importance of literacy that not only includes academic skills, but also an understanding of religious texts, so that students can develop critical and analytical thinking skills in accordance with Islamic teachings. Thus, the synergy between the national assessment and Kemenag policies is expected to create a more literate and characterful generation.

The implementation of the Computer-Based National Assessment (ANBK) aims to assess the quality of each school, madrasah, and equivalent program at the elementary and secondary education levels (Hermann, 2022; Laupichler, 2022). The assessment of the quality of this educational unit is based on the learning achievements of students including literacy, numeracy, and character, as well as on the quality of the learning process and educational environment that supports the creation of effective learning. The data is obtained through three main instruments, namely the Minimum Competency Assessment (AKM), character survey, and learning environment survey. The implementation of this assessment is needed to improve the quality of education, by providing accurate information to support improvements in the learning process, so that it has an impact on improving student learning outcomes.

The purpose of the Computer-Based National Assessment (ANBK) is not only to assess school quality, but also has various other targets, such as monitoring the development of school quality over time, identifying gaps in the education system (for example, gaps between socio-economic groups within educational units, between public and private schools in a region, between regions, or between groups based on certain attributes), and evaluating the development of student competencies and characters. In addition, the Computer-Based National Assessment (ANBK) also aims to provide an overview of the characteristics of effective educational units (Lewkowich, 2022; Tuffour, 2022). Participants in the Computer-Based National Assessment (ANBK) are fifth grade students, who are randomly selected as samples in the implementation of the national assessment.

Computer-Based National Assessment (ANBK) is one of the important instruments in measuring the level of student competence in various fields, including literacy and numeracy. The importance of Computer-Based National Assessment (ANBK) requires madrasahs to develop effective strategies to prepare students to face the exam. These strategies include innovative learning methods, the use of technology in the learning process, improving teacher competence, parental support, and other factors that influence the effectiveness of education in madrasahs (Khera, 2022; E. Vraga, 2022). Madrasahs have a significant role in education in Indonesia, especially in shaping the character and intelligence of students. However, the challenges faced by madrasahs are not few, especially in dealing with the development of information and communication technology that continues to grow.

Minimum Competency Assessment (AKM) is an assessment of basic competencies required by all students in educational units. This Minimum Competency Assessment aims to develop self-capacity and students can participate positively in their surroundings such as family, school, and society. The assessment in this Minimum Competency Assessment is divided into 2 categories, namely Literacy and Numeracy. Literacy is a skill or activity that is able to interpret information critically, so that when knowing knowledge and technology can be used as an effort to improve the quality of life. Meanwhile, numeracy is a person's ability to formulate, interpret, and apply mathematics as a context, including the ability to reason critically, and be able to use concepts, procedures, and facts that describe, explain, examine, and estimate an event or phenomenon.

In facing the National Assessment, the school environment and the role of teachers greatly influence student success. Teachers and their teaching skills have a great influence in developing student learning motivation. The educational goals of a nation are difficult to achieve without competent and standardized educators. With all the competencies and attitudes possessed by teachers, this is never separated from the strategy developed by the principal as an educator. This is also related to how the principal's strategy is in preparing students to face the National Assessment.

Literacy and numeracy skills are part of a person's ability to use reasoning. Reasoning is the ability to analyze and understand statements, through activities by manipulating language and mathematical signs encountered in everyday life to manifest the affirmation verbally and in writing, so that numeracy and literacy play a role as the most important units to face everyday problems and answer the challenges of the 21st century.

In the context of globalization and increasingly tight competition, it is important for Madrasah Ibtidaiyah to continue to innovate and adapt to the times. By implementing effective strategies in improving literacy and numeracy, madrasahs can ensure that their students are ready to face the challenges of the modern world. Madrasah Ibtidaiyah has a central role in providing quality education for Indonesian children with a holistic Islamic approach. However, the challenges in improving literacy and numeracy in the madrasah environment are still quite large. Limited resources, lack of use of technology in learning, and the need for more effective strategies in dealing with the Computer-Based National Assessment (ANBK) are some of the factors that need to be considered.

Madrasahs that are able to implement these strategies well can be one of the determining factors in improving Indonesia's educational achievements at the international level. With a strong emphasis on literacy and numeracy, madrasahs can also make a greater contribution to the country's social and economic development. Students' good reading, writing, and arithmetic skills will open the door to wider access to higher education, better job opportunities, and the ability to actively participate in community development.

Based on initial observations at the South Jakarta Elementary Madrasah, researchers found phenomena including the madrasah's strategy in improving literacy and numeracy that was not optimal, the need for teacher training related to improving literacy and numeracy such as teaching methods to improve literacy and numeracy, creating questions related to Minimum Competency Assessment questions, how to process and evaluate the results of the Computer-Based National Assessment (ANBK).

The results of literacy and numeracy in ANBK 2024 in DKI Jakarta at the Madrasah Ibtidaiyah level are generally good. Madrasah Ibtidaiyah based on literacy achievement data has achieved good, but the report card score is still not optimal. This is because several indicators are still below achievement. The proportion of participants achieving the above is still 16.53%. The ability of each sub-indicator is still below 62% on average. While in the numeracy results, the achievement indicator is moderate. The proportion of participants achieving the above is still 5.54%. The ability of each sub-indicator is still below 65% on average.

Meanwhile, the literacy results of the Computer-Based National Assessment (ANBK) in South Jakarta City at the Elementary Madrasah level were overall good. The combined literacy achievement results of State and Private Elementary Madrasahs reached good, State Elementary Madrasahs reached good and Private Elementary Madrasahs reached good.

From the education report card data, literacy and numeracy achievement results need to be improved. A strategy is needed to improve literacy and numeracy. Based on education report card data and initial observations of activities that can improve literacy and numeracy achievements in the Computer-Based National Assessment (ANBK) in South Jakarta, there is Madrasah Ibtidaiyah Pembangunan with a value that has reached good.

Madrasah Ibtidaiyah Pembangunan Universitas Indonesia Negeri Jakarta is a formal educational institution under the Ministry of Religion located in the city of South Jakarta. Madrasah Ibtidaiyah Pembangunan Universitas Indonesia Negeri was founded by alumni of Universitas Indonesia Negeri Syarif Hidayatullah Jakarta who have quality in accordance with its vision, namely: "To become a leading educational institution in the development of Islam, science, and Indonesianness, by appreciating the potential of students.". As an Islamic-based school, Madrasah Ibtidaiyah Pembangunan Universitas Indonesia Negeri Jakarta has a great role in education. The development of science, Islam, and Indonesianness is packaged in such a way as to make students of Madrasah Ibtidaiyah Pembangunan have good character, especially in great interest in reading books. In early 2016, the school launched a literacy movement to be implemented at every level of the Madrasah Ibtidaiyah class in shaping students.

Based on the advantages and activities of the State University of Indonesia Development Elementary School related to the achievement of the minimum competency assessment results, the researcher determined the State University of Indonesia Development Elementary School as a place for madrasah research that has strategies and ecosystems that support improving literacy and numeracy from the results of the Computer-Based National Assessment (ANBK).

Theories that can support this research include: 1) constructivism theory. This theory emphasizes that learning is an active process in which students build new knowledge based on existing experience and knowledge. In the context of madrasas, constructivist approaches can be applied to improve literacy and numeracy through interactive teaching methods; 2) Problem-Based Learning Theory. This theory supports learning that focuses on solving real problems. Madrasah strategies can include activities that link literacy and numeracy to everyday

situations to make learning more relevant and engaging; 3) Multiple intelligences theory. Proposed by Howard Gardner, this theory identifies the different types of intelligence that students have. Madrasah can develop strategies that accommodate various student intelligences in improving literacy and numeracy; 4) Learning motivation theory. This theory, as put forward by Deci and Ryan, focuses on the factors that motivate students in learning. An effective madrasah strategy should consider students' motivation to increase their involvement in literacy and numeracy; 5) Formative assessment theory. This theory focuses on the use of assessments to support the learning process, not just as an evaluation tool. Madrasah strategies that utilize feedback from assessments can help students understand their strengths and weaknesses in literacy and numeracy; 6) Collaborative Learning Theory. This theory emphasizes the importance of interaction and collaboration between students. Madrasas can implement strategies that encourage group cooperation to improve literacy and numeracy skills; 7) Educational Technology Theory. Considering the use of technology in learning, this theory is relevant to computer-based national assessments.

RESEARCH METHOD

Research Venue

The research was conducted at Madrasah Ibtidaiyah Pembangunan Univeristas Indonesia Negeri Jakarta which is a private madrasah that also seeks to improve students' literacy and numeracy skills through various strategies relevant to ANBK (Dalgıç, 2024; Kass-Hanna, 2022). Madrasah Ibtidaiyah Pembangunan Universitas Indonesia Negeri Jakarta is a private madrasah located in the academic environment of the State Islamic University (UIN) Jakarta (C. H. Wang, 2022; Yagi, 2022). This madrasah has a vision to improve students' literacy and numeracy skills through innovative strategies that are relevant to the implementation of ANBK.

The research identifies various approaches used by teachers to improve students' literacy and numeracy skills, both through conventional and modern methods. As a private madrasah, MI Pembangunan has a program that involves the role of parents in supporting student success.

Research Informant

The informants in this research are: 1) Head of Madrasah MI Pembangunan, as a policy maker in preparing literacy and numeracy education strategies; 2) Class teachers and subject teachers who are directly involved in the literacy and numeracy learning process; 3) Grade 5 and 6 students in the two madrasas who are participants in ANBK; 4) ANBK Operator, who is responsible for the technical management of computer-based ANBK implementation.

Data Collection Techniques

The data collection technique can be obtained from data sources. In this study, the research data sources are divided into two, namely: Primary data is obtained through interviews, observations, and direct documentation in the field. This information was obtained from madrasah heads, teachers, students, and operators involved in ANBK in both madrasas. Secondary data was obtained from various supporting sources such as madrasah program documents, ANBK evaluation records of the previous year, and literature related to strategies to improve literacy and numeracy in educational institutions.

RESULTS AND DISCUSSION

Intracurricular is part of the learning activities that take place in the classroom according to the curriculum structure that has been determined by the educational institution (Adjin-Tettey, 2022; Y. Wang, 2023). This activity is the core of the formal learning process that must

be followed by every student. Intracurricular activities are designed to achieve learning outcomes that have been determined in the curriculum, both in the cognitive, affective, and psychomotor domains. Intracurricular activities have several main characteristics, namely: 1) Structured and formal which are organized based on the official curriculum determined by the government or educational institution.; b) Competency-oriented: which aims to achieve competencies that have been determined in the curriculum, such as literacy and numeracy skills; c) Integrated in Subjects, namely intracurricular activities cover various core subjects, including Indonesian, Mathematics, Science, and religious subjects; d) Intracurricular learning can be carried out with various approaches, such as text-based learning, class discussions, and project-based learning (Project-Based Learning)

Intracurricular activities are designed to improve the quality of learning with various methods that are appropriate to the needs and development of students. One of the methods used is Text-based Learning, where teachers utilize various reading materials to train students' reading and analysis skills. Through this activity, students are invited to understand the contents of the reading and compile reports of reading results systematically.

In addition, Project-Based Learning (PBL) is also implemented, which allows students to work on project-based assignments to connect academic concepts to real life. This approach not only improves students' understanding of the material, but also develops critical and collaborative thinking skills. To support the development of digital literacy, the use of digital literacy modules, such as e-books and educational applications, is implemented, which help students improve their reading skills and understand information from various digital sources.

In preparation for the exam, Madrasah Ibtidaiyah Pembangunan also implemented a computer-based exam simulation (ANBK). This exercise familiarizes students with computer-based questions, increases their comfort in using technology, and hones their readiness to face the real exam.

The implementation of intracurricular activities in madrasahs and schools in Indonesia is based on various educational regulations and theories that support holistic and flexible learning. One of the main regulations is Permendikbud No. 12 of 2024 concerning the Independent Curriculum, which provides flexibility for educational units to adjust learning to students' needs. This curriculum emphasizes flexibility in teaching methods and a project-based approach, which aims to improve students' critical thinking and problem-solving skills in real-life contexts. For general subjects, Madrasah Ibtidaiyah Pembangunan implements the Independent curriculum in accordance with Permendikbud No. 12 of 2024.

Meanwhile, for the Islamic Religious Education Subject of Madrasah Ibtidaiyah Pembangunan, the regulation used as a reference is KMA No. 450 of 2024, which regulates the implementation of the curriculum by emphasizing the values of Rahmatan lil Alamin.

The implementation of intracurricular activities at Madrasah Ibtidaiyah Pembangunan aims to improve the quality of learning and shape students' characters based on academic and Islamic values. With a planned program, various aspects of student development can be improved, including: 1) Improving literacy and numeracy. Programs such as daily reading, project-based learning, and daily contextual practice questions are applied to hone students' reading, writing, and numerical thinking skills. This approach helps students understand the concepts of literacy and numeracy more deeply and are able to apply them in everyday life; 2) Readiness to face Computer-Based Exams (ANBK) as part of the preparation for the Computer-Based National Assessment (ANBK), students are accustomed to digital-based

practice questions. This aims to improve their understanding of question patterns and train their skills in using technology as a learning evaluation tool; 3) Strengthening student character through the implementation of the Pancasila Rahmatan Lil Alamin Student Profile Strengthening Project (P5RA), students are taught to internalize the values of Pancasila and Islam in their lives. This program encourages them to become individuals with noble morals, have a tolerant attitude, and are able to contribute positively to society.

Intracurricular strategies play an important role in improving students' literacy and numeracy by implementing various systematic, structured, and curriculum-based learning approaches. Literacy includes reading, writing, understanding, and critical thinking skills in processing information. Intracurricular strategies implemented at Madrasah Ibtidaiyah Pembangunan to improve literacy include: 1). Text-based learning where teachers provide various types of texts (narrative, descriptive, expository, and argumentative) for students to analyze. 2). Daily reading programs are carried out every morning before learning begins, students read books or short texts for 15 minutes. Teachers provide a reading corner in the classroom to improve reading habits. 3). Reflective writing where students write short essays or reflective reports after reading a material. Student writing is compiled into a class book or published in the school library. 4). Project-Based Learning (PBL), Students are given project-based assignments that require exploration, analysis, and presentation of results.

In the intracurricular activities of Madrasah Ibtidaiyah Pembangunan, several strategies are implemented to improve numeracy. Numeracy is an important skill that includes the ability to think logically, understand mathematical concepts, and apply them in everyday life. To improve students' numeracy skills at MI Pembangunan, various effective and research-based intracurricular strategies are implemented, including: 1) Daily contextual exercises. Students are given one or two real-life-based questions every day to work on and discuss; Math Games Simulation; 2) Numeracy-based thematic learning. This strategy integrates numeracy with other subjects, such as reading graphs in social studies or calculating materials in science; 3) Getting used to ANBK format questions. Teachers routinely provide questions based on the Computer-Based National Assessment (ANBK) in daily evaluations and school exams.

Extracurricular

Extracurricular activities in madrasahs are activities carried out outside of main class hours to develop students' interests, talents, social skills, and Islamic values. Based on research results in several madrasahs, extracurricular activities have a strategic role in improving character, academic skills, and students' readiness to face global challenges.

Extracurricular activities in madrasahs can be categorized into three main aspects: 1) Strengthening Islamic character through activities such as tahfidz, tadarus, congregational prayer, and Islamic studies; 2) Development of literacy and numeracy skills, for example the Madrasah Literacy Movement, math clubs, and data-based experiments; 3) Strengthening social and leadership skills in Scouts, OSIS, and PHBN.

Research conducted at Madrasah Ibtidaiyah Pembangunan shows that extracurricular activities based on religion have a significant influence in shaping the religious character of students. These activities not only improve their understanding of Islam, but also build positive habits that have an impact on daily life. 1) Improving the Quality of Al-Qur'an Reading through Tahfidz and Tadarus; 2) Islamic Studies in the Commemoration of Islamic Holidays (PHBI); 3) Strengthening Spiritual Discipline through Congregational Prayer and Practicing

Prayer Congregational prayer activities that are carried out routinely train students to be more disciplined in carrying out worship.

Extracurricular activities at Madrasah Ibtidaiyah Pembangunan are designed to support the strengthening of literacy, numeracy, and character building of students. Through various structured programs, students gain a more comprehensive and applicable learning experience, so that they not only develop in academic aspects, but also in critical thinking skills and strong personalities.

Literacy-based extracurricular activities contribute greatly to improving students' reading, writing, and analytical thinking skills. Some of the programs implemented include: 1) Madrasah Literacy Movement (GLM). Students are encouraged to read at least one book every week and write a reflection of their reading results; 2) Public speaking and debate club. This program helps students improve their oral communication and argumentation skills. Students are trained to speak in public with confidence, express their opinions logically, and defend their arguments well.

Numeracy-based extracurricular activities aim to help students understand mathematical concepts in a more applicable and contextual way. Some of the programs run include: 1) Mathematics Club and MIPA Workshop; 2) Project-Based Numeracy Students are given project-based assignments that involve analyzing data from social activities or the surrounding environment.

The results of the study at Madrasah Ibtidaiyah Pembangunan showed that student involvement in extracurricular activities based on Islam, leadership, and nationality had a significant impact on shaping their character and social skills. Various programs implemented helped students in building attitudes of discipline, responsibility, social awareness, religiosity, and creativity.

Formation of Discipline, Responsibility, and Mutual Cooperation Character through Scouting and Leadership. Scouting extracurricular activities at Madrasah Ibtidaiyah Pembangunan play an important role in instilling discipline, cooperation, and responsibility in students. Through various marching exercises, camping, and social services, students are trained to work together in teams, face challenges, and have concern for the environment and the surrounding community.

Instilling Islamic Religious and Moral Values through the Tahfidz Program and Islamic Studies. The Tahfidz Al-Qur'an Program provides students with the opportunity to memorize and understand the meaning of holy verses, which not only increases their love for the Qur'an but also forms a strong religious character.

Infrastructure

Educational infrastructure plays an important role in creating a conducive, effective, and innovative learning environment. Research conducted at MI Pembangunan shows that good infrastructure management can improve literacy, numeracy, and technology-based skills for students. Infrastructure that supports education in madrasas includes: 1). Digital and physical libraries to improve student literacy. 2). Mathematics and science laboratories to strengthen practice-based understanding of numeracy. 3). Learning Management System (LMS) to support online learning and digital evaluation. 4). Literacy zones and school bulletin boards as a means of publishing student work. 5). Green open spaces and interactive media that support project-based learning and exploration.

Observation results at Madrasah Ibtidaiyah Pembangunan show that digital libraries have become part of the literacy strategy at the madrasah. The Madrasah Ibtidaiyah Pembangunan Library provides data-based collections, graphics, and interactive materials to support numeracy. The impact of digital libraries improves information literacy skills and makes it easier for students to get relevant reading materials. Madrasahs have now adopted a Learning Management System (LMS) to support online learning and digital-based evaluation. MI Pembangunan uses platforms such as Google Classroom, madrasah e-learning and Moodle for literacy and numeracy learning. Digital-based evaluation is implemented through Google Form and automatic assessment software. The impact of these activities is that learning becomes more flexible, evaluation is faster, and students are more independent in accessing materials. The impact of infrastructure on improving literacy and numeracy is: 1). Improving digital literacy and numeracy. The existence of a digital library and LMS helps students access teaching materials more flexibly. Class wall magazines and student publications increase motivation to write and think critically, 2). Strengthening Technology-Based Numeracy. The use of mathematics laboratories and educational software strengthens students' understanding of abstract concepts. Computer-based ANBK simulations familiarize students with digital evaluations and improve their readiness for exams, 3). Student Readiness in the Digital Era. Digital infrastructure ensures inclusive access to learning, including for students with special needs. Green zones and educational parks provide a more interactive outdoor learning experience.

The results of the study show that well-designed infrastructure in madrasas has a significant impact on improving literacy, numeracy, and student readiness in the digital era. With the right infrastructure strategy, madrasas can 1) Improve digital literacy through technology-based libraries and LMS; 2) Develop numeracy through interactive laboratories and digital-based evaluations; 3) Accustom students to critical and analytical thinking through publication media and school bulletin boards; 4) Create an adaptive and inclusive learning ecosystem, ensuring that every student gets equal access to education.

Implementation of Strategies to Improve Literacy and Numeracy

Intracurricular

The strategy for improving literacy and numeracy in intracurricular activities in madrasahs aims to develop students' reading, writing, critical thinking, and mathematical reasoning skills. The implementation of this strategy is carried out through a text-based approach, project learning, and technology integration in the learning process. Based on the results of research at MI Pembangunan, this strategy shows a significant increase in students' academic abilities (Kelly, 2022; Khan, 2022). The strategy for implementing literacy in intracurricular activities is carried out through:

Daily reading program. Students are directed to read for 15 minutes before the lesson begins. Reading reflections are published in class bulletin boards or anthology books to increase reading and writing motivation (Choukou, 2022; E. K. Vraga, 2022). The impact of these activities improves students' reading comprehension and writing skills and gets students used to analyzing texts and conveying ideas in writing.

Project-Based Learning (PBL) (Liu, 2022; Tully, 2022). Students work on literacy-based projects, such as making daily expense reports, writing essays, or making survey data graphs. Each project is linked to real life and themes, such as PHBN (National Holiday Commemoration) and the values of Rahmatan lil Alamin. The impact of these activities

improves critical thinking and problem-solving skills and builds connections between literacy and numeracy in everyday life.

Integration of literacy in thematic subjects. Each subject is associated with literacy, for example in social studies, students read and analyze demographic data. Data-based learning uses graphs and statistics in social studies and science to link understanding of literacy and numeracy (Laupichler, 2023; Urstad, 2022). The impact of the activity increases understanding of texts in various disciplines and helps students understand data-based information more broadly.

The strategy for implementing numeracy in intracurricular activities carried out by MI Pembangunan is through: Daily contextual practice questions. Students are given one or two real-life numeracy questions every day. The impact of these activities helps students understand the application of mathematics in everyday life and improves data-based problem-solving skills. Use of math games (GASING). The GASING math game is applied to help students understand basic mathematical operations in a fun way. Students practice fast counting and logical thinking through game-based methods (Popa, 2022; Southworth, 2023). The impact of these activities reduces students' anxiety about mathematics and improves their understanding of basic numeracy concepts more quickly. Digital-based ANBK simulations through a computer room equipped with an ANBK simulation system, where students practice computer-based questions every week. Automatic software-based evaluation is used to monitor learning outcomes and provide fast feedback. The impact of these activities is that students are better prepared to face computer-based exams (ANBK) and improve students' digital skills in understanding numeracy question patterns.

Strategy for implementing technology integration in literacy and numeracy learning through; Use of Learning Management System (LMS). Madrasahs adopt Google Classroom, Edmodo, and Moodle to support online practice questions and discussions. Using madrasah e-learning provided by the Ministry of Religion. LMS is used as a medium for digital evaluation, project-based practice questions, and literacy discussions (Zhan, 2022; Zhao, 2022). The impact of these activities increases flexibility in literacy and numeracy learning and makes it easier for teachers to monitor student progress. Digital-based evaluation. Teachers use Google Form and numeracy analysis software to evaluate student understanding. An automatic assessment system is implemented to provide fast feedback. The impact of these activities is that evaluation becomes more efficient and accurate and makes it easier for teachers to identify students who need additional guidance.

Based on the results of research at Madrasah Ibtidaiyah Pembangunan, the strategy of increasing literacy and numeracy in intracurricular activities shows a significant positive impact on students in increasing literacy, namely the daily reading program and reading reflection improve students' understanding of texts and writing skills (Dogruel, 2022; Hoo, 2022). Project-based learning helps students think critically and understand the relationship between literacy and numeracy.

Positive impacts of numeracy improvement are Daily contextual practice questions help students understand mathematics in real life. ANBK simulations improve students' readiness to face digital-based exams. In technology integration, namely LMS and digital-based evaluations, learning efficiency is increased. Numeracy software and interactive media help accelerate students' understanding of mathematical concepts and data.

Extracurricular

Extracurricular activities in madrasahs not only function as a means of developing students' interests and talents, but also as an effective medium to improve literacy and numeracy skills. Based on the results of research at Madrasah Ibtidaiyah Pembangunan, various extracurricular programs that are systematically designed have been proven to be able to improve students' understanding of texts, reasoning skills, and numeracy-based data processing.

Extracurricular strategies that support the improvement of literacy and numeracy in madrasahs include 1). Madrasah Literacy Movement (GLM) and research clubs to improve reading, writing, and critical thinking skills; 2). MIPA workshops and mathematics clubs to strengthen the understanding of numeracy concepts in an applied manner; 3). project-based approaches and interactive numeracy discussions to connect literacy and numeracy concepts with real life.

The literacy implementation strategy in extracurricular activities carried out by MI Pembangunan is; Madrasah literacy movement which is carried out once a week with the agenda of reading together, literacy discussions, and publication of student writing on the wall magazine. This program is carried out through competitions and publication of student writing. The impact of the activities is that students become more accustomed to reading and understanding various types of texts critically and improve writing skills through publication of reflections and articles on the school wall magazine. Literacy research and study club, students are invited to conduct simple research based on social data and compile literacy-based reports. Public speaking and debate, this program aims to improve public speaking skills, argumentation, and understanding of literacy issues. The impact of this activity is that students become more confident in expressing opinions and critical thinking skills and communication skills increase.

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The results of the study at MI Pembangunan showed that the implementation of extracurricular strategies in improving literacy and numeracy gave significant results. The Madrasah Literacy Movement and research clubs improved reading and writing skills. Public speaking and debate improved communication and critical thinking skills. The Mathematics Club and the MIPA Workshop improved analytical and logical thinking skills. Project-based learning strengthened students' understanding of academic concepts in real life.

Infrastructure

Educational infrastructure plays a key role in creating a learning environment that supports improving literacy and numeracy in madrasas. Based on research at MI Pembangunan, a systematic infrastructure management strategy can improve student access to learning resources, strengthen academic competencies, and support technology-based learning. The development of infrastructure that supports literacy and numeracy in madrasas includes 1) Digital libraries and reading corners to improve reading habits; 2) Mathematics and science laboratories to support practice-based learning; 3) Literacy zones and school bulletin boards as a medium for publishing student work; 4) Learning Management System (LMS) and digital-based evaluation to support online learning.

Implementation of infrastructure to improve literacy through several activities, namely; Optimization of digital libraries. The Madrasah Ibtidaiyah Pembangunan Library was developed into an application-based digital library, allowing students to access e-books and educational journals with their personal accounts. The book collection includes fiction and non-fiction books as well as data-based literacy materials. Flexible access through digital platforms allows students to learn anytime and anywhere. The impact of these activities is Improving students' digital literacy and information literacy skills and facilitating access to relevant reading materials. Reading corners and each. Each class has a reading corner to get students used to reading before learning. The class wall magazine is used as a medium for literacy reflection, where students write and publish the results of their reading. The impact of the activity is to improve students' daily reading habits and writing motivation as well as strengthen communication and critical thinking skills.

The use of Learning Management System (LMS) in literacy. In the activity, Google Classroom is used, e-learning madrasah to support literacy exercises and online discussions. Students can access digital materials, do literacy exercises, and take online evaluations. The impact of these activities is that students are accustomed to online learning and help improve technology-based literacy skills and make it easier for teachers to provide data-based feedback.

To implement ANBK simulations and digital-based evaluations, Madrasah Ibtidaiyah Pembangunan is equipped with a computer room that allows students to practice computer-based questions every week. The Madrasah utilizes technology-based numeracy education software, such as mathematical simulations and interactive applications. Numeracy-based e-books are developed to help students learn mathematical concepts more flexibly. The results of the study show that the right infrastructure management strategy in the madrasah has a significant impact on improving student literacy and numeracy. Digital libraries and reading corners help students access quality reading materials to help improve students' literacy skills. The use of LMS and online evaluations improve digital literacy skills. Mathematics laboratories and numeracy experiments strengthen understanding of mathematical concepts. ANBK simulations help students get used to computer-based exams. Numeracy software and digital media improve learning effectiveness.

With this strategy, madrasahs can create Smart Madrasah & Digital Ecosystem, support technology-based adaptive learning, and ensure more inclusive and efficient access to education.

Based on the analysis of various findings and theoretical frameworks used, this study found a new concept as a formal finding, namely Intracurricular, extracurricular, and infrastructure strategies resulting in Smart Madrasah with Smart Learning & Assessment that improves understanding of literacy and numeracy in a personal, adaptive, and technology-

based manner, strengthening STEM-based student competitiveness through numeracy and literacy competitions, and Digital Ecosystem that supports a technology-based learning ecosystem to create an innovative and inclusive educational environment.

CONCLUSION

This study highlights the importance of literacy and numeracy improvement strategies in Madrasah Ibtidaiyah in facing the Computer-Based National Assessment (ANBK). Based on the results of the study, the intracurricular activity strategy implemented by MI Pembangunan UIN Jakarta includes the integration of literacy in all subjects, the use of problem-based learning methods, and technology-based approaches. This strategy helps improve students' critical thinking skills in understanding and analyzing texts and numeracy concepts.

Extracurricular activity strategies such as school literacy movements, reading group coaching, and technology-based numeracy training programs also contribute to increasing student motivation in developing literacy and numeracy skills outside of class hours. The strategy of utilizing infrastructure to support literacy and numeracy-based learning still needs to be improved, especially in the use of technology and digital resources. Madrasahs that have utilized digital learning platforms show better results in ANBK achievements. Overall, the results of the study indicate that effective strategies in improving literacy and numeracy can help students be better prepared in facing ANBK and improve the quality of learning in Madrasah Ibtidaiyah.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.
Author 2: Conceptualization; Data curation; In-vestigation.
Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest

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