Education and Human Development Journal Vol. **10** No.**3**, 287–301 (2025)
doi: 10.33086/ehdj.v10i3.8160

EHDJ | Education and Human Development Journal

ARTICLE

Implementing Computer-Based National Assessment in the Package C Equivalency Program: A Case Study of PKBM Tunas Mekar, Cilacap Regency

Radivan Bagas Kusuma* and Joko Sutarto

Universitas Negeri Semarang, Semarang, Indonesia
*Corresponding author: ivanbagas25@students.unnes.ac.id

(Received: 07 October 2025; Accepted: 11 November 2025; Published: 30 December 2025)

Abstract

This study aims to analyze the implementation of the Computer-Based National Assessment *(Asesmen Nasional Berbasis Komputer/ANBK)* in the Package C equivalency program at PKBM Tunas Mekar, Cilacap Regency, and to identify the supporting and inhibiting factors encountered by the institution. This issue emerges from limited technological infrastructure, low levels of digital literacy among learners, and regulatory demands requiring all educational providers—including non-formal education units—to administer computer-based national assessments. Employing a qualitative case study design, the research focuses on the internal dynamics of the institution in responding to educational policy mandates. The study was conducted from August to October 2025. Data were collected through interviews with four key informants (one PKBM manager, one Package C tutor, and two Package C learners), direct observations during the ANBK implementation, and a review of supporting documents. Data analysis followed the interactive model of Miles, Huberman, and Saldaña, encompassing data reduction, data display, and conclusion verification through source and technique triangulation.The findings indicate that the implementation of ANBK at PKBM Tunas Mekar has generally aligned with national standards, as evidenced by the preparation of required facilities, dissemination of information, simulation activities, and tutor assistance. Supporting factors include government policy support, effective internal coordination, and the availability of digital literacy training. Meanwhile, the primary obstacles derive from the low digital literacy of older learners and technical disruptions related to the central examination server. This study underscores the need for policy support tailored to local institutional contexts and highlights the importance of enhancing PKBM capacity to adapt to the demands of the digital era.

Keywords: Computer-Based National Assessment, Non-Formal Education, PKBM Tunas Mekar

1. Introduction

Education is recognized as a strategic instrument for shaping the quality of human resources and determining a nation's competitiveness. The transformation of Indonesia's learning evaluation sys-

 ISSN 2541-0156 (print), 2599-0292 (online).

tem—marked by the replacement of the National Examination with the Computer-Based National Assessment *(Asesmen Nasional Berbasis Komputer/ANBK)* in 2021—signifies a paradigm shift from solely measuring cognitive achievement to generating a more holistic portrayal of educational inputs, processes, and outcomes [1, 2, 3]. ANBK assesses not only reading literacy and numeracy but also character development and learning environments, thereby offering a more comprehensive representation of the educational ecosystem. Consequently, all educational units, including equivalency programs within non-formal institutions such as Community Learning Activity Centers (PKBM), are required to implement this assessment.

The existing studies on the Asesmen Nasional Berbasis Komputer (ANBK) remain largely concentrated on formal education settings—namely elementary, junior high, and senior high/vocational schools—while the non-formal education sector has received comparatively limited scholarly attention. This situation creates a research gap in understanding how institutions such as Pusat Kegiatan Belajar Masyarakat (PKBM) interpret and implement digitally based national policies despite constraints related to resources and institutional legitimacy [4]. Analyses of national assessment practices indicate that ANBK plays an important role in monitoring educational progress; however, disparities in infrastructure and institutional capacity across regions remain substantial [5].

Equality education programs are designed to safeguard the educational rights of citizens who are not accommodated by the formal school system, without age limitations, while also serving as an alternative pathway for individuals who have experienced school dropouts or socio-economic constraints. The implementation of the Independent Curriculum within equality education demands curriculum flexibility, competency-based assessment practices, and the integration of adaptive learning technologies [6]. Studies on blended learning in Package C programs within PKBM demonstrate that the combination of face-to-face and online modalities can broaden access while preserving the quality and depth of learning interactions [7]. Moreover, evidence from the implementation of Package C across various non-formal education units underscores the strategic role of PKBM as an alternative institution that supports the continuity of secondary education for vulnerable and marginalized groups [8].

Amid increasing demands for the digitization of educational assessments, the strengthening of digital literacy and technical competence has become a critical prerequisite, particularly for learners and operators within equality education programs. Advanced computer-operator training conducted in PKBM settings has been shown to enhance participants' technical proficiency in managing computer-based devices and digital applications—an essential foundation for independently administering ANBK [9]. Learners' digital literacy also constitutes a key determinant in meeting the requirements of the Minimum Competency Assessment and in adapting effectively to online learning platforms [10]. Digital literacy mentoring initiatives implemented in PKBM Abdi Pertiwi and PKBM Insan Madani, for instance, demonstrate increased learner engagement in digital environments and more reflective, secure, and purposeful use of ICT tools [11].

The andragogy approach is an essential foundation in designing learning for adult learners in equality programs, especially when learning shifts to online mode. A study on online learning in equality education found that learning management that adjusts to the learning rhythm of adults can increase the independence and technological readiness of learning citizens [12]. Another study at PKBM Jakarta indicates that an online learning strategy designed to effectively improve the motivation and learning outcomes of Package C residents [13]. In line with that, the implementation of blended learning based on the online application at PKBM Budi Utama Surabaya encourages more flexible, efficient, and able to increase students' interest in learning post-pandemic [14].

However, the implementation of ANBK in PKBM is influenced not only by pedagogical design but also by the readiness of infrastructure and the socio-economic conditions of the learning commu-

nity. Data from the Central Statistics Agency indicate that the school participation rate for children aged 7–12 has surpassed 99%. In contrast, participation among those aged 16–18 has remained stagnant at approximately 72–74% as of 2024, highlighting a persistent gap in access to upper secondary education [15]. Furthermore, studies on elementary schools' preparedness for ANBK reveal that comprehension of technical guidelines and the ability to adapt to the education report card platform are critical factors determining the effectiveness of data-driven follow-up actions [16]. The disparities in internet connectivity, device ownership, and network quality across regions further illustrate the digital divide, which directly affects equitable participation in national assessments [17].

This gap is even more apparent when comparing the readiness of infrastructure between formal and non-formal education units. A study on education planning and standardization at PKBM Minda Utama Bandung City shows that the limitations of ICT facilities, financing support, and accreditation have a direct effect on the ability of institutions to meet national standards for education services, including the demands of implementing ANBK [18]. On the other hand, the development of a project-based ethno-STEAM learning model in Package C shows that the integration of local wisdom and contextual approaches is able to improve the numeracy literacy of learning citizens, even though technological means are still limited [19]. Efforts to improve the digital literacy of educators at PKBM Hati Nurani Bangsa through the training of interactive modules based on Book Creator show that strengthening the capacity of tutors is an important buffer for the successful implementation of computer-based assessments [20].

As the demands of digitalization continue to evolve, several PKBMs have begun to innovate by adopting more adaptive approaches to learning and assessment. The implementation of the SeTARA Online application in Package C programs across various PKBMs demonstrates that the integration of online platforms can broaden access to learning while simultaneously reducing reliance on traditional offline models [21]. The management of e-learning learning during the Covid-19 pandemic at PKBM Gema Tasikmalaya, explained that content management, schedules, and communication based on digital platforms are able to maintain continuity of learning and equality and prepare learning residents to face ICT-based assessments [22]. Other findings regarding the management of online learning at PKBM Lestari Banyuwangi show that the quality of planning, monitoring, and technical support is closely related to the learning outcomes of Package C, so it is relevant as a reference for other PKBMs that will organize ANBK [23].

At the policy and governance level, the successful implementation of ANBK in secondary schools is largely determined by the managerial capacity of educational leaders, the effectiveness of institutional planning, and coordination with regional stakeholders. A study on ANBK management at the senior high school and vocational school levels within the East Java Education Office indicates that principals' instructional leadership, systematic resource mapping, and technical training for teachers constitute the primary determinants of effective and seamless assessments implementation [24]. Other research on the determinants of junior high school students' readiness for national assessments showed that self-efficacy, parental support, and previous experience using computers contributed significantly to students' psychological and technical readiness [25]. In the non-formal context, factors influencing the success of online platform-based learning at SKB 2 Samarinda include institutional management support, motivation of learning residents, and the availability of adequate digital infrastructure [26].

The dimension of tutor competence is also a determining factor in bridging curriculum policies and assessment practices in the field. A study on the pedagogic competence of tutors in the implementation of the Independent Curriculum in Package A equality education shows that the ability to design competency-based learning, utilize digital media, and conduct authentic assessments greatly affects the quality of citizens' learning experience [27]. In remote elementary schools, an evaluation of the implementation of ANBK showed that limited equipment, access to electricity, and technical sup-

port were not only operational constraints, but also had an impact on the comfort and confidence of students in doing assessments [28]. On the other hand, research on the influence of digital literacy on the digital awareness of learning citizens shows that the better the ability of students to learn to use the internet critically and safely, the higher their readiness to face based assessments.

The challenge of implementing ANBK in equality education does not only arise at the institutional level, but also at the individual level of learning citizens. The basic computer learning program designed as a preparation for ANBK for grade V students of SD Negeri 2 Neglasari has succeeded in increasing students' confidence and technical skills in using computer devices [29]. Another study related to the implementation of ANBK at SDN 24 Teluk Pakedai revealed that intensive mentoring and coordination between teachers, operators, and parents are the key to reducing students' anxiety about online assessments [30]. In equality education, socialization of digital literacy competencies to form smart digital citizenship at PKBM Harati emphasized that citizens' habituation of learning in productive and ethical digital activities can reduce resistance to technology while increasing confidence in facing computer-based assessments [31].

The experience of non-formal education units that have begun to organize ANBK independently shows dynamics that are not much different from formal units in remote areas. The implementation of ANBK at SDN 01 Benteng Hulu shows that the limitations of the internet network and the availability of devices force schools to make various technical adjustments and rescheduling to ensure the smooth assessment [32]. This phenomenon can be read through the lens of institutional planning theory that emphasizes how educational organizations respond to regulatory and normative pressures when new policies are enacted nationally [33]. On the other hand, policy implementation theory highlights the importance of clarity of objectives, consistency of rules, and capacity of implementers in influencing the degree of success of ANBK policy translation at the grassroots level [34].

The perspective of street-level bureaucracy places tutors, PKBM managers, and operators as frontline actors who have discretion in adapting ANBK policies in accordance with real conditions in the field. This discretion is reflected in daily decisions related to simulation scheduling, selection of implementation modes, and strategies for assisting learning residents who have limited digital literacy [35]. In the context of PKBM, the discretionary space is often wider than formal schools due to a more flexible organizational structure, limited resources, and strong influence of community social relations.

The integration of top-down and bottom-up perspectives in policy implementation studies allows for a more complete analysis of the process of implementing ANBK in PKBM. The public policy process model emphasizes that the success of implementation is not solely determined by the design of regulations, but also by the communication, coordination, and adaptability of local actors to the surrounding social, economic, and technological dynamics [36]. In the case of PKBM, this is reflected in the way managers take advantage of the support of the district PKBM forum, cooperation with the parent school, as well as access to training and technical assistance from related agencies.

From a conceptual perspective, ANBK is part of the global trend of assessment digitalization that prioritizes reliability, accuracy, and efficiency, while opening up opportunities for the integration of assessment data with an education quality assurance system. The study of computer-based assessment in the measurement of reading ability confirms that the use of technology allows the presentation of stimuli and question items that are more varied, adaptive, and in accordance with the context of the learning community's life [37]. However, this advantage depends on the readiness of the device, the network, and the ability of the participants to navigate the digital interface, which is often a weak point in the non-formal education unit.

Methodologically, the phenomenon of ANBK implementation in PKBM Tunas Mekar which acts as

an organizing unit as well as a parent institution for several other PKBMs is more appropriate to be analyzed through an in-depth case study approach. The case study design allows researchers to explore in detail the interactions between policies, institutional structures, and the day-to-day practices of actors in the field in specific contexts [38]. This approach is relevant to illustrate how PKBM with accreditation and infrastructure that is not yet ideal still strives to meet national standards for the implementation of assessments.

The selection of a qualitative approach provides space for researchers to capture the subjective experiences of tutors, managers, and learning residents in dealing with ANBK, including their perceptions of technical and psychological obstacles. Educational research with a qualitative approach emphasizes the importance of rich narrative data to understand the meaning behind the actions and decisions of actors [39]. Through in-depth interviews, participatory observations, and documentation studies, researchers can reconstruct the adaptation strategies carried out by PKBM in responding to the demands of computer-based assessments.

On the other hand, the selection of design and analysis techniques in this study is also guided by a qualitative inquiry framework that prioritizes the credibility, transferability, dependability, and confirmability of findings. The approach as described by [40] helps researchers devise systematic steps ranging from focus determination, data collection, to repetitive and reflective thematic analysis. Thus, the results of the study are expected not only to describe the situation in PKBM Tunas Mekar, but also to provide a conceptual contribution that can be considered by other PKBMs with similar characteristics.

PKBM Tunas Mekar in Cilacap Regency is a relevant locus because it has organized ANBK for residents to learn Package C as well as function as a parent institution for other PKBMs that are not yet independent in the implementation of assessments. Despite having a C accreditation status and facing limited facilities and digital literacy for learning residents, this institution still strives to meet national standards, including through scheduling arrangements, borrowing devices, intensive assistance, and coordinating with the district PKBM forum. Technical glitches such as central server constraints, network quality, and limited computer lab space confirm the existence of systemic challenges that are not entirely within the agency's control. This condition strengthens the urgency of research to understand adaptation strategies, supporting factors, and inhibiting factors for the implementation of ANBK in the context of non-formal education.

Academically, this research contributes to enriching the study of the implementation of ANBK in non-formal education units that have been relatively marginalized in the literature. Practically, the results of the research are expected to be the basis for the preparation of policy recommendations that are more sensitive to PKBM conditions, ranging from strengthening infrastructure, increasing the capacity of tutors and operators, to more sustainable institutional support schemes. For stakeholders at the regional and central levels, a deeper understanding of the dynamics of ANBK implementation in PKBM can help formulate interventions that are not only oriented towards administrative compliance, but also ensure fair access and quality of assessment experiences for citizens learning equality education. Based on this description, this study specifically answers:

1. How is the implementation of computer-based national assessment in the Package C equality program at PKBM Tunas Mekar, Cilacap Regency?
2. What are the supporting and inhibiting factors for computer-based national assessments faced by PKBM Tunas Mekar Cilacap Regency?

2. Methods

3. Research Methodology

This research uses a qualitative approach with a case study type. The selection of this approach is based on the purpose of the research to understand in depth the dynamics of the implementation of computer-based national assessments in the Package C equality program at PKBM Tunas Mekar, Cilacap Regency. The case study was chosen because the researcher was able to uncover the impact of assessment, supporting factors, and barriers [38].

3.1 Research Location and Time

The research location is at PKBM Tunas Mekar Cilacap. The research was carried out for two months, with the stages of activities including observation, data collection, verification, and analysis. The selection of this location is based on the status of PKBM Tunas Mekar as an institution that not only conducts assessments for its own learning residents, but also becomes the implementing parent for other PKBMs in the vicinity.

3.2 Theoretical Framework

The research instruments are compiled based on the principles of source triangulation, triangulation techniques, and documentation to maintain the validity of the data [39]. The research indicators refer to three main frameworks.

3.2.1 Institutional Planning Theory

First, the theory of planning educational institutions in its implementation, identifies three forms of external pressure that affect organizational planning, namely normative, coercive, and mimetic pressure. Normative pressure was born from professional standards and values that prevailed at that time, for example the policy that educational institutions refer to the national standards of Indonesian education. Coercive pressure arises due to education regulations that are binding, such as the obligation to carry out the Computer-Based National Assessment (ANBK). Meanwhile, mimetic pressure arises when imitating the way other institutions work that are considered recognized and more successful. This is very relevant to the context of PKBM Tunas Mekar which acts as the parent organizer of ANBK for other PKBMs in the vicinity.

This theory also emphasizes that education is not something neutral but full of social legitimacy and values in it. For example, PKBM not only functions as an organizer of equality education, but also as a symbol of the state's presence in providing educational rights to the needs of the community. Thus, the implementation of ANBK in PKBM can be understood as a step of institutional planning to maintain legitimacy in front of the community, the government, and the wider world of education. [33] asserts that institutional adjustment is driven more by the need to maintain legitimacy than by achieving administrative efficiency.

The application of institutional planning theory in this study can explain why PKBM Tunas Mekar seeks to meet ANBK standards despite facing limited infrastructure facilities and completeness of digital devices. This effort is not only technical, but also normative, namely maintaining public trust and institutional legitimacy in the education office. This means that the theory of institutional planning is the key to understanding the dynamics of institutional planning in facing the direction of education policies in the non-formal field [33] with a focus on normative, coercive, and mimetic pressures as a planning for the implementation of computer-based national assessments.

3.2.2 Education Policy Implementation Theory

Second, education policy implementation theory focuses on how policies at the macro level are translated into concrete steps at the micro level. [34] develop a top-down or top-down implementation

pattern, which emphasizes the importance of clarity of policy objectives, regulatory consistency, and adequate availability of resources. In this pattern, implementation is considered effective if the implementing stakeholders carry out policies according to the implementation pattern. This can be seen in the ANBK policy which has been regulated nationally with standard procedures, both in formal and non-formal schools.

The difference in paradigm according to [35] through the theory of street-level bureaucracy with a bottom-up approach. Lipsky argues that the implementation of policies is greatly influenced by implementing stakeholders in the field, such as tutors and institutional managers. They can harmonize according to the conditions of their educational environment. In the context of PKBM, tutors and managers play an important role in determining strategies for assisting residents to learn equality, especially package C in dealing with ANBK, even though the policies from the center are uniform.

[36] combining the two approaches by stating that policy implementation cannot be understood only from a top-down or bottom-up perspective. According to him, contextual communication between stakeholders, and institutional capacity are the main factors for the success of implementation. In the case of ANBK, the success of implementation in PKBM is largely determined by the institution's ability to communicate policies to tutors and learning residents, as well as institutional capacity in providing infrastructure to support the implementation of ANBK.

Based on policy implementation theory, research at PKBM Tunas Mekar can reveal how the uniform nature of ANBK can be adjusted to the conditions of non-formal institutions. From theoretical theory, it emphasizes the dimensions of the top-down and bottom-up processes, the role of tutors and managers, as well as communication and context.

3.2.3 Computer-Based Assessment Concept

Third, the concept of computer-based assessment, Innovation in the field of educational evaluation by utilizing digital technology to improve the quality of assessment is computer-based assessment. This concept is not just about moving questions from paper to computer screens, but includes various technical aspects such as interactive questions, the application of algorithms, and the use of data to monitor learning outcomes. According to [37] that computer-based assessments have an identifier of the aspects of accuracy-reliability, technical obstacles, and digital literacy skills with advantages such as data display, accelerating the process of correcting answers, and personalization capabilities, for example in assessing the literacy skills of learning citizens.

In addition to making it more efficient, the use of ANBK is considered to increase the level of accuracy as a measuring tool which is able to perform various measurement methods. For example, simulation-based questions can be used to assess problem-solving and critical thinking skills, compared to the traditional paper-based assessments that have now changed to focus on measuring reading literacy, numeracy literacy, and learning environment surveys, the results of which are expected to be more representative through ANBK. However, the implementation of computer-based assessments is inseparable from challenges, especially in non-formal institutions. Limited computer devices, uneven internet access, and lack of digital skills of learning citizens, which is the opposite of formal schools with more complete facilities, make the main problem.

Computer-Based Assessment opens up opportunities to develop accuracy-reliability assessments, which are systems that adjust the difficulty level of questions to the ability of participants in real-time. This allows for a more accurate measurement of individual competencies. This innovation also requires more sophisticated technological readiness, something that PKBM cannot necessarily fulfill. Therefore, the study of the readiness planning of non-formal institutions in carrying out computer-based assessments is important to identify the gap between the ideal concept and the reality in the field. It is interpreted to include indicators of accuracy and reliability, technical constraints, and dig-

ital literacy skills of students as well as the supporting and inhibiting factors. All instruments were tested for validity and reliability through a process of triangulating data from interviews, observations, and official documents.

3.3 Data Collection Techniques

The research data collection technique uses a data collection procedure through three main stages.

Preparation Stage First, the preparation stage includes the preparation of research instruments, permit management, and the determination of informants according to their roles in computer-based national assessment activities with a period of 2 months through interviews with key informants, namely 1 PKBM Tunas Mekar manager, 1 equity tutor of package C, and 2 residents studying the status of package C.

Implementation Stage Second, the implementation stage, namely the collection of field data through interviews is carried out with interview guidelines that are arranged in a structured manner with contains 25 open-ended questions to each informant focusing on three main aspects, namely: (1) Implementation Planning, (2) Policy Implementation Process, (3) Computer-based National Assessment Concept and (4) Obstacles and support faced during the computer-based national assessment process. Participatory observation is carried out at the stage of preparation, simulation, and implementation of assessments to observe behavior, interaction, and dynamics of activities in PKBM. The researcher acts as an active observer to get a real picture of the implementation of computer-based national assessments in PKBM, including technical aspects, citizen participation, as well as institutional infrastructure support.

Data Verification and Organization Stage Third, the data verification and organization stage, where all interview results are transcribed, observation data is compiled in the form of field notes, and documents are analyzed thematically. The process of checking members is carried out on informants to ensure the consistency and credibility of the data before further analysis is carried out. Documentation studies are used to corroborate the findings of interviews and observations through the search for various written sources. The documents analyzed included guidelines for the implementation of the Juklak and Juknis computer-based National Studies, reports on PKBM's internal activities, and statistical data from BPS related to educational participation. The use of this documentation is justified as a triangulation instrument to improve the validity of the data and strengthen the interpretation of the research results.

3.4 Data Analysis

Data analysis was conducted using an interactive model [40] which included four stages. First, data collection is carried out through field notes, transcribed interview recordings. Second, data reduction is carried out by filtering relevant information in accordance with the focus of the research, namely Planning, Policy Processes, Computer-based Assessment Concepts and supporting and inhibiting factors, as well as the experience of learning residents in assessment. Third, the presentation of data is carried out in the form of a descriptive narrative and a thematic matrix to facilitate interpretation. Fourth, conclusions are drawn by verifying the findings of Institutional theory planning, policy process theory, and computer-based assessment concepts to gain a complete understanding.

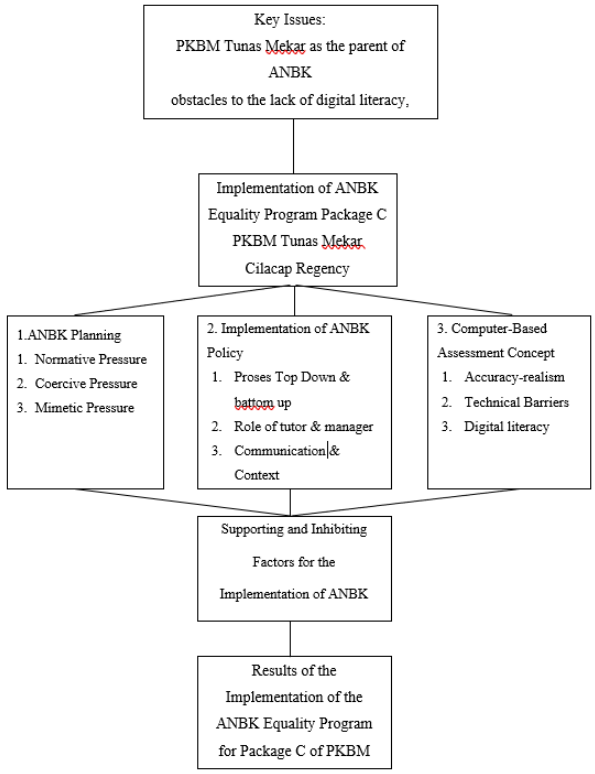

Figure 1. Data Analysis Process

3.5 Expected Outcomes

The findings of this research are expected to yield a rigorous and empirically grounded portrayal of the internal dynamics within PKBM Tunas Mekar in relation to the implementation of computer-based national assessments. Beyond describing these organizational processes, the study aims to offer substantive theoretical insights that enrich scholarly discourse on assessment practices in non-formal education settings. Additionally, the results are anticipated to contribute practical implications that may support policymakers, administrators, and educators in enhancing the effectiveness, readiness, and sustainability of computer-based assessment initiatives within similar educational institutions.

4. Results and Discussion

4.1 Results

Before presenting the research findings, the coding system employed to safeguard participants' identities and ensure data confidentiality is first explained. Each interview excerpt included in the results section is accompanied by a corresponding code in parentheses, indicating the source of the data, such as such as (PP;WL;W1), (TR;TM;W2), (WB;RW;W3), or (WB;SA;W4). The code consists of three parts: the first part shows the role of the informant (PP = manager, TR = tutor, WB = The Learned Persons), The second part is the initials or pseudonym of each informant (e.g. WL, TM, RW, SA), and the third part shows the order of the interviews (W1, W2, W3, and so on). This coding system

is used to maintain the confidentiality of participants' identities while making it easier to trace data sources in the analysis process.

4.1.1 Implementation of computer-based national assessment at PKBM Tunas Mekar

The results of the study indicate that PKBM Tunas Mekar carries out a computer-based national assessment based on official guidelines in the form of juklak and juknis issued by the government. Policy socialization is carried out through circulars, the official website of computer-based national assessments, WhatsApp groups, and face-to-face forums held by the Education Office. The manager ensures the readiness of infrastructure facilities, especially computers, obtained through BOS funds with the ARKAS plan. "We are trying to equip computers gradually so that computer-based national assessments can run according to standards" (PP;WL;W1). Tutors also adjust learning patterns by inserting literacy, numeracy, and HOTS-based questions. The tutor emphasized, "In every meeting I include practice computer-based national assessment questions, so that students are not surprised when doing according to the guidelines on the ANBK website" (TR;TM;W2). This shows the process of institutional and pedagogical adaptation carried out by PKBM.

The implementation of computer-based national assessments at PKBM Tunas Mekar took place in a combined top-down and bottom-up pattern. Instructions from the center are implemented in the SOP of PKBM institutions, but flexibility is given to tutors and learning residents to adjust to local conditions. Tutors are given space to convey technical ideas, such as variety of questions and schedule adjustments, while residents learn to engage through simulations and discussion forums. One of the learning residents revealed, "We were invited to discuss the simulation schedule, and even given the opportunity to practice computers early." (WB;RW;W3). This shows that there is a two-way interaction that strengthens the participation of learning residents.

Regular communication between managers, tutors, and learning residents is an essential aspect. Computer-based national assessment information is disseminated through the WhatsApp application, meetings, and face-to-face meetings, so that everyone feels they have a clear explanation. "We are always given detailed information about the implementation of computer-based national assessments, both from managers and tutors, so nothing is missed" (WB;SA;W4). This intensive communication has succeeded in minimizing the potential for miscommunication and making the implementation of computer-based national assessments more targeted.

4.1.2 Supporting and Inhibiting Factors

The successful implementation of computer-based national assessments at PKBM Tunas Mekar is supported by several key factors. First, there is strong policy support from the Education Office. Second, the institution has access to relatively adequate technological and infrastructural resources. Third, tutors play an active role in providing guidance related to literacy, numeracy, and computer skills. Fourth, learning residents participate in simulations and practice sessions designed to build familiarity with assessment procedures. One learning resident noted, "We often receive training by completing practice questions from the ANBK website, and the tutor always patiently guides us during the process" (WB; RW; W3). This statement illustrates the significance of continuous pedagogical interaction in strengthening learners' readiness for computer-based national assessments.

The obstacles encountered in the implementation process cannot be overlooked. The primary technical challenge involved disruptions to the central server during the assessment, which resulted in delays and interruptions. As one respondent explained, "The server experienced an error, and we could only wait for instructions from the tutor and technician" (WB; SA; W4). Another significant challenge relates to limited digital literacy, particularly among elderly learners. A tutor reported, "Elderly learners often have difficulty operating computers, so they require additional assistance" (TR; TM; W2). Despite these challenges, PKBM has taken proactive measures to mitigate them through

repeated computer practice sessions, online assignments, and simulations of the computer-based national assessment. These efforts help to reduce learners' anxiety and improve their overall readiness.

Overall, the implementation of computer-based national assessments at PKBM Tunas Mekar has been running according to national regulations, but it is still colored by capacity inequality between learning residents and external technical obstacles. These findings show a balance between supporting factors in the form of management, tutors, and infrastructure, with inhibiting factors such as server errors and limited digital literacy of some learning.

Table 1. Supporting Factors

Supporting Factors	Description	Source of Findings
Policy Support	The Education Office provides support and regulations for the implementation of ANBK in PKBM.	Documents & interviews of the
Adequate Infrastructure	Availability of computers, internet network, and exam lab space.	Field observation
Active Tutor Roles	Tutors provide literacy, numeracy, and computer skills guidance on a regular basis.	Tutor interview (TR;TM;W2)
Citizen Learning Involvement	Residents learn to participate in ANBK simulations and exercises on an ongoing basis.	Interviews with students (WB;RW;W3)

Table 2. Inhibiting Factors

Inhibiting Factors	Description	Impact
Server Disruption	Technical errors during the exam led to delays in implementation.	The exam is delayed, lowering the concentration of the participants.
Low Digital Literacy	Elderly participants had difficulty operating computer devices.	Requires intensive mentoring from tutors.
Capacity Inequality	Differences in digital skills between learning residents.	Affect the smooth running of the implementer

4.2 Discussion

The results of this study indicate that the implementation of the Computer-Based National Assessment (ANBK) in the Package C equality program at PKBM Tunas Mekar has been running in accordance with national guidelines, even though it is colored by the limitations of infrastructure facilities and digital literacy of learning citizens. These findings are in line with research [2], which emphasizes the importance of non-formal institution management in translating ANBK policies to suit field conditions. However, this study expands on previous findings by highlighting how an adaptive approach based on learning citizen participation is able to create a balance between policy pressures from the central and the local needs of institutions.

Studies [6] emphasize the importance of project-based learning models to improve numeracy literacy. In contrast, this study found that increasing literacy and numeracy in equality education relies more on intensive tutoring and repetitive digital learning simulations, not just learning model innovations. This approach proves the relevance of policy implementation theory [36] that the success of education policy depends on communication and social context at the implementing level.

In addition, this study reinforces the results of studies [4] and [7] that affirm the flexibility of the equality education system in Indonesia. However, the uniqueness of this research lies in the empirical analysis of how this flexibility translates into digital readiness through training and coordination between PKBMs, especially when institutions have to play a dual role as implementers and parents of computer-based national assessments for other PKBMs that are not yet independent.

From an institutional perspective, these findings also enrich the institutional theory [33] through evidence of normative, coercive, and mimetic pressures that are responded differently by PKBM Tunas Mekar. If previous research described more regulatory compliance, this study shows institutional innovations, such as the use of digital communication media (WhatsApp Group and ANBK pages) as a form of efficient and contextual mimetic adaptation in a non-formal education environment.

Previous studies such as [24] and [25] have highlighted the readiness of infrastructure in formal schools as the dominant factor for the success of ANBK. In contrast, the results of this study confirm that human resource factors, especially tutor competence and the motivation of learning residents, determine the success of the implementation of ANBK in non-formal institutions. This proves that the human-centered approach is more effective than the device-based approach alone, especially in the context of elderly learners.

The uniqueness of this study lies in its contribution to expanding the understanding of how digital-based national policies can be adaptively implemented within PKBM Tunas Mekar, an institution operating with limited resources. The findings highlight that a collaborative approach involving administrators, tutors, and learning residents serves as a critical success factor—an aspect that has received limited attention in previous research. These results reinforce the view that inclusive education policies must account for the social context, digital readiness, and adaptive capacity of local institutions in order to be implemented effectively and sustainably.

This study also has several limitations. First, the research focuses solely on a single institution, PKBM Tunas Mekar; therefore, the findings cannot be generalized to other non-formal education settings with different characteristics. Second, the research was conducted during the 2025 ANBK implementation period for Package C equivalency programs, a phase that remains transitional. Consequently, the findings reflect the conditions of adaptation to the new curriculum and policy environment rather than the outcomes of a fully stabilized implementation process.

In the future, further research is suggested to expand the object to several PKBMs in order to obtain a comparative picture between institutions, use a mixed approach to strengthen the validity of the results, and conduct longitudinal studies to see the development of digital readiness over time. The next study can also assess the impact of ANBK policies on the competence of learning citizens and design a digital learning model that is in accordance with the character of non-formal education in Indonesia.

5. Conclusion

Based on the results of the analysis, this study concludes that the implementation of the Computer-Based National Assessment (ANBK) in the Package C equivalency program at PKBM Tunas Mekar, Cilacap Regency, has been carried out in accordance with national standards through an adaptive strategy that integrates both top-down and bottom-up approaches. Institutional readiness is supported by strong internal coordination, the active involvement of tutors in strengthening digital literacy, and policy support from the local Education Office. Nevertheless, several challenges remain, particularly limitations in technological facilities, low levels of digital literacy among older learning residents, and technical disruptions originating from the central assessment server.

These findings provide an in-depth understanding that the success of digital education policy implementation in non-formal institutions is not determined solely by infrastructure availability; rather, it is strongly influenced by human capacity, socio-institutional adaptation, and the ability of institutions to respond to contextual demands. Theoretically, this study contributes to Institutional Theory by demonstrating the presence of normative, coercive, and mimetic pressures that are contextually negotiated by PKBM. It also reinforces Policy Implementation Theory by highlighting the roles of

communication, flexibility, and socio-cultural context as essential determinants of successful policy execution at the grassroots level. Socially and culturally, the findings underscore the importance of strengthening the digital competencies of marginalized learning communities to prevent further exclusion in the ongoing national education transformation.

The limitations of this research lie in its single-case scope and relatively short observation period. Therefore, future studies should involve a broader range of PKBMs across different provinces to obtain a more comprehensive depiction of the dynamics of ANBK implementation in Indonesia's non-formal education sector.

5.1 Recommendations

Based on the findings, it is recommended that non-formal education practitioners enhance digital literacy training and provide continuous ANBK simulation activities for learning residents. Strengthening coordination mechanisms among PKBM, the local Education Office, and the central ANBK server management is necessary to minimize technical disruptions. For academics, the study offers a foundation for developing a contextual, participatory model of digital-based education policy implementation. Meanwhile, the government is encouraged to provide affirmative support for PKBMs with limited resources through infrastructure grants, technician training, and tutor certification programs. Future research should employ multi-location comparative designs to explore variations in digital readiness, policy adaptation strategies, and their implications for learning outcomes. The use of data triangulation is also recommended to deepen the understanding of institutional change in the context of computer-based national education policy implementation.

5.2 Broader Implications

More broadly, this study contributes to the discourse on equitable and inclusive national education policy. The implementation of ANBK at PKBM Tunas Mekar indicates that digital transformation in education extends beyond technological advancement; it also reflects the state's commitment to guaranteeing equal educational rights for all citizens, including those enrolled in non-formal pathways. The findings confirm that the digital divide remains a significant barrier to achieving equitable education quality. Thus, national policies must emphasize not only infrastructure provision but also the enhancement of human and institutional capacity. This study therefore supports the formulation of education policies that are context-sensitive, grounded in principles of digital justice, and oriented toward empowering communities to adapt to technological change in an inclusive and sustainable manner.

References

[1] Kemendikbudristek. *Peraturan Menteri Pendidikan, Kebudayaan, Riset, Dan Teknologi Republik Indonesia Nomor 17 Tahun 2021 Tentang Asesmen Nasional Asesmen Nasional.* 2021.

[2] D. Nurcahyani and Widodo. "Manajemen Lembaga Pendidikan Nonformal dalam Mengimplementasikan Kebijakan Asesmen Nasional". In: 12.2 (2023), pp. 112–118.

[3] A. Sadat. "Asesmen Nasional Dan Rapor Pendidikan Serta Pemanfaatannya Untuk Perencanaan Berbasis Data". In: *Jurnal Instrumen* 6.1 (2024), pp. 73–82.

[4] I. Rosmilawati. "Notions of Non-Mainstream Educational Provision: Understanding the Indonesia Equivalency Programs Among Established Alternative Education Throughout the World". In: *Jurnal Pendidikan Indonesia Gemilang* 3.2 (2023), pp. 323–336. DOI: 10.53889/jpig.v3i2.297.

[5] S. Sumartiningsih and A. Yuwono. "Analisis Penilaian Asesmen Nasional Berbasis Komputer Terhadap Kemajuan Pendidikan Di Indonesia". In: *Pendas Jurnal Ilmiah ...* 09 (2024). DOI: https://doi.org/10.23969/jp.v9i04.19809.

[6] A. Nafiurrohmah and I. Ilyas. "Implementasi Kurikulum Merdeka Belajar Pada Program Pendidikan Kesetaraan". In: *NUSRA Jurnal Penelitian dan Ilmu Pendidikan* 5.2 (2024), pp. 804–814. DOI: 10.55681/nusra.v5i2.2648.

[7] H. Siregar, D. Darmawan, I. Rosmilawati, and L. M. Samosir. "Implementasi Model Pembelajaran Blended Learning Pada Pendidikan Kesetaraan Paket C Di Pkbm Abdi Pertiwi Kota Serang". In: *Jurnal Eksistensi Pendidikan Luar Sekolah* 7.2 (2022). DOI: 10.30870/e-plus.v7i2.17621.

[8] R. Yulita, A. Marwan Fachruddin, and B. Alang. "Efektivitas Penyelenggaraan Program Pendidikan Kesetaraan Paket C Pada Sanggar Kegiatan Belajar". In: *Jurnal Educational Science Foundation and Application* 3.1 (2024), pp. 58–75. DOI: 10.56959/jesfa.v3i1.78.

[9] N. Andzarini and J. Sutarto. "Manajemen Pelatihan Operator Komputer Tingkat Lanjutan". In: *Jurnal Eksistensi Pendidikan Luar Sekolah* 5.2 (2020).

[10] L. Desmawati, F. Fakhruddin, M. Muarifuddin, and R. D. Hastuti. "Literasi Digital dalam Pemenuhan Asesmen Kompetensi Minimum bagi Warga Belajar Pendidikan Kesetaraan". In: *Jurnal Bina Desa* 4.3 (2023), pp. 312–317. DOI: 10.15294/jbd.v4i3.32028.

[11] D. Darmawan, A. Fauzi, and H. Siregar. "Pengembangan Kompetensi Literasi Digital Warga Belajar Pendidikan Kesetaraan dalam Menghadapi Era Revolusi Industri 4.0". In: *Jurnal Pengabdian Pada Masyarakat* 9.2 (2024), pp. 397–404. DOI: 10.30653/jppm.v9i2.730.

[12] T. Destiani, M. Arbarini, and I. Shofwan. "Pendekatan Andragogi dalam Pembelajaran seTARA Daring pada Program Pendidikan Kesetaraan". In: *Jendela PLS* 8.1 (2023), pp. 32–44. DOI: 10.37058/jpls.v8i1.7093.

[13] A. Suryadi, A. Ansharullah, L. Subaryanto, and Z. Arif. "The Effectiveness of Learning Strategy based on "SETARA DARING" Application at Equivalency Education in Community Learning Center in Jakarta". In: *AL-ISHLAH Jurnal Pendidikan* 15.4 (2023), pp. 6468–6474.

[14] R. Sri Lestari and W. Yulianingsih. "Penerapan Metode Blended Learning Berbasis Aplikasi seTARA Daring untuk Meningkatkan Minat Belajar Peserta Didik Pasca Pandemi di Program Kesetaraan Paket C PKBM Budi Utama Surabaya". In: *J+PLUS Jurnal Mahasiswa Pendidikan Luar Sekolah* 12.1 (2023), pp. 46–57.

[15] BPS. *Indikator Pendidikan, 1994-2024*. 2025. URL: https://www.bps.go.id/id/statistics-table/1/MTUyNSMx/indikator-pendidikan-1994-2024.html.

[16] Z. P. K. Wardhani. "Persiapan sekolah dalam menghadapi Asesmen Nasional Berbasis Komputer (ANBK) di SDN Tambibendo 1 Kediri". MA thesis. Universitas Islam Negeri Maulana Malik Ibrahim, 2024.

[17] Wahida Suddin, Muh Akbar, and Nur Riswandi Marsuki. "Kesetaraan Akses Digital". In: *Jurnal Kajian dan Penelitian Umum* 2.1 (2024), pp. 159–168. DOI: 10.47861/jkpu-nalanda.v2i1.858.

[18] S. Handayani, H. Purwanti, F. N. Anggraeni, and A. Setiawan. "Analisis Perencanaan dan Standarisasi Pendidikan di PKBM Minda Utama Kota Bandung". In: *JIIP (Jurnal Ilmiah Ilmu Pendidikan)* 8.5 (2025), pp. 5354–5363. DOI: https://doi.org/10.54371/jiip.v8i5.7950.

[19] H. Haryanto, S. Samsudi, and M. Arbarini. "Development of project-based learning model based on ethno-steam to improve numeracy literacy skills". In: *Inovasi Kurikulum* 21.1 (2024), pp. 255–266. DOI: 10.17509/jik.v21i1.63400.

[20] N. Kania, L. M. Angraini, D. D. Hariri, H. Mahmudah, and F. S. Wibawa. "Peningkatan Literasi Digital Guru Melalui Pelatihan Pembuatan E-Module Interaktif Berbasis Aplikasi Book Creator Di PKBM Hati Nurani Bangsa". In: *INCOME Indonesian Journal of Community Service Engagement* 4.3 (2025), pp. 184–197. DOI: 10.56855/income.v4i3.1698.

[21] A. Prasanti and J. Sutarto. "Implementasi Aplikasi Setara Daring Pada Pembelajaran Program Kejar Paket C". In: 8 (2025), pp. 308–318.

[22] A. Rizky, W. Herwina, N. Novitasari, L. Yuliani, and L. Oktiwanti. "Manajemen Pembelajaran E-Learning di Masa Pandemi Covid-19 (Study pada Program Kesetaraan Paket C di PKBM

Gema Kota Tasikmalaya)". In: 1.7 (2023), pp. 2023–2036. DOI: https://doi.org/10.21831/diklus.v7i1.58712.

[23] E. Rosita, M. Irfan Hilmi, and N. Imsiyah. "'Setara Daring' Learning Management on Learning Results In Package C at PKBM Lestari Banyuwangi". In: *SPEKTRUM Jurnal Pendidikan Luar Sekolah* 10.2 (2022), p. 349. DOI: 10.24036/spektrumpls.v10i2.116829.

[24] Ahmad Fauzi, Milla Rohmatul Azizah, Arina Ayu Fitrotin, and Dewi Tsamrotul. "Manajemen Asesmen Nasional Berbasis Komputer (ANBK) Jenjang SMA/ SMK Dinas Pendidikan Jawa Timur". In: *Jurnal Administrasi Pendidikan Islam* 5.2 (2023), pp. 204–212. DOI: 10.15642/japi.2023.5.2.204-212.

[25] I. Setiawan, M. Muslihati, and H. Indreswari. "Determinan kesiapan siswa sekolah menengah pertama dalam menghadapi asesmen nasional". In: *Jurnal Konseling dan Pendidikan* 10.2 (2022), p. 313. DOI: 10.29210/176500.

[26] T. R. Veralion, Saraka, H. T. Winarti, and Mustangin. "FACTORS AFFECTING THE IMPLEMENTATION OF SETARA DARING PLATFORM-BASED LEARNING AT SKB 2 SAMARINDA". In: 7.2 (2023), pp. 690–696. DOI: 10.36526/js.v3i2.2986.

[27] B. Fikri and R. Nugroho. "Kompetensi Pedagogik Tutor dalam Implementasi Kurikulum Merdeka Pada Pendidikan Kesetaraan Paket A di PKBM Insan Cerdas Indonesia". In: *J+ PLUS UNESA* 14.2 (2025), pp. 48–61.

[28] S. A. Kharismawati. "Evaluasi Pelaksanaan Asesmen Nasional Berbasis Komputer di Sekolah Dasar Terpencil". In: *Ideguru Jurnal Karya Ilmiah Guru* 7.2 (2022), pp. 229–234. DOI: 10.51169/ideguru.v7i2.372.

[29] S. Hilal. "Basic Computer Learning Sebagai Persiapan Menyambut Pelaksanaan Asesmen Nasional Berbasis Komputer pada Peserta Didik Kelas V SD Negeri 2 Neglasari". In: *Jurnal Pendidikan Ilmu Pengetahuan Alam* 4.01 (2023), pp. 6–9. DOI: 10.56842/jp-ipa.v4i01.175.

[30] S. Sobirin, M. Ihsan, M. Ainin, and M. T. Nugraha. "Implementasi Asesmen Nasional Berbasis Komputer (ANBK) di SDN 24 Teluk Pakedai". In: *Jurnal Ilmiah Profesi Pendidikan* 9.1 (2024), pp. 293–299. DOI: 10.29303/jipp.v9i1.1900.

[31] C. A. Putra, A. Purtina, F. Zannah, D. Ade, and S. Permadi. "Sosialisasi Kompetensi Literasi Digital untuk Membentuk Smart Digital Citizenship Warga Belajar di PKBM Harati". In: *Jurnal Pengabdian Masyarakat* 01.1 (2024), pp. 13–16. DOI: https://doi.org/10.33084/humabetang.v1i1.6585.

[32] S. N. Lahagu and T. Panduwinata. "Implementasi Pelaksanaan Asessmen Nasional Berbasis Komputer (ANBK) di SDN 01 Benteng Hulu". In: *ALACRITY Journal of Education* (2024), pp. 165–179. DOI: 10.52121/alacrity.v4i1.265.

[33] M. Jakobsen. "W. Richard Scott, Institutions and Organizations: Ideas, Interests, and Identities". In: *Copenhagen Journal of Asian Studies* 32.2 (2015), pp. 136–139. DOI: 10.22439/cjas.v32i2.4764.

[34] D. A. Mazmanian and P. A. Sabatier. *Implementation and Public Policy*. Scott, Foresman public policy analysis and management series. Scott, Foresman, 1983. URL: https://books.google.co.id/books?id=TqyJ_8m4gYAC.

[35] D. Yates. "Street-Level Bureaucracy: Dilemmas of the Individual in Public Services. By Michael Lipsky. (New York: Russell Sage Foundation, 1980. Pp. xviii + 211. $10.00.)" In: *American Political Science Review* 76.1 (1982), pp. 145–146. DOI: 10.2307/1960475.

[36] M. Hill and F. Varone. *The Public Policy Process*. Eighth. Routledge, 2021. DOI: 10.4324/9781003010203.

[37] C. Singleton. "Computer-based assessment of reading". In: *The psychological assessment of reading*. Routledge, 2021, pp. 257–278.

[38] R. K. Yin. *Case study research: Design and methods*. Vol. 5. Sage, 2009.

[39] D. Sugiyono. *Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan R&D*. 2013.

[40] J. W. Creswell and C. N. Poth. *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications, 2016.