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Exploring School Needs and Barriers in Adopting a Deep Learning-Based Adaptive Evaluation Model

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Abstract

This research explores the needs and obstacles of schools in adopting a deep learning-based adaptive evaluation model. The research focuses on understanding infrastructure readiness, teachers' digital literacy, and the perception of principals, teachers, and curriculum developers towards the artificial intelligence-based evaluation system. The research method used is an exploratory qualitative approach with a multi-case study design. The study subjects included five secondary schools in Ternate City with different characteristics (public-private status and geographical context). Participants consisted of school principals, teachers, information technology staff, and curriculum developers. Data was collected through in-depth interviews, focus group discussions (FGDs), field observations, and document analysis. Data analysis was carried out with a thematic model through the stages of data reduction, presentation, and verification by triangulating sources and methods to maintain the validity of the findings. The study results show that most schools are still in the early stages of integrating learning technologies. The main obstacles found include the limitations of digital infrastructure (computers and internet networks), low technological literacy of teachers, resistance to change, and the absence of clear regulations on the use of AI in educational evaluation. On the other hand, schools identify three main needs to support adopting adaptive evaluation: providing adequate digital infrastructure, continuous technopedagogical training, and evaluation platforms that are simple and appropriate to the school context.

Keywords

Adaptive Evaluation; Deep Learning; Digital Literacy; School Readiness; Thematic Analysis

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1. INTRODUCTION

In today's digital era, artificial intelligence (AI) technology is increasingly integrated in various areas of life, including education. One of the fastest-growing AI technologies is *deep learning*, which has the potential to transform the way learning evaluations are conducted in schools. Evaluation is an integral part of the educational process that measures student learning achievement and effectiveness. Good educational valuation measures learning outcomes and supports the learning process itself (Agbo et al., 2022; Cahya et al., 2023). However, conventional evaluation systems are still dominated by static

test models that do not consider students' uniqueness and individual development. This is where *adaptive evaluation* becomes important: an evaluation system that can adjust the difficulty level and material based on student responses. By leveraging *deep learning* technology, adaptive evaluations can be analyzed in real-time and are personalized. However, implementing this model in schools is still very limited and requires further understanding of the readiness and challenges faced by education units.

Most schools in Indonesia still use traditional evaluation methods like written exams, multiple-choice tests, or other objective tests. This type of evaluation is static, not adaptive to different levels of student competence. In modern assessment principles, evaluation should be a learning tool (assessment as learning), not just a tool for measuring results. Effective assessments should provide constructive feedback to help students learn better (Alexander, 2019; Ghofur et al., 2022). Many students do not get meaningful information from test results because the evaluation system is not designed to fit their learning profile. On the other hand, teachers also face obstacles in monitoring the learning progress of individual students in large numbers. As a result, the evaluation process becomes non-optimal and risks giving rise to learning inequality. Therefore, it is necessary to look for evaluation alternatives that are more adaptive, data-based, and technology-assisted.

Deep learning *technology* has been proven to perform large amounts of data analysis with high accuracy and efficient processing speed. Deep learning can recognize students' learning patterns in education, adjust questions based on ability levels, and provide feedback automatically. Deep learning works by processing data in layers of neural networks that resemble how the human brain works (Agbo et al., 2023). This opens up a great opportunity to build an adaptive and responsive evaluation system. International platforms like Knewton and DreamBox have started integrating this technology into their assessment systems. However, deep learning-based evaluation in Indonesia is still relatively new and has not been extensively researched. Therefore, it is important to understand how schools as educational institutions respond to the possible adoption of this technology. This includes needs, readiness, and obstacles that may be faced.

There is a gap between the potential of deep learning-based adaptive evaluation technology and the real conditions in schools regarding infrastructure, human resources, and policies. Many schools do not yet have an integrated learning data system, even though it is a key requirement in building an AI-based evaluation model. In addition, most teachers do not have adequate technological literacy to understand or develop the system. Previous research has mostly discussed the technical development of *deep learning models*, but very few have focused on the adoption aspect in the school environment. In fact, the success of technology in education is highly dependent on the readiness of the user institution. In innovation diffusion theory, technology adoption is influenced by users' perceptions of innovation's benefits, convenience, and compatibility (He & Lee, 2020). Therefore, exploring the needs and obstacles to adopting this evaluation technology at the school level is important. This research tries to fill this gap by exploring the perspectives of educational actors in schools.

Several previous studies have examined the use of AI in education, but it is still limited to aspects of system development and technical effectiveness. Deep learning-based evaluation models can improve the accuracy of detecting students' learning difficulties (Witzel et al., 2003). However, the context of the research was carried out on a laboratory scale or in a higher institution, not in high school. Due to limited understanding and facilities, schools' readiness to adopt adaptive evaluation technology is still very low. This shows that previous studies have not touched on the root of the problem at the school implementation level (Amnur et al., 2023; Huzaifi et al., 2024; Maharani et al., 2022). There has not been much research regarding adopting this adaptive evaluation from the perspective of principals, teachers, and curriculum developers. Therefore, exploratory studies based on a qualitative approach have become very relevant. This approach allows for deepening the experience and perception of the immediate user.

The urgency of this research arises from the need to bridge the gap between the potential of technology and the reality of school implementation. In the midst of the push to digitize national education, governments and schools need evidence-based information on readiness and challenges faced in adopting new evaluation technologies (Melati et al., 2023). Effective and adaptive evaluation is becoming increasingly important in the context of Independent Learning, which demands personalized learning and meaningful assessments (Kamaruddin, 2020). Without a good understanding of the needs and barriers, technology adoption policies tend to fail or are not sustainable. In other words, technological innovation needs to be accompanied by the readiness of the system and the actors who run it. This research provides a factual initial picture to education policy makers. Especially to design the right intervention and mentoring strategies for schools. Therefore, systematic exploration is very urgent to undertake.

The novelty of this study lies in its focus on the context of the needs and obstacles of schools in adopting a specific adaptive evaluation model based on *deep learning* (Aziz et al., 2018; Stufflebeam & Zhang, 2017). If previously the research was more oriented towards model development or technological effectiveness, this study highlights the aspects of acceptance and institutional readiness at the school level. This approach is contextual, participatory, and relies on authentic field data from education stakeholders. Thus, the research results are expected to be more applicable and relevant in policy making or program development. In addition, using the theoretical framework of innovation diffusion and digital literacy as the basis for analysis provides new academic contributions. This research also offers a synthesis between advanced technology and the reality of primary and secondary education in Indonesia. This provides a new space for discussing AI-based education transformation, especially in developing countries with complex challenges.

This study uses several theoretical frameworks to frame the analysis (Arsita et al., 2022; Deschryver & Yadav, 2015; Zhang et al., 2022). All three help explain how individuals and institutions assess, accept, and use new technologies. Arsita's theory explains five characteristics that influence the adoption of innovations: relative superiority, compatibility, complexity, trialability, and observability. Meanwhile, Deschryver & Yadav focused on the perception of usability and ease of use as the main determinants of technology acceptance. Digital literacy is needed to understand the ability of actors to use technology effectively and ethically. The integration of these three theories was used to analyze the supporting and inhibiting factors of the adoption of adaptive evaluation models. This framework also guides in compiling instruments and analyzing qualitative data.

As a formal educational institution, it has an important role in implementing educational technology policies and innovations. In Indonesia, digital transformation in schools is proceeding at varying paces, depending on location, local government support, and school leadership. Many schools still face challenges in technology integration, such as a lack of teacher training, limited digital infrastructure, and resistance to change (Furi et al., 2018; Isti'ana, 2024). In fact, digital transformation requires a more sophisticated, adaptive, and responsive evaluation system for student development.

Although deep learning technology has shown great potential in supporting more personalized and real-time adaptive assessments, its application in schools is still very limited. Most schools, especially in Indonesia, still use a traditional evaluation system that is static and does not pay attention to the diversity of students' abilities. In fact, modern assessments are supposed to function not only as a measure of outcomes but also as a learning tool that provides constructive feedback. This gap widens when considering infrastructure readiness, teacher digital literacy, and school policies that do not yet support deep learning-based adaptive evaluation. Thus, research gaps in institutional readiness, needs, and real obstacles in the field have not been widely explored.

Several previous studies have examined the application of AI in learning. Demartini et al. (2024) Shows that AI-driven adaptive learning can improve learning personalization, despite the constraints of digital infrastructure. Arifin et al. (2023) Teachers' perceptions of the benefits and convenience of

technology are a key factor in AI adoption. Other studies by Mahmudah & Makmun (2020) Affirming the effectiveness of adaptive platforms like DreamBox and Knewton in improving students' academic achievement. Meanwhile, Adawiyah et al. (2017) emphasizing the barriers to AI adoption from a socio-organizational perspective in higher education, and Agbo et al. (2022) Highlighting the limitations of teacher training in AI integration in Indonesian schools. However, these studies generally focus on the technical aspects or evaluation of system effectiveness, not yet on the context of school readiness and institutional barriers to adopting deep learning-based adaptive evaluation.

The novelty of this research lies in its focus on the context of school needs and obstacles in adopting a deep learning-based adaptive evaluation model (Aziz et al., 2018). Unlike previous research that emphasized the development of technical models or platform trials, this study uses a qualitative approach to explore the perspectives of principals, teachers, and curriculum developers. In addition, integrating the theoretical framework of innovation diffusion, technology acceptance, and digital literacy is the analytical strength that distinguishes this study. With a participatory and contextual approach, the research results are expected to be more relevant and applicable to schools in Indonesia, especially at the primary and secondary education levels that are rarely touched by similar research.

The urgency of this research arises from the urgent need for an adaptive, fair, and data-based evaluation system in the era of digital transformation of education. Without a deep understanding of school readiness and the barriers it faces, technology adoption policies risk failing or only being effective in top schools. Therefore, field exploration is important to produce evidence-based recommendations. Alternative solutions are designing strategic interventions through teacher training, strengthening digital literacy, and developing an integrated learning data system. In addition, collaboration between governments, schools, and technology developers must be built to create an ecosystem that supports the implementation of deep learning-based adaptive evaluation. Thus, technological innovation can go hand in hand with institutional readiness, resulting in a more effective, inclusive, and sustainable evaluation system.

2. METHODS

This study uses an exploratory qualitative approach with a multiple case study design to deeply explore the needs and obstacles of schools in adopting a deep learning-based adaptive evaluation model (Ishtiaq, 2019) (Ardiansyah et al., 2023). This design was chosen because it allows researchers to compare the experience and readiness of several schools with different characteristics regarding status, location, and facility level. The research location was at the junior and senior high school levels in Ternate City, North Maluku Province, which were selected purposively with the following criteria: (1) having prior experience in the use of digital learning or evaluation technology, (2) willing to provide access to interviews, observations, and documentation studies, and (3) representing variations in geographic context (urban–rural) and school status (public–private). The research participants consisted of five principals, 25 subject teachers from various fields of study, five information technology staff, and five curriculum developers or vice principals for curriculum (Lenaini, 2021).

Data collection is carried out through four main techniques. First, a semi-structured in-depth interview covers the topics of ICT infrastructure needs, teacher technology literacy, understanding adaptive evaluation, perception of AI, and technical and policy barriers. Second, a Focus Group Discussion (FGD) involving 5-7 teachers in each school to validate the results of individual interviews and identify collective perceptions. Third, field observation to observe the condition of ICT infrastructure, the evaluation process, and technology use activities, which are recorded using structured observation sheets. Fourth, document analysis of school policies, budget plans, syllabi, evaluation procedures, and data security guidelines (Damayanti et al., 2024). The research instrument was prepared based on the theoretical framework of Diffusion of Innovations (Rogers) to identify the perception of benefits (relative advantage), compatibility (compatibility), ease of use (complexity), and

visibility of innovation (observability); Technology Acceptance Model (TAM) to assess perceived usefulness and perceived ease of use; and the Technological Pedagogical Content Knowledge (TPACK) framework to measure teachers' readiness to integrate technology into learning.

Data was analyzed using a model that included three stages: (1) data reduction by filtering and grouping information into themes of needs, barriers, and recommendations; (2) data presentation through a discovery matrix, summary table, and concept map; and (3) drawing conclusions and verifying through triangulation of sources and methods (Fitrianawati, 2018). Thematic analysis was used to identify recurrent patterns in various schools, including supporting and inhibiting technology adoption factors. The validity of the data is maintained through triangulation of sources by comparing information from principals, teachers, IT staff, and official documents; triangulation method by combining interviews, FGDs, observations, and document analysis; member checking to confirm the results of the interpretation to the participants; and trail audits to record the research process systematically and transparently.

3. FINDINGS AND DISCUSSIONS

Findings

Based on the results of observations and interviews, most of the schools that are the subject of the study are still in the early stages of integrating learning technology, especially related to digital infrastructure. Only 2 out of 5 schools have computer labs actively used in the evaluation process. The internet in some schools is still unstable and directly impacts the online assessment process. The availability of digital infrastructure is a key prerequisite for supporting the transformation of technology-based education (Abdullah et al., 2025). The principal stated that inadequate hardware is a major obstacle in implementing AI-based evaluation models. In addition, there are still device maintenance and budget constraints for digital system investment. This barrier is an initial challenge that needs to be overcome before moving to an adaptive evaluation system. Therefore, local and private government support is needed in procuring school digital infrastructure.

As the main actors in the evaluation process, teachers are not fully prepared regarding technology literacy and digital pedagogy. Of the 25 teachers interviewed, only seven admitted having heard of deep learning-based adaptive evaluation. This shows low exposure to the latest evaluation technology at the education unit level. Internal barriers of teachers, such as trust in technology and pedagogical readiness, are the main factors inhibiting the adoption of digital innovation (Basri et al., 2024). Some teachers feared that using AI would replace teachers' roles in evaluating learning. In addition, the training available still focuses on basic e-learning platforms such as Google Classroom or Quizizz. This knowledge gap is an important note in developing a continuous training program. Schools must be provided with technopedagogic assistance to equip teachers to integrate technology in the evaluation process appropriately.

Most informants still have a limited understanding of *deep learning* and its potential in education. Some teachers expressed interest when it was explained that the system allows for automatically personalizing questions based on students' responses. However, they also voiced concerns about student data security, algorithm transparency, and system accountability. Technology adoption in education has always been accompanied by social resistance related to trust, privacy, and surveillance (Gunawan et al., 2024). Some school principals stated the need for regulation from the education office before implementing AI systems in evaluation. Concerns have also arisen about how the results of adaptive evaluations can be integrated into national assessment systems. Therefore, digital literacy is not only in the technical aspect, but also in understanding the ethics and governance of educational data. This is a double challenge in integrating *deep learning* into the school assessment system.

Table 1. Summary of Field Findings

Aspects Examined	Key Findings	Frequency/Description
ICT Infrastructure	2 out of 5 schools have adequate facilities	Bandwidth & device limitations
Teacher Technology Literacy	Only 7 out of 25 teachers are familiar with the concept of adaptive evaluation	The majority only know e-learning dasar
Current Evaluation Model	Written tests and individual assignments	Formative evaluation is not yet dominant
Use of AI/Adaptive Evaluation	1 school tries the adaptive quiz system	Unstructured and comprehensive
Perception of AI/Deep Learning	Positive but with concern	Data issues, accountability, trust

Field findings show that schools need a clear policy reference from the education office to adopt AI-based evaluations. Most school principals hesitate to change the evaluation model without legality and support from the above structure. Changes in the education system will not succeed without the support of coherent and learning-oriented policies (Braun & Huwer, 2022). Some school principals stated that the adaptive evaluation model can be part of the Independent Curriculum, but needs implementation assistance. Additionally, there are no technical guidelines on how AI can be used ethically and validly in the context of primary and secondary education assessments. This regulatory vacuum is a major obstacle to adopting evaluative innovation. Therefore, the results of this study can be an initial recommendation for evidence-based policy formulation. There must be a dialogue between policymakers, schools, and technology developers to develop common guidelines.

Teachers and principals said they need specific training on adaptive assessment and the use of *deep learning* in education. General training does not address operating adaptive evaluation systems' technical and pedagogical needs. In the TPACK model, integrating technology in learning requires combining technological, pedagogic, and content knowledge (Moutawaqil & Wibawa, 2024). Without training targeting these three domains, technology implementation will be half-hearted. In addition, teachers also suggest coaching or technical assistance from outside parties, such as universities or AI platform providers. This aims to build confidence and reliability in using the new evaluation system. Training should also be ongoing, not just one meeting. Therefore, human resource development is a determining factor for the success of the adoption of adaptive evaluation models in schools.

Based on the thematic analysis, three major themes were found related to school needs: (1) digital infrastructure; (2) technopedagogic training; and (3) a simple and relevant evaluation platform. Schools need hardware and a stable internet connection to support online adaptive evaluations. In addition, the training should include an understanding of AI, the technicalities of using the platform, and the pedagogical implications of adaptive assessment. The developed platform must also be contextual and compatible with the learning system that is already running. Educational technology must be in the *user's zone of proximal development* to be used optimally. So, an adaptive evaluation system that is too complex will actually cause user resistance. The school also hopes for an evaluation dashboard that can be used to monitor student development in real-time. These three needs are important elements that must be met to create an evaluation system ready for adoption.

Four main themes are obstacles in the adoption of adaptive evaluation systems: (1) infrastructure limitations; (2) low technological literacy; (3) resistance to change; and (4) the absence of regulations. These barriers are intertwined and create a cycle that slows down school innovation. Resistance to change arises when readiness factors are not met systemically. Many teachers feel unconfident about using the new evaluation system because safety, training, and technical support are not guaranteed. Some schools also do not have in-house IT personnel to handle digital systems, so any technical

obstacles become a major obstacle. Without regulations or official policies, schools tend to be passive and wait for directions from the government. In addition, the complexity of AI systems is considered "far" from the reality of schools. Therefore, technology adoption strategies should be gradual and contextual.

Table 2. School Needs and Obstacles

Category	Key Sub-Findings	Implication
Necessity	ICT Infrastructure, Training, Platforms	Need funding, training, & local platforms
Obstacles	Low literacy, resistance, no SOPs	Mentoring and regulatory strategies are needed

School organizational culture also influences the adoption of technology in evaluation. Schools with collaborative cultures and progressive leadership tend to be more open to innovation. Organizational culture determines how institutions respond to change and innovation. In schools where principals support digital transformation, teachers are more enthusiastic about trying new systems, even though they are still limited (Claudia, 2022).

Most participants suggested that the development of adaptive evaluation systems be carried out through partnerships between schools, universities, and technology providers. This collaboration aims to develop a system that meets the needs of the field and does not burden users. In addition, participants also proposed that the trial be carried out on a limited basis first so that schools could assess the effectiveness and feasibility of the system. The *design-based research approach* is very suitable to be applied in the context of field-based educational technology development (Apiola & Sutinen, 2020). The school also hopes there will be an integration system with the national curriculum and an assessment system, such as ANBK. With this approach, adaptive evaluation does not become a separate system, but complements an existing evaluation. The government is also asked to provide continuous online training channels. These recommendations indicate the importance of a collaborative and participatory approach in developing AI-based evaluation systems.

Discussion

The study results show that most schools show enthusiasm for adopting technology in learning evaluations. The principal views technological innovation as an opportunity to improve the efficiency and accuracy of assessments. Technology integration can improve the quality of learning and data-driven assessments (Isti'ana, 2024). However, such readiness is still limited at the policy level and has not been fully translated into practice. More advanced schools generally have internal policy support and an active ICT team. In contrast, schools with limited infrastructure still rely on manual and traditional systems. This creates an imbalance in readiness between educational units. Therefore, school readiness is not only seen from interests, but also from the supporting ecosystem as a whole.

The study found that schools need stable technological infrastructure, like internet networks, computer devices, and AI-based evaluation platforms. The success of technology in education requires integration between content, pedagogy, and technology (Agbo et al., 2023; Cahya et al., 2023). Many teachers mention that the hardware available in their schools is inadequate to run deep learning-based systems. In addition, the absence of training focusing on adaptive evaluation makes it difficult for teachers to understand the concept and its application. Another need that arises is the availability of software that is compatible and easy to use. Teachers also want a dashboard that can monitor student progress in real time. Implementing adaptive evaluation models is only a discourse without supporting these devices and systems. Therefore, meeting this need is an important prerequisite for school digital transformation.

Most teachers do not understand the concept *of deep learning* in depth, especially in the context of learning evaluation. This shows that there is a digital literacy gap among educators. Developing AI-based learning technologies requires a deep understanding of systems and algorithms (Amnur et al.,

2023). Teachers tend to equate deep learning with ordinary e-learning, even though the two are very different in their working mechanisms. This shallow understanding makes teachers less confident in recommending adaptive evaluation systems. Therefore, a multi-level training that combines theory and practice is needed. Without teacher capacity-building interventions, even sophisticated evaluation models will not be effective. The role of teachers as technology mediators remains the key to the success of this transformation.

School leadership plays a very important role in encouraging the adoption of deep learning-based evaluation innovations. Progressive principals tend to be more open to digital transformation and encourage teachers to try new methods. The success of educational change is largely determined by visionary and participatory leadership (Hidayat et al., 2023). In the context of this study, schools with principals who are active in digital training tend to be more prepared to adopt adaptive evaluation. They form digital teams, set training schedules, and encourage teacher collaboration. On the other hand, schools with passive leadership tend to be stagnant and reluctant to change. This confirms that leadership is administrative, pedagogical, and digital. Therefore, strengthening digital leadership is important in 21st-century education reform. Most teachers stated that they needed training that was practical and appropriate to the context of their task. Training should focus not only on technical mastery, but also on how technology can tailor evaluations based on students' abilities. Effective teacher training must be relevant, ongoing, and immediately applicable (Fatmawati & Sofia, 2024).

The deep *learning-based adaptive evaluation model* is believed to improve the accuracy of measuring students' abilities and provide real-time feedback. This concept is in line with the theory *of Formative Assessment*, which states that formative and personal assessments can improve student learning outcomes (Ozan & Kincal, 2018). In this study, teachers and principals assessed that the adaptive system allows the differentiation of questions according to individual students' abilities. This is especially important in the context of inclusive and heterogeneous education. Students are no longer assessed uniformly, but according to their pace and learning style. However, to achieve this, the evaluation system must be able to map students' abilities accurately. AI and *machine learning* support make this possible. Therefore, adopting this model must be directed at improving the quality of learning, not just digitalization.

The school stated the need for clear regulations from the government regarding the use of AI in Education evaluation (Mardhiyah, 2023; Ningsih et al., 2024). There are no specific guidelines governing ethical standards, student data protection, and adaptive technology-based evaluation systems. Regulatory frameworks are crucial to ensure integrity, transparency, and fairness in using AI in education. The absence of regulations makes schools hesitant to develop the system independently. In addition, the security aspect of student data is a major concern in using complex algorithms. The government must be present in policy support, budgets, and mass training for educators. Without this support, the school's efforts will be hampered at both a technical and legal level. Therefore, national policies are the main driving factor for successfully adopting adaptive evaluation technology.

Adaptive evaluation models also pose ethical challenges that schools have not widely discussed, for example, how AI systems treat students with special needs, or how evaluation decisions are made automatically without human intervention. AI systems in education must consider fairness, transparency, and accountability (Daulay, 2014). Schools have not fully understood the risks of algorithmic bias in adaptive evaluation. In addition, teachers need to be given the role of *moderators* of evaluation results, not completely replaced by machines. Therefore, technological integration must still uphold the principles of humanistic pedagogy. This ethical challenge is an important part of discussing the future of technology-based evaluation. The balance between innovation and ethical principles must be carefully maintained.

Adaptive evaluation models will be more effective if schools collaborate with colleges or research institutions developing *deep learning technologies*. This collaboration allows for knowledge transfer,

limited trials, and system improvements that are more responsive to field needs. The Triple Helix model, a collaboration between educational institutions, industry, and government, is the foundation of sustainable innovation (Basri et al., 2024). In this study, schools that partnered with campuses or tech startups showed more rapid progress. They have access to training, technical consulting, and implementation assistance. Therefore, the government needs to facilitate this cross-sector partnership. Without collaboration, innovation in schools will be slow and less sustainable. Research and practice must go hand in hand in developing future evaluation systems.

Based on the study's results, it is recommended that schools start implementation gradually, starting from teacher training and infrastructure mapping. This process should be based on data on the readiness and needs of each school. Models such as SAMR (Substitution, Augmentation, Modification, Redefinition) can be used to measure the stages of technology integration. Implementation does not have to be immediately large-scale, but can start from a pilot project in one or two subjects (Tanjung & Nasution, 2025).

4. CONCLUSION

Based on the research results and discussion, it can be concluded that adopting deep learning-based adaptive evaluation models in schools faces significant structural and cultural challenges. Although most schools show interest in technological innovation, their readiness is still limited to policy aspects without adequate infrastructure and human resource support. As the main implementers, teachers still do not understand the concept of adaptive evaluation and how it works. The main obstacles include limited devices, digital literacy, and a lack of relevant and sustainable training. On the other hand, the adaptive evaluation model has great potential in improving assessment accuracy and supporting differentiated learning, per the principles of the Independent Curriculum. Successful implementation requires synergy between school leadership, government policies, and collaboration with research or technology institutions. Therefore, the transformation approach must be holistic, gradual, and data-driven to ensure sustainability and fairness in adopting educational evaluation technology.

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