Kelola
Jurnal Manajemen Pendidikan
Magister Manajemen Pendidikan
FKIP Universitas Kristen Satya Wacana
jurnalkelola@gmail.com

e-ISSN 2549-9661
Volume: 13, No. 1, Januari-Juni 2026
Halaman: 1-15

An Adaptive Rapid Supervision (ARS) Model for Multigrade Classrooms in 3T (Disadvantaged, Frontier, and Outermost) Regions

Sahbana Ridha
Universitas Lambung Mangkurat
2541216310002@mhs.ulm.ac.id

Ahmad Suriansyah
Universitas Lambung Mangkurat
a.suriansyah@ulm.ac.id

Aslamiah
Universitas Lambung Mangkurat
aslamiah@ulm.ac.id

ABSTRACT

Multigrade classrooms in Indonesia's 3T (Disadvantaged, Frontier, and Outermost) regions face unique pedagogical challenges that require adaptive supervision approaches different from single-grade contexts. This study developed the Adaptive Rapid Supervision (ARS) Model for multigrade classroom learning in 3T regions and assessed its validity, practicality, and initial benefit indications. The research employed an Educational Design Research approach through preliminary, prototype development, and limited trial evaluation stages. The research context was combined grade 3–4 classrooms at SDN Kecil Juhu and SDN Kecil Datar Batung. The ARS product comprises a model document and operational instrument package including brief pre-observation, one-page two-round observation instrument, four-level rubric, work evidence checklist, single-focus coaching guide, and weekly micro follow-up. Validation by two experts using a Likert scale (1–5) showed a mean of 4.26 (very high category). Limited trials across four sessions showed all ARS components were implemented within 23–28 minutes (mean 25.5 minutes). Process indicators showed improvements after micro follow-up: independent class interruptions decreased from a mean of 8 to 4 times per 10 minutes, on-task behavior increased from 62% to 76%, and rotation transitions improved from approximately 3 minutes to 1.5 minutes. Practitioner practicality and teacher acceptance fell in the very high category with means of 4.34 and 4.22 respectively. ARS is assessed as valid, practical, and has potential to strengthen evidence-based supervision in multigrade classrooms in 3T regions.

***Keywords**: Academic Supervision, Multigrade Classrooms, 3T Regions*

Article Info

Received date: 18 Desember 2025 Revised date: 30 Maret 2026 Accepted date: 12 Juni 2026

INTRODUCTION

National education is fundamentally directed toward developing Indonesian citizens who are faithful, noble in character, healthy, knowledgeable, capable, creative, independent, and responsible democratic citizens. This

formulation emphasizes that learning should not stop at content delivery but must lead to the holistic and meaningful development of students' capacities (Carney & Carty, 2024). Within this framework, the state affirms the principles of educational provision that are just, non-discriminatory, and uphold human rights. These principles become particularly important when schools face resource constraints, as educational equity is not merely about access but also about the quality of learning experiences that every child receives.

This guarantee of equity becomes more explicit in Law No. 20 of 2003 on the National Education System, Article 5 (1), which states that every citizen has equal rights to obtain quality education. Simultaneously, the law also affirms the rights of citizens in remote or underdeveloped areas and isolated indigenous communities to receive special educational services. This means that geographical remoteness should not be a reason to diminish quality commitments but rather a rationale for providing more adaptive and contextually appropriate services. From this perspective, 3T regions are not merely geographical categories but service contexts requiring different learning designs, school management, and professional development approaches to truly realize the right to quality education.

The consequences of this special education service mandate can be seen in Law No. 20 of 2003 on the National Education System, 32 (2), concerning special education services that encompass students in remote or underdeveloped areas, isolated indigenous communities, and disaster-affected conditions. This formulation demonstrates that the state acknowledges unequal field conditions, requiring educational services to adapt while maintaining continuity and quality. In many disadvantaged schools, such adaptation emerges in the form of multigrade classroom practices, where multiple grade levels share one space with one teacher (Minaz et al., 2024; Qayoom & Akram, 2024). Multigrade classrooms ultimately become a service strategy to ensure learning continues despite limited teachers, small class sizes, or inadequate classroom availability.

However, multigrade classrooms present distinctive pedagogical challenges that cannot be equated with single-grade classrooms. Teachers must serve two groups of students with different learning outcomes, material complexity levels, and learning needs simultaneously (Ares-ferreirós & Martínez-iglesias, 2025). When teachers provide direct instruction to one class, the other class must continue learning independently in a structured manner. This is where problems frequently occur: learning appears to proceed, but one group experiences prolonged waiting time, task confusion, or activities that merely keep students quiet without generating understanding. Long-term impacts may include achievement gaps between grade levels, decreased motivation, and increased teacher burden as energy is exhausted managing underserved classes.

At this juncture, academic supervision becomes a key element, as supervision should ensure that the learning process runs effectively and continuously improves (Singh, 2024; Sunaryo, 2020). The problem is that commonly used supervision approaches often focus on lengthy instruments and assess multiple aspects simultaneously, making them difficult to implement regularly, especially in 3T schools facing time, distance, and support constraints. More importantly, supervision instruments designed for single-grade classrooms are often insensitive to the most critical indicators in multigrade classrooms: whether both classes continue learning when the teacher divides attention, whether service rotation is clear, whether independent tasks have adequate scaffolding, and whether there is tangible evidence of work from both classes during instruction (Rabenstein, 2018). When

supervision fails to capture these core issues, feedback becomes less targeted, and improvements in teaching practice do not address the most impactful areas.

The regulatory framework actually provides a strong foundation that academic supervision is not an additional activity but part of instructional leadership (Hamini et al., 2025). Principal standards include supervision competencies that require principals to plan academic supervision programs, implement academic supervision with appropriate approaches and techniques, and follow up on supervision results to enhance teacher professionalism (Lorensius, 2022). This formulation conveys that supervision is not merely formal observation but a cycle of improvement that must produce concrete follow-up actions. In the context of multigrade classrooms, this requires principals to ensure that supervision is relevant to multigrade needs and capable of driving the most needed practice changes.

On the other hand, supervisor standards also affirm the supervisor's role in supervision through mastery of supervision methods, techniques, and principles to improve quality, the ability to develop supervision programs, and prepare instruments and reports for follow-up (Hamilton et al., 2022). Professional development for multigrade teachers should therefore move beyond assessment toward evidence-based mentoring that helps teachers find immediately applicable solutions particularly critical in 3T schools where supervisory visits are infrequent and each visit must be effective, focused, and yield clear improvement priorities. However, field conditions reveal a gap between this normative ideal and the realities of supervision provision for multigrade classrooms in 3T regions.

The urgency of developing a supervision model specifically designed for multigrade classrooms in 3T regions rests not only on theoretical arguments but also on empirical realities identified through preliminary research. Interviews with principals of SDN Kecil Juhu and SDN Kecil Datar Batung, as well as district education officials including the current and former Head of Primary Education Division of Hulu Sungai Tengah District, reveal a set of structural conditions shaping the context of multigrade classroom provision in these areas. First, relatively small student enrollments at each grade level, combined with a teacher shortage reaching only half the ideal requirement for six grade levels, have compelled schools to implement class consolidation as an adaptive strategy to ensure learning continuity. Second, although multigrade classroom practices are already underway, teachers have not received specialized training in multigrade pedagogy, leading them to conduct simultaneous instruction across two grade levels based on intuition and experience rather than adequate methodological frameworks. Third, academic supervision conducted by school principals continues to employ instruments and approaches designed for single-grade classrooms, rendering it insensitive to the most critical indicators in multigrade settings such as learning continuity in the class not receiving direct instruction or the quality of independent tasks that scaffold learning in the teacher's absence. Consequently, supervision feedback tends to focus on teacher interaction with one class, while the dynamics of the independently working class escape observation and mentoring attention.

This condition becomes more pressing as the district government plans to formalize multigrade classrooms in 2026 as an efficiency policy for educational provision in small schools. Policy implementation without supervision instruments adaptive to multigrade classroom characteristics risks perpetuating the gap between pedagogical demands and available mentoring support. Multigrade teachers face dual challenges: managing

simultaneous instruction for two groups with different learning outcomes, while receiving supervision that fails to capture the essence of this challenge. Within this context, the development of the Adaptive Rapid Supervision (ARS) Model functions not only as a response to gaps in the multigrade supervision literature but also as an effort to provide instruments that directly address field needs. ARS is designed to ensure that supervision does not stop at performance assessment but provides evidence-based feedback that helps teachers identify and improve the most critical aspects of multigrade instruction. Thus, ARS possesses dual relevance: as a solution for schools already conducting multigrade classrooms informally, and as system preparation for schools that will implement them under formal policy mandates.

Integrating the empirical findings above with theoretical analysis, the need for a rapid yet targeted supervision model becomes increasingly clear. 3T schools require supervision that is lightweight enough for routine implementation, adaptive to multigrade classroom characteristics, evidence-based to ensure fairness without relying on impressions, and follow-up oriented to produce changes in teaching behavior. In resource-constrained field conditions, practice improvement tends to succeed more through consistent small steps rather than long recommendation lists that are difficult to implement (Yulidar et al., 2025). A review of existing literature indicates that available supervision models have not been specifically designed to address the characteristics of multigrade classrooms, particularly in assessing whether both classes learn simultaneously, whether service rotation operates clearly, and whether independent tasks are adequately scaffolded to reduce full dependence on teacher presence. This gap underscores the need to develop a supervision model that takes multigrade classroom dynamics as its starting point, rather than as an adaptation of single-grade models.

This study aims to develop the Adaptive Rapid Supervision (ARS) Model for multigrade classroom learning in 3T regions and to assess its validity, practicality, and initial benefit indications through an Educational Design Research approach. The model is designed around the continuous and simultaneous learning of both classes as its core indicator, as this aspect most critically determines multigrade learning quality yet is most frequently overlooked by conventional supervision instruments. This study addresses three research questions that remain inadequately answered in the existing literature: first, how valid is the ARS Model based on expert assessment of indicator relevance, procedural clarity, and instrument quality for 3T contexts; second, how practical is ARS implementation under actual multigrade classroom conditions; and third, what initial benefits does ARS demonstrate on multigrade learning process indicators following micro follow-up implementation.

METHODS

This study employed an Educational Design Research (EDR) approach to develop the Adaptive Rapid Supervision (ARS) Model for multigrade classroom learning in Indonesia's 3T regions (Akker et al., 2006). EDR was chosen because it enables the design of solutions that originate from real field problems, are tested incrementally, and are refined through validation and evaluation cycles, thereby producing operationally sound and scientifically accountable products (Akker et al., 2006; Akker et al., 2013). The research context focused on multigrade classrooms combining grades 3 and 4 in a single room at two schools: SDN Kecil Juhu and SDN Kecil Datar Batung. Supervision implementation involved school principals in their academic supervision role, while multigrade teachers

served as the primary recipients of supervision feedback. The three-stage EDR procedure Table 1 was conducted through interconnected phases as described below.

Table 1. Educational Design Research Procedure for ARS Model Development

EDR Stage	Activities	Data Collection Methods	Output
Stage 1: Preliminary Research	Mapping supervision needs in multigrade classrooms; Identifying primary problems when teachers divide focus; Analyzing service rotation patterns; Examining quality of independent tasks; Identifying types of interruptions	Initial classroom observations; Brief reviews of learning materials; Semi-structured interviews with teachers and principals	Problem identification; Needs analysis; Preliminary framework of core supervision indicators for multigrade classrooms
Stage 2: Prototype Design & Development	Designing initial ARS prototype; Developing 7 supporting instruments; Expert validation; Prototype revision based on validator input	Validation questionnaire (Likert 1–5) assessing content validity, procedural clarity, applicability, instrument readability, rubric clarity; Consolidated feedback from two expert validators (lecturers & BAN-PDM assessors)	Validated ARS prototype; Revised instrument package (model document, pre-observation sheet, observation instrument, rubric, evidence checklist, coaching guide, micro follow-up sheet)
Stage 3: Limited Trial & Evaluation	Implementing ARS across 4 sessions (2 per school); Monitoring process indicators; Collecting practitioner and teacher feedback; Final product refinement	Implementation checklists; Two-round observation instruments; Work evidence checks (≥2 students/class); Practicality questionnaire (principals); Acceptance questionnaire (teachers); Process indicator monitoring (researcher & Head of Primary Education Division)	Feasibility evidence; Practicality and acceptance ratings; Initial benefit indications on learning process; Final ARS product ready for implementation

The first stage consisted of preliminary research that systematically mapped supervision needs in multigrade classrooms. This included identification of primary problems occurring when teachers divide their instructional focus, service rotation patterns, quality of independent tasks, types of interruptions arising when classes are not directly served, and the supervision indicators most critical to ensuring simultaneous learning across both classes. Data at this stage were collected through initial classroom observations, brief reviews of learning materials in use, and semi-structured interviews with teachers and principals to explore field constraints and priority needs.

The second stage involved prototype design and development, beginning with the drafting of the initial ARS prototype and its supporting instrument package: a model document, pre-observation sheet, one-page two-round observation instrument, four-level rubric, work evidence checklist, single-focus coaching guide, and weekly micro follow-up sheet. The prototype was subsequently validated by two validators selected on the basis of their expertise and direct relevance to the research context. Both validators are university lecturers who concurrently serve as assessors of the National Accreditation Board for Primary and Secondary Education (BAN-PDM), providing them with the competence to evaluate supervision instrument quality and primary education standards, as well as extensive field experience in assessing educational provision across diverse school contexts, including resource-constrained schools. Validation was conducted using a Likert scale questionnaire (1–5) assessing content validity, conceptual and procedural clarity, applicability in 3T schools, instrument readability, rubric clarity, and quality of feedback and follow-up guidelines. Input from both validators was consolidated prior to revision, ensuring that all prototype

changes reflected comprehensive consideration from two expert perspectives. Revisions focused on sharpening operational definitions of indicators, strengthening the requirement to document at least two factual pieces of evidence per observation round, mandating work evidence checks for at least two students per class, and simplifying rubric wording to make level distinctions clearer and more usable in rapid supervision contexts.

The third stage comprised prototype evaluation through limited trials and product refinement. Trials were conducted across four sessions within the grade 3–4 multigrade context: two sessions at SDN Kecil Juhu and two sessions at SDN Kecil Datar Batung. The trials aimed to assess ARS procedure implementation feasibility, instrument practicality during actual instruction, teacher responses to the supervision process, and initial benefits on multigrade learning process indicators. Trial data were collected through ARS implementation checklists completed by school principals as supervision practitioners, two-round observation instrument results containing evidence for each class, work evidence checks for at least two students per class, single-focus coaching feedback notes and follow-up plans, and respondent comments. Supervision practitioner practicality was measured using a Likert scale questionnaire (1–5) completed by both school principals from the two participating schools. Teacher acceptance and perceived benefits were measured using a Likert scale questionnaire (1–5) completed by both multigrade teachers after receiving supervision, yielding a total of two teacher respondents.

To strengthen the documentation of learning process changes, this study also monitored simple process indicators relevant to multigrade classroom characteristics, including interruption frequency in independent classes during 10-minute observation periods, independent class on-task percentage through periodic headcounts, work evidence distribution across both classes through work sampling, and smoothness of teacher service rotation transitions through transition duration estimation. Process indicator monitoring was conducted jointly by the researcher and the Head of Primary Education Division of the Hulu Sungai Tengah District Education Office, who was present during trial sessions. The involvement of the Head of Primary Education Division strengthened the objectivity of observations and provided an additional policy and field experience perspective on model feasibility within the 3T school contexts under her administrative supervision.

Data analysis was conducted using a mixed-method approach integrating quantitative and qualitative techniques. Quantitative data obtained from questionnaires were analyzed using descriptive statistics, particularly mean scores, which were then converted into assessment categories based on Sugiyono (2022): 1.00–1.80 very low, 1.81–2.60 low, 2.61–3.40 moderate, 3.41–4.20 high, and 4.21–5.00 very high. This analysis was used to determine the level of validity, practicality, and initial benefit indications of the developed supervision model. Qualitative data, including observation notes, respondent comments, and follow-up documentation, were analyzed using an interactive model consisting of data reduction, data display, and conclusion drawing (Miles et al., 2014). These analyses aimed to identify patterns of supervision problems, changes in the implementation process after revisions, and aspects of the product requiring further refinement. The integration of quantitative and qualitative findings was carried out at the evaluation stage, where qualitative results were used to explain and strengthen quantitative findings. The combined results served as the basis for iterative revisions, leading to the finalization of the ARS product along with its instrument

package for implementation in multigrade classroom supervision in 3T regions.

RESULTS AND DISCUSSION

Results

This development research produced a final product in the form of the Adaptive Rapid Supervision (ARS) Model for multigrade classroom learning in 3T regions, along with a ready-to-use implementation instrument package for schools. The final ARS product includes a model document containing principles, core indicators, and supervision implementation procedures; a brief pre-observation sheet; a one-page rapid observation instrument with a two-round observation pattern; a four-level rubric for assessing core indicators; a student work evidence checklist; a single-focus coaching feedback guide; and a weekly micro follow-up sheet. The product is designed for multigrade classroom contexts such as grades 3 and 4 in a single room, thus the supervision procedure deliberately requires evidence from both classes, not only the class currently receiving teacher instruction.

The preliminary stage revealed that the dominant challenge in multigrade classroom learning at the two target schools emerged during moments when teachers divided their instructional focus. In initial observations, classes not currently receiving instruction tended to experience waiting time, stopped working when encountering difficulties, or repeatedly called the teacher, thereby disrupting the learning rhythm in the class receiving instruction. This pattern was most frequently related to independent task instructions that were insufficiently visible and inadequately supported by work examples or completion steps, as well as the absence of help protocols that would provide students with a sequence of actions before requesting teacher assistance. These preliminary findings were used as the basis for establishing ARS core indicators that emphasize continuous learning in both classes, clarity of rotation and transitions, quality of independent tasks along with their scaffolding, and support and control systems to minimize interruptions.

Product content validation was conducted by two validators using a Likert scale questionnaire (1–5). Validation results showed an overall mean of 4.26, categorized as very high. The content validity and relevance aspect obtained a mean of 4.55, indicating that core indicators were deemed highly appropriate for multigrade classroom supervision needs in 3T regions. The conceptual and procedural clarity aspect obtained a mean of 4.30, indicating that the sequence of pre-observation, two-round observation, evidence checking, feedback, and follow-up was considered logical and realistic. The instrument and rubric quality aspect obtained a mean of 4.05, categorized as high, with the main note that rubric wording needed simplification to make distinctions between levels clearer and that the evidence column needed emphasis as a mandatory component to ensure consistent data-based assessment. The feedback and follow-up quality aspect obtained a mean of 4.15, categorized as high, and validators emphasized the importance of maintaining the one-focus-per-week coaching principle so that follow-up could be realistically implemented by multigrade teachers. A summary of expert validation scores is presented in Table 2.

Table 2. Summary of Expert Validation of ARS Product on Likert Scale 1–5

Aspect	Item	Mean	Category
Content validity and relevance	1–4	4.55	Very high
Conceptual and procedural clarity	5–8	4.30	Very high
Instrument and rubric quality	9–12	4.05	High
Feedback and follow-up quality	13–16	4.15	High
Overall total	1–16	4.26	Very high

Categories: 1.00–1.80 very low, 1.81–2.60 low, 2.61–3.40 moderate, 3.41–4.20 high, 4.21–5.00 very high

Validator input was used to revise the prototype, making the product more operational and consistent. Revisions focused on sharpening operational definitions of indicators, strengthening the requirement to document at least two factual pieces of evidence in each observation round, mandating work evidence checks for at least two students per class, and simplifying rubric wording to make distinctions between levels easier to use in rapid supervision. A summary of the relationship between input and product revisions is presented in Table 3.

Table 3. Validator Input and ARS Product Revisions

Component	Main validator input	Prototype revision actions
Core indicators	Should not expand like general supervision	Condensed into operational core indicators for multigrade classrooms
Observation instrument	Risk of impression-based assessment	Evidence column mandatory, minimum 2 pieces of evidence per round
Work evidence check	Need minimum sampling standard	Minimum 2 work samples per class and briefly documented
Rubric	Levels need clear differentiators	Level descriptions simplified and made operational
Feedback	Should not have too many recommendations	Single-focus coaching with fact–impact–action format
Follow-up	Need brief monitoring	Added weekly micro follow-up sheet

Limited trials were conducted in four multigrade grade 3–4 learning sessions: two sessions at SDN Kecil Juhu and two sessions at SDN Kecil Datar Batung. Implementation feasibility results showed that all core ARS steps were completed in all four sessions, including brief pre-observation, two-round observation, work evidence check for both classes, single-focus coaching feedback, and micro follow-up documentation. ARS implementation duration ranged from 23–28 minutes with a mean of 25.5 minutes, thus implementation can be categorized as rapid and realistic for 3T school needs. A summary of implementation feasibility per session is presented in Table 4.

Table 4. ARS Implementation Feasibility in 4 Trial Sessions

Sesi	School	Subject	Duration (min)	Components completed
1	SDN Kecil Juhu	Mathematics	26	P, O2, WE, SF, MF
2	SDN Kecil Juhu	Indonesian Language	25	P, O2, WE, SF, MF
3	SDN Kecil Datar Batung	Mathematics	28	P, O2, WE, SF, MF
4	SDN Kecil Datar Batung	Indonesian Language	23	P, O2, WE, SF, MF

Component abbreviations: P = pre-observation, O2 = two-round observation, WE = work evidence check ≥2 students per class, SF = single-focus coaching, MF = micro follow-up documented

To strengthen reporting of multigrade classroom learning processes during trials, this study monitored process indicators relevant to multigrade characteristics, including independent class interruptions, independent class on-task percentage, work evidence distribution across both classes, and teacher service rotation transition duration. Operational definitions and brief measurement methods for each indicator are presented in

Table 5. Process Indicators Monitored during ARS Trials

Process Indicator	Operational Definition (Brief)	Rapid Measurement Method	Unit
Independent class interruptions	Students stopping activities to call or wait for teacher when teacher is serving another class	Count during 10-minute observation of independent class	Frequency
Independent class on-task	Students working on assigned tasks according to instructions when not being directly served	Headcount every 2 minutes during 10-minute observation, take average	Percentage
Work evidence from both classes	Work products according to instructions and demonstrating learning process traces	Minimum sampling of 2 works per class plus brief notes	Number of valid samples
Rotation transition duration	Time to switch focus between classes	Estimate transition duration	Minutes

A summary of process indicator observation results showed consistent improvement after micro follow-up was implemented. In the first two sessions, independent class interruptions ranged from 7–9 times per 10-minute observation period with a mean of 8 times, independent class on-task percentage ranged from 58–66 percent, and valid work evidence was stronger in the class receiving instruction compared to the independent class. In the subsequent two sessions after improvement focus was attempted, independent class interruptions decreased to 3–5 times per 10 minutes with a mean of 4 times, on-task percentage increased to 72–81 percent, and valid work evidence from both classes became more balanced, while rotation transition duration improved from approximately 3 minutes to approximately 1–2 minutes. A summary of process indicator changes before and after micro follow-up is presented in Table 6.

Table 6. Process Indicator Changes Before and After Micro Follow-up

Process indicator	Sessions 1–2 Mean	Sessions 3–4 Mean	Direction of change
Independent class interruptions per 10 minutes	8	4	Decreased
Independent class on-task	62%	76%	Increased
Valid work evidence Grade 3 out of 2 samples	1.5/2	2/2	Increased
Valid work evidence Grade 4 out of 2 samples	2/2	2/2	Stable high
Rotation transition duration	3 minutes	1.5 minutes	Poor to improved

Improvement focus emerging from single-focus coaching in the trials was largely related to strengthening independent task scaffolding and interruption control, particularly adding work examples and visible brief steps, implementing staged help protocols before calling the teacher, and using transition signals to support service rotation rhythm. In micro follow-up, these small actions were noted as relatively easy to attempt and produced rapid changes in independent class stability, marked by decreased repeated questions and increased work productivity. A summary of improvement focus and initial impact evidence is presented in Table 7.

Table 7. Single-Focus Coaching Improvement Focus and Initial Impact Evidence

Improvement focus	Example small actions	Documented impact evidence
Independent task work examples	Write 1 complete example plus 2 steps on the board	Interruptions decreased, work products increased
Brief visual instructions	2–3 point task steps posted or written clearly	On-task increased, waiting time reduced
Staged help protocol	Read instructions, see example, ask peer, then call teacher	Repeated questions reduced
Rotation transition signals	Timer or tapping for focus switching	Transitions faster and more orderly

ARS practicality was assessed by supervision practitioners using a Likert scale questionnaire (1–5) and obtained a mean of 4.34, categorized as very high. ARS acceptance and benefits were assessed by teachers using a Likert scale questionnaire (1–5) and obtained a mean of 4.22, categorized as very high, with strong ratings on aspects of evidence-based feedback that was easy to understand and realistic improvement focus to attempt. A summary of user assessments is presented in Table 8.

Table 8. Practitioner Practicality and Teacher Acceptance

Respondent	Instrument	Mean	Category	Strongest indicators
Supervision practitioners	10-item practicality questionnaire	4.34	Very high	Easy to use, realistic duration, evidence checking helpful
Multigrade teachers	10-item acceptance questionnaire	4.22	Very high	Clear feedbac, realistic improvement focus

Overall, research findings indicate that the ARS product meets validity and practicality criteria and shows initial benefit indications on multigrade classroom learning process indicators after micro follow-up implementation. Expert validation confirmed indicator relevance and instrument validity, while limited trials confirmed model feasibility within a short duration, ease of instrument use, and consistent process improvements after micro follow-up implementation. The final ARS product was then established as an instrument package with completion instructions per sheet, document codes, and version numbers, making it ready for use and adaptation by 3T schools with multigrade classrooms.

Discussion

The development results of the Adaptive Rapid Supervision (ARS) Model demonstrate that academic supervision for multigrade classrooms in 3T regions needs to focus on different determining factors compared to single-grade classrooms, as learning quality in multigrade classrooms is determined by the ability to keep two learning groups functioning when teacher attention shifts. Literature on multigrade in rural contexts shows that multigrade classrooms emerge as an educational strategy due to demographic and geographical conditions but bring distinctive challenges in learning management, differentiation needs, and availability of learning materials and scaffolding so students can work without complete dependence on teachers (Ares-ferreirós & Martínez-iglesias, 2025). Preliminary findings indicating dominance of waiting time, cessation of activities when encountering difficulties, and repeated interruptions in classes not receiving instruction reveal that "time without teacher" constitutes a critical point determining students' learning opportunities. Therefore, establishment of ARS core indicators emphasizing continuous learning in both classes simultaneously, clarity of rotation and transitions, quality of independent tasks along with their scaffolding, and support and control systems represents a sharpening of supervision targets aligned with multigrade classroom characteristics, not a reduction of supervision standards.

The strength of ARS design is also evident from validators' consistent acceptance on content validity and relevance aspects as well as model procedural clarity. Expert validation summary shows that content validity and relevance aspects fall in the very high category with a combined mean of 4.55, while conceptual and procedural clarity also falls in the very high category with a mean of 4.30, indicating that ARS indicator selection and procedural sequence are viewed as appropriate and realistic for supervision contexts in 3T

regions. Simultaneously, instrument and rubric quality aspects fall in the high category with a mean of 4.05, signaling that development challenges lie not in model direction accuracy but in how instruments guide assessment to remain consistent under brief observation conditions. Validator notes requesting emphasis on minimum evidence and rubric simplification, as summarized in the input-revision relationship, reinforce the principle that multigrade classroom supervision must be evidence-based to avoid becoming impression-based assessment, especially when observers easily focus on the class receiving instruction and overlook the independent class (Sariakin et al., 2025).

Prototype revisions conducted after validation demonstrate that ARS product quality improved through iterative mechanisms characteristic of EDR (Akker et al., 2013). Emphasis on mandatory documentation of at least two factual pieces of evidence in each observation round and mandatory work evidence checks for at least two students per class constitute important methodological strengthening because they force observers to collect data from both classes in a balanced manner. Substantively, this change addresses two problems simultaneously: observation bias tending to assess learning from teacher interaction in one group and supervision tendencies that are too normative without concrete data support. Thus, revisions not only refine format but enhance supervision process validity by linking feedback to evidence that can be shown, discussed, and tracked in subsequent visits.

ARS feasibility in four trial sessions with all core components completed and an average duration of 25.5 minutes strengthens the argument that ARS is suitable for 3T contexts with limited time and supervision access. Implementation duration ranging from 23–28 minutes shows that pre-observation procedures, two-round observation, evidence checking, single-focus coaching, and micro follow-up can be executed as a minimum supervision package that is brief yet remains substantive. This finding is important because one challenge of supervision in resource-constrained schools is consistency, where lengthy supervision tends to be infrequently conducted, while overly brief supervision often loses improvement power (Halimah et al., 2024; Rasuani et al., 2025). ARS functions as a format balancing evidence needs with efficiency needs, making it more likely to be repeatedly implemented as a school practice rather than merely an administrative activity.

Initial benefit indications of ARS are clearly visible in multigrade classroom learning process indicators after micro follow-up implementation. The strongest changes occurred in independent class stability, evident from decreased independent class interruptions from a mean of 8 times to 4 times per 10 minutes, increased independent class on-task percentage from approximately 62 percent to 76 percent, and improved teacher service rotation transition duration from approximately 3 minutes to approximately 1.5 minutes. This pattern shows that ARS influences aspects that directly constitute multigrade classroom vulnerability points, namely student dependence on teachers when teachers must shift focus. Additionally, improved work evidence distribution visible in grade 3, from a mean of 1.5 out of 2 samples to 2 out of 2 samples, indicates that small interventions established through single-focus coaching contribute to increased learning productivity at grade levels typically requiring more concrete support. Meanwhile, work evidence in grade 4 that remained stable high from the beginning shows that more mature independent learning capacity at higher grade levels can make those classes more ready to work independently, thus improvement focus has greater impact on lower grade levels, and this has implications that independent task scaffolding in multigrade

classrooms should be adjusted to developmental characteristics of each grade level. Multigrade literature on challenges of providing teaching materials and needs for context-appropriate rural strategies also supports the importance of learning scaffolding to maintain independent work continuity (Carrete-Marín et al., 2024).

The working mechanism of ARS explaining these process changes lies in the relationship between evidence, improvement focus, and monitoring. Improvement focus most frequently emerging in single-focus coaching adding work examples and brief visual instructions, implementing staged help protocols, and using transition signals works directly on primary causes of interruptions and waiting time. Work examples and visible brief steps increase task clarity and reduce students' interpretation burden when teachers are not near them, thus students are better able to continue work without waiting. Staged help protocols transform dependence patterns into tiered problem-solving patterns, thus questions previously directed immediately to teachers are redirected to independent attempts and peer support first. Transition signals improve service rotation rhythm because students understand when to stop, listen to instructions, and return to work, thus transitions become faster and do not consume learning time. Because these actions are small, specific, and can be implemented immediately, process changes can be visible in short cycles and can be monitored through micro follow-up, ultimately reinforcing gradual improvement habits.

The strength of this research's findings can also be explained through pattern consistency across multiple data sources, which practically functions as triangulation. Process improvement findings not only emerged from two-round observation notes but were also strengthened by student work evidence checks and user perceptions (principals). Supervision practitioners assessed ARS practicality in the very high category with a mean of 4.34, while teachers assessed acceptance and benefits in the very high category with a mean of 4.22, thus changes recorded in process indicators do not stand alone as numbers but align with perceptions that ARS procedures are easy to implement, feedback is easy to understand, and improvement focus is realistic to attempt. Alignment between process indicator changes, work evidence, and user responses strengthens interpretation that ARS is not only implementable but also drives practice improvements perceived as meaningful by principals and teachers.

Nevertheless, discussion needs to maintain claim proportionality according to trial design limitations. This research has demonstrated validity, practicality, and initial benefit indications on process indicators but is not yet sufficient to declare causal effectiveness on long-term learning outcomes because trial scope remains limited to two schools and four sessions. Additionally, inter-rater reliability for ARS rubric use has not been formally tested, thus score consistency across different supervision practitioners remains an important agenda. Accordingly, these research findings are more appropriately understood as evidence that ARS meets development product quality criteria at valid and practical levels and shows initial benefit potential, while effectiveness evidence strengthening requires follow-up research with more cycles, more school contexts, and more direct outcome indicators.

Practical implications of these findings affirm that multigrade classroom supervision in 3T regions should position independent class stability as the primary target because this aspect determines continuous learning in both classes simultaneously. In implementation, principals and supervisors can use ARS as a routine supervision package because its duration is brief and instruments are concise, yet it still forces evidence collection through two observation rounds and work evidence

checks. The single-focus coaching principle and micro follow-up provide a realistic framework for driving gradual change, thus supervision does not stop at assessment but becomes an improvement cycle that can be monitored. At the classroom level, teachers can make work examples, brief visual instructions, staged help protocols, and transition signals simple yet impactful tools for reducing interruptions and increasing independent class productivity. Overall, ARS demonstrates capacity to address primary multigrade classroom needs in 3T regions by combining supervision efficiency, evidence-based assessment, and measurable follow-up, thus potentially building a more consistent learning improvement culture in resource-constrained school contexts.

CONCLUSIONS

This research successfully developed the Adaptive Rapid Supervision (ARS) Model for multigrade classroom learning in 3T regions along with a concise and ready-to-implement operational instrument package. ARS is designed by positioning the most critical indicators in multigrade classrooms: continuous learning in both classes simultaneously, clarity of teacher service rotation and transitions, quality of independent tasks along with their scaffolding, and support and control systems to minimize interruptions when teachers divide focus. Validation by two experts shows that the product falls in the very high category overall and is assessed as relevant and realistic for 3T contexts, thus revisions focused on strengthening minimum evidence and simplifying rubrics to make assessment more consistently data-based.

Limited trials at SDN Kecil Juhu and SDN Kecil Datar Batung demonstrate that ARS can be fully implemented in a brief duration and is easy to use, and provides initial benefit indications on multigrade classroom learning processes. After micro follow-up was conducted through single-focus coaching, consistent improvements occurred in independent class stability, evident from decreased interruptions, increased on-task behavior, balanced work evidence, and improved teacher service rotation transitions. Thus, ARS meets development product criteria that are valid and practical, and has potential to strengthen evidence-based supervision culture and gradual improvement in resource-constrained 3T schools.

RECOMMENDATIONS

Based on the research findings, several recommendations can be proposed. First, principals and supervisors in 3T schools are encouraged to adopt ARS as a routine supervision practice because its brief duration and evidence-based approach make it more sustainable than lengthy supervision instruments. Second, teacher professional development programs should emphasize practical scaffolding strategies for independent tasks, staged help protocols, and transition management to strengthen multigrade teaching capacity. Third, education authorities should consider adapting ARS principles for policy development on multigrade classroom quality assurance in remote areas. Fourth, future research should extend trials to more schools and cycles to test inter-rater reliability and examine long-term impacts on student learning outcomes. Finally, development of complementary resources such as multigrade lesson plan templates and independent task banks would enhance ARS implementation effectiveness in 3T school contexts.

REFERENCE

Akker, J. van den, Bannan, B., Kelly, A. E., Nieveen, N., & Plomp, T. (2013). Educational Design Research Educational Design Research. *Netherlands Institute for Curriculum Development: SLO*, 1–206.

Akker, J. Van Den, Gravemeijer, K., Mckenney, S., & Nieveen, N. (2006). *Design research from a technology perspective. Chapter in Educational Design Research*. Routledge Taylor & Francis Group.

Ares-ferreirós, M., & Martínez-iglesias, J. M. Á. (2025). Challenges and Opportunities of Multi-Grade Teaching : A Systematic Review of Recent International Studies. *Education Sciences*, *15*(1052), 1–19. https://doi.org/10.3390/educsci15081052

Carney, S., & Carty, C. (2024). Pathways to change: The transformative potential of human rights and sustainable development in and through education. *Prospects*, *54*(2), 483–490. https://doi.org/10.1007/s11125-023-09671-8

Carrete-Marín, N., Domingo-Peñafiel, L., & Simó-Gil, N. (2024). Teaching materials for rural schools: challenges and practical considerations from an international perspective. *International Journal of Educational Research Open*, *7*(May). https://doi.org/10.1016/j.ijedro.2024.100365

Halimah, N., Megawati, S., Fatah, A., Nordin, N. E., & Mulyanto, A. (2024). Transformasi Peran Pengawas dalam Upaya Peningkatan Mutu Pendidikan Sekolah: Sebuah Kajian Literatur. *EduInovasi: Journal of Basic Educational Studies*, *4*(3), 2263–2277. https://doi.org/10.47467/edu.v4i3.6127

Hamilton, S. J., Briggs, L., Peterson, E. E., Slattery, M., & O'Donovan, A. (2022). Supporting conscious competency: Validation of the Generic Supervision Assessment Tool (GSAT). *Psychology and Psychotherapy: Theory, Research and Practice*, *95*(1), 113–136. https://doi.org/10.1111/papt.12369

Hamini, Dahyanti, Bobby, A., Dedi, A., Warman, & Yahya, M. (2025). Paradigma Baru Supervisi Akademik: Antara Evaluasi, Pendampingan, Dan Pemberdayaan Guru – Sebuah Tinjauan Literatur. *Jurnal Media Akademik (Jma)*, *3*(8), 3031–5220. https://doi.org/10.62281/v3i8.2674

Lorensius. (2022). The Academic Supervision for Improving Teacher Professionalism Empirical Evidence from The Secondary School in East Borneo, Indonesia. *Posted Content*, *175*(4), 156–157. https://doi.org/10.31219/osf.io/3q9yd

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook*. SAGE Publications.

Minaz, M., Baig, G. N., & Ali, M. (2024). The Pedagogical Competencies of Multi-Grade Teachers : A Literature Review. *Proscholar Insights*, *3*(1), 78–86. https://doi.org/10.62997/psi.2024a-31019

Qayoom, A., & Akram, M. (2024). Multi-grade Teaching and its Detrimental Effects on the Performance of Primary School Teachers in District Hub , Balochistan. *International Journal of Social Science and Entrepreneurship (IJSSE)*, *4*(1), 271–284. https://doi.org/10.58661/ijsse.v4i1.263

Rabenstein, K. (2018). Monitoring von Arbeitsprozessen im Unterricht der autonomen Schule als Bürokratisierung von Lernbiografien: Eine explorative Instrumentenanalyse. In *Verwaltete Biografien* (pp. 27–40). Springer VS, Wiesbaden.

https://doi.org/10.1007/978-3-658-20522-5_2

Rasuani, M., Aprilianty, F., & Susmita, I. (2025). Pendekatan Supervisi Kepala Sekolah yang Efektif dalam Meningkatkan Profesionalisme Guru: Systematic Literature Review. *Journal of Innovation in Teaching and Instructional Media*, *6*(1), 129–151. https://doi.org/10.52690/jitim.v6i1.1119

Sariakin, Yulsafli, Fajriansyah, & Syarfuni. (2025). A lesson study-based clinical supervision model for enhancing teacher performance. *Global Journal of Guidance and Counseling in Schools: Current Perspectives*, *15*(1), 1–11. https://doi.org/10.18844/gjgc.v15i1.9643

Singh, M. K. S. (2024). Effective Supervision in Doctoral Studies through Constructive and Motivational Feedback : The CoMFeS Model. *Research Square*, 1–18. https://doi.org/10.21203/rs.3.rs-5049678

Sugiyono. (2022). Metode Penelitian Kuantitatif Kualitatif dan R&D. In *Bandung Alfabeta* (4th ed.). Alfabeta.

Sunaryo, Y. (2020). Academic Supervision of School Principals and Teacher Performance: A Literature Review. *International Journal Pedagogy of Social Studies*, *5*(2), 17–34. https://doi.org/10.17509/ijposs.v5i2.29094

Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional. (n.d.).

Yulidar, Aswad, F. H., & Badrun, M. (2025). Implementasi Supervisi Akademik Berbasis Coaching Dalam Meningkatkan Kualitas Pembelajaran Pada Kurikulum Merdeka. *Manajemen Pendidikan*, *20*(1), 187–196. https://doi.org/10.23917/jmp/v9i2.7572