



## Developing the Smart Observer Toolkit for School Environment Observation in Primary Teacher Education

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### Abstract

School environment observation is an important field experience for pre-service primary teachers because it provides opportunities to connect university-based knowledge with authentic educational settings. However, beginning student teachers may experience difficulties in conducting systematic and objective observations, particularly when they have limited exposure to foundational educational courses and rely on observation sheets that emphasize administrative description. This study aimed to develop, refine, and examine the initial implementation of the Smart Observer Toolkit, an interactive digital handbook and structured observation instrument for second-semester students in the Primary School Teacher Education Program at Universitas Negeri Jakarta. The study employed a development-oriented educational design consisting of needs assessment, literature and regulatory review, instrument development, expert and peer review, revision, digitalization, and classroom implementation. A preliminary needs assessment involving 19 students showed that 16 required guidance in interpreting observation data, 15 in using observation instruments, 13 in preparing observation reports, and eight in observation ethics. The resulting toolkit integrates the eight Indonesian National Education Standards and Child-Friendly School principles into four interconnected observation pillars: instructional and academic climate, physical environment and infrastructure, school and classroom management, and socio-emotional culture and school climate. Expert and peer review supported the feasibility and refinement of the toolkit prior to digitalization. Initial implementation indicated that the structured indicators, quantitative rating rubrics, qualitative evidence records, and reflective prompts supported students in conducting more systematic and child-centered school observations. While delivered as an interactive digital handbook for practical accessibility in the field, the primary value of the toolkit lies in its structured pedagogical scaffolding, which strengthens early field experiences and supports the development of professional observation skills among pre-service primary teachers.

**Keywords:** Pre-Service Teachers, School Environment Observation, Smart Observer Toolkit, Child-Friendly School, Primary Teacher Education



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### Introduction

Field-based experiences constitute an essential component of initial teacher education because they provide pre-service teachers with opportunities to encounter the

complexity of educational practice before assuming full responsibility for classroom teaching. Kwok & Bartanen (2022) describe early field experiences as opportunities for prospective teachers to observe, reflect on, and gradually understand professional practice. Similarly, Nduagbo & Casale (2023) and Romero et al. (2022) emphasize that reflective engagement during field experiences can contribute to professional learning, self-efficacy, and the formation of teacher identity. However, exposure to schools does not automatically produce meaningful professional learning. García-Lázaro & Reyes-de-Cózar (2025) show that reflection during field experiences may remain descriptive unless students are supported by structures that help them interpret their experiences more critically. Thus, the educational value of early field observation depends not only on where students are placed, but also on how they are guided to identify relevant evidence, interpret school conditions, and connect observations with professional knowledge.

This challenge is closely related to teacher noticing or professional vision, which refers to the professional capacity to attend to and interpret significant educational events. van Es & Sherin (2021) conceptualize teacher noticing as involving selective attention and knowledge-based interpretation, while König et al. (2022) demonstrate that this competence develops progressively through experience and appropriately designed learning opportunities. Amador et al. (2021) reveal considerable variation in the instructional approaches used to support prospective teachers' noticing, suggesting that the quality of scaffolding strongly influences the development of this competence. At the same time, Bastian et al. (2022) further show meaningful differences in noticing competence across pre-service, early-career, and experienced teachers. Although their findings originate from secondary mathematics classrooms, this developmental contrast underscores that professional attention and interpretation are non-automatic capacities across educational levels, thereby highlighting the necessity of structured pedagogical scaffolds for novice primary teacher candidates.

The challenge is particularly relevant for beginning pre-service teachers whose pedagogical knowledge is still developing. Vondrová et al. (2023) found that prospective teachers often struggled to identify significant instructional situations and to connect observed events with relevant theoretical knowledge. Structured instructional support can therefore help novice observers move beyond intuitive or surface-level judgments. Prilop et al. (2021) demonstrate that expert feedback can strengthen pre-service teachers' professional vision, while Martin et al. (2023) show that focused prompts and targeted

theoretical information can direct attention toward relevant events and improve subsequent interpretation. Extending this evidence, [Farrell et al. \(2024\)](#) indicate that instructional cues and focused prompts can support professional-vision training, particularly for learners with limited prior knowledge. Collectively, these findings support the use of observation instruments as cognitive scaffolds rather than merely as administrative recording sheets.

Despite these developments, much of the professional-noticing literature remains concentrated on classroom events and frequently uses video-based representations of teaching. [Weyers et al. \(2023\)](#) identified 22 standardized teacher-noticing instruments and found that most focused on specific classroom situations, while their observational domains and validation approaches varied considerably. Such instruments are valuable for examining instructional practice, but early field experiences in primary teacher education involve a broader school ecosystem. Beginning students encounter not only classroom instruction but also physical environments, school management, organizational routines, interpersonal relationships, safety conditions, accessibility, and school culture. Consequently, an observation instrument for early-semester pre-service teachers needs to extend beyond selected classroom events and provide a structured framework for interpreting multiple dimensions of school life.

This need was identified in the Primary School Teacher Education Program (Pendidikan Guru Sekolah Dasar [PGSD]) at Universitas Negeri Jakarta, particularly in the two-credit Pra Kondisi SD course undertaken by second-semester students. The course functions as an early bridge between university learning and the professional realities of primary schools, requiring students to examine instructional, physical, managerial, and socio-emotional dimensions through observation, interviews, document review, and discussion. However, prior to the development of this toolkit, student observation in the Pra Kondisi SD course relied on conventional open-ended forms and descriptive checklists. These legacy materials predominantly emphasized administrative inventory (such as documenting facility presence or physical dimensions) without providing analytical rubrics or child-centered pedagogical lenses. Because second-semester students had not yet completed foundational educational psychology coursework, their field observations frequently produced superficial descriptions rather than meaningful educational analysis. A preliminary needs assessment involving 19 students indicated substantial needs for guidance in interpreting observation data, using observation instruments, preparing reports, and

applying appropriate observation ethics. The instructional problem, therefore, was not simply how students should collect information, but how novice observers could transform field evidence into meaningful educational analysis.

A comprehensive interpretation of primary school environments also requires attention to how institutional conditions are experienced by children. [Zynuiddin et al. \(2023\)](#) show that school climate is associated with students' well-being, engagement, safety, relationships, and behavior, while [Aldridge & Blackstock \(2024\)](#) emphasize that students' perceptions are essential for understanding the quality of primary-school environments. Within the Indonesian context, [Saptono \(2022\)](#) links Child-Friendly School policies with efforts to reduce violence and strengthen safe learning environments. [Effendi \(2023\)](#) further argue that child-friendly schooling requires attention to non-discrimination, infrastructure, educator capacity, and supportive school management, whereas [Miftahudin et al. \(2023\)](#) identify school policy, learning processes, facilities, child participation, and family-community involvement as interconnected dimensions of implementation. These perspectives indicate that school quality cannot be evaluated only through the existence of facilities, documents, or administrative procedures; prospective teachers also need to consider whether these conditions actually support children's safety, inclusion, participation, comfort, and well-being.

The Indonesian regulatory framework strengthens the need for such an integrated perspective. [Pemerintah Republik Indonesia \(2022\)](#) establishes the National Education Standards (Standar Nasional Pendidikan [SNP]) as the national framework for educational quality, covering graduate competencies, content, learning processes, assessment, educators and education personnel, facilities and infrastructure, management, and financing. At the same time, [Kemen PPPA RI \(2024\)](#) reinforces institutional responsibility for the fulfillment of children's rights. Within this regulatory framework, the eight standards were translated into observable field dimensions; specifically, while institutional financing standards were contextualized within the management pillar through observable indicators of resource maintenance, material allocation, and facility upkeep rather than confidential fiscal audits, the remaining standards directly informed instructional, environmental, and socio-emotional criteria. Nevertheless, an instructional gap remains between these national frameworks and early field observation practices in Indonesian teacher education. Previous studies on initial school orientation (such as *Pengenalan Lapangan Persekolahan* [PLP]) indicate that existing observation instruments predominantly rely on administrative checklists that

focus on institutional compliance and facility inventories rather than analytical noticing (e.g., Ngula et al., 2026; Sahira & Herianto, 2023). While several initiatives have examined Child-Friendly Schools in primary settings, these frameworks are rarely translated into operational observation scaffolds for beginning pre-service teachers. Furthermore, existing professional-noticing literature largely concentrates on video-based classroom teaching episodes. Consequently, the pedagogical need is not merely for another checklist or digitized recording form, but for an integrated scaffold that translates national educational standards and child-centered principles into observable field indicators, qualitative evidence triangulation, and structured reflection.

To address this gap, the present study developed the Smart Observer Toolkit, an interactive digital handbook and structured school-environment observation instrument for early-semester PGSD students. The toolkit integrates the eight Indonesian National Education Standards with Child-Friendly School perspectives through four interconnected observation pillars: (1) instructional and academic climate, (2) physical environment and infrastructure, (3) school and classroom management, and (4) socio-emotional culture and school climate. The novelty of the Smart Observer Toolkit becomes evident when contrasted with standard early-field observation instruments commonly employed in initial teacher education, such as conventional PLP I observation sheets or general school facility checklists. While existing instruments typically function as descriptive inventories or binary verification forms (presence versus absence of administrative items), they rarely provide explicit criteria for evaluating the quality of learning environments from a child-centered perspective. In contrast, the novelty of the Smart Observer Toolkit lies in its multi-layered pedagogical design: it embeds the eight National Education Standards and Child-Friendly School indicators into four interconnected pillars, operationalized through four-point qualitative rating rubrics, multi-source evidence triangulation (direct observation, interviews, and documentation), and structured critical reflection (What?–So What?–Now What?). Thus, rather than serving as a mere administrative audit, the toolkit functions as an integrated cognitive scaffold that trains novice teacher candidates to interpret the pedagogical and developmental implications of school environments. Accordingly, this study aimed to develop, refine, and examine the initial implementation of the Smart Observer Toolkit in primary teacher education. Specifically, the study investigated the needs underlying its development, the structure and formative feasibility of the resulting toolkit, and its initial use in supporting more systematic, evidence-based, and child-centered school

observation. Initial implementation suggested that the toolkit was feasible as an instructional scaffold for strengthening early professional observation among pre-service primary teachers.

## **Research Method**

### ***Research Design and Participants***

This study employed a development-oriented educational design guided by the ADDIE instructional design framework (Branch, 2009) to develop, refine, and examine the initial implementation of the Smart Observer Toolkit. The investigation was conducted in the Primary School Teacher Education Program (Pendidikan Guru Sekolah Dasar [PGSD]), Faculty of Education, Universitas Negeri Jakarta, Indonesia, from April to June 2026 within the two-credit Pra Kondisi SD course. Rather than testing causal effectiveness through an experimental design, the study focused on formative product development, iterative refinement, and initial instructional usability.

The preliminary needs assessment involved an intact cohort of 19 second-semester PGSD students enrolled in the Pra Kondisi SD course, examining their perceived difficulties across four operational areas: interpreting observation data, using observation instruments, preparing reports, and applying observation ethics. Following prototype review and refinement by three reviewers using a structured review form, this same intact cohort of 19 students participated in the initial field implementation. The findings therefore reflect a single formative cycle conducted within one defined cohort rather than independent confirmatory evidence from separate samples. Evidence of implementation was gathered through student participation documentation, completed student observation reports, and structured written lecturer feedback based on predefined evaluative criteria.

### ***Development Procedure***

The development procedure followed the ADDIE instructional design framework (Branch & Varank, 2009), encompassing five sequential phases: Analysis, Design, Development, Implementation, and Formative Evaluation.

In the Analysis phase, a preliminary needs assessment was conducted with pre-service teachers, complemented by a systematic review of foundational literature and national educational regulations (Standar Nasional Pendidikan [SNP] and Child-Friendly School guidelines) to identify core instructional challenges in early field observations.

In the Design phase, the conceptual framework of the Smart Observer Toolkit

was mapped into four interconnected observation pillars: instructional and academic climate, physical environment and infrastructure, school and classroom management, and socio-emotional culture and school climate.

In the Development phase, observation indicators, four-point analytical rubrics, and qualitative recording prompts were drafted. The prototype subsequently underwent formative expert and peer review involving three reviewers across four evaluation dimensions (content substance, language/readability, rubric quality, and contextual relevance). Feedback from this review guided iterative revisions of terminology, criteria, and instructions. The revised product was then converted into an interactive PDF format equipped with navigation features and verified for multi-device accessibility.

In the Implementation phase, pre-service teachers received orientation and technical briefing before deploying the interactive toolkit during authentic school-environment observation activities within the Pra Kondisi SD course.

Finally, in the Formative Evaluation phase, student observation reports, qualitative evidence records, and lecturer feedback were analyzed to assess the practical usability, clarity, and pedagogical feasibility of the toolkit in supporting systematic observation.

### ***Instruments and Data Collection***

Three main data sources were used. The student needs-assessment questionnaire identified perceived difficulties across four predetermined operational dimensions: observation-data interpretation, instrument usage, report preparation, and observation ethics. These four dimensions were deductively established from two primary sources: (1) recurring pedagogical challenges documented by course instructors in prior semesters of the Pra Kondisi SD course, where novice students frequently struggled to move beyond descriptive checklists; and (2) established teacher-noticing literature indicating that early-stage pre-service teachers typically encounter specific difficulties in interpreting complex classroom events, navigating observation rubrics, and adhering to ethical standards during authentic field placements (e.g., [Amador et al., 2021](#); [Finefter-Rosenbluh & Power, 2023](#)). A structured review form was used to collect reviewer ratings and written recommendations regarding the prototype. The Smart Observer Toolkit functioned as the developed product and the structured observation instrument used during field activities.

The toolkit combined National Education Standards and Child-Friendly School

perspectives through structured 1–4 rating criteria. Students supported their ratings with qualitative evidence collected through direct observation, interviews, and document review. The reporting format comprised five structured sections: four domain-specific appraisal sections corresponding to each observation pillar, followed by a mandatory capstone section (Section V: Comprehensive Cross-Pillar Synthesis). In this culminating section, candidates were explicitly required to integrate findings across all four pillars—evaluating how managerial policies and physical facilities interact to shape instructional dynamics and children's socio-emotional well-being—using the What?–So What?–Now What? reflective sequence.

Needs-assessment data were collected before prototype development, reviewer feedback during the formative review stage, and implementation evidence after students used the toolkit during field observation.

### ***Data Analysis***

Needs-assessment responses were analyzed descriptively using frequencies and percentages. Reviewer ratings and comments were examined descriptively to identify components requiring revision and to support formative product refinement.

Initial implementation data were examined through descriptive document analysis of student observation reports and lecturer feedback using a predefined qualitative evaluation framework. Student reports were analyzed against three explicit criteria: (1) reporting depth, coded as either 'administrative' (reports that merely listed physical assets or completed binary checklists) or 'interpretive' (reports that examined the educational and developmental implications of school conditions for children's learning and well-being); (2) evidence grounding, assessed by the presence of triangulated field data (combining direct observations, interview notes, and institutional documents) versus unsupported subjective impressions; and (3) cross-pillar integration, evaluating whether findings were synthesized across the four observation pillars using the What?–So What?–Now What? reflective model. No inferential statistical tests were conducted because the study was designed as an initial formative development and implementation study.

## **Results and Discussion**

### ***Needs Assessment***

The preliminary needs assessment involving 19 students showed that 16 students (84.2%) required guidance in interpreting observation data, 15 (78.9%) in using observation instruments, 13 (68.4%) in preparing reports, and eight (42.1%) in

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observation ethics. The predominance of interpretive difficulties indicates that the main challenge extended beyond collecting information to determining the educational significance of observed conditions. These findings are summarized in Table 1.

**Table 1** Students' Needs for School-Environment Observation Guidance

| Area of Need                       | Frequency (n) | Percentage (%) |
|------------------------------------|---------------|----------------|
| Interpretation of observation data | 16            | 84.2           |
| Use of observation instruments     | 15            | 78.9           |
| Preparation of observation reports | 13            | 68.4           |
| Observation ethics                 | 8             | 42.1           |

*Note: Total percentage exceeds 100% because categories were not mutually exclusive; respondents were permitted to indicate needs in multiple areas. With a small sample size (n = 19), each respondent represents approximately 5.26 percentage points.*

The highest percentage was found in the interpretation of observation data, indicating that the main challenge extended beyond the mechanics of collecting information. Students needed support in determining which school conditions were educationally significant and how the evidence they collected should be interpreted. This finding is particularly relevant for beginning teacher candidates who encounter the complexity of authentic school environments while their pedagogical knowledge is still developing. [Gardesten & Herrlin \(2024\)](#) similarly show that initial field experiences expose teacher candidates to instructional, relational, moral, and emotional dimensions that may be difficult for novices to interpret simultaneously.

The need for interpretive guidance also indicates that direct exposure to school settings does not necessarily result in analytical learning. [Yee et al. \(2022\)](#) found that pre-service teachers' reflection may remain descriptive when explicit structures for deeper interpretation are limited. In the present study, the previous observation process tended to emphasize visible and administrative information, such as facilities and physical school conditions, without sufficiently guiding students to examine their educational implications. The needs assessment therefore provided a basis for developing an instrument that could direct students from merely recording what exists in a school toward interpreting what those conditions mean for teaching, learning, safety, accessibility, and children's experiences.

### *Development and Characteristics of the Smart Observer Toolkit*

The development process resulted in the Smart Observer Toolkit, an interactive digital handbook and structured school-environment observation instrument designed for early-semester pre-service primary teachers. The framework was organized into four interconnected observation pillars: (1) instructional and academic climate, (2) physical environment and infrastructure, (3) school and classroom management, and (4) socio-

emotional culture and school climate. These pillars were designed to reduce the complexity of school observation by directing students toward specific but interconnected dimensions of the school environment.

The structured organization of the toolkit is particularly relevant for novice observers whose professional knowledge is still developing. [Grub et al. \(2022\)](#) demonstrate that prospective teachers' professional knowledge influences their ability to identify relevant educational events, suggesting that beginning observers may benefit from explicit guidance regarding what deserves attention. At the same time, [Dueckers et al. \(2022\)](#) show that professional vision may remain focus-specific among student teachers. These findings support the use of separate observation pillars while also requiring students to examine relationships among instructional, physical, managerial, and socio-emotional conditions.

Within the four pillars, the toolkit operationalized the eight Indonesian National Education Standards (Standar Nasional Pendidikan [SNP]) into observable school conditions. Rather than treating regulatory clauses as isolated administrative checklists, the toolkit mapped them functionally across the four pillars. Process and educational assessment standards correspond directly to the instructional and academic climate pillar; facilities and infrastructure standards to the physical environment pillar; and school management along with contextualized financing standards (specifically observed through resource allocation transparency and facility maintenance) correspond to the school management pillar. Furthermore, the fourth pillar—socio-emotional culture and school climate—specifically incorporates the graduate competency standards (particularly character and socio-emotional dimensions) and educator/personnel standards (focusing on non-violent discipline and communicative rapport). The comprehensive mapping across all eight national standards is presented in Table 2.

**Table 2** Alignment of the Four Observation Pillars with the Eight National Education Standards and Child-Friendly Dimensions

| Observation Pillar                       | Corresponding National Education Standards (SNP)                                    | Child-Friendly School (SRA) Alignment                                              | Key Observable Focus                                                                                     |
|------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Instructional & Academic Climate         | Process Standards, Educational Assessment Standards                                 | Active, participatory, non-violent, and gender-equitable learning                  | Differentiated instruction, positive reinforcement, active student participation, fair assessment        |
| Physical Environment & Infrastructure    | Facilities and Infrastructure Standards                                             | Safe, clean, healthy, accessible, and hazard-free physical spaces                  | Universal accessibility (ramps, handrails), sanitation hygiene, classroom safety, play areas             |
| School & Classroom Management            | Management Standards, Financing Standards (contextualized)                          | Transparent school governance, anti-violence task force, institutional policies    | Visible allocation for child safety, transparent budget display for facilities, non-discriminatory rules |
| Socio-Emotional Culture & School Climate | Graduate Competency Standards (Attitude/Character), Educators & Personnel Standards | Psychological safety, non-discrimination, protection against bullying and violence | Warm educator-student rapport, peer inclusivity, anti-bullying mechanisms, emotional well-being          |

This structured mapping enabled national regulatory criteria to be translated into concrete, interconnected dimensions that pre-service teachers could systematically observe, evaluate, and reflect upon during field placement.

A distinctive feature of the Smart Observer Toolkit is the integration of the National Education Standards with a Child-Friendly School perspective. Each observation pillar applies structured 1–4 rating criteria that represent both regulatory-administrative conditions and psychological or child-centered considerations. Students are therefore required not only to determine whether a facility, policy, practice, or document exists, but also to examine its condition and implications for children's safety, inclusion, participation, comfort, and well-being.

The use of explicit observation indicators was intended to direct students toward educationally meaningful evidence. [Kosko et al. \(2022\)](#) demonstrate that patterns of attention influence which pedagogical events pre-service teachers subsequently describe. In the Smart Observer Toolkit, structured indicators perform a similar scaffolding function by identifying aspects of the school environment that novice observers might otherwise overlook. This feature is complemented by attention to ethical and relational dimensions. [Finefter-Rosenbluh & Power \(2023\)](#) emphasize ethical noticing as an important component of professional vision, supporting the inclusion of

indicators related to psychological safety, non-violent interactions, inclusion, privacy, participation, and socio-emotional relationships.

The toolkit also requires students to support their ratings with qualitative evidence collected through direct observation, interviews, and document review. Evidence from these sources is compared rather than treated independently, allowing students to identify consistencies or discrepancies between formal policies, stakeholder explanations, and actual school practices. This triangulation process was intended to strengthen evidence-based interpretation and reduce reliance on personal impressions. For example, in one field report evaluating inclusive physical infrastructure, an observer initially recorded an impressionistic rating of 'adequate' based solely on the visual presence of a newly painted entrance ramp. However, during subsequent triangulated inquiry, the student reviewed school safety logs and interviewed the third-grade teacher, discovering that the ramp slope exceeded safe gradient angles for unaccompanied wheelchair use and lacked tactile ground indicators. By juxtaposing observational impressions against stakeholder accounts and physical safety standards, the student revised their analytical rating from 'fully compliant' to 'partially accessible with physical barriers,' explicitly proposing safety modifications in the reflective action plan. Such concrete instances illustrate how multi-source triangulation actively shifted novice evaluations from superficial visual assumptions toward evidence-grounded critical noticing.

Overall, the resulting toolkit combines structured observation indicators, dual SNP-Child-Friendly School criteria, quantitative rating rubrics, qualitative evidence recording, interviews, document review, cross-source comparison, reporting guidance, and critical reflection. The product therefore functions not only as an observation checklist but as a scaffold for organizing evidence and supporting more systematic interpretation of the primary school environment.

### ***Expert Review, Digitalization, and Initial Implementation***

The prototype Smart Observer Toolkit underwent a formative review by three reviewers before being finalized. The structured review covered ten indicators across four dimensions: content and substance, language and readability, assessment-rubric quality, and contextual relevance to primary school settings. Rather than using numerical rating scales or a blind review protocol, this phase was conducted as an open, formative expert appraisal utilizing categorical determinations ('feasible without revision', 'feasible with minor revisions', or 'not feasible') supplemented by detailed

written feedback. All three reviewers unanimously deemed the toolkit feasible for authentic field implementation, categorizing it as 'feasible with minor revisions.' Constructive recommendations centered primarily on operationalizing ambiguous rubric descriptors and simplifying complex terminology, which directly guided iterative refinements prior to digital conversion.

Because the available review documentation did not include a standardized psychometric validity coefficient, the review results were interpreted as evidence of formative refinement and initial feasibility, rather than as formal psychometric validation. This distinction is important because the purpose of the review stage was to improve the usability and contextual appropriateness of the developing toolkit rather than to establish definitive measurement properties.

Following revision, the toolkit was converted into an interactive PDF-based handbook. Navigation features were incorporated to enable students to access observation indicators and supporting sections efficiently during field activities. To verify cross-platform usability prior to field implementation, the digital handbook was tested across common consumer devices (smartphones, tablets, and laptops) running Android, iOS, and Windows using standard PDF applications. This step confirmed that internal navigational hyperlinks, interactive fillable fields, and offline data entry functioned reliably without layout distortion across mobile and desktop screens. Digitalization was therefore used primarily as an accessibility mechanism rather than as the central innovation of the product.

The initial implementation involved orientation, technical guidance, field use, mentoring, and lecturer review of students' observation reports. Students were introduced to the four observation pillars, the 1–4 rating rubrics, qualitative evidence recording, interview guidance, and reporting procedures before using the toolkit during school-environment observation activities. Implementation documentation included student participation records, observation reports prepared using the new toolkit, and lecturer feedback on the resulting reports.

The structured observation process is relevant to the characteristics of novice professional attention. Witt et al. (2024) demonstrated through eye-tracking methodologies that pre-service teachers exhibit less focused patterns of visual attention compared to experienced educators, frequently distributing their attention diffusely across peripheral stimuli rather than attending to educationally critical events. Although eye-tracking examines real-time visual gaze in classroom settings, its fundamental

cognitive implication applies directly to document-guided field observations: without explicit structural scaffolding, novice observers lack internal schemata to discern salient educational indicators from background noise. By translating professional vision into structured, itemized prompts, an interactive PDF handbook provides the external cognitive scaffolding necessary to guide novices' attention toward pedagogical and environmental features they might otherwise visually overlook.

The reporting component further required students to transform field evidence into interpretation rather than stopping at numerical ratings. Students were expected to record supporting evidence, compare information from different sources, and reflect on the educational significance of the conditions they observed. The toolkit also incorporated the What?–So What?–Now What? reflective sequence, guiding students from describing an observed condition to considering its significance and identifying possible professional responses. This structure is consistent with [Sancar & Atal \(2023\)](#) who show that structured reflective engagement can deepen pre-service teachers' interpretation of educational situations. Similarly, [Alazmi \(2023\)](#) demonstrates that systematic and iterative reflection, supported by feedback and structured learning experiences, can strengthen professional awareness and reasoning.

Qualitative analysis of student reports indicated that evidence triangulation functioned effectively as an analytical filter. Across the 19 completed reports, discrepancies between official documentation, direct observations, and stakeholder interviews were explicitly identified in 13 reports (68.4%), primarily within the infrastructure and school-climate pillars. For instance, in one representative case, the school's administrative profile documented full compliance with standard hygiene provisions by recording functional handwashing stations outside every classroom. However, direct student observations revealed that water flow was non-existent during peak midday hours, and subsequent interviews with grade 2 pupils indicated that children routinely skipped hand hygiene or purchased bottled water to wash their hands. By contrasting formal institutional records against live physical conditions and stakeholder accounts, prospective teachers moved beyond accepting nominal paperwork at face value to capture the authentic, uncured realities of primary school ecologies.

Documentation from the initial implementation indicated that students' reports became less exclusively administrative and more oriented toward interpreting actual school conditions through National Education Standards and Child-Friendly School

considerations. Rather than merely noting the presence or absence of mandatory facilities, student reflections synthesized direct visual evidence with child-safety and pedagogical implications. For example, regarding physical infrastructure, one student reflected:

*"Although the school formally satisfies facility requirements by having designated handwashing basins outside each classroom, direct observation during recess revealed that water pressure was insufficient and basins lacked soap or non-slip floor mats. Consequently, younger pupils in grades 1–2 frequently avoided washing their hands or rushed through slippery corridors. What appears adequate on paper still poses health and slipping hazards that require immediate school maintenance action."* (Student 07, Field Report)

Similarly, when examining school climate and disciplinary practices, another student synthesized interview data with observation of peer dynamics:

*"The school display board lists an anti-bullying decree, yet our interviews with recess monitors showed that instances of verbal exclusion among upper-grade students often go unrecorded because there is no discreet reporting channel. Without clear mechanisms for peer support, formal anti-violence regulations remain merely symbolic rather than protective."* (Student 14, Field Report)

However, the implementation did not include a control group, baseline measurement, or pre-test–post-test comparison. Consequently, these findings should be interpreted as preliminary descriptive evidence of instructional usability, not as evidence that the Smart Observer Toolkit caused measurable improvement in professional noticing.

## Discussion

The findings suggest that the main contribution of the Smart Observer Toolkit lies in supporting pre-service teachers in moving from merely seeing school conditions toward interpreting their professional significance. The high proportion of students requiring support in interpreting observation data indicates that early-semester pre-service teachers may be able to identify visible conditions without necessarily recognizing their implications for teaching, learning, safety, or student well-being. [König et al. \(2022\)](#) similarly emphasize that professional noticing involves both selective attention and interpretation, while [Grub et al. \(2022\)](#) demonstrate that professional knowledge influences prospective teachers' ability to recognize educationally relevant events. In this context, the toolkit is designed to function as an initial scaffold by providing explicit observation targets, evidence requirements, and interpretive criteria that reduce uncertainty about what should be attended to and how observed conditions should be examined.

This structured approach is consistent with broader research on professional vision. [Kosko et al. \(2022\)](#) show that patterns of visual attention influence the

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pedagogical events subsequently identified by pre-service teachers, suggesting that observation quality depends partly on where attention is directed. At the same time, [Weyers et al. \(2023\)](#) report considerable variation in the focus and design of standardized teacher-noticing instruments, while [Dueckers et al. \(2022\)](#) indicate that professional vision may remain focus-specific among student teachers. These findings support the use of differentiated observation dimensions rather than treating professional observation as a single general ability. The four-pillar structure of the Smart Observer Toolkit therefore directs students toward instructional, physical, managerial, and socio-emotional aspects of school life, while the reporting template's capstone synthesis section explicitly requires them to connect findings across these dimensions in their final interpretation.

An important contribution of the toolkit is its extension of professional noticing beyond selected classroom events to the broader school environment. Professional-vision research frequently concentrates on teaching episodes, teacher-student interactions, or subject-specific classroom situations (e.g., [Amador et al., 2021](#); [Farrell et al., 2024](#)). Conversely, existing instruments that specifically evaluate the broader school ecology—such as standard Child-Friendly School (Sekolah Ramah Anak [SRA]) assessment rubrics and national institutional accreditation instruments—are predominantly designed for summative administrative auditing, relying on binary checklists (present/absent) rather than developmental learning scaffolds. The Smart Observer Toolkit departs from both traditions by translating macro-level institutional, infrastructural, and regulatory standards into a four-pillar pedagogical scaffold tailored to novice observers. This broader orientation is particularly relevant during early field experiences because beginning pre-service primary teachers encounter schools as complex educational ecosystems rather than only as sites of classroom instruction. By organizing school observation around interconnected pillars, combining multi-level rubrics with qualitative evidence triangulation and structured reflection, the toolkit encourages students to interpret relationships among institutional decisions, environmental conditions, and children's educational experiences.

The whole-school orientation is also consistent with Indonesian research on Child-Friendly Schools. [Rahmad et al. \(2024\)](#) and [Pratiwi et al. \(2022\)](#) identify school policy, learning processes, infrastructure, educator readiness, student participation, and community involvement as interconnected dimensions of child-friendly schooling. More recent studies by [Hastira et al. \(2025\)](#) and [Mastur et al. \(2025\)](#) further demonstrate

that implementation may vary across participation, inclusion, coordination, institutional preparedness, and other contextual dimensions. These findings support the toolkit's integration of the National Education Standards with a Child-Friendly School perspective. The dual perspective allows students to distinguish between formal or administrative compliance and the actual quality of children's experiences. For example, the existence of a school facility may satisfy an administrative requirement while remaining inadequate from a child-centered perspective if it is unsafe, inaccessible, poorly maintained, or insufficiently supportive of students' needs. The toolkit therefore encourages students to examine not only whether institutional requirements are present, but also how those conditions affect children's safety, participation, comfort, inclusion, and well-being.

The triangulation and reflection components are intended to facilitate the transition from descriptive observation toward evidence-based professional reasoning. Students are required to compare evidence obtained through direct observation, interviews, and school documents rather than relying on a single source or personal impression. Discrepancies among these sources become objects of analysis and may reveal differences between formal policies and actual practices. This approach is compatible with [Finefter-Rosenbluh & Power \(2023\)](#) who highlight ethical dimensions of professional vision, and with [Yee et al. \(2022\)](#) who show the importance of structured frameworks for moving pre-service teachers beyond superficial reflection. The toolkit's reflective prompts further encourage students to consider what was observed, why it matters, and what professional response might be appropriate. In this way, observation becomes connected to evidence, interpretation, ethical judgment, and prospective professional action.

Digitalization should therefore be understood as an enabling mechanism rather than the principal innovation of the Smart Observer Toolkit. The interactive PDF facilitates access to indicators and supporting guidance during field activities, but its pedagogical value lies primarily in the structured reasoning embedded within the toolkit. [Sancar & Atal \(2023\)](#) similarly demonstrate that technology-mediated reflective activities become educationally meaningful when they support deeper professional analysis rather than functioning merely as digital media. Accordingly, the novelty of the Smart Observer Toolkit lies in the integration of structured professional observation, National Education Standards, child-centered criteria, quantitative ratings, qualitative evidence, triangulation, and critical reflection within a single field-based scaffold.

The findings should nevertheless be interpreted within several limitations. The needs assessment involved only 19 students from one teacher education program, and the initial implementation was formative rather than experimental. No control group or pre-test-post-test comparison was used, and the available reviewer evidence supported product refinement but did not constitute comprehensive psychometric validation. Consequently, the present findings provide preliminary evidence of feasibility and instructional usability rather than proof that the toolkit caused measurable improvement in professional noticing. Future research should examine the toolkit with larger and more diverse samples across different teacher education institutions, conduct systematic content-validity and reliability testing, and employ comparative or longitudinal designs to determine whether structured toolkit use contributes to measurable development in professional noticing and evidence-based school-environment interpretation.

## Conclusion

The Smart Observer Toolkit was developed as a structured digital scaffold to support school-environment observation among early-semester pre-service primary teachers. The toolkit integrates the eight Indonesian National Education Standards with Child-Friendly School perspectives through four interconnected observation pillars and combines structured rating criteria, qualitative evidence, interviews, document review, and reflection. Initial implementation indicated that the toolkit was feasible as an instructional support for guiding students toward more systematic, evidence-based, and child-centered observation.

The main contribution of the toolkit lies in extending professional noticing beyond selected classroom events toward a broader interpretation of the school environment. By linking regulatory standards with children's lived experiences, the initial implementation suggests that the toolkit holds considerable potential to support pre-service teachers in moving from descriptive recording toward more purposeful professional interpretation.

These findings remain preliminary because the study involved a limited sample, formative review, and no experimental or pre-test-post-test comparison. Future research should therefore examine the toolkit across larger and more diverse samples, conduct formal validity and reliability testing, and investigate whether its use contributes to measurable development in professional noticing.

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## Participant Consent

This research was conducted based on informed consent from all participants. Participants received an explanation of the purpose, procedures, potential risks and benefits of the research, as well as their right to withdraw at any time without consequence. Written consent was obtained from all participants.

## Conflict of Interest

The authors declare no conflict of interest.

## Author Contributions

M.H.A. conceptualized the research framework, designed the prototype toolkit, developed the methodology, coordinated field implementation, performed data analysis, and wrote the original manuscript draft. The co-authors (D.N.J., F.I., W.W., V.P.S., and L.F.) contributed to literature synthesis, data curation, qualitative evaluation of student reports, critical revision of the manuscript for intellectual content, and final editorial verification. All authors confirm that they have read and approved the final version of this manuscript. The percentage contributions for the conceptualization, drafting, and revision of this paper are as follows: M.H.A.: 40%, D.N.J.: 12%, F.I.: 12%, W.W.: 12%, V.P.S.: 12%, and L.F.: 12%.

## References

- Alazmi, H. S. (2023). The value of systematic, iterative, video-based reflection analysis on preservice teacher actions in Kuwait: A preservice social studies teacher example. *Teaching and Teacher Education*, 121, Artikel 103910. <https://doi.org/10.1016/j.tate.2022.103910>
- Aldridge, J. M., & Blackstock, M. J. (2024). Assessing students' perceptions of school climate in primary schools. *Learning Environments Research*, 27(3), 579–602. <https://doi.org/10.1007/s10984-024-09492-2>
- Amador, J. M., Bragelman, J., & Superfine, A. C. (2021). Prospective teachers' noticing: A literature review of methodological approaches to support and analyze noticing. *Teaching and Teacher Education*, 99, Artikel 103256. <https://doi.org/10.1016/j.tate.2020.103256>
- Bastian, A., Kaiser, G., Meyer, D., Schwarz, B., & König, J. (2022). Teacher noticing and its growth toward expertise: An expert-novice comparison with pre-service and in-service secondary mathematics teachers. *Educational Studies in Mathematics*, 110(2), 205–232. <https://doi.org/10.1007/s10649-021-10128-y>
- Branch, R. M., & Varank, İ. (2009). *Instructional design: The ADDIE approach*. Springer. <https://doi.org/10.1007/978-0-387-09506-6>
- Dueckers, C., Hoerter, P., Junker, R., & Holodynski, M. (2022). Professional vision of teaching as a focus-specific or focus-integrated skill–Conceptual considerations and video-based assessment. *Teaching and Teacher Education*, 117, Artikel 103797. <https://doi.org/10.1016/j.tate.2022.103797>
- Effendi, M. S. (2023). Child-friendly school environment management. *JPI (Jurnal Pendidikan Indonesia)*, 12(4), 732–740. <https://doi.org/10.23887/jpiundiksha.v12i4.68681>
- Farrell, M., Martin, M., Böheim, R., Renkl, A., Rieß, W., Könings, K. D., van Merriënboer, J. J. G., & Seidel, T. (2024). Signaling cues and focused prompts for professional vision support: The interplay of instructional design and situational interest in preservice teachers' video analysis. *Instructional Science*, 52(6), 879–917. <https://doi.org/10.1007/s11251-024-09662-y>
- Finefter-Rosenbluh, I., & Power, K. (2023). Exploring preservice teachers' professional vision: Modes of isolation, ethical noticing, and anticipation in research communities of practice. *Teaching and Teacher Education*, 132, Artikel 104245. <https://doi.org/10.1016/j.tate.2023.104245>
- García-Lázaro, I., & Reyes-de-Cózar, S. (2025). Preservice teachers' reflective processes during field experiences: A systematic review from the ONION model framework. *Reflective Practice*, 26(1), 115–134. <https://doi.org/10.1080/14623943.2024.2421597>
- Gardesten, J., & Herrlin, K. (2024). The initial field experiences of teacher candidates: Emotional challenges in a complex environment. *Teaching and Teacher Education*, 138, Artikel 104430. <https://doi.org/10.1016/j.tate.2023.104430>
- Grub, A.-S., Biermann, A., Lewalter, D., & Brünken, R. (2022). Professional knowledge and task instruction specificity as influencing factors of prospective teachers' professional vision. *Teaching and Teacher Education*, 109, Artikel 103517. <https://doi.org/10.1016/j.tate.2021.103517>
- Hastira, M. F., Ahmad, A., Syaharuddin, M., & Maksum, A. (2025). Inclusive revolution: *Pedagogik Journal of Islamic Elementary School*

- Children's right to participation and inclusivity in child-friendly schools in Indonesia. *Jurnal Pendidikan dan Kebudayaan*, 10(2), 227–251. <https://doi.org/10.24832/jpnk.v10i2.6428>
- Kementerian Pemberdayaan Perempuan dan Perlindungan Anak Republik Indonesia. (2024). *Peraturan Menteri Pemberdayaan Perempuan dan Perlindungan Anak Republik Indonesia Nomor 4 Tahun 2024 tentang Penyelenggaraan Layanan Pemenuhan Hak Anak*.
- König, J., Santagata, R., Scheiner, T., Adleff, A.-K., Yang, X., & Kaiser, G. (2022). Teacher noticing: A systematic literature review of conceptualizations, research designs, and findings on learning to notice. *Educational Research Review*, 36, Artikel 100453. <https://doi.org/10.1016/j.edurev.2022.100453>
- Kosko, K. W., Heisler, J., & Gandolfi, E. (2022). Using 360-degree video to explore teachers' professional noticing. *Computers & Education*, 180, Artikel 104443. <https://doi.org/10.1016/j.compedu.2022.104443>
- Kwok, A., & Bartanen, B. (2022). Examining early field experiences in teacher education. *Teaching and Teacher Education*, 118, Artikel 103820. <https://doi.org/10.1016/j.tate.2022.103820>
- Martin, M., Farrell, M., Seidel, T., Riess, W., Könings, K. D., van Merriënboer, J. J. G., & Renkl, A. (2023). Knowing what matters: Short introductory texts support pre-service teachers' professional vision of tutoring interactions. *Teaching and Teacher Education*, 124, Artikel 104014. <https://doi.org/10.1016/j.tate.2023.104014>
- Mastur, S. N., Kramer, P., Amanina, N., Frisila, M., & Lutfiana, A. F. (2025). Evaluation of Child-Friendly School Program at the primary school in the Bantul District, Indonesia: School preparedness for an international program. *Jurnal Manajemen Pendidikan*, 16(2), 169–183. <https://journal.unj.ac.id/unj/index.php/jmp/article/view/66510>
- Nduagbo, K., & Casale, C. (2023). Preservice teachers' reflective practices, self-efficacy, and professional growth. *Experiential Learning and Teaching in Higher Education*, 6(1), 56–66. <https://doi.org/10.46787/elthe.v6i1.3524>
- Ngula, P. D., Moi, M. E., Ewo, M. J., Mau, M. F., & Kaka, P. W. (2026). Pengenalan lapangan persekolahan dalam membentuk kepekaan pedagogik terhadap keberagaman gaya belajar siswa sekolah dasar Kabupaten Ngada. *Jurnal Citra Pendidikan Anak*, 5(2), 163–176. <https://jurnal.citrabakti.ac.id/index.php/jcpa/article/view/6881>
- Pemerintah Republik Indonesia. (2022). *Peraturan Pemerintah Republik Indonesia Nomor 4 Tahun 2022 tentang Perubahan atas Peraturan Pemerintah Nomor 57 Tahun 2021 tentang Standar Nasional Pendidikan*. Sekretariat Negara Republik Indonesia.
- Pratiwi, R. F., Rusilowati, A., & Subali, B. (2022). Analysis of child-friendly schools in building SDN Krebet 1 Sragen student's disciplined character. *Journal of Primary Education*, 11(2), 203–214. <https://journal.unnes.ac.id/sju/jpe/article/view/63278>
- Prilop, C. N., Weber, K. E., & Kleinknecht, M. (2021). The role of expert feedback in the development of pre-service teachers' professional vision of classroom management in an online blended learning environment. *Teaching and Teacher Education*, 99, Artikel 103276. <https://doi.org/10.1016/j.tate.2020.103276>
- Rahmad, R., Syar, N. I., Syahmidi, S., & Mualimin, M. (2024). Child-friendly schools in *Pedagogik Journal of Islamic Elementary School*

- primary education institutions. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, 14(2), 121–134. <https://doi.org/10.18592/aladzkapgmi.v14i2.13738>
- Romero, D., Leigh, M., & Lo, W. (2022). Pre-service teachers' reflective writing and learning in early field experiences. *Journal of Educational Research and Innovation*, 10(1), Artikel 3. <https://digscholarship.unco.edu/jeri/vol10/iss1/3/>
- Sahira, E., & Herianto, E. (2023). Menyiapkan guru profesional melalui program Pengenalan Lapangan Persekolahan. *Jurnal Ilmiah Profesi Pendidikan*, 8(3), 1957–1964. <https://doi.org/10.29303/jipp.v8i3.1947>
- Sancar, R., & Atal, D. (2023). Learning from expert or own practice: Reflectively editing video cases for professional development. *Reflective Practice*, 24(2), 168–182. <https://doi.org/10.1080/14623943.2022.2146083>
- Saptono, B. (2022). Implications of child-friendly school policies in reducing cases of violence against children in elementary schools. *Jurnal Prima Edukasia*, 10(1), 96–103. <https://doi.org/10.21831/jpe.v10i1.45816>
- Miftahudin, Suharti, L. ., Sugiarto, A. ., & Sasongko, G. . (2023). Why Does Anti-Bullying Child-Friendly School Program Matter? A Study of Junior High Schools in Indonesia. *Journal of Educational and Social Research*, 13(6), 131. <https://doi.org/10.36941/jesr-2023-0153>
- van Es, E. A., & Sherin, M. G. (2021). Expanding on prior conceptualizations of teacher noticing. *ZDM – Mathematics Education*, 53(1), 17–27. <https://doi.org/10.1007/s11858-020-01211-4>
- Vondrová, N., Novotná, M., Pavlasová, L., Robová, J., Stará, J., & Uličná, K. (2023). Pre-service teachers' noticing: On the way to expert target. *Scientia in Education*, 14(1), 27–39. <https://doi.org/10.14712/18047106.2774>
- Weyers, J., König, J., Santagata, R., Scheiner, T., & Kaiser, G. (2023). Measuring teacher noticing: A scoping review of standardized instruments. *Teaching and Teacher Education*, 122, Artikel 103970. <https://doi.org/10.1016/j.tate.2022.103970>
- Witt, J., Schorer, J., Loffing, F., & Roden, I. (2024). Eye-tracking research on teachers' professional vision: A scoping review. *Teaching and Teacher Education*, 144, Artikel 104568. <https://doi.org/10.1016/j.tate.2024.104568>
- Yee, B. C., Abdullah, T., & Mohd Nawi, A. (2022). Exploring pre-service teachers' reflective practice through an analysis of six-stage framework in reflective journals. *Reflective Practice*, 23(5), 552–564. <https://doi.org/10.1080/14623943.2022.2071246>
- Zynuddin, S. N., Kenayathulla, H. B., & Sumintono, B. (2023). The relationship between school climate and students' non-cognitive skills: A systematic literature review. *Heliyon*, 9(4), Artikel e15132. <https://doi.org/10.1016/j.heliyon.2023.e14773>