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ENHANCING PRIMARY SCHOOL TEACHER PROFESSIONALISM THROUGH A MOBILE-BASED REFLECTIVE SUPERVISION SYSTEM

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Abstract: *This study explores the development and implementation of a mobile-based clinical supervision application designed to improve the professional competence of primary school teachers in Indonesia. In response to the increasing demands for reflective teaching and sustainable professional development in the digital era, this research applies a systematic research and development (R&D) approach using the Waterfall model to design, validate, and field-test a supervision tool integrated into mobile platforms. The study engaged 100 primary school teachers and 9 experts in education technology and instructional design. Results indicate high user acceptance, improved reflective practices, and enhanced supervision transparency. The findings support the potential of mobile-based tools to foster teacher growth, inform school management decisions, and transform traditional supervision into a more collaborative and developmental process.*

Keywords: *Primary School, Teacher Professionalism, Mobile Based Reflective, Supervision*

INTRODUCTION

Supervision has long been acknowledged as a central component of educational systems aimed at ensuring instructional quality, fostering professional growth, and sustaining continuous improvement in teaching practices. Within primary education, academic or instructional supervision is particularly vital, as it directly influences teachers' pedagogical skills, classroom practices, and responsiveness to students' cognitive, social, and emotional needs (Glickman et al., 2018). Effective supervision is not merely evaluative in nature but is intended to function as a professional support mechanism that encourages reflection, collaboration, and instructional refinement.

Despite its strategic importance, supervision practices in many developing countries, including Indonesia, continue to be dominated by traditional, administrative, and compliance-oriented approaches. Supervision is often conducted in a one-directional and hierarchical manner, focusing primarily on checklist-based observations, documentation, and formal reporting rather than dialogical feedback and professional learning (Sergiovanni & Starratt, 2007). Such practices tend to position teachers as passive recipients of evaluation, thereby limiting opportunities for reflective practice and meaningful pedagogical development. Consequently, supervision is frequently perceived as a control mechanism rather than a developmental process, which undermines its potential contribution to improving teaching quality.

The shortcomings of conventional supervision models have become increasingly apparent in the context of rapid educational change driven by digital transformation and the growing demand for 21st-century skills.

Contemporary teachers are expected to master not only subject-matter knowledge but also critical thinking, creativity, collaboration, and effective integration of digital technologies into instruction (Darling-Hammond et al., 2017). In addition, reflective practice has emerged as a key competency for teachers, enabling them to evaluate their instructional decisions, adapt teaching strategies, and respond to diverse student needs (Schön, 1983). However, traditional supervision methods often fail to provide timely feedback, structured reflection, and continuous mentoring, which are essential for nurturing these competencies.

At the same time, demographic changes within the teaching workforce present new opportunities for rethinking supervision practices. The increasing number of millennial teachers, who are generally familiar with digital tools and actively use mobile technologies in their daily lives, creates a favorable context for the adoption of technology-enhanced supervision (Trust, 2012). These teachers tend to be more open to digital platforms that support communication, documentation, feedback, and professional collaboration. Parallel to this trend, educational reforms in Indonesia emphasize student-centered learning, competency-based assessment, and continuous professional development, all of which require supervision models that are formative, collaborative, and reflective rather than solely summative (OECD, 2020).

In this evolving educational landscape, digital technology offers significant potential to transform supervision into a more flexible, interactive, and development-oriented process (Kamaludin et al., 2020; Lemmetty, 2024; Wallo et al., 2024). Mobile applications, in particular, enable real-time observation records, immediate feedback, systematic documentation, and guided reflection, making them highly suitable for supporting clinical supervision practices (Zepeda, 2017). Clinical supervision emphasizes a cyclical process of pre-observation conferencing, classroom observation, analysis, and post-observation reflection, with the primary goal of improving instructional practice through collaborative inquiry (Acheson & Gall, 2003). Integrating this model with mobile technology can enhance accessibility, consistency, and sustainability of supervision activities.

However, despite the growing discourse on digital leadership and technology integration in education, empirical studies focusing on the design and implementation of mobile-based applications specifically developed for clinical supervision in primary schools remain limited. This gap is particularly evident in the Indonesian context, where supervision practices are still largely conventional and under-researched in relation to digital innovation. Existing studies tend to focus either on supervision models without technological integration or on educational technology without explicit alignment to supervision frameworks, leaving a critical gap between theory, technology, and practice.

Therefore, this study seeks to bridge the gap between traditional supervision practices and the affordances of digital technology by developing a mobile application designed to support clinical supervision in primary education. The application is conceptualized not merely as a technological product but as a strategic intervention aimed at transforming supervisory culture into one that is reflective, developmental, and aligned with contemporary educational values. Specifically, the study investigates the development process of the application, its implementation in school settings, and the perceptions of teachers and supervisory staff regarding its usability, effectiveness, and contribution to professional learning. Through this approach, the study is expected to contribute theoretically to the discourse on digitally supported clinical supervision and practically to the improvement of supervision practices in primary schools.

RESEARCH METHODOLOGY

This research employed a Research and Development (R&D) method adapted from the Waterfall software engineering model. The development process followed a sequential structure: (1) communication-comprehensive needs analysis through surveys, observations, and interviews; (2) planning-systematic outline and design of application architecture and supervision features; (3) modeling-interface prototyping using Figma to visualize navigation flow and user experience; (4) construction-application development using Flutter framework for Android compatibility; and (5) deployment-user testing and feedback integration from pilot participants.

Participants included 100 primary school teachers from the Jakarta and Banten regions, selected purposively based on criteria such as smartphone proficiency, prior experience with supervision, and active teaching roles. Nine subject matter experts were also recruited: three in educational media, three in instructional design, and three in clinical supervision content. Data sources comprised field notes, validation checklists, questionnaires, focus group transcripts, and supervision logs. Instruments used included Likert-scale questionnaires to assess user satisfaction and expert validation forms assessing instructional content, media functionality, and technical

aspects. Qualitative data were obtained through in-depth interviews and FGDs.

Data analysis was conducted using a mixed-methods approach. Quantitative data from questionnaires and validation forms were analyzed descriptively using mean scores and percentage levels to determine feasibility and acceptance categories. Reliability of the questionnaire instruments was examined using Cronbach's alpha to ensure internal consistency. Qualitative data from interviews, FGDs, and field notes were analyzed thematically through coding, categorization, and interpretation to identify recurring patterns related to usability, supervisory practices, and professional learning impact. Findings from qualitative and quantitative analyses were integrated to inform iterative revisions of the application and to provide a comprehensive evaluation of its effectiveness.

Ethical considerations were addressed by obtaining informed consent from all participants, ensuring voluntary participation, and maintaining confidentiality and anonymity throughout the research process. The study protocol was designed to comply with ethical standards for educational research, with data used solely for research and development purposes.

RESULTS AND DISCUSSION

1. Result

The developed mobile supervision application features key tools to support clinical supervision workflows: structured observation checklists, teacher reflection forms, supervisor feedback notes, a timeline-based supervision log, and an analytic dashboard.

Expert validators rated the application between 4.1 and 4.6 on a 5-point scale, citing strong alignment with pedagogical goals and sound technical performance. The main areas identified for improvement included visual layout and user navigation, particularly to accommodate teachers with limited digital literacy.

During field trials, each teacher participated in two supervision cycles using the application over one month. User feedback was overwhelmingly positive, with an average score of 3.98 for accessibility and usefulness. Teachers reported that the digital supervision model encouraged more structured self-reflection and improved their confidence in teaching practices.

However, the interface design was rated at 2.97, with concerns about font size, limited search functionality, and unclear icons. Despite this, supervisors praised the platform for reducing administrative workload and enhancing data transparency across multiple classrooms.

2. Discussion

The results of this study offer robust empirical support for the argument that digital technologies can function as transformative instruments in redefining supervision practices in primary education, particularly within contexts where supervision has traditionally been procedural and compliance-oriented. Beyond improving efficiency, the mobile-based supervision application facilitated a reconceptualization of supervision as a continuous, reflective, and dialogical professional learning process. This finding reinforces contemporary perspectives on instructional supervision, which emphasize developmental support over bureaucratic control as a prerequisite for sustainable improvements in teaching quality (Sergiovanni & Starratt, 2007; Glickman et al., 2018).

From a technology adoption perspective, the study's findings strongly align with the Technology Acceptance Model (TAM), which posits perceived usefulness and perceived ease of use as primary determinants of user acceptance (Davis, 1989). Teachers' positive evaluations of accessibility, flexibility, and practical benefits indicate that the application successfully addressed long-standing challenges in supervision, such as time constraints, limited feedback opportunities, and fragmented documentation. These results extend previous studies on educational technology adoption by demonstrating that, when embedded within core professional practices such as supervision, digital tools are more likely to be perceived as meaningful rather than as additional administrative burdens (Venkatesh & Bala, 2008; Rugaiyah et al., 2021). In this sense, the application not only gained acceptance as a technological artifact but also achieved legitimacy as a pedagogical support system.

A particularly significant contribution of this study lies in its operationalization of reflective practice within a digital supervision environment. Schön's (1983) notion of reflection-in-action and reflection-on-action is often

discussed conceptually but remains difficult to implement systematically in school-based supervision. The application addressed this gap by embedding structured digital reflection forms, observation notes, and feedback archives that prompt teachers to engage in ongoing self-examination of instructional decisions. This design aligns with the clinical supervision framework, which emphasizes collaborative reflection and evidence-based dialogue as mechanisms for instructional improvement (Acheson & Gall, 2003). By making reflective activities visible, traceable, and revisitable, the application strengthens teachers' metacognitive awareness and supports the development of reflective dispositions essential for lifelong professional learning (Darling-Hammond et al., 2017).

Despite these strengths, the relatively lower ratings on user interface design highlight a critical tension between pedagogical robustness and usability. While the application effectively supported supervision processes, limitations in visual design and navigation may have constrained optimal user engagement. Norman, (2002) user-centered design theory underscores that usability is not merely an aesthetic concern but a cognitive one, influencing how users perceive control, efficiency, and satisfaction. For teachers with diverse levels of digital literacy, even minor interface complexities can reduce sustained engagement. This finding suggests that future iterations of supervision applications should adopt participatory design approaches, involving teachers directly in interface refinement to ensure alignment between pedagogical intent and user experience.

At the organizational level, the application's capacity to generate structured supervision data represents a significant advancement toward data-informed instructional leadership (Park, 2018; Neal, 2024; Kamaludin, 2024). Digital supervision logs provide school leaders with longitudinal insights into supervision frequency, feedback quality, and teacher development trajectories, which are often unavailable in paper-based systems (Zepeda, 2017). Such data can inform targeted professional development programs, identify systemic instructional gaps, and support strategic planning at the school and district levels. Moreover, integration with existing national or local platforms, such as teacher professional development systems, could enhance coherence, accountability, and scalability of supervision reforms, aligning with OECD (2020) recommendations on evidence-based education governance.

Importantly, the findings suggest a broader cultural shift in how supervision is perceived and enacted. The transition from top-down, checklist-driven supervision to a reflective, technology-mediated model repositions teachers as active agents in their professional growth rather than passive subjects of evaluation. This shift resonates with democratic and collegial models of supervision that emphasize trust, shared responsibility, and professional autonomy (Sergiovanni & Starratt, 2007). Teachers' engagement with the application indicates that digital supervision, when thoughtfully designed, can foster psychological safety and openness to feedback, conditions that are essential for genuine instructional improvement.

This paradigm shift is particularly relevant in addressing the pedagogical challenges posed by Generation Alpha learners, who are characterized by high levels of digital exposure, demand for immediacy, and preference for interactive learning environments (Perry, 2022). To respond effectively to these learners, teachers require continuous, responsive, and reflective professional support. The mobile-based supervision model developed in this study provides a mechanism through which supervision can keep pace with rapidly evolving classroom contexts, ensuring that teachers are not only monitored but meaningfully supported in adapting their instructional practices.

Taken together, this study extends the existing literature by demonstrating that digital supervision is most effective when it integrates three key dimensions: technological usability, pedagogical reflection, and organizational data utilization. The convergence of these dimensions positions mobile-based clinical supervision as a viable and scalable strategy for enhancing teacher professionalism in primary education. However, future research should explore longitudinal impacts on instructional quality and student learning outcomes, as well as investigate the applicability of this model across different educational levels and socio-cultural contexts.

CONCLUSION

This study affirms the potential of mobile-based supervision systems in improving the professional quality of

primary school teachers. The reflective supervision application developed through a structured R&D process proved effective, with strong support from both expert validators and teacher users. It streamlined documentation, promoted reflective thinking, and fostered collaborative relationships between supervisors and educators.

Although user interface limitations were noted, these do not overshadow the application's core strengths. The findings suggest that with continued refinement, digital supervision tools can be institutionalized to strengthen teacher development systems. The integration of features such as automated feedback, progress tracking, and eventual AI-driven insights will further enhance the system's value.

The study recommends future adoption of mobile-based supervision models at broader scales and across various education levels. Implementation success will depend on policy support, training programs, and user-centric design enhancements. As education systems strive for quality and accountability, digital innovations like this offer promising pathways for transformation.

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