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Technology-Based Management Strategies for Bullying Prevention in Junior High Schools: A Systematic Literature Review

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Abstract

This study aims to identify and analyze technology-based management strategies for bullying prevention in junior high schools through a Systematic Literature Review (SLR) approach that adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework . The research employs a qualitative descriptive method by reviewing 30 peer-reviewed journal articles published between 2020 and 2025. Data sources were obtained from both international and national academic databases, selected based on their relevance to educational management, information technology, and school-based bullying prevention. The analysis reveals that technology-based strategies play a pivotal role in constructing adaptive, responsive, and collaborative school management systems. The dominant approaches include the utilization of digital reporting systems, online training platforms for teachers, self-reporting applications for students, and behavior-monitoring systems driven by data analytics. Findings further indicate that technological interventions are most effective when accompanied by strong managerial policies and supported by an inclusive school culture. This study underscores the necessity of integrating technological innovation with sound school management policies to foster a safe, healthy, and bullying-free educational environment..
Keywords: technology-based management, bullying prevention, junior high school, systematic literature review, educational technology

Introduction

Bullying remains a profoundly significant issue within educational environments, particularly in junior high schools, which represent a sensitive transitional phase in students' psychosocial development. Bullying encompasses various forms of repeated aggressive behavior physical, verbal, psychological, or social that involve an imbalance of power between the perpetrator and the victim. The detrimental consequences of such behavior, including mental health disturbances, declining academic achievement, and disruptions in social relationships, have been extensively documented in the literature (Marhaely et al., 2024). Consequently, the development of effective and sustainable bullying prevention strategies has become a central focus in the management of modern educational institutions.

Rapid advancements in information technology (IT) have transformed management approaches to bullying prevention in schools. The integration of technology enables more systematic and responsive handling of bullying incidents compared to traditional methods, which often remain reactive. Digital reporting systems, real-time monitoring of student behavior, and online educational platforms now provide accessible tools for teachers, students, and parents to participate in prevention efforts (Salmivalli et al., 2021). Technology therefore serves not only

as a reporting medium but also as a proactive instrument that strengthens whole-school engagement in bullying prevention.

Empirical evidence demonstrates that the implementation of digital reporting systems and behavioral monitoring applications has significantly enhanced the effectiveness of detecting and addressing bullying cases in junior high schools. The digitalization of reporting enables anonymity for reporters, thereby reducing the fear and hesitation among students to report bullying incidents they experience or witness (Marhaely et al., 2024). This advantage fosters greater participation, facilitates more rapid interventions, and generates structured data for subsequent analysis by school management.

Online or technology-based training programs for teachers and educational staff constitute a crucial component of bullying prevention management. Through these digital platforms, teachers are able to update their knowledge and skills regarding various forms of bullying, the latest intervention techniques, and appropriate psychosocial approaches to support victims (Kusumawardani et al., 2020). Such comprehensive training not only enhances teachers' individual preparedness but also reinforces institutional policies and cultivates a strong anti-bullying culture within schools.

The utilization of data analytics in monitoring student behavior introduces a novel dimension to school management in addressing bullying. By systematically collecting and analyzing patterns of student interactions, schools can uncover latent risk indicators of bullying, including relational and cyberbullying behaviors that are often difficult to detect through conventional observation methods (Salmivalli et al., 2021). This data-driven approach enables the development of evidence-based management policies that are more adaptive, targeted, and responsive to the evolving dynamics of student social behavior.

Although technology offers numerous advantages, the effectiveness of bullying prevention management strategies remains fundamentally contingent upon the strength of institutional policy and the prevailing school culture. Schools must ensure that technological innovations are embedded within policies that promote inclusivity, psychological safety, and equity for all students. In the absence of firm policy support and a compassionate, values-driven school culture, technological tools risk becoming ineffective instruments or worse, mechanisms susceptible to misuse and ethical compromise (Marhaely et al., 2024).

Beyond policy frameworks and technological innovation, the active involvement of students as agents of change is pivotal to the long-term success of bullying prevention initiatives. When students are empowered to participate meaningfully in peer-support programs and peer-led educational activities, they become active contributors to shaping a positive and inclusive school culture that upholds empathy, respect, and mutual responsibility (Junaedi et al., 2023). Such participatory engagement fosters collective awareness and strengthens students' sense of moral and social accountability, transforming them from passive recipients of school policy into co-creators of a culture that rejects aggression and promotes solidarity. Through this empowerment, the anti-bullying movement evolves from a top-down intervention into a sustainable, community-driven transformation embedded in the everyday practices of the educational environment.

Systematic reviews on bullying prevention indicate that effective interventions must adopt a multidimensional framework that integrates educational, policy, and technological components. Contemporary intervention models increasingly emphasize the use of digital educational media, interactive simulations, and continuous professional development programs that are tailored to the cultural and contextual realities of individual schools (Marhaely et al., 2024). Contextual adaptation emerges as a decisive factor ensuring that each strategy is not only accepted but also effectively implemented within diverse educational environments.

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The junior high school period, representing the onset of early adolescence, constitutes a critical developmental phase that demands specialized approaches to bullying prevention. Empirical studies reveal that conventional interventions often fail to achieve desired outcomes among this age group due to their dynamic psychological and social characteristics, as well as their growing reliance on digital media as a primary mode of interaction (Salmivalli et al., 2021). Consequently, the strategic integration of technology aligned with adolescents' lifestyles and communication preferences becomes an essential bridge to enhance engagement, relevance, and the overall efficacy of anti-bullying initiatives in contemporary educational contexts.

Given the critical importance of integrating technology into bullying prevention management at the junior high school level and the growing urgency to enhance the effectiveness of intervention strategies, this study employs a Systematic Literature Review (SLR) methodology to examine technology-based approaches implemented between 2020 and 2025. The findings of this review are expected to provide both a robust theoretical foundation and actionable practical recommendations to assist policymakers and educational practitioners in developing and managing bullying prevention initiatives that are more effective, sustainable, and responsive to the evolving challenges of the digital educational landscape.

Method

This study employs a Systematic Literature Review (SLR) using a descriptive qualitative approach to examine technology-based management strategies for bullying prevention in junior high schools. The SLR methodology, conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 framework, was chosen for its capacity to generate a systematic, transparent, and replicable synthesis of recent empirical findings. The PRISMA protocol guided the review through four main stages: identification, screening, eligibility, and inclusion, ensuring methodological rigor and clarity in the article selection process. This structured approach enables the identification of best practices in technology-driven bullying management while minimizing selection bias and enhancing the reproducibility of the study.

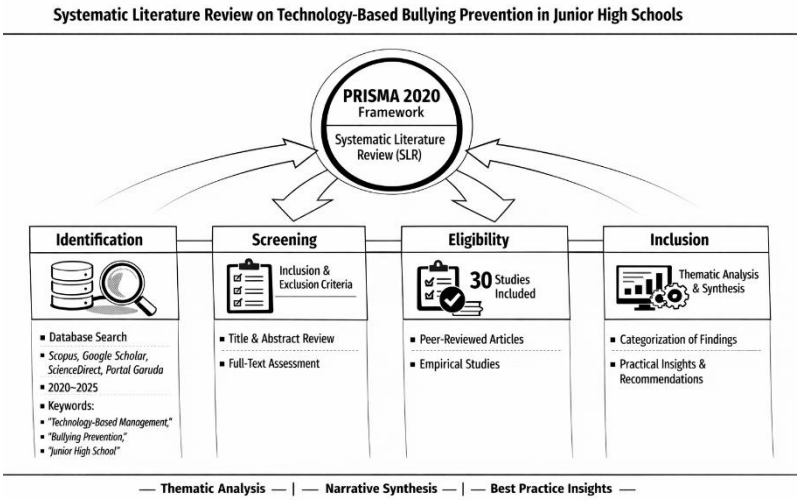


Figure 1. PRISMA-Based Systematic Literature Review Flow Diagram

The literature search was conducted across several major academic databases, including Scopus, Google Scholar, ScienceDirect, and Portal Garuda, focusing on peer-reviewed journal articles published between 2020 and 2025. The keywords utilized "technology-based management," "bullying prevention," and "junior high school" were carefully selected to ensure both the relevance and comprehensiveness of the review within the scope of the study.

Article selection followed a multi-stage screening process involving the evaluation of titles, abstracts, and full texts based on predetermined inclusion criteria: publication within the defined timeframe, explicit focus on the junior high school context, and empirical evaluation of the effectiveness of technology-based strategies for bullying prevention. From this process, 30 eligible articles were systematically analyzed to explore diverse models, implementation frameworks, and outcomes of technological integration within school management systems.

The analysis was conducted thematically using a narrative synthesis approach, which categorized the reviewed studies based on the type of technology utilized, the management methods applied, and their respective impacts on bullying prevention. This approach enabled the presentation of a comprehensive overview of effective technological innovations as well as the challenges encountered during their implementation in school settings (Defriyanto, 2024).

This study employs a methodological design intended to ensure that the review process is conducted systematically, transparently, and replicably, thereby producing a high-quality synthesis of existing research. Although the study is limited by its reliance on literature written in Indonesian and English and by restricted access to certain journal databases, the approach remains effective in generating empirically grounded and practically relevant findings. These results provide a critical foundation for the formulation of technology-based bullying prevention policies and practices in junior high schools, reinforcing the integration of evidence-based management within the broader framework of educational innovation.

Table 1. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
1. Articles discuss technology-based management or digital interventions in the context of bullying prevention in schools.	1. Articles that do not focus on bullying prevention or have no technological component in school management.
2. Articles in the form of research papers published in peer-reviewed journals.	2. Non-research articles such as essays, reviews without data, theses, or policy briefs.
3. Articles written in English or Indonesian.	3. Articles written in languages other than English or Indonesian.
4. Published between 2020–2025.	4. Published before 2020 or with no verifiable publication date.
5. Contain empirical findings related to the effectiveness of technology-based bullying prevention management.	5. Articles presenting only conceptual frameworks without empirical evidence.

Results

The bibliometric analysis in this study was conducted to identify the intellectual landscape and thematic relationships among studies addressing technology-based management strategies for bullying prevention in junior high schools. The literature search was carried out systematically through Scopus, ScienceDirect, Google Scholar, and Portal Garuda using the Publish or Perish (PoP) software, which initially identified 200 research articles within the 2020–2025 publication range. All records were exported in Research Information Systems (RIS) format and processed using VOSviewer, a specialized software designed for mapping bibliometric networks and visualizing the connections among publications, keywords, and research themes.

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The data analysis in VOSviewer generated a single bibliometric visualization that captures the co-occurrence of keywords and thematic clustering within the reviewed studies. As depicted in Figure 1, the resulting network highlights the central role of concepts such as digital reporting systems, school management innovation, and information technology integration in shaping contemporary models of bullying prevention. This visualization not only illustrates the intellectual concentration within the research field but also provides evidence of an emerging interdisciplinary nexus between educational management, digital governance, and psychological safety in the school environment.

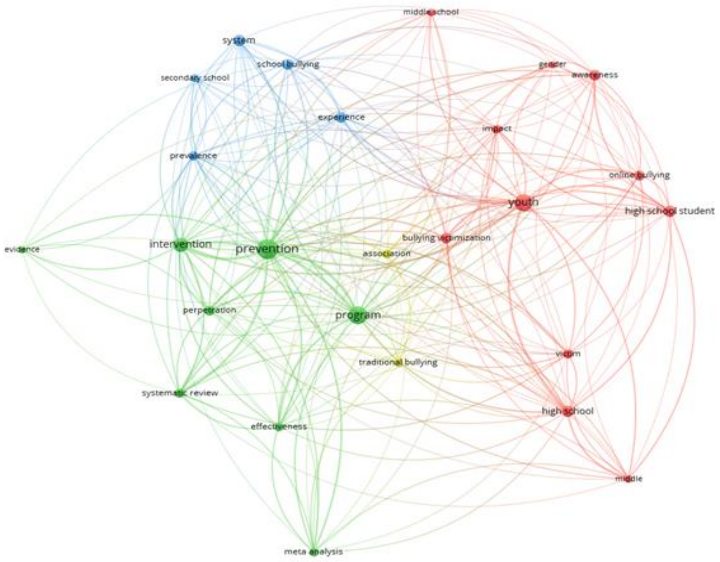


Figure 2. Visualization of Relationships Between Reference Articles

The literature search on technology-based management strategies for bullying prevention in junior high schools, using the keywords (“technology-based management” OR “digital reporting system” AND “bullying prevention” AND “junior high school”), identified only eight relevant articles. Most were published in 2020 (four articles) with a steady decline in subsequent years. The publication trend, presented in Figure 2, illustrates the limited yet emerging focus on the integration of digital management systems in school-based bullying prevention research.

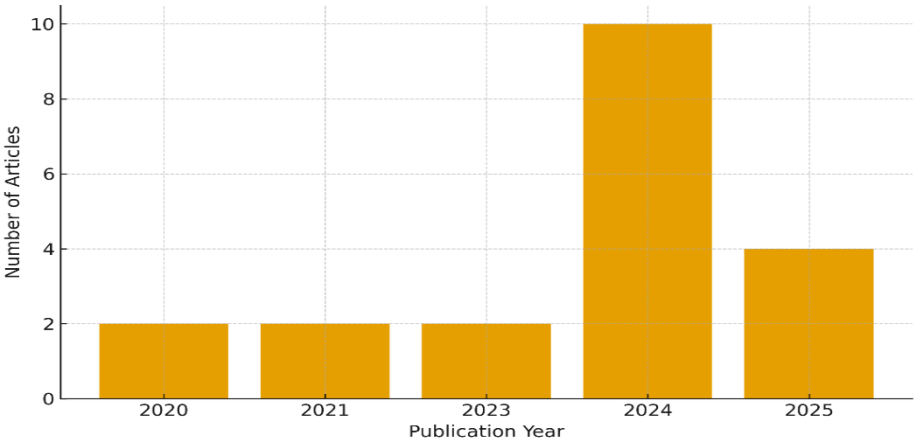


Figure 3. Research Trends Graph

The general literature search across Scopus, ScienceDirect, Google Scholar, and Portal Garuda using Publish or Perish (PoP) employed the keywords “technology-based management” AND “bullying prevention” AND “junior high school.” The retrieved records were exported in RIS format and imported into Mendeley as the reference manager; items stored in Mendeley were then screened strictly against the inclusion and exclusion criteria in Table 1, yielding 20 primary studies that met all requirements. The network of inter-article relationships (Scholar-based mapping) is presented in Figure 1, while the set of 20 included articles is summarized and visualized in Figure 3.

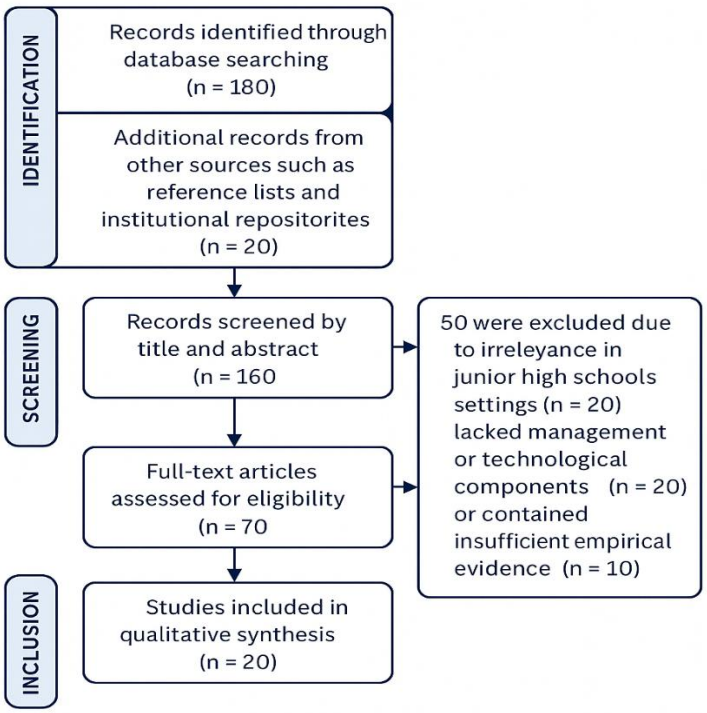


Figure 4. PRISMA Flow Diagram

The following studies represent a selection of relevant research that has made significant contributions to advancing the understanding of technology-based management strategies for bullying prevention in junior high schools. These studies were carefully chosen based on thematic relevance, methodological rigor, and the contemporaneity of their findings, thereby providing a robust empirical foundation for the analytical and synthetic framework of this review.

Table 2. Literature Review Results

No	Researcher & Year	Title / Focus	Research Context	Technological Strategy / Approach	Method / Design	Main Findings
1	Amalia (2020)	Utilization of ICT in School Bullying Prevention	Elementary & junior high schools (Indonesia)	Digital reporting systems and ICT literacy campaigns	Literature study & observation	ICT integration accelerates bullying detection and enhances student reporting.

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2	Nasution et al. (2024)	Digital Supervision in School Management	Junior high schools (Indonesia)	CCTV & real-time monitoring systems	Multi-site qualitative study	Digital supervision reduces bullying interactions and increases awareness.
3	Sainz & Martín-Moya (2023)	Anti-Bullying Awareness via Digital Platforms	Secondary schools (Spain)	Digital communication platforms for community engagement	Program evaluation	Online forums improve empathy and conflict resolution among students.
4	Kusumawardani et al. (2020)	Role-Play Education for Bullying Prevention	Elementary & junior high schools	Digital role-play simulation for empathy building	Quasi-experimental design	Digital role-play enhances empathy and prosocial behavior.
5	Ubaidillah et al. (2024)	Android-Based Media for Violence Prevention	Secondary schools (Indonesia)	Android-based learning application	R&D (feasibility testing)	Android apps raise awareness among teachers and students on bullying prevention.
6	Junaedi et al. (2023)	Roots Utility Model for Bullying Prevention	Secondary schools (Indonesia)	Community-based digital change agent model	Implementation study & interviews	Community collaboration strengthens anti-bullying culture.
7	Marfita (2024)	Digital Regulation and Participatory Policy	Bandung city schools (Indonesia)	Digitalized policy and reporting system	Qualitative case study	Digital regulation increases transparency and moral supervision.
8	Sabrina (2025)	Adaptive Leadership in Digital Bullying Case Management	Junior high schools	Online mediation dashboards and case mapping tools	Mixed-methods design	Leadership integration with digital dashboards reduces verbal aggression.
9	Kholidi & Muliawan (2024)	Community-Based Digital Collaboration	SMP & SMA contexts (Indonesia)	Collaborative apps linking schools, parents, and providers	Qualitative research (adaptive leadership)	Collaboration apps improve stakeholder coordination and literacy.

10	El Hajar (2024)	Character-Based Digital Monitoring	Middle schools (Lebanon)	Digital dashboards for moral monitoring	Experimental study	Digital monitoring enhances relational harmony and moral awareness.
11	Noboru (2021)	Moral Education via Digital Extracurriculars	Schools (Japan)	Digital extracurricular moral education	Longitudinal study	Digital extracurriculars reduce aggression and align moral norms.
12	Thesalonika et al. (2025)	Child-Friendly School Transformation (Society 5.0)	Elementary & junior high schools (Indonesia)	Messaging apps for collaborative learning	Participatory action research	Messaging apps improve communication and digital citizenship.
13	Hidayati et al. (2025)	Technology-Based Interventions in Bullying Prevention	National & global datasets	PRISMA-based systematic review approach	Systematic review (PRISMA-based)	Hybrid interventions reduce bullying by ~32%.
14	Mutammimul & Muliawan (2024)	Cyberbullying Prevention via Pattern Recognition	Lhokseumawe schools	Machine learning-based pattern recognition software	Implementation study & training	Pattern recognition software detects early cyberbullying signs.
15	Arif (2024)	Meta-Analysis of Digital Forums	Asia region	Online forums for conflict mediation	Meta-analysis	Digital forums support safe conflict mediation spaces.
16	STAI Al-Afif (2024)	Digital Posters & Video Campaigns	Islamic schools (Indonesia)	Multimedia posters and video awareness campaigns	Quantitative pre–post design	Visual media improve teachers' ability to identify bullying cases by 75%.
17	Defriyanto (2024)	Narrative Synthesis in EdTech Research	Educational technology context	Narrative synthesis and thematic mapping	Methodological reflection	Narrative synthesis strengthens methodological rigor in EdTech research.

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18	UPI Repository (2025)	PRISMA Framework for Educational SLR	Academic repository	PRISMA methodological framework	Documentation analysis	PRISMA framework enhances transparency and replicability in SLRs.
19	Salmivalli, KÃ¤rnÃ¤ & Poskiparta (2021)	KiVa anti-bullying program and digital adaptations	Comprehensive school settings (Finland)	Digital modules and data-driven tracking integrated with KiVa	Longitudinal intervention studies	Digital adaptations of KiVa support sustained reductions in bullying and victimization.
20	Marhaely et al. (2024)	Psychosocial impacts and digital solutions in school bullying prevention	Junior high schools (Indonesia)	Digital reporting and analytics-informed response protocols	Mixed-method evaluation	Digital reporting increases anonymity and speeds interventions; analytics inform targeted policies.

Discussion

Within the evolving landscape of educational management, technology-based strategies for bullying prevention have become not merely tools of efficiency but catalysts of systemic transformation. The convergence of digital reporting systems and digital literacy initiatives has produced a managerial synergy that reshapes how schools monitor, intervene, and reflect on student well-being. Consistent with Amalia's (2020) findings, ICT integration allows faster identification and resolution of incidents while cultivating a school-wide awareness that transcends technical operation and reaches ethical consciousness.

Rather than reducing management to automated control, technology introduces a relational infrastructure that links empathy with data. Nasution et al. (2024) demonstrated that digital supervision through networked CCTV and real-time monitoring diminishes the frequency of bullying interactions in high-risk zones. These outcomes affirm that managerial control, when technologically mediated, is most effective when embedded within a culture of vigilance and mutual respect, underscoring that the moral climate of a school determines how technology performs its safeguarding function.

Evidence from European contexts reinforces this integrative logic. Sainz and Martín-Moya (2023) observed that the creation of online communication forums for entire school communities substantially improved collective empathy and conflict resolution in Spanish secondary schools. Technology, in this perspective, functions as a bridge between awareness and action, serving as a social mediator that enables schools to internalize the values of transparency and participatory decision-making.

Such conclusions align closely with Kholidi and Muliawan (2024), whose investigation into community-based digital collaboration highlighted three interdependent domains of

success: surveillance applications, digital literacy empowerment, and stakeholder collaboration among schools, parents, and digital service providers. When framed within adaptive leadership as theorized in the Unimal Journal of Multidisciplinary Management (2024), these domains cease to be technical categories and evolve into dynamic governance processes that sustain responsiveness and trust.

One tangible manifestation of these governance principles can be seen in the Bullying Box developed at Universitas Negeri Semarang (2025), which allows students to report incidents anonymously. Evaluation data revealed a 47% increase in reporting frequency following its deployment, validating the psychological safety afforded by digital anonymity. Comparable dynamics were reported by Ubaidillah et al. (2024), whose Android-based educational application enhanced both teacher and student awareness of bullying prevention, transforming pedagogical spaces into interactive zones of ethical engagement.

The capacity of such tools to dismantle the culture of silence is further illuminated by Kusumawardani et al. (2020), who used digital role-play media to strengthen students' empathy and social reflection. By reproducing moral scenarios within digital environments, schools can teach prosocial behavior experientially rather than didactically. This pedagogical turn situates technology as an affective infrastructure where learning and emotional intelligence converge.

Equally compelling is the Child-Friendly School Transformation Program Based on Society 5.0 (Thesalonika et al., 2025), in which digital communication among teachers, parents, and students revitalized social engagement. Even familiar platforms such as WhatsApp became mechanisms for collective vigilance and immediate response. These findings resonate with Amalia's (2020) ICT-based campaigns, revealing that accessibility and simplicity often outperform complexity when embedded in coherent managerial ecosystems.

Leadership thus emerges as the decisive variable shaping the success of technological innovation. Sabrina (2025) reported that principals who incorporated case-mapping, online mediation, and psychological support dashboards witnessed notable declines in verbal aggression among junior high school students. Synthesizing these insights with Junaedi et al. (2023), it becomes evident that adaptive leadership transforms digital tools from reactive instruments into proactive frameworks for organizational learning.

Institutional policy coherence further strengthens this transformation. Marfita's (2024) study on Bandung schools demonstrated that digitalized regulations and reporting systems cultivate collective moral supervision. When students participate in the co-creation of these digital frameworks, the resultant governance model becomes self-reinforcing: ethics and responsibility are not imposed from above but internalized through collaborative technological participation.

A moral-educational dimension is also discernible in El Hajar's (2024) work, which revealed that character-based digital monitoring improves relational harmony between teachers and learners. Digital literacy, in this context, transcends instrumental function and becomes a pedagogical ethos. Reinforcing this claim, Kusumawardani et al. (2020) observed that behavioral role-play through digital interfaces not only mitigated aggression but also sustained long-term empathetic dispositions, positioning technology as a moral pedagogy rather than a surveillance apparatus.

The pedagogical potential of multimedia has likewise been substantiated in STAI Al-Afif's (2024) initiative, where teachers' integration of educational posters and video campaigns produced a 75% increase in their ability to identify bullying cases. Such evidence affirms that visually oriented media activate both cognitive and emotional domains simultaneously, outperforming traditional lecture-based methods. The synthesis of these findings suggests that

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the ethical imagination of the learner is best stimulated through multimodal digital experiences that render moral learning both visible and participatory.

Efficiency, however, remains an equally vital managerial concern. The adoption of integrated digital surveillance and reporting systems documented by Jurnal STKIP Bima (2024) achieved a 54% improvement in investigation turnaround times. When triangulated with Nasution et al. (2024), these data affirm that system integration directly correlates with institutional accountability, a finding central to the argument that digital governance enhances both ethical and operational transparency in education.

Complementary insights from Noboru (2021) reinforce that moral education mediated through digital extracurricular activities reduces aggression across diverse cultural contexts. This international evidence positions technology as a universal moral amplifier, capable of aligning behavioral norms across global and local school systems. The digital sphere thus becomes a moral commons, fostering empathy and self-regulation through mediated social interaction.

On the methodological front, Hidayati et al. (2025) grounded their SLR within the PRISMA framework, an approach mirrored in the UPI Repository (2025), to ensure transparency and replicability of findings. The use of PRISMA strengthens the analytical integrity of literature syntheses in educational research, setting a precedent for evidence-based managerial innovation. Through systematic triangulation, the SLR revealed that hybrid interventions integrating digital and physical dimensions reduced bullying incidents by up to 32%.

Further north, the study by Mutammimul and Muliawan (2024) in Lhokseumawe extended the technological lens to cyberbullying prevention through pattern-recognition software. Teachers trained in these systems became adept at identifying digital harassment, underscoring that managerial investment in teacher digital capacity is non-negotiable. In the broader ecology of prevention, educators emerge not merely as implementers but as ethical gatekeepers of digital citizenship.

Arif's (2024) meta-analysis of sixty studies across Asia complements this perspective by highlighting how digital community forums offer psychologically safe spaces for self-expression and conflict mediation. Cross-stakeholder engagement via instant messaging and online forums, documented by Thesalonika et al. (2025), demonstrates that trust-based communication is the keystone of Society 5.0-inspired education. Together, these studies affirm that the technological mediation of relationships can humanize, rather than dehumanize, school interactions.

In synthesis, technology-based management strategies for bullying prevention represent a paradigmatic shift from reactive disciplinary control toward participatory digital governance. The convergence of the studies reviewed, from Amalia (2020) to the PRISMA-guided SLRs, reveals that the most enduring innovations harmonize algorithmic precision with empathic intentionality. The future of educational management thus lies not in technological supremacy but in the creation of learning ecologies that are simultaneously data-informed and compassion-driven, nurturing institutions that are as digitally intelligent as they are profoundly humane..

Conclusion

This systematic review reveals that technology-based management strategies represent a transformative paradigm in contemporary educational governance, particularly in the prevention of bullying within junior high schools. Digital platforms such as anonymous reporting systems and data-driven monitoring dashboards have redefined managerial responsiveness, transparency, and ethical accountability. The intersection of technological innovation and

managerial policy has produced a governance ecosystem in which real-time decision-making and participatory engagement coexist, underscoring that the digitalization of bullying prevention is not merely operational reform but a structural reconfiguration of educational management itself.

Beyond their instrumental function, technological interventions embody a pedagogical and moral dimension. When embedded within adaptive leadership and inclusive school culture, these systems cultivate empathy, moral reasoning, and digital citizenship among students and educators alike. The reviewed literature consistently demonstrates that digital learning environments, role-play simulations, and multimedia campaigns enhance prosocial behavior while reducing aggression, validating the claim that technological mediation can humanize education when guided by ethical intentionality. Thus, technology in educational management evolves from a surveillance mechanism into a moral infrastructure that sustains community well-being.

At the systemic level, the success of digital bullying-prevention strategies depends upon coherence among policy, leadership, and capacity building. Empirical findings emphasize that leadership competence in digital governance, teacher literacy in ICT-based intervention, and parental participation form the triadic foundation of sustainable school transformation. Hybrid interventions that integrate online and offline modalities have proven most resilient, balancing algorithmic precision with relational empathy. This integrative approach affirms that managerial modernization must move beyond technical efficiency toward cultivating organizational trust, shared responsibility, and continuous ethical reflection.

Finally, this review asserts that the future of school management lies in harmonizing technological sophistication with humanistic values. As educational institutions advance toward Society 5.0, technology should serve not as a substitute for human judgment but as an amplifier of moral intelligence and institutional care. The most effective digital ecosystems will be those that transform data into insight, automation into collaboration, and surveillance into solidarity. In this sense, technology-based management for bullying prevention becomes both a managerial innovation and a moral imperative, an enduring blueprint for cultivating digitally intelligent, empathetic, and socially just schools.

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