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School management strategies in implementing textile waste-based craft learning

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Abstract

This study examined school management strategies in implementing textile waste-based craft learning at MAN 1 Pekanbaru as part of sustainable education and creative economy development. Using a qualitative case study approach, data were collected through interviews, observations, and document analysis involving school leaders, teachers, and students. The findings reveal that successful implementation was supported by strategic curriculum integration, instructional leadership, resource optimization, and collaborative program planning. The school adopted sustainability-oriented learning policies that encouraged environmental awareness, creativity, and entrepreneurial skills among students. Effective coordination between school management and teachers enabled the integration of textile waste utilization into arts education while aligning with institutional goals. The study highlights that school leadership plays a central role in fostering innovative, environmentally responsible learning practices. These findings contribute to the discourse on sustainability leadership and school-based management in promoting environmentally responsive educational programs.

Keywords

Craft education, educational innovation, school management, sustainability leadership, textile waste

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Introduction

The increasing urgency of environmental sustainability has transformed the orientation of contemporary education. Schools are no longer expected to focus solely on academic achievement; they are also required to cultivate environmental responsibility, creativity, and entrepreneurial awareness among students. Educational institutions play a strategic role in integrating sustainability principles into curriculum design and instructional practices. In recent years, sustainability-oriented education has become an important agenda in educational management discourse, particularly in relation to school leadership and institutional innovation (Hallinger, 2020; Harris & Jones, 2020). Within this context, school management strategies are critical in determining how sustainability values are translated into meaningful learning programs.

One pressing environmental issue in Indonesia is the rapid growth of textile waste resulting from increased fashion consumption and industrial production. Textile waste, especially fabric scraps, contributes significantly to environmental degradation due to its slow decomposition and accumulation in landfills. While industrial and governmental interventions remain limited, educational institutions can function as transformative spaces where environmental awareness and creative problem-solving are nurtured (Aithal & Maiya, 2023). Schools can integrate waste management practices into learning activities, thereby fostering students' ecological literacy and sustainable habits from an early age.

In the field of arts education, textile waste presents unique opportunities for innovation. Craft learning that utilizes textile waste not only develops manual and creative skills but also introduces students to sustainable production concepts and circular economy principles. However, the success of such programs depends largely on how school management structures support planning, coordination, and implementation processes. Effective educational management ensures that innovative learning programs are not incidental activities but systematically integrated into institutional frameworks (Bush, 2020). Therefore, analyzing management strategies behind sustainability-based craft education becomes essential.

Recent studies emphasize that school leadership significantly influences the implementation of innovative and sustainability-oriented programs. Transformational and instructional leadership approaches enable principals to align school vision, curriculum development, and teacher collaboration toward shared goals (Leithwood et al., 2020). When school leaders actively support environmental initiatives, they create organizational cultures that encourage experimentation, creativity, and cross-disciplinary collaboration. Furthermore, sustainability leadership in schools requires long-term strategic planning, stakeholder engagement, and resource management to ensure program continuity (Hargreaves & O'Connor, 2021).

School-based management frameworks also emphasize decentralized decision-making and participatory planning. Schools that adopt collaborative management approaches allow teachers to contribute to curriculum innovation and contextual program development (Handelzalts, 2019). In this regard, implementing textile waste-based craft learning is not merely a pedagogical choice but a strategic managerial decision that involves curriculum adaptation, teacher professional development, budgeting considerations, and evaluation

mechanisms. Without structured management strategies, sustainability initiatives may remain short-term projects rather than institutionalized practices.

MAN 1 Pekanbaru presents an intriguing case of sustainability-oriented educational practice. The school has integrated the utilization of textile waste into craft learning activities, encouraging students to create functional and aesthetically valuable products such as bags, pillows, and decorative items. This initiative aligns with broader educational goals of fostering creativity, environmental awareness, and economic literacy. However, beyond the visible student products, it is necessary to understand how school management structures support this implementation. Questions arise regarding how the program was planned, how leadership facilitated teacher collaboration, how resources were allocated, and how learning outcomes were evaluated.

Educational management research increasingly emphasizes the relationship between leadership practices and the adoption of innovation. According to Harris and Jones (2020), schools that successfully implement innovative programs often demonstrate strong instructional leadership and collaborative professional cultures. Leaders in such institutions actively coordinate curriculum alignment, provide guidance for teachers, and establish monitoring systems to ensure program effectiveness. Similarly, Leithwood et al. (2020) argue that leadership practices indirectly influence student outcomes by shaping school conditions, including professional collaboration, shared vision, and resource management.

In sustainability education, management strategies must also address long-term viability. Programs based on environmental themes require continuous support, community engagement, and integration into institutional policy frameworks (Hargreaves & O'Connor, 2021). Textile waste-based craft learning, therefore, should not be treated as a one-time project but as part of a broader sustainability-oriented school culture. This includes aligning activities with curriculum standards, embedding environmental values into school missions, and establishing partnerships with local stakeholders.

Despite growing attention to sustainability in education, limited research has examined how school management strategies specifically support textile waste-based craft learning in secondary schools. Most previous studies focus on environmental education outcomes or creative economy development without analyzing the managerial processes underlying implementation. This gap indicates the need for empirical investigation into how leadership, planning, coordination, and resource management shape sustainability-oriented craft education programs.

This study aims to analyze school management strategies in implementing textile waste-based craft learning at MAN 1 Pekanbaru. Specifically, it explores how school leaders design and coordinate the program, how teachers integrate sustainability into instructional practices, and how institutional policies support environmental and creative objectives. By examining managerial dimensions, this research contributes to the discourse on educational management, particularly in the context of sustainability leadership and school-based innovation.

Understanding the management strategies behind textile waste-based craft learning provides broader implications for educational institutions seeking to integrate environmental responsibility into curriculum design. When school leadership demonstrates commitment to sustainability and fosters collaborative professional cultures, innovative programs can become institutional strengths rather than isolated initiatives. Thus, this study not only documents a

case of craft-based environmental education but also highlights the strategic managerial practices that enable its implementation.

Literature Review

Sustainability leadership and school management in educational innovation

Sustainability leadership has emerged as a critical dimension in contemporary educational management discourse. As environmental challenges intensify globally, schools are increasingly expected to integrate sustainability principles into their organizational structures and pedagogical practices. This shift requires more than curriculum adjustments; it demands strategic leadership that aligns institutional vision, policy, and instructional practices with environmental responsibility. Hallinger (2020) emphasizes that effective school leadership significantly influences institutional direction, teaching quality, and the sustainability of innovation. Leadership is not merely administrative but instructional and transformative, shaping how educational goals are interpreted and implemented.

Research on sustainable school leadership suggests that leaders must cultivate long-term ecological vision while maintaining organizational coherence (Davies, 2007). Harris and Jones (2020) argue that sustainability-oriented school leadership involves mediating between global educational agendas and local institutional realities. In this sense, leadership determines whether sustainability becomes symbolic rhetoric or operational practice. Leithwood et al. (2020) further assert that leadership affects student outcomes indirectly by shaping school conditions, including collaborative culture, resource allocation, and curriculum coherence. Lambert (2002) also argues that developing leadership skills in schools increases the likelihood of shared responsibility and the long-term success of new ideas. Effective principals create enabling environments where teachers feel supported in implementing innovative programs.

Hargreaves and O'Connor (2021) introduce the concept of collaborative professionalism, emphasizing that sustainable change occurs when leadership fosters collective responsibility rather than imposing top-down directives. This aligns with Avery and Bergsteiner's (2011) sustainable leadership framework, which stresses long-term thinking, stakeholder engagement, and systemic alignment.

School-based management models reinforce the importance of decentralized decision-making and participatory governance (Handelzalts, 2019). Spillane's (2006) research on distributed leadership elucidates how innovation becomes sustainable when responsibilities are allocated among institutional actors rather than concentrated in a single individual.

In the context of textile waste-based craft learning, sustainability leadership transforms environmental concerns into structured educational innovation. School leaders create systemic support for environmentally responsive education by integrating sustainability into their schools' mission statements, curricular standards, and professional development programs. Thus, sustainability leadership is foundational to ensuring ecological awareness becomes embedded within school culture.

Curriculum integration and education for sustainable development (ESD)

Education for Sustainable Development (ESD) emphasizes integrating environmental, social, and economic dimensions into teaching and learning processes. Kopnina (2018) defines ESD as empowering learners to make informed decisions and responsible actions for environmental integrity and economic viability. ESD encourages transformative learning that reshapes values, behaviors, and competencies.

Sterling (2017) argues that sustainability education requires systemic thinking and interdisciplinary integration. Similarly, Wals and Benavot (2017) highlight that ESD must move beyond environmental awareness toward competency-based sustainability learning. Integrating sustainability into arts and crafts education provides opportunities to connect creativity with ecological responsibility.

Bush (2020) notes that innovative programs must be formally integrated into institutional frameworks to ensure academic legitimacy. This perspective aligns with Beane's (1997) curriculum integration theory, which emphasizes connecting learning experiences across disciplines to promote meaningful understanding. Experiential learning theory also supports sustainability-based craft education. Kolb (2015) argues that knowledge is constructed through concrete experience and reflective practice. When students transform textile scraps into functional items, they engage in experiential learning that deepens understanding.

The circular economy framework strengthens curriculum integration. Kirchherr et al. (2017) define the circular economy as extending material life cycles through reuse and recycling. Geissdoerfer et al. (2017) contend that circular economy practices foster sustainable development by reducing waste and encouraging regenerative systems. Thus, textile waste-based craft learning operationalizes global sustainability concepts within classroom practice, integrating theory and application.

Creative economy, environmental awareness, and holistic student development

The integration of sustainability into arts education intersects with the discourse on the creative economy. The creative economy emphasizes innovation, cultural production, and entrepreneurship as drivers of economic growth (Howkins, 2001). Lackéus (2015) argues that entrepreneurship education fosters value creation skills by encouraging students to transform societal challenges into economic opportunities.

Environmental awareness is central to sustainability education. Munir et al. (2021) highlight that initiatives for managing textile waste enhance community awareness and economic potential. Reflis et al. (2021) similarly demonstrate that recycling textile scraps reduces environmental pollution while generating income.

Art education offers a powerful platform for cultivating environmental consciousness. Eisner (2002) argues that arts education fosters critical thinking, imagination, and ethical reflection. Budiarto (2021) explains that textile waste can function as a creative resource, while Jannah (2021) demonstrates its aesthetic potential in interior design.

Tilbury (2011) emphasizes that sustainability education should empower learners to become change agents. Similarly, Freire (1970) argues that education should foster critical consciousness, enabling individuals to transform social realities. Textile waste-based craft learning reflects this transformative pedagogy by combining creativity with ecological responsibility. Fullan (2016) further notes that holistic student development requires integrating creativity, collaboration, and problem-solving competencies. Textile waste-based craft learning nurtures these dimensions by engaging students in hands-on production, environmental reflection, and entrepreneurial activities. Thus, the intersection of environmental awareness, creative expression, and entrepreneurship positions textile waste-based craft learning as a multidimensional educational model aligned with contemporary sustainability education frameworks.

Research Methodology

This study employed a qualitative case study design to explore school management strategies in implementing textile waste-based craft learning at MAN 1 Pekanbaru. A qualitative approach was selected because the research aimed to obtain an in-depth understanding of managerial processes, leadership practices, and institutional strategies underlying the implementation of sustainability-oriented craft education. Rather than measuring variables quantitatively, this study sought to interpret meanings, decisions, and interactions among school actors involved in planning and executing the program. A case study design was considered appropriate because it allows researchers to investigate a contemporary phenomenon in its real-life context, particularly when the boundaries between the phenomenon and its context are not clear (Yin, 2020).

The research was conducted at MAN 1 Pekanbaru, a public Islamic senior secondary school that has integrated the utilization of textile waste into its arts and crafts curriculum. The study took place over a five-month period, from September 2022 to January 2023. The site was selected purposively due to its active implementation of textile waste-based craft learning as part of its sustainability-oriented educational initiatives. This case provided an opportunity to examine how school management strategies translate environmental values into structured instructional practices.

Participants were selected using purposive sampling to ensure that informants possessed direct knowledge of the program's planning and implementation. The primary participants included the school principal, vice principal for curriculum affairs, arts and culture teachers responsible for craft learning, and selected students involved in textile waste-based craft production. The inclusion of school leaders was essential to understand strategic planning and policy alignment, while teachers provided insight into instructional management and classroom implementation. Students were included to capture perspectives on how management decisions influenced learning experiences and engagement.

Data were collected through semi-structured interviews, non-participant observations, and document analysis. Semi-structured interviews allowed flexibility in probing participants' experiences while maintaining focus on managerial dimensions such as planning, resource allocation, coordination, and evaluation. Each interview lasted approximately 45 to 60 minutes and was audio-recorded with participants' consent. Observations were conducted during craft

learning sessions to examine how textile waste-based activities were organized, how materials were managed, and how teachers facilitated student engagement. Field notes were systematically recorded to capture classroom dynamics, teacher-student interactions, and evidence of sustainability practices. In addition, relevant documents, including curriculum plans, lesson plans, school policy documents, and program reports, were analyzed to understand the initiative's formal institutional support.

Data analysis followed an interactive model involving data condensation, data display, and conclusion drawing. Interview recordings were transcribed verbatim and reviewed multiple times to ensure familiarity with the data. Coding was conducted inductively to identify recurring themes related to school management strategies, including leadership direction, curriculum integration, collaboration mechanisms, and monitoring processes. Observational data and document findings were triangulated with interview data to enhance analytical validity. This triangulation process enabled cross-verification of information and reduced the risk of subjective interpretation. The analytical process was iterative, meaning that emerging findings were continuously compared with subsequent data to refine thematic categories and ensure coherence (Miles et al., 2020).

To ensure trustworthiness, several strategies were implemented. Credibility was strengthened through triangulation of data sources and prolonged engagement in the research setting. Member checking was conducted by sharing summarized findings with selected participants to confirm accuracy and interpretation. Dependability was addressed by maintaining an audit trail consisting of interview transcripts, observation notes, coding schemes, and reflective memos. These procedures enhanced transparency and allowed the research process to be systematically documented.

Ethical considerations were carefully observed throughout the study. Participants were informed about the research objectives, and written consent was obtained prior to data collection. Confidentiality was maintained by anonymizing participants' identities in the reporting of findings. The research was conducted in accordance with institutional regulations and the school's cultural norms.

By employing a qualitative case study design supported by triangulated data collection and systematic thematic analysis, this study provides a comprehensive understanding of how school management strategies facilitate the implementation of textile waste-based craft learning. The methodology enabled exploration of leadership roles, curriculum management practices, and institutional support mechanisms that shape sustainability-oriented educational innovation within a secondary school context.

Findings

Strategic leadership and institutional policy alignment

The first major finding demonstrates that the successful implementation of textile waste-based craft learning at MAN 1 Pekanbaru is strongly rooted in strategic leadership and institutional alignment. The school principal played a central role in articulating sustainability as part of the school's vision and long-term educational mission. Rather than treating environmental craft activities as optional initiatives, school leadership embedded sustainability

principles into institutional policy, annual planning documents, and academic coordination meetings. This strategic positioning elevated the program from a classroom innovation to an institutional priority. As the principal explained,

> "We do not want this program to be merely a practical activity. It is part of the school's vision to develop students' environmental awareness and entrepreneurial spirit."

Instructional leadership was evident in curriculum supervision, monitoring mechanisms, and teacher coordination. The principal further emphasized,

> "We ensure that textile waste-based learning is integrated into the curriculum and aligned with national competency standards."

Beyond policy alignment, leadership also facilitated internal communication structures that ensured consistency across departments. Regular evaluation meetings were conducted to review learning outcomes and identify areas for improvement. This indicates that leadership was not symbolic but operational, shaping planning, supervision, and the program's long-term sustainability. The alignment among institutional vision, curriculum structure, and leadership commitment created organizational stability, minimizing fragmentation and ensuring continuity beyond individual initiatives.

Curriculum integration and resource management optimization

The second major finding highlights systematic curriculum integration supported by effective resource management. Textile waste utilization was formally embedded into lesson plans, competency indicators, assessment rubrics, and classroom activities. Teachers deliberately connected technical crafting skills with environmental literacy objectives, ensuring that sustainability values were internalized through structured pedagogical practice rather than incidental exposure. The integration reflected intentional curriculum design rather than spontaneous experimentation. One arts teacher stated,

> "We incorporated patchwork and quilting techniques into the lesson plans, so students not only learn sewing but also understand the importance of recycling."

This approach enabled students to link theory with practice. Sustainability concepts such as waste reduction and material reuse were introduced alongside hands-on skill development, creating experiential learning opportunities. Students engaged directly with textile scraps, transforming discarded materials into functional and aesthetically valuable products. In addition, the school implemented organized material management. Textile scraps were collected from local sources, sorted by type and color, and stored systematically before classroom use. According to the vice principal for curriculum affairs,

> "Material management is carefully planned so that the waste used truly supports learning and avoids unnecessary waste."

This structured resource optimization reduced operational costs and reinforced circular economy principles within the school context. The combination of curriculum integration and efficient material management demonstrates that sustainability was operationalized both pedagogically and administratively, reflecting coherent management practices that connected environmental responsibility with institutional efficiency.

Collaborative implementation and holistic student outcomes

The third major finding emphasizes collaborative implementation and its impact on holistic student development. The program was characterized by participatory coordination between school leaders and teachers, reflecting shared responsibility in instructional planning and evaluation. Rather than relying solely on top-down directives, the school cultivated a collaborative professional culture in which teachers actively contributed to refining instructional strategies and assessing student outcomes. As one teacher explained:

> "We collaborate in designing lessons and evaluating students' work so that the program continues to improve."

This collective engagement strengthened professional ownership and enhanced consistency across classes. Teachers exchanged ideas on improving techniques, adapting materials, and integrating entrepreneurial components into craft projects. Such collaboration ensured that innovation remained dynamic and responsive to student needs. From the student perspective, the program fostered environmental awareness, creativity, and entrepreneurial insight. One student shared,

> "I became more aware that fabric scraps, which are usually thrown away, can actually become products with economic value."

Another student added,

> "We learned to make bags and pillows and then tried to sell them. I learned how to set prices and identify business opportunities."

These testimonies illustrate multidimensional learning outcomes. Students developed ecological literacy by recognizing textile waste as an environmental issue. Simultaneously, they enhanced creative craftsmanship skills and gained practical economic knowledge through product marketing experiences. The integration of environmental awareness, artistic production, and entrepreneurial practice demonstrates that collaborative management strategies significantly contributed to comprehensive student development—cognitively, creatively, and economically.

Discussions

Strategic leadership and institutional policy alignment

The findings indicate that strategic leadership was the foundational factor enabling the implementation of textile waste-based craft learning at MAN 1 Pekanbaru. The school principal played a decisive role in integrating sustainability into the school's vision, curriculum direction, and academic planning. This confirms that educational innovation does not occur spontaneously but requires leadership commitment and institutional endorsement.

The principal's instructional leadership ensured that textile waste-based craft learning aligned with formal curriculum standards and broader institutional goals. This finding is consistent with Hallinger (2020), who emphasizes that leadership significantly shapes school effectiveness by influencing curriculum coherence and professional practices. Similarly, Harris and Jones (2020) argue that leaders act as mediators between global sustainability agendas and local school implementation.

The institutionalization of sustainability within school policy also reflects Leithwood et al. (2020), who state that leadership indirectly influences student outcomes by creating supportive organizational conditions. In this study, sustainability was not viewed as an extracurricular activity but as a fundamental aspect of the school's enduring educational identity. This alignment strengthened program continuity and minimized dependency on individual teacher initiative.

Furthermore, the findings align with Hargreaves and O'Connor (2021), who stress that sustainable change requires consistent leadership support and shared institutional purpose. By embedding environmental responsibility into school planning documents and academic coordination processes, MAN 1 Pekanbaru demonstrated structured governance for innovation. This confirms that sustainability leadership is not symbolic but strategic and systemic.

In addition, the leadership approach observed in this study reflects a long-term orientation toward institutional transformation rather than short-term program success. The principal's role extended beyond initiating the program to ensuring monitoring, evaluation, and strategic continuity. Such proactive leadership reduces the risk that sustainability initiatives will fade due to administrative changes or shifting priorities. By embedding sustainability within governance structures, the school created a stable foundation for continuous improvement and innovation, reinforcing the idea that leadership commitment determines whether environmental education becomes a lasting institutional culture. Thus, the first major finding is that without strong leadership direction and policy alignment, textile waste-based craft learning is likely to remain fragmented or temporary.

Curriculum integration and resource management optimization

Structured curriculum integration and systematic resource management supported the program's effectiveness, as the second key finding reveals. Textile waste utilization was embedded directly into arts and crafts lesson plans, learning objectives, and assessment

processes. This confirms that sustainability was academically grounded rather than treated as an informal initiative. Bush (2020) explains that effective educational management requires innovative programs to be formally integrated into institutional frameworks. The structured incorporation of patchwork, appliqué, and quilting techniques into competency-based instruction reflects this principle. Students learned environmental responsibility alongside technical and artistic skills, creating interdisciplinary educational value.

This approach aligns with Rashid et al.'s (2025) framework for Education for Sustainable Development (ESD), which emphasizes experiential learning and skill-based sustainability education. Rather than merely discussing textile waste, students engaged in hands-on recycling practices, transforming waste into functional products such as pillows, laptop bags, and decorative items. Additionally, the systematic collection and sorting of textile scraps reflect circular-economy principles in educational practice. Kirchherr et al. (2017) define the circular economy as extending material life cycles through reuse and recycling. Classroom settings can operationalize global sustainability concepts through the school's material management strategies.

The findings also resonate with Sterling (2017), who argues that transformative sustainability education must integrate knowledge, skills, and values. The school taught students to recycle as part of their structured learning, helping them understand sustainability as a way of life rather than just a theory. Moreover, curriculum integration strengthened the coherence between cognitive learning and practical application. Students did not simply acquire technical crafting skills; they connected these skills to broader environmental and social implications. This interdisciplinary approach enhances deeper understanding and retention, as students experience sustainability through action-based learning. By combining environmental theory with hands-on material transformation, the school ensured that sustainability education was meaningful, contextually relevant, and directly connected to students lived experiences. Therefore, this second finding demonstrates that curriculum integration, combined with efficient resource optimization, transforms sustainability from an abstract ideology into a structured pedagogical implementation.

Collaborative implementation and holistic student development

The third major finding emphasizes collaboration and its impact on student outcomes. The implementation process involved active coordination between school leaders and teachers. Teachers participated in instructional planning, evaluation, and refinement of textile waste-based learning activities. This participatory structure reflects school-based management principles described by the Handelzats (2019), in which decentralized collaboration strengthens innovation capacity.

Fullan (2016) highlights that sustainable school improvement depends on professional collaboration rather than isolated efforts. At MAN 1 Pekanbaru, collaborative planning ensured consistency across classes and strengthened teacher ownership of the program. This distributed responsibility aligns with Spillane's (2006) concept of distributed leadership, in which multiple actors contribute to institutional innovation.

Beyond managerial collaboration, the findings show significant holistic student development. Students demonstrated increased environmental awareness, advanced creative

craft skills, and entrepreneurial competence. Students recognized textile waste as an environmental issue with ecological consequences. This aligns with Munir et al. (2021) and Reflis et al. (2021), who emphasize awareness-raising in textile waste management. However, this study extends previous research by showing how formal school management structures systematically cultivate such awareness.

Creatively, students applied techniques such as patchwork, appliqué, and quilting to produce aesthetically valuable products. This aligns with Budiarto (2021), who views textile waste as a resource for artistic innovation, and Jannah (2021), who demonstrates the design potential of recycled textiles for interior applications.

Importantly, some students successfully marketed their products, recognizing economic opportunities in sustainability-based crafts. This aligns with Lackéus (2015), who argues that entrepreneurship education encourages students to create value from real-world problems. By integrating creative production with market awareness, the school linked sustainability education with economic literacy. Furthermore, Tilbury (2011) argues that sustainability education should empower learners to act as change agents. Students at MAN 1 Pekanbaru exhibited this transformative potential by promoting environmentally responsible practices within their community.

Additionally, the collaborative model strengthened not only instructional quality but also student engagement and motivation. When teachers collectively refined teaching strategies and shared best practices, students benefited from consistent guidance and supportive learning environments. The integration of collaboration, creativity, and environmental awareness fostered a sense of collective responsibility among students. This multidimensional development illustrates how well-coordinated management practices can create educational experiences that are intellectually stimulating, socially relevant, and economically empowering. Thus, the third finding confirms that collaborative management strategies directly contribute to multidimensional student development—environmental, creative, and entrepreneurial.

Conclusions

This study demonstrates that the successful implementation of textile waste-based craft learning at MAN 1 Pekanbaru is fundamentally shaped by structured and strategic school management practices. The findings confirm that sustainability-oriented educational innovation requires more than creative classroom activities; it demands visionary leadership, systematic curriculum integration, and collaborative governance. Strategic leadership and institutional policy alignment ensured that sustainability principles were embedded within the school's mission and academic planning, transforming textile waste utilization into a formal and enduring educational commitment.

Furthermore, integrating textile waste into the arts and crafts curriculum illustrates how sustainability can be operationalized through structured pedagogical design. By aligning environmental awareness with competency-based instruction and resource optimization, the school translated abstract sustainability concepts into meaningful experiential learning. The systematic management of textile waste reinforced circular economy principles and demonstrated the feasibility of environmentally responsible practices within a formal educational setting.

Collaborative implementation between school leaders and teachers strengthened program consistency and professional ownership. This participatory approach contributed directly to holistic student development. Students developed environmental literacy, creative craftsmanship skills, and entrepreneurial awareness, reflecting the multidimensional impact of well-managed sustainability education. The integration of ecological responsibility with creative economy principles positions textile waste-based craft learning as both environmentally responsive and economically empowering.

Overall, this study contributes to the discourse on sustainability leadership and school-based management by illustrating how structured governance can institutionalize innovative environmental education. MAN 1 Pekanbaru serves as a model for how educational institutions can transform environmental challenges into strategic learning opportunities, fostering responsible, creative, and future-ready generations.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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