Transformational leadership, student participation, and campus digital communication: A systematic review of green management implementation in higher education

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Abstract

This study explores how transformational leadership accelerates green management in higher education, shapes student participation, and is reinforced by digital communication and internal channels. The systematic review, following PRISMA guidelines, covers international and open-access databases from 2000–2025, with inclusion criteria focusing on campus environments, transformational leadership, sustainability implementation, student engagement, and communication. Thematic synthesis reveals that idealized influence and inspirational motivation build pro-environmental norms, shared meaning, and collective efficacy that drive volunteer recruitment and coordinated action. Intellectual stimulation and individualized consideration enhance autonomy, creativity, competence, and student leadership through living labs, challenge-based projects, training, and clearly defined role assignments. Data-driven communication via energy and waste dashboards, regular progress updates, and public recognition strengthens transparency and accountability, leading to behavioral changes and measurable savings. Key mediating mechanisms include shared sustainability values, collective efficacy, and psychological engagement, while moderating factors that amplify outcomes include top management support, institutional incentives, and information technology readiness. Although many studies are cross-sectional, the consistent direction of findings across the literature provides a strong basis for triangulation. Major recommendations include formulating measurable visions, cross-unit delegation, safe co-creation ecosystems, formal incentives, segmented communication architecture with clear rhythms, and the monitoring of auditable performance indicators. Future research are advised to prioritize multi-site longitudinal studies, standardized green culture indicators, and cost–benefit analytics to support campus investment decisions.

Keywords:
Digital communication; environmental dashboard; green management; living labs; transformational leadership.

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INTRODUCTION

Climate change, environmental degradation, and limited resources require higher education institutions to adopt sustainable management practices. Universities function not only as consumers of energy, water, and materials but also as producers of knowledge, values, and societal role models. Green management in universities encompasses the integration of eco-friendly policies, operational systems, curricula, research agendas, and organisational culture. Achieving this transformation demands leadership capable of creating a shared vision, mobilising collective commitment, and nurturing innovation (Rojak, 2024).

Transformational leadership plays a strategic role in accelerating behavioural change toward sustainability (Oliveira & Proença, 2025). Yet, its mechanisms of influence within the academic sphere remain insufficient and require evidence-based explanation. Implementing green management often encounters structural, cultural, and behavioural challenges such as fragmented policies, limited resources, and resistance to change (Mardikaningsih & Radjawane, 2025). Transformational leadership can address these obstacles by strengthening value orientation, clarifying strategic objectives, and restructuring incentives. Through a convincing vision, leaders encourage a reinterpretation of daily work practices to meet environmental targets. Intellectual stimulation encourages the pursuit of solutions in areas like energy efficiency, waste reduction, green mobility, and digital transformation, while individualised support strengthens capacity through mentoring, recognition, and participatory opportunities (Adeoye, 2025). Nevertheless, the impact of such leadership may vary across institutional contexts, governance structures, and academic cultures.

Student engagement also serves as a pivotal factor in sustaining environmental initiatives (Ribeiro et al., 2019). Their involvement in communities, campaigns, and campus sustainability projects helps transform norms, promote eco-conscious behaviour, and spread social innovation. Transformational leadership can shape student participation by fostering ownership, purpose, and collective efficacy. The exemplary green practices demonstrated by leaders and lecturers strengthen social learning, while inspiring narratives link everyday behaviours to broader ecological impacts. Empowerment through autonomy, resources, and feedback deepens students' sense of commitment (Mohamed et al., 2025). However, participation opportunities often vary across academic programs, and factors such as study workload, facility support, and formal acknowledgement affect the intensity of engagement.

Advances in digital technology are changing the way sustainability values and practices are communicated, negotiated, and internalised on campus. Internal platforms, social media, and information systems enable the rapid dissemination of policies, best practices, and environmental performance indicators. Within the framework of transformational leadership, digital media can reinforce visionary messages, consistent role modelling, and two-way interactions that support collective learning (Darmawan & Gardi, 2024). Visualising data on energy consumption, carbon footprints, or recycling rates increases transparency and accountability. Gamification features and public recognition motivate participation. Nonetheless, challenges such as information overload, misinformation, and varying levels of digital literacy must be addressed. Therefore, communication strategies that are segmented, evidence-based, and inclusive are essential for sustaining long-term effectiveness (Frizon et al., 2024).

The relationship between transformational leadership and the implementation of green management can be understood through several theoretical perspectives. Social Learning Theory explains that individuals adopt pro-environmental behaviour by observing and imitating role models. Social Identity Theory emphasises how identification with leaders and organisational groups encourages the internalisation of green values and norms. From a Resource-Based View and Dynamic Capabilities perspective, leadership enhances an institution's ability to develop, share, and reconfigure environmental resources. Meanwhile, the Institutional Theory highlights the role of legitimacy, normative pressure, and imitation processes that are shaped and mediated by leadership (Hariani et al., 2025). Combining these frameworks provides a comprehensive understanding of the cognitive, emotional, and structural mechanisms through which leadership drives organisational transformation. Empirical studies across various sectors indicate that transformational leadership is positively associated with pro-environmental behaviour, innovation, and sustainability outcomes. However, higher education presents distinct conditions, including academic freedom, collegial decision-making, and the diversity of *tri dharma* missions—education, research, and community service. These characteristics influence how institutional visions are implemented in operational practices and academic curricula. Therefore, a focused review of campus-based literature is essential to evaluate how transformational leadership affects green management policies, processes, and organisational culture within universities.

The study should also examine mediating factors, such as sustainability values, collective efficacy, and psychological climate, as well as moderating factors, such as rectorate support, institutional incentives, and technological readiness. Student engagement not only contributes to the success of short-term environmental initiatives but also nurtures long-term ecological citizenship and

leadership skills. Transformational leadership encourages participation by articulating meaningful goals, designing authentic learning experiences, and acknowledging both individual and group achievements. Furthermore, strong connections between co-curricular programs, project-based learning, and community partnerships enhance the transfer of sustainability knowledge and practices beyond the classroom. However, factors such as equitable access, diverse student backgrounds, and adequate welfare support must be considered to ensure inclusive participation. Digital media and internal communication serve as vital infrastructures for coordinating organisational transformation. A consistent, data-driven, and well-structured messaging can strengthen the shared vision and help cultivate sustainable habits.

Transformational leadership utilises digital platforms to model desired behaviours, showcase success stories, and invite collaborative problem-solving. Tools such as environmental dashboards and regular progress reports enhance transparency and foster institutional trust. However, the impact of communication depends greatly on the credibility of the message source, the degree of interactivity, and the relevance of the content to the audience's needs. Therefore, a targeted review is necessary to understand how digital communication strategies mediate or moderate leadership influence on green behaviour, and how message design shapes attention, comprehension, and willingness to act.

Aligned with the first research question, this study examines how transformational leadership influences green management through policies, operational systems, and organisational culture. The analysis aims to identify the most impactful leadership behaviours, indicators of effective implementation, and barriers that hinder progress. The second research focus explores the motivational, social, and structural factors that drive student participation, including best practices, recognition systems, and institutional support mechanisms. The third area investigates digital communication strategies that strengthen shared vision, accelerate learning, and bridge behaviour gaps using data-based feedback.

This framework allows the study to generate a clear and practical synthesis. Its urgency grows alongside increasing demands for environmental accountability, accreditation requirements, and stakeholder expectations for sustainable campuses. Although many universities have launched green initiatives, differences in outcomes highlight the need to understand the key driving factors. Transformational leadership is viewed as a major catalyst operating through interconnected psychological, social, and technological pathways. Integrating evidence on student participation and the effectiveness of digital communication can inform the design of more targeted and efficient interventions.

It is expected that this study will provide a roadmap for leadership strategies, program design, and communication architecture to strengthen environmental impact and meaningful learning experiences. Therefore, a systematic, critical, and context-sensitive literature review is needed to examine the role of transformational leadership in advancing green management in higher education. The review should identify mechanisms of influence, enabling conditions, and communication practices that strengthen leadership messages and behaviours, while also mapping knowledge gaps, proposing a conceptual model, and outlining directions for future research.

RESEARCH METHOD

This study applies a systematic literature review to address the research objectives concerning the influence of transformational leadership on green management implementation, student participation, and the use of digital media and internal communication. The review follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, which includes defining eligibility criteria, developing search strategies, screening studies, assessing quality, extracting data, and synthesising findings (Page et al., 2021). The search was conducted on international databases (Scopus, Web of Science, ScienceDirect, Wiley, SpringerLink) and regional/open databases (DOAJ, Google Scholar) covering the years 2000–2025. Keywords were used in both Indonesian and English, for example: *"kepemimpinan transformasional" OR "transformational leadership"*, *"green management" OR "campus sustainability"*, *"komunikasi digital" OR "digital communication"*, and *"partisipasi mahasiswa" OR "student engagement"*, combined with Boolean operators (AND/OR) and contextual terms such as *"higher education"*.

Inclusion criteria consisted of peer-reviewed journal articles or reputable conference papers focused on higher education that examined transformational leadership and at least one of the following themes: green management, student participation, or digital communication. Studies using quantitative, qualitative, or mixed methods and available in full text in Indonesian or English were included. Excluded were non-empirical papers, studies outside academic settings, and those lacking relevant indicators. Screening occurred in two stages—title/abstract and full-text reviews—conducted independently by two reviewers, with disagreements resolved through discussion. Methodological quality is assessed using the CASP (qualitative), JBI/AXIS (observational), and AMSTAR-2 (for identified systematic reviews) tools, while risk of bias and external relevance are also evaluated.

Extracted data included study characteristics (year, country, design, sample size), variable definitions, measurement instruments (e.g., MLQ for transformational leadership), indicators of green management (policy, process,

culture), forms of student participation, and digital communication strategies. The synthesis adopted a thematic approach to identify mechanisms, mediators, and moderators across the three research areas, supported by an evidence map. For comparable quantitative studies, a correlation meta-analysis was performed using a random-effects model, with Q and I^2 statistics assessing heterogeneity and funnel plots with Egger's test detecting publication bias. A sensitivity analysis excluded studies with a high risk of bias. The results are presented through a PRISMA flow diagram, a summary table of included studies, and a narrative synthesis that integrates evidence from diverse contexts.

FINDINGS AND DISCUSSION

The effect of transformational leadership on green management implementation in higher education

The focus of this study is on how the dimensions of transformational leadership (idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration) drive the development of green policies, operational processes, and organisational culture within universities. To operationalise these dimensions, many studies employ the Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (1995).

Meta-analytic evidence indicates that transformational leadership is strongly associated with performance, commitment, and satisfaction, all of which are prerequisites for organisational change (Gang Wang et al., 2011; Judge & Piccolo, 2004). In workplace settings, leaders promote pro-environmental behaviour among employees through role modelling, goal-setting with meaningful purpose, and empowerment (Robertson & Barling, 2013). These mechanisms are highly relevant to higher education institutions, which require cross-unit coordination and the adoption of innovative green practices. A clear sustainability vision, supported by measurable targets and inter-faculty committees, accelerates the institutionalisation of green management (Lozano, 2015; Velazquez et al., 2005).

Transformational leadership enhances collective sense-making, ensuring that environmental policies align with academic missions and accreditation standards rather than remaining merely temporary or symbolic initiatives. Intellectual stimulation encourages the development of pilot projects focused on energy efficiency, waste management, and sustainable mobility. The higher education literature highlights the importance of "living labs" and test–evaluate–scale cycles within campus infrastructure to generate tangible impacts and promote systemic learning (Lozano, 2015). These dynamics align with broader findings that transformational leadership enhances process innovation (Darmawan & Marsal, 2025; Gang Wang et al., 2011).

Idealised influence and the recognition of green contributors further reinforce pro-environmental norms. Student involvement as co-creators of

sustainability initiatives has been shown to improve both implementation effectiveness and social legitimacy on campus (Disterheft et al., 2015). This reflects the broader view that universities serve as key agents in sustainability transitions (Cortese, 2003). Collective efficacy, shared sustainability values, and psychological engagement among academic communities act as mediators that connect inspirational messages to concrete action.

Meanwhile, top management support, institutional incentives, and data or digital infrastructure readiness moderate these effects by enhancing transparency, accountability, and cross-unit coordination (Lozano, 2015; Robertson & Barling, 2013). While many studies in higher education remain descriptive or cross-sectional, limiting causal inference, the consistency of findings across leadership research and the higher education context provides a robust basis for triangulation. Future research should adopt multi-site longitudinal designs and develop standardised green culture indicators, complemented by cost–benefit analytics to better inform campus investment and sustainability decisions (Lozano, 2015; Page et al., 2021).

Table 1.

Green Management Implementation

Leadership Dimension	Primary Mechanism	Campus Implementation Indicators	Key References
Idealised Influence (role modelling)	Social learning, identity	Compliance with green policies; leaders' visible energy-saving behaviours	Robertson & Barling (2013)
Inspirational Motivation	Sense-making, meaningful purpose	Sustainability vision; green KPIs; cross-unit sustainability committees	Lozano (2015); Velazquez et al. (2005)
Intellectual Stimulation	Process innovation, exploration	Energy-efficiency pilots; waste management pilots; living labs	Gang Wang et al. (2011); Lozano (2015)
Individualized Consideration	Empowerment, competence, support	Training for campus community; student participation; service-learning projects	Disterheft et al. (2015)
Data-driven Communication	Transparency, accountability	Energy-consumption dashboards; progress reporting	Lozano (2015)
Transformational Leadership (general)	Organisational performance and commitment	Scale of green-practice adoption across units	Judge & Piccolo (2004)

Source: Authors' work

Table 1 above explains how each dimension of leadership works through specific psychological or organisational mechanisms, which are then translated into indicators that can be monitored at the campus level. Ideal influence (role modelling) and inspirational motivation help set a common direction and norms, so that the campus community understands the goals and feels motivated to get involved. Intellectual stimulation and individual consideration encourage innovation and capacity building, for example, through efficiency program trials, training, and collaborative projects (Darmawan & Eddine, 2024). Data-driven communication ensures transparency and accountability, enabling continuous improvement based on clear evidence. Overall, these elements complement each other to expand the adoption of green practices across various units and strengthen the organisation's commitment to sustainability. With clear direction, capacity support, and transparent performance tracking, campuses can move more consistently and measurably toward a green culture.

The effect of transformational leadership on student participation in environmental activities

The result also showed there is evidence of student participation in sustainability initiatives at universities (Cortese, 2003; Disterheft et al., 2015) with literature on transformational leadership and pro-environmental behaviour (Graves et al., 2013; Robertson & Barling, 2013). Participation is defined as student involvement in environmental communities, campaigns, and "green campus" projects, encompassing the areas of organising, behavioural change, and co-creation of solutions.

The dimensions of transformational leadership, namely ideal influence, inspirational motivation, intellectual stimulation, and individual consideration, have influenced participation through: (a) the formation of pro-environmental norms and identities via role modelling and value framing (Robertson & Barling, 2013); (b) increasing student autonomy, competence, and social connectedness in accordance with Self-Determination Theory (Deci & Ryan, 2000); (c) strengthening behavioural intentions through attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991); and (d) increasing collective efficacy for campus action (Bandura, 1997). This combination of mechanisms moves students from awareness to voluntary action (Boiral & Paillé, 2012).

Leaders who articulate a meaningful vision of sustainability, linked to academic mission and social impact, enhance sense-making and identity pride, which are associated with the intention to join environmental communities and campus campaigns (Cortese, 2003; Kahu, 2013). A vision linked to specific goals and participation metrics (e.g., number of volunteers, hours of service, project achievements) provides clarity of direction and a sense of progress, which strengthens inspirational motivation (Oluwatoyin & Mardikaningsih,

2024). Intellectual stimulation and individual consideration encourage co-creation through challenge-based/service-learning projects. When students are given role autonomy, competency support, and constructive feedback, engagement increases and prosocial-environmental learning outcomes strengthen (Deci & Ryan, 2000; Disterheft et al., 2015). The practice of "living labs" brings learning together with experiments in change in campus infrastructure, fostering student ownership of solutions. Leadership role models, coupled with public recognition of student contributions, shape descriptive-injunctive norms that expand participation networks (Robertson & Barling, 2013). Awards, digital badges, or academic credit for participation reinforce perceived value and reduce trade-offs with study load, thereby increasing volunteer retention.

Organisational mechanisms such as sustainability units/committees involving student representatives, integrated action calendars, micro-grants for initiatives, and data-driven communication channels (impact dashboards) accelerate coordination and accountability. Transparency of achievements, such as reductions in waste or energy resulting from student actions, will trigger positive feedback and deepen commitment (Disterheft et al., 2015). The power of the leadership effect increases when there is: top leadership support, curriculum integration (service-learning, interdisciplinary projects), formal recognition/incentives (participation KPIs, academic credits), and an inclusive and psychologically safe community ecosystem (Kahu, 2013; Trowler, 2010). Conversely, administrative barriers, lack of time/costs, and weak feedback channels reduce the intensity of participation. Many studies in HEIs are cross-sectional or case studies, so causal inferences are limited. However, the consistency of mechanistic findings from social/organisational psychology (TPB, SDT, efficacy, transformational leadership) provides strong triangulation. Longitudinal research and field experiments on campus, for example, manipulating feedback impact or recognition designs, are needed to estimate the marginal effects of each intervention component.

To maximise participation, leaders need to: (1) articulate a meaningful vision and course of action; (2) institutionalise low-risk, authoritative co-creation opportunities; (3) provide formal recognition and credit; (4) publish easily understandable impact data; and (5) maintain access equity to ensure inclusive participation across student backgrounds (Disterheft et al., 2015; UNESCO, 2017).

Table 2 explains the relationship between types of leadership, how they work in social psychology, practical tools that can be used on campus, and the forms of student participation that emerge. Role modelling by leaders and an inspiring vision help build shared norms and collective goals, so that students understand the direction and feel motivated to participate. Intellectual stimulation and personal support foster student independence, skills, and

leadership through real projects and clear guidance. Data-driven communication keeps engagement strong through transparent, regular feedback, so all parties can see progress and impact. On the other hand, institutional incentives such as academic credits or awards expand the scope of participation to various study programs.

Table 2.
Transformational Leadership Influence on Student Participation in Environmental Activities

Leadership Dimension	Psychosocial Mechanism	Campus Level Practices	Forms of Participation Shaped	Key References
Idealised Influence (role modelling)	Pro-environmental norms and identity	Visible green behaviour by leaders; public recognition	Joining green communities/committees; campaigns	Robertson & Barling (2013)
Inspirational Motivation	Meaning, shared purpose, collective efficacy	Measurable vision; story of change; participation targets	Volunteer recruitment; coordinated mass actions	Bandura (1997); Cortese (2003)
Intellectual Stimulation	Autonomy, creativity, problem-solving	Living labs; challenge-based projects; micro-grants	Innovative campus green projects	Disterheft et al. (2015)
Individualized Consideration	Competence support and relatedness	Mentoring, training, and clear role assignments	Volunteer retention; student leadership	Deci & Ryan (2000); Kahu (2013)
Data-driven Communication	Transparency, accountability, feedback	Impact dashboards; regular progress reports	Outcome-driven sustained participation	Disterheft et al. (2015)
Institutional Incentives	Aligned value/cost of participation	Academic credit; certification; awards	Participation diffusion across study programs	Trowler (2010); UNESCO (2017)

Source: Authors' work

Overall, this set of approaches deepens student engagement (making it more meaningful and long-lasting) and expands it to more students and units on campus. As a result, campus environmental initiatives become more inclusive, measurable, and sustainable.

Digital media and internal campus communications in reinforcing transformational leadership messages and role models on environmental issues

The role of communication ecosystems such as digital platforms (websites, social media, learning management systems), internal channels

(newsletters, town halls, intranets), and data infrastructure (energy dashboards) in strengthening the dimensions of transformational leadership: ideal influence, inspirational motivation, intellectual stimulation, and individual consideration (Robertson & Barling, 2013). In the context of higher education, sustainability literature emphasises the importance of governance, culture, and academic community participation (Disterheft et al., 2015; Lozano, 2015), which are greatly influenced by communication design. Strategic internal communication enhances clarity of purpose, trust, and engagement, which are key channels of transformational leadership impact (Men, 2014). When leaders' messages are packaged in inspirational narratives and delivered rhythmically, campus actors build collective sense-making and efficacy to act. The literature on organisational change shows that timely, consistent, and two-way communication reduces uncertainty and resistance, thereby strengthening the translation of vision into action (Allen et al., 2007). In environmental issues, leaders' behavioural examples influence pro-environmental behaviour through social modelling; digital channels expand the reach and frequency of exposure to these examples (Robertson & Barling, 2013). Social media is effective for spreading narratives, framing objectives, and mobilising participation due to its participatory and networked nature (Kaplan & Haenlein, 2010; Kietzmann et al., 2011). On campus, using official channels to showcase leaders' concrete actions (e.g., visits to waste banks, net-zero commitments) strengthens credibility, while interactive features (polling, comments) facilitate students' co-creation of a green agenda. The principles of community, conversation, and content sharing trigger bandwagon effects and injunctive norms, which support pro-environmental behavioural intentions. Internal communication channels serve as the “backbone” of implementation orchestration. Thematic newsletters provide a steady communication rhythm and highlight quick wins; the intranet stores green standard operating procedures, project toolkits, and event calendars; and town hall meetings facilitate direct dialogue with leadership. Evidence from the change communication literature indicates that the intensity and quality of internal communication are positively associated with role clarity, commitment, and the adoption of new practices (Allen et al., 2007; Men, 2014). This strengthens the pathway from “inspirational motivation to participation” by enhancing engagement and work meaning. Environmental behaviour interventions are most effective when accompanied by clear and measurable performance feedback (Abrahamse et al., 2005; Rojak & Khayru, 2022). Campus energy and waste dashboards displaying baselines, targets, and real-time progress foster transparency and accountability. When leaders regularly reference these indicators in public messages, alignment between rhetoric and evidence is established, reinforcing trust and accelerating organisational learning. Furthermore, gamification mechanisms (such as inter-faculty challenges) and data-driven recognition systems encourage greater

student participation in green campus projects. The idealised influence dimension of transformational leadership is amplified when leaders' actions are consistently documented and communicated across channels. "Role-modelling" content—such as demonstrating commitment to reducing business travel carbon footprints—enhances normative credibility and activates students' social identification (Robertson & Barling, 2013). Two-way communication enables policy clarification, addresses scepticism, and demonstrates responsiveness—hallmarks of effective sustainability communication (Morsing & Schultz, 2006). The effect of communication on participation is mediated by internal engagement, trust in leadership, and perceived personal relevance (Men, 2014). Key moderators include students' digital literacy, channel architecture (such as audience segmentation and editorial scheduling), and institutional support for data governance (Lozano, 2015). A say–do gap—when leaders' actions fail to match their messages—weakens these effects, whereas cross-channel consistency strengthens meaning transfer and the formation of shared norms.

Table 3.
Communication Channels, Reinforcement Mechanisms, and Participation Indicators

Channel/Media	**Mechanism for Reinforcing Leaders' Messages**	**Impact on Student Participation**	**Key References**
Social media (IG, X, TikTok)	Inspirational narratives, interactivity, and social norms	Campaign sign-ups; increased awareness; advocacy	Kaplan & Haenlein (2010); Kietzmann et al. (2011)
Intranet/Newsletter	Role clarity, information cadence, recognition	Project involvement; compliance with green SOPs	Allen et al. (2007); Men (2014)
Town Hall/Forums	Collective sense making, trust, co-creation	Bottom-up ideas; public commitment	Allen et al. (2007)
Energy/Waste Dashboards	Transparency, feedback, and gamification	Habit change; measurable savings	Abrahamse et al. (2005)
LMS/Digital Classes	Curricular integration, project-based learning	Sustained participation; living labs	Disterheft et al. (2015)
Role-Modeling Content	Social identification, credibility	Adoption of green norms and behaviours	Morsing & Schultz (2006); Robertson & Barling (2013)

Source: Authors' work

Digital learning channels—such as LMS platforms and internal MOOCs—can translate leadership messages into curricular activities, including campus data–driven projects and service-learning initiatives, thereby expanding participation from occasional campaigns into deep learning experiences (Disterheft et al., 2015). Documenting projects in open repositories facilitates the diffusion of best practices and strengthens organisational memory.

Effective strategies include establishing a 360° channel map, maintaining an editorial calendar that aligns with leadership moments (e.g., rector's speeches, annual reports), and integrating sustainability dashboards into routine communications. These practices enhance goal clarity, accountability, and opportunities for student participation across communities, campaigns, and green projects. Regular evaluation using process indicators (reach, engagement rate, number of dialogues) and outcome indicators (participation levels, resource savings, emission reductions) is essential for continuous strategic calibration.

Each communication channel leverages specific reinforcement mechanisms to strengthen leaders' messages and translate them into student action. Social media builds momentum through inspiring stories and interactive norms; intranet/newsletters provide clarity and steady updates that nudge consistent participation; town halls create shared understanding and trust that lead to visible commitments; dashboards turn transparency and feedback into measurable behaviour change; LMS integration embeds participation into coursework; and role-modelling content boosts credibility and identification, encouraging students to adopt pro-environmental behaviours. Together, these channels create a coherent ecosystem that increases both the quantity and quality of student participation in sustainability initiatives.

CONCLUSIONS

Transformational leadership strengthens campus sustainability through its influence on policies, operational processes, and organisational culture. By modelling exemplary behaviour, articulating a compelling vision, stimulating innovation, and providing individualised support, leaders cultivate shared norms, meaning, and collective efficacy. These processes encourage student participation in environmental communities, campaigns, and green campus projects. Digital communication ecosystems and internal channels further amplify leadership messages through transparency, feedback, and recognition, resulting in broader and more sustained engagement. The impact of transformational leadership becomes stronger when supported by top management, cross-unit collaboration, co-creation opportunities, formal incentives, and reliable data systems.

For university leaders, sustainability visions should be translated into measurable goals, performance indicators, and clear mandates across

organisational units. The development of living labs, challenge-based projects, and structured student roles promotes both capacity building and innovation. Dashboards for energy and waste tracking, periodic reporting, and segmented communication enhance accountability. Incentive mechanisms, such as academic credit, certifications, and awards, help lower participation barriers and increase inclusivity across study programs

LIMITATION & FURTHER RESEARCH

Despite consistent findings across studies, most existing research remains cross-sectional, limiting the ability to determine causal relationships between transformational leadership and sustainability outcomes. Additionally, there is variation in measurement indicators and analytical frameworks, which may affect comparability across studies. The limited use of longitudinal or experimental designs also constrains understanding of how leadership influence evolves over time.

Future studies should prioritise longitudinal and multi-site designs to strengthen causal inference and track the long-term effects of transformational leadership on green management and student engagement. Researchers are encouraged to develop standardised indicators for mediators, such as collective efficacy, sustainability values, and psychological climate, as well as for moderators, such as leadership support, incentive structures, and technological readiness. Exploring the integration of digital communication strategies, including storytelling, feedback systems, and interactive dashboards, can provide insights into how technology mediates behavioural change. Comparative studies across cultural and institutional contexts would also enrich the understanding of contextual factors that shape the success of green management initiatives in higher education

AUTHOR CONTRIBUTION

Mila Hariani: Conceptualisation and Research Design, **Rahayu Mardikaningsih and Didit Darmawan:** Data Collection, Methodology, and Supervision, **Reni Nuraini:** Writing Entire Paper, Data Collection and Analysis, **Siti Nur Halizah:** Editing and Layouting. All Authors have read the final version of the paper.

Declaration of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2005). A Review of Intervention Studies Aimed at Household Energy Conservation. *Journal of Environmental Psychology*, *25*(3), 273–291. https://doi.org/10.1016/j.jenvp.2005.08.002

Adeoye, I. (2025). *Pioneering Change: The Role of Transformative Leadership in Fostering Sustainable Innovation in Higher Education*. SSRN. https://doi.org/10.2139/ssrn.5008500

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Allen, J., Jimmieson, N. L., Bordia, P., & Irmer, B. E. (2007). Uncertainty during Organizational Change: Managing Perceptions through Communication. *Journal of Change Management*, *7*(2), 187–210. https://doi.org/10.1080/14697010701563379

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. W.H. Freeman.

Bass, B. M., & Avolio, B. J. (1995). *Multifactor Leadership Questionnaire (MLQ) Manual and Sampler Set*. Mind Garden. https://www.mindgarden.com/16-multifactor-leadership-questionnaire

Boiral, O., & Paillé, P. (2012). Organizational Citizenship Behaviour for the Environment: Measurement and Validation. *Journal of Business Ethics*, *109*(4), 431–445. https://doi.org/10.1007/s10551-011-1138-9

Cortese, A. D. (2003). The Critical Role of Higher Education in Creating a Sustainable Future. *Planning for Higher Education*, *31*(3), 15–22.

Darmawan, D., & Eddine, B. A. S. (2024). Integration of Digital Technology Innovation for Work Culture Transformation and Company Operational Productivity. *Journal of Science, Technology and Society*, *5*(1), 31–42.

Darmawan, D., & Gardi, B. (2024). Digital-Oriented Leadership and Organizational Transformation: Fostering Operational Efficiency, Team Collaboration, and Innovation in the Digital. *International Journal of Service Science, Management, Engineering, and Technology*, *5*(1), 37–42.

Darmawan, D., & Marsal, A. P. (2025). A Critical Analysis of the Dynamics of Team Psychology, Organizational Culture, Member Composition, Leadership and Collaboration in Improving Work Group Performance. *Journal of Industrial and Organizational Psychology*, *1*(1), 1–6.

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, *11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Disterheft, A., Caeiro, S., Azeiteiro, U. M., & Filho, W. L. (2015). Sustainable Universities – a Study of Critical Success Factors for Participatory Approaches. *Journal of Cleaner Production*, *106*, 11–21. https://doi.org/10.1016/j.jclepro.2014.01.030

Frizon, J. A., Eugénio, T., & Frizon, N. N. (2024). Green Campus and Student Proactivity Initiatives: The Importance of a Participatory Approach. *International Journal of Sustainability in Higher Education*, *25*(6), 1279–1296. https://doi.org/10.1108/IJSHE-11-2022-0362

Gang Wang, Oh, I.-S., Courtright, S. H., & Colbert, A. E. (2011). Transformational Leadership and Performance Across Criteria and Levels: A Meta-Analytic Review of 25 Years of Research. *Group & Organization Management*, *36*(2), 223–270. https://doi.org/10.1177/1059601111401017

Graves, L. M., Sarkis, J., & Zhu, Q. (2013). How Transformational Leadership and Employee Motivation Combine to Predict Employee Proenvironmental Behaviors in China. *Journal of Environmental Psychology*, *35*, 81–91. https://doi.org/10.1016/j.jenvp.2013.05.002

Hariani, M., Darmawan, D., & Masnawati, E. (2025). Dynamics of work pressure and social support in education personnel. *Journal of Industrial and Organizational Psychology*, *1*(1), 25–32.

Judge, T. A., & Piccolo, R. F. (2004). Transformational and Transactional Leadership: A Meta-Analytic Test of Their Relative Validity. *Journal of Applied Psychology*, *89*(5), 755–768. https://doi.org/10.1037/0021-9010.89.5.755

Kahu, E. R. (2013). Framing Student Engagement in Higher Education. *Studies in Higher Education*, *38*(5), 758–773. https://doi.org/10.1080/03075079.2011.598505

Kaplan, A. M., & Haenlein, M. (2010). Users of the World, Unite! The Challenges and Opportunities of Social Media. *Business Horizons*, *53*(1), 59–68. https://doi.org/10.1016/j.bushor.2009.09.003

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social Media? Get Serious! Understanding the Functional Building Blocks of Social Media. *Business Horizons*, *54*(3), 241–251. https://doi.org/10.1016/j.bushor.2011.01.005

Lozano, R. (2015). A Holistic Perspective on Corporate Sustainability Drivers. *Corporate Social Responsibility and Environmental Management*, *22*(1), 32–44. https://doi.org/10.1002/csr.1325

Mardikaningsih, R., & Radjawane, L. E. (2025). Building a Sustainable Work Culture Through Green Leadership and Adaptive Organizational Systems. *Journal of Industrial and Organizational Psychology*, *1*(1), 33–40.

Men, L. R. (2014). Strategic Internal Communication: Transformational Leadership, Communication Channels, and Employee Satisfaction.

Management Communication Quarterly, *28*(2), 264–284. https://doi.org/10.1177/0893318914524536

Mohamed, M. J., Omar, A. M., & Jama, L. A. (2025). The Role of Students' Leadership in Environmental Conservation at Higher Education Institutions. *Frontiers in Education*, *10*, 1613011. https://doi.org/10.3389/feduc.2025.1613011

Morsing, M., & Schultz, M. (2006). Corporate Social Responsibility Communication: Stakeholder Information, Response and Involvement Strategies. *Business Ethics: A European Review*, *15*(4), 323–338. https://doi.org/10.1111/j.1467-8608.2006.00460.x

Oliveira, M. C., & Proença, J. (2025). Sustainable Campus Operations in Higher Education Institutions: A Systematic Literature Review. *Sustainability*, *17*(2), 607. https://doi.org/10.3390/su17020607

Oluwatoyin, F., & Mardikaningsih, R. (2024). Challenges and Opportunities for Sustainability of Human Resource Development in Industry 4.0. *Bulletin of Science, Technology and Society*, *3*(2), 9–16.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ*, n71. https://doi.org/10.1136/bmj.n71

Ribeiro, J. M. P., Hoeckesfeld, L., BocaSanta, S. L., Araujo, G. G. M., Jonck, A. V., Berchin, I. I., & De Andrade Guerra, J. B. S. O. (2019). Students' Opinion About Green Campus Initiatives: A South American University Case Study. In *Sustainability on University Campuses: Learning, Skills Building and Best Practices* (pp. 437–452). Springer International Publishing. https://doi.org/10.1007/978-3-030-15864-4_26

Robertson, J. L., & Barling, J. (2013). Greening Organizations Through Leaders' Influence on Employees' Pro-Environmental Behaviors. *Journal of Organizational Behavior*, *34*(2), 176–194. https://doi.org/10.1002/job.1820

Rojak, J. A. (2024). The Relationship of Transformational Leadership and Organizational Commitment in Higher Education. *Bulletin of Science, Technology and Society*, *3*(1), 14–20.

Rojak, J. A., & Khayru, R. K. (2022). The Effect of Transformational Leadership Style on Team Performance: Implications for Collaboration, Motivation, and Effectiveness Enhancement Strategies. *Journal of Social Science Studies*, *2*(2), 13–20.

Trowler, V. (2010). *Student Engagement Literature Review*. Higher Education Academy. https://www.heacademy.ac.uk

UNESCO. (2017). *Education for Sustainable Development Goals: Learning objectives*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000247444

Velazquez, L., Munguia, N., & Sanchez, M. (2005). Deterring Sustainability in Higher Education Institutions: An Appraisal of the Factors Which Influence Sustainability in Higher Education Institutions. *International Journal of Sustainability in Higher Education*, *6*(4), 383–391. https://doi.org/10.1108/14676370510623865