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AI and Sustainability-Oriented Teaching: An Exploratory Qualitative Study of Lecturers' Perspectives from Four Countries

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Abstract

This exploratory qualitative study examines how lecturers perceive artificial intelligence (AI) as supporting green behavior in higher education through sustainability-oriented teaching practices, responsible digital use, and institutional adaptation. Although AI adoption, sustainability education, and green behavior have been widely discussed, limited qualitative evidence explains how lecturers interpret the relationship between AI use and sustainability-oriented academic practice. This study clarifies AI-supported green behavior as lecturers' perceived use of AI to support resource-conscious teaching, digital material optimization, responsible digital practice, ethical academic decision-making, and pedagogical redesign aligned with sustainability values. A qualitative research design was employed using semi-structured interviews with seven lecturers from Indonesia, Malaysia, Denmark, and Morocco. Data were analyzed using thematic analysis. The findings show that lecturers perceived AI as supporting sustainability-oriented academic practices by reducing repetitive workload, enabling cognitive reallocation, strengthening digital material optimization, raising ethical concerns, and highlighting the importance of institutional readiness, lecturer self-efficacy, and adaptive academic leadership. AI does not automatically produce green behavior; rather, its contribution depends on ethical governance, lecturer capability, institutional support, and sustainability-oriented academic culture. This study offers lecturer-centered qualitative insight into AI as a potential enabler of responsible and sustainability-oriented teaching innovation.

KEYWORDS

artificial intelligence (AI); green behavior; higher education; sustainability-oriented teaching; qualitative research.

Introduction

The integration of artificial intelligence (AI) into higher education has accelerated the transformation of teaching, learning, and institutional management in the digital era. Universities are no longer expected merely to transmit knowledge, but also to become adaptive ecosystems that integrate technology, sustainability, and socially responsible innovation into academic practice. Within this changing landscape, higher education institutions are increasingly required to create learning environments that are efficient, ethical, inclusive, and sustainability-oriented. This expectation is closely connected with broader discussions on Education for Sustainable Development (ESD), which emphasize the role of educational institutions in shaping values, responsibility, and long-term behavioral change toward more sustainable futures (Amin et al., 2023; Khoo & Jørgensen, 2021; Monzó-Martínez et al., 2024; Žalėnienė & Pereira, 2021).

At the same time, the concept of green behavior has received growing scholarly attention across education, management, and the social sciences. Green behavior

generally refers to conscious actions, attitudes, and decisions that reduce negative environmental impact and support sustainability goals (Peattie & Crane, 2005; Varela-Candamio et al., 2018). In educational contexts, green behavior has been associated not only with environmental awareness and sustainable consumption, but also with curriculum design, institutional policy, conservation culture, and value-based learning processes (Al-Naqbi & Alshannag, 2018; Heeren et al., 2016; Mohammadi et al., 2023; Sonetti et al., 2019). Recent literature further shows that sustainability education increasingly intersects with leadership, organizational behavior, global citizenship, and interdisciplinary learning, indicating that green behavior in higher education should be understood as both an individual and institutional phenomenon (Erlande et al., 2025; Fearon, 2024; Khoo & Jørgensen, 2021; Yanti et al., 2025).

Within the scope of this exploratory study, AI-supported green behavior does not refer to directly measured reductions in carbon emissions, energy consumption, or other environmental outcomes. Rather, it refers to lecturers' perceived use of AI to support sustainability-oriented academic practices, including resource-conscious teaching, digital material optimization, the reduction of unnecessary paper-based and repetitive processes, responsible digital practice, ethical academic decision-making, and pedagogical redesign aligned with sustainability values. This construct differs from general digital transformation because it focuses specifically on the perceived sustainability-oriented implications of AI-mediated academic practices. It also differs from conventional sustainability education because it concerns how AI reshapes lecturers' everyday teaching workflows, resource decisions, and pedagogical practices, rather than focusing only on sustainability content within the curriculum.

The emergence of AI adds a new layer of complexity to this discussion. AI technologies offer significant opportunities to improve instructional efficiency, automate repetitive academic tasks, personalize learning experiences, and support digital content development (Chatterjee & Bhattacharjee, 2020; Mohammadi et al., 2023; Pedro et al., 2019; Yusriani et al., 2023). In this sense, AI may contribute to more adaptive and resource-conscious teaching practices by reducing routine workload and enabling lecturers to reallocate their cognitive effort toward innovation, reflection, and pedagogical redesign. This potential aligns with broader debates on sustainable digitalization, which argue that digital technologies can support long-term institutional transformation when implemented responsibly and strategically (Ertz et al., 2024; Gao et al., 2022). In higher education, digital competence and self-efficacy also appear increasingly important in shaping whether technological tools are perceived as empowering or burdensome (Dwivedi, 2025; Oke & Fernandes, 2020; Yentür, 2023; Yusriani et al., 2023; Yusriani & Patiro, 2024).

This issue is increasingly relevant in university practice, where AI has begun to be used not only for simple administrative support but also for complex academic purposes, such as designing learning materials, preparing project-based assignments, developing assessment strategies, and supporting analytical work in advanced subjects. In many academic settings, lecturers and students are already interacting with AI in ways that affect how knowledge is delivered, interpreted, and applied. This early empirical reality suggests that AI is no longer peripheral in higher education; rather, it is becoming part of the academic workflow in subjects and tasks that require judgment, creativity, and decision-making. Such developments make it important to understand not only whether AI is adopted, but also how it is interpreted in relation to sustainable and responsible educational practice.

To provide visual context for the academic activities discussed in this study, Figure 1 presents an author-developed conceptual illustration of common AI-supported tasks in university teaching and learning. The figure is intended solely as a contextual aid and should not be interpreted as empirical evidence derived from the interview data.

Figure 1 conceptually summarizes several academic activities in which AI may be used, including learning-material development, project and proposal preparation, assessment support, analytical problem-solving, and academic writing assistance. The illustration is not derived from the interview findings and is not presented as empirical evidence. Instead, it provides a visual overview of the academic context within which lecturers interpret AI use and its possible relationship with sustainability-oriented teaching practices.

However, AI integration in higher education is not merely a technical or operational matter. It is also a social, ethical, and organizational issue. Institutions must address concerns related to data privacy, algorithmic bias, academic integrity, unequal access to digital infrastructure, and the psychological readiness of educators to adopt new tools. These concerns become especially relevant in cross-national settings, where infrastructure quality, institutional culture, and governance systems may differ substantially. Previous studies have shown that sustainable transformation in higher education depends not only on technological availability, but also on leadership quality, professional motivation, institutional support, and organizational climate (Aboramadan, 2022; Al-Zawahreh et al., 2019; Webster et al., 2021; Widiantari et al., 2024). In parallel, research on pro-environmental and sustainable behavior has demonstrated that self-efficacy, social influence, values, and intrinsic motivation strongly shape behavioral adoption and commitment to sustainability-oriented action (Bosnjak et al., 2020; Faraz et al., 2021; Lazaric et al., 2020; Stern et al., 1999). Related scholarship also shows that sustainable behavior in educational and social settings is influenced by environmental knowledge, emotional engagement, climate awareness, and institutional support systems (Baker et al., 2021; Ojala, 2012; Yulianti et al., 2021).

Although research on artificial intelligence, sustainability education, and green behavior has expanded, these areas have generally developed through separate scholarly conversations. Studies on sustainability in higher education have frequently examined students' environmental awareness, sustainable consumption, curriculum integration, institutional policy, and green management practices. Meanwhile, research on educational technology has largely focused on AI adoption, digital learning outcomes, faculty competence, and

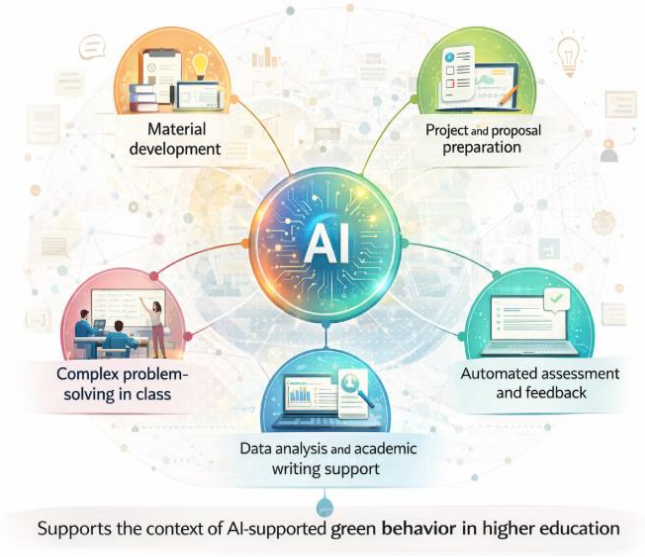

Figure 1. Conceptual Illustration of AI-Supported Academic Tasks in Higher Education (Developed by the authors, 2026).

institutional digital transformation. Recent scholarship has also emphasized the importance of digital leadership in supporting higher education transformation (Sukandi, 2024) and the broader role of AI in institutional and public-sector innovation (Taufiqurokhman et al., 2024). However, limited qualitative evidence explains how lecturers themselves interpret the relationship between everyday AI use and sustainability-oriented academic practice.

This lecturer-centered gap is important because lecturers are not merely users of digital technologies. They translate institutional policies, sustainability values, and technological possibilities into teaching materials, assessment practices, academic decisions, and interactions with students. Existing research has not sufficiently explained how lecturers perceive AI as influencing resource-conscious teaching, responsible digital practice, pedagogical redesign, academic integrity, and institutional readiness within their daily work. Consequently, the relationship between AI-supported academic efficiency and sustainability-oriented teaching remains conceptually underdeveloped and empirically underexplored.

The problem addressed in this study is therefore not whether AI generally improves teaching or whether its use directly produces measurable environmental outcomes. Instead, the study examines how lecturers perceive AI as potentially supporting sustainability-oriented academic practices and under what institutional, ethical, and psychological conditions this relationship becomes possible. Accordingly, this study is guided by the following research question: How do lecturers perceive the role of AI in supporting sustainability-oriented teaching practices across different institutional and national contexts?

The purpose of this study is to explore lecturers' interpretations of AI-supported academic practices in relation to resource-conscious teaching, responsible digital use, pedagogical innovation, lecturer self-efficacy, ethical governance, and institutional readiness. Indonesia, Malaysia, Denmark, and Morocco are treated not as nationally representative cases, but as sources of contextual variation that enable the study to examine how lecturers' perceptions emerge across different academic and institutional environments.

The contribution of this study lies in explaining an underexplored perceptual mechanism rather than merely combining AI, green behavior, and higher education within one study. The study proposes that lecturers may associate AI-supported academic efficiency and digital resource optimization with greater cognitive capacity for reflective teaching and pedagogical redesign. However, this perceived relationship is enabled and constrained by lecturer self-efficacy, ethical governance, institutional infrastructure, and adaptive academic leadership. Thus, AI-supported green behavior is positioned as a perception-based and practice-oriented process through which AI may contribute to sustainability-oriented teaching, rather than as direct evidence that AI automatically generates environmental behavior change.

Methodologically, this study adopts an exploratory qualitative design using semi-structured interviews with seven lecturers from Indonesia, Malaysia, Denmark, and Morocco. This approach enables an in-depth examination of lecturers' experiences, interpretations, and contextual meanings concerning an emerging interdisciplinary phenomenon that intersects technological, pedagogical, psychological, ethical, and institutional dimensions.

Methods

Research Type

This study employed an exploratory qualitative research design to investigate lecturers' perspectives on the role of artificial intelligence (AI) in supporting green behavior and sustainability-oriented academic practices in higher education. A qualitative approach was appropriate because the study sought to understand participants' experiences, interpretations, and contextual meanings rather than test predetermined hypotheses or establish causal relationships. Qualitative inquiry enables researchers to obtain in-depth insight from participants who possess direct experience of the phenomenon under investigation (Patton, 2015).

The study focused on how lecturers interpret the use of AI in teaching practices, academic task management, research, supervision, and sustainability-oriented educational activities. Understanding these interpretations is important because lecturers translate institutional digital strategies, ethical principles, and sustainability values into everyday pedagogical practice. Previous research also indicates that technology adoption in education is influenced not only by technical availability but also by psychological readiness, professional confidence, and institutional support (Yentür, 2023; Yusriani et al., 2023; Yusriani & Patiro, 2024).

This study was positioned as a cross-country exploratory inquiry. The inclusion of lecturers from Indonesia, Malaysia, Denmark, and Morocco was not intended to produce nationally representative findings or systematic comparisons between national higher education systems. Instead, the four contexts were included to capture variation in how AI-supported academic practices are interpreted within different institutional, technological, cultural, and sustainability-oriented environments.

Population and Sample/Informants

The participants consisted of seven lecturers working in higher education institutions in Indonesia, Malaysia, Denmark, and Morocco. Informants were selected using purposive sampling to identify information-rich participants who possessed direct academic experience relevant to the phenomenon under investigation. Purposive sampling is appropriate in exploratory qualitative research when the objective is to obtain depth of understanding from participants who can meaningfully reflect on the research topic rather than achieve statistical representativeness (Patton, 2015).

Eligible lecturers were invited individually to participate voluntarily in the study. The decision to include seven informants was based on the focused nature of the research question, the specificity and academic experience of the participants, and the depth of information obtained through the interviews. The number was considered sufficient when the interviews began to produce recurrent insights across the main areas of inquiry and additional interviews yielded limited new conceptual information. The study therefore emphasized information power, thematic sufficiency, and analytical depth rather than numerical breadth (Malterud et al., 2016).

The selection criteria were as follows:

1. being an active lecturer in a higher education institution;
2. having substantial academic experience, generally around 10 years or more, to support reflection on changes in teaching practice and institutional development;
3. having experience using artificial intelligence or other digital technologies in teaching, research, supervision, or other academic work; and
4. being involved in academic activities requiring analytical, managerial, reflective, or project-based tasks.

The inclusion of four national contexts was intended to capture variation in digital infrastructure, institutional support, academic culture, and sustainability-oriented teaching practices. Indonesia, Malaysia, Denmark, and Morocco were treated as analytically relevant settings that may differ in their readiness for AI integration and educational innovation. Rather than representing their respective national systems as a whole, the contexts enabled the study to explore how lecturers'

perceptions emerge across different academic environments (Amin et al., 2023; Erlande et al., 2025; Yanti et al., 2025).

Research Location

The study involved lecturers working in higher education institutions in Indonesia, Malaysia, Denmark, and Morocco. These contexts reflect varying levels of technological infrastructure, institutional governance, academic culture, and sustainability-oriented educational development, all of which may influence how lecturers interpret and integrate AI-supported academic practices (Monzó-Martínez et al., 2024; Sukandi, 2024; Žalėnienė & Pereira, 2021).

The participating universities were not treated as institutional case studies or units of national comparison. Their names are therefore not reported in the participant profile to reduce the possibility of identifying individual lecturers within the relatively small sample. The national contexts are reported because they are analytically relevant to understanding differences in institutional readiness and academic practice. The affiliations of the manuscript authors, which are publicly disclosed on the title page, are separate from the anonymized affiliations of the research participants.

Data collection was conducted primarily through individual online interviews because the informants were geographically dispersed. Where direct interaction was feasible, the same interview procedure and core questions were maintained. This arrangement enabled the researchers to collect comparable qualitative information while accommodating participants' locations and availability.

Instrumentation or Tools

Data were collected using a semi-structured interview guide developed from the research question and relevant literature on AI adoption, sustainability-oriented education, lecturer self-efficacy, ethical governance, and institutional readiness. A semi-structured format was selected because it provides consistency across interviews while allowing researchers to investigate participants' experiences and contextual interpretations in greater depth (Kallio et al., 2016).

The interview guide included open-ended questions covering the following areas:

1. lecturers' experiences of using AI in teaching, research, supervision, and other academic activities;
2. perceptions of AI in supporting complex academic tasks, including learning-material development, assessment, project preparation, and analytical work;
3. perceived relationships between AI use, resource-conscious teaching, responsible digital practice, and sustainability-oriented academic activities;
4. ethical concerns, academic integrity, and human responsibility in AI-supported academic work;
5. lecturers' confidence and self-efficacy in experimenting with AI tools; and
6. institutional infrastructure, leadership support, professional development, and organizational readiness for responsible AI integration.

The same core interview questions were used for all participants to maintain comparability. Follow-up probes were used when clarification or deeper explanation was required, allowing participants to elaborate on experiences specific to their disciplinary, institutional, and national contexts.

Data Collection Procedures

Data were collected through individual in-depth semi-structured interviews conducted between May and September 2025. Most interviews were conducted through online communication platforms because the participants were located in different countries, while direct interviews were used where circumstances permitted. Each interview lasted approximately 30-60 minutes.

Before each interview, participants received an explanation of the study's purpose, the voluntary nature of participation, the intended academic use of the data, and their right to decline any question or withdraw without consequence. Informed consent was obtained before each interview. With participants' permission, the interviews were recorded and subsequently transcribed verbatim.

The interviews were conducted in a language mutually understood by the participant and interviewer. Where Indonesian or other non-English explanations were used, the relevant material was translated into English and checked against the original wording to preserve the intended meaning. The first author reviewed the completed transcripts against the interview recordings to check their accuracy, completeness, and consistency before coding. The use of a consistent semi-structured protocol, together with contextual follow-up questions, supported both comparability and interpretive depth across the interviews (Kallio et al., 2016).

Data Analysis

The interview data were analyzed using thematic analysis, which is appropriate for identifying, interpreting, and reporting recurring patterns of meaning within qualitative data (Braun & Clarke, 2006). The analysis was primarily inductive, allowing the coding structure and themes to develop from participants' accounts while remaining guided by the research question concerning AI-supported sustainability-oriented teaching practices.

The analysis followed six interconnected stages. First, the researchers became familiar with the data through repeated reading of the interview transcripts. Second, the first author generated initial codes by identifying meaningful segments related to AI-supported academic efficiency, sustainability-oriented practice, ethical concerns, institutional readiness, lecturer self-efficacy, and leadership support. Third, related codes were grouped into provisional conceptual categories. Fourth, the developing categories were examined to identify broader candidate themes. Fifth, the themes were reviewed against the coded extracts and complete transcripts to assess their coherence, distinctiveness, and relevance to the research question. Finally, the themes were defined, named, and organized into the analytical narrative presented in the Results section (Braun & Clarke, 2006).

The initial coding was conducted by the first author. The coding framework and developing themes were subsequently reviewed through analytical discussions with the co-authors, particularly the author responsible for supporting data analysis and interpretation. These research-team discussions were part of the analytical review process and were not focus group discussions with the participants. Differences in interpretation were resolved through discussion and renewed examination of the relevant transcript sections. This collaborative process reduced the likelihood that the final themes reflected only one researcher's interpretation.

Several procedures were used to strengthen the trustworthiness of the analysis. Credibility was supported through repeated engagement with the transcripts, comparison of recurring and contrasting accounts, and the inclusion of direct quotations and detailed paraphrased evidence. Dependability and confirmability were strengthened by maintaining records of coding decisions, category development, theme refinement, and research-team discussions. The researchers also returned to the original transcripts whenever clarification was required, ensuring that the final themes remained grounded in participants' accounts (Lincoln & Guba, 1985; Nowell et al., 2017).

Through this iterative analytical process, five interconnected themes were identified: instructional efficiency

and cognitive reallocation; ethical considerations and algorithmic governance; digital infrastructure and institutional readiness; lecturer self-efficacy as a psychological enabler; and adaptive academic leadership and institutional culture transformation.

Ethical Approval

This preliminary, researcher-initiated study involved individual interviews with adult professional participants concerning their academic experiences and perspectives. No formal institutional ethics approval was sought or issued for this study. Before data collection, all participants were informed about the purpose and procedures of the research, the voluntary nature of participation, the intended academic use of the interview data, confidentiality measures, and their right to decline any question or withdraw at any time without consequence. Informed consent was obtained before each interview.

Participants' identities were anonymized using coded identifiers such as ID-01, MY-02, DK-03, and MR-04. Identifying information, including the names of the participating universities, was excluded from the transcripts, participant table, and research report to reduce the risk of re-identification. Interview recordings, transcripts, and analytical documents were securely stored and accessed only for academic research purposes. The conflict-of-interest declaration is presented separately after the Conclusion in accordance with the journal's required manuscript structure.

Result and Discussion

This section presents the empirical findings derived from thematic analysis of individual in-depth interviews with seven lecturers working in higher education institutions in Indonesia, Malaysia, Denmark, and Morocco. The findings represent exploratory, contextually situated perspectives and should not be interpreted as representative descriptions of lecturers or higher education systems in the four countries.

Table 1 presents the profile of the lecturers who participated in this study, including their country of affiliation, academic fields, years of experience, and the contexts in which AI is used in their academic work. Presenting participant characteristics is important in qualitative research to provide contextual understanding of the informants whose experiences inform the analysis (Gao et al., 2022; Patton, 2015).

Informant Characteristics

Table 1 summarizes the participants' national context, academic field, professional experience, and reported use of AI in academic work. The lecturers represented management, business, economics, innovation, education, and graduate education, with academic experience ranging from 11 to 25 years. Their reported AI-use contexts included teaching preparation, assessment, project supervision, curriculum development, digital learning, research-related work, and innovation-oriented academic activities.

The diversity of participants provided contextual variation in disciplinary background, institutional experience, and AI use. However, the national affiliations were used only to situate the participants' accounts and were not intended to support country-level comparisons. The analysis therefore focused on recurring and contrasting meanings within the lecturers' experiences rather than on generalizing differences between national higher education systems.

Thematic Findings

The thematic analysis identified five interconnected themes:

1. instructional efficiency and cognitive reallocation;
2. ethical considerations and algorithmic governance;
3. digital infrastructure and institutional readiness;
4. lecturer self-efficacy as a psychological enabler; and
5. adaptive academic leadership and institutional culture transformation.

The themes reflect how lecturers interpreted the role of AI in academic work and its perceived relationship with sustainability-oriented teaching practices. The findings do not demonstrate direct environmental outcomes. Instead, they show how participants connected AI use with resource-conscious academic workflows, responsible digital practice, pedagogical redesign, and the institutional conditions required for responsible adoption.

Instructional Efficiency and Cognitive Reallocation

The first theme concerned lecturers' perceptions that AI could reduce the time and cognitive effort required for repetitive academic tasks. Participants described using AI to support the preparation of teaching materials, assignment design, preliminary literature exploration, organization of project ideas, data-related tasks, and formative feedback. These uses were perceived as helping lecturers redirect attention toward conceptual discussion, student mentoring, reflective teaching, and pedagogical innovation.

Participants teaching management, business, and innovation-related subjects particularly emphasized the usefulness of AI in project-based and analytical activities. They explained that AI could help organize preliminary ideas, clarify project structures, and support early-stage information processing. However, participants did not view this efficiency as an environmental outcome in itself. Rather, they associated it with more organized, digitally mediated, and potentially resource-conscious academic practice.

For example, ID-01 described how AI reduced the time required to prepare learning materials and review student work, allowing greater attention to mentoring and conceptual discussion. Similar accounts indicated that the perceived value of AI was not simply speed, but the possibility of reallocating lecturers' cognitive effort from repetitive procedures toward higher-level academic engagement.

Ethical Considerations and Algorithmic Governance

The second theme concerned ethical responsibility,

Table 1. Informant Profile

	Code	Country	Field	Academic Experience	AI Usage Context
1.	ID-01	Indonesia	Management	25 years	Teaching and assessment
2.	MY-02	Malaysia	Business	12 years	Project supervision
3.	DK-03	Denmark	Innovation	14 years	AI-supported teaching
4.	MR-04	Morocco	Economics	11 years	Digital learning
5.	ID-05	Indonesia	Economics	15 years	Curriculum and entrepreneurial learning development
6.	MR-06	Morocco	Education	17 years	Teaching and learning
7.	MY-07	Malaysia	Graduate School & Business	12 years	Digital learning and innovation

Source: Primary Data

academic integrity, and the need for clear boundaries in AI-supported academic work. Participants emphasized that AI should assist learning and academic decision-making rather than replace human reasoning, intellectual responsibility, or critical judgment.

MY-02 explained: "AI tools help us structure ideas and make project discussions more organized and coherent. However, the main ideas and final decisions must always come from the students and lecturers themselves. AI only helps to explain possibilities and arrange the puzzle of ideas."

Similarly, ID-01 stated: "We are careful when introducing AI to students. It can help with speed and clarity in preparing assignments or projects, but we remind them that the responsibility for ideas and decisions always belongs to humans."

These accounts show that participants did not interpret responsible AI use simply as technological competence. They associated it with the ability to verify information, maintain academic authorship, protect independent thinking, and communicate clear expectations to students. Ethical governance was therefore perceived as a necessary condition for ensuring that efficiency gains did not weaken educational values or academic integrity.

Digital Infrastructure and Institutional Readiness

The third theme concerned differences in access to technological infrastructure, institutional policy, and formal support for AI integration. Participants described varying levels of access to digital platforms, institutional training, technical support, and guidance regarding responsible AI use.

DK-03 explained: "In our institution, digital platforms and AI tools are increasingly integrated into teaching environments. This allows lecturers to experiment with new approaches in project-based learning and data analysis."

In contrast, MR-04 described a setting in which experimentation depended more strongly on individual initiative: "Sometimes the initiative comes from lecturers themselves rather than from institutional policy. We explore AI tools independently and then gradually introduce them into classroom activities."

These accounts illustrate participant-level differences in institutional experience rather than systematic differences between countries. Where institutional systems, training, and digital platforms were perceived as available, lecturers described greater confidence in experimenting with AI-supported teaching. Where formal support was limited, lecturers relied more heavily on self-directed learning and informal exploration. Institutional readiness was therefore interpreted as an enabling condition that shaped whether AI-supported practice could be adopted consistently and responsibly.

Lecturer Self-Efficacy as a Psychological Enabler

The fourth theme concerned lecturers' confidence in their ability to understand, evaluate, and use AI tools. Participants indicated that willingness to experiment was closely related to perceived digital competence, curiosity, and confidence in learning new technological practices.

MY-07 emphasized the importance of continuous learning: "AI is developing very rapidly, so as lecturers we must be willing to learn continuously. Once we understand how to use the tools properly, they can significantly support teaching and research activities."

ID-05 described self-efficacy as something that developed through gradual experimentation: "At first I was not very confident using AI tools, but after exploring them in small teaching tasks and research activities, I realized that they can help clarify complex ideas and support project development."

These accounts suggest that lecturer self-efficacy was not a fixed personal characteristic. Confidence developed through manageable experience, repeated use, and opportunities to observe how AI could support specific academic tasks. Participants with stronger perceived competence described greater willingness to explore AI, while limited confidence was associated with more cautious adoption. Self-efficacy therefore emerged as an important psychological condition linking access to technology with its practical use in teaching and academic work.

Adaptive Academic Leadership and Institutional Culture Transformatio

The fifth theme concerned the role of leadership and institutional culture in supporting responsible technological experimentation. Participants described leadership support as important for providing training, establishing ethical guidance, encouraging collaboration, and creating a safe environment in which lecturers could explore AI without compromising academic standards.

MR-06 stated: "When university leaders encourage innovation and provide space for experimentation, lecturers feel more confident exploring AI tools in their teaching and research activities."

DK-03 similarly highlighted the importance of collaborative institutional culture: "If the institution encourages collaboration and learning among lecturers, technological innovation becomes easier to adopt and integrate into academic practices."

Participants' accounts suggested that infrastructure alone was insufficient. AI adoption was perceived as more sustainable when leaders communicated clear expectations, supported professional learning, encouraged peer exchange, and connected technological innovation with broader educational values. Adaptive leadership and collaborative institutional culture therefore functioned as organizational conditions that could strengthen lecturer confidence, ethical awareness, and responsible pedagogical innovation.

Institutional culture is particularly important because sustainability-oriented behavior is reinforced through education, visible modeling, shared expectations, and continuing communication. Schelly et al. (2012) demonstrated that a conservation culture in an educational setting can be strengthened when formal learning, institutional modeling, and communication operate together. This supports the present finding that adaptive leadership should not be limited to providing access to AI tools; leaders must also model responsible use, facilitate peer learning, and communicate how AI-supported practices relate to wider educational and sustainability values.

Synthesis of the Findings

Taken together, the five themes indicate that lecturers perceived AI as a potential enabler of sustainability-oriented academic practice rather than as a direct cause of green behavior. The empirical pattern suggests a perceived pathway in which AI-supported efficiency and digital resource optimization may enable cognitive reallocation and pedagogical redesign. However, this pathway depends on ethical governance, lecturer self-efficacy, institutional infrastructure, and adaptive academic leadership.

The findings therefore position AI-supported green behavior as a perception-based and practice-oriented process. Within this process, AI may contribute to more responsible, organized, digitally mediated, and resource-conscious teaching practices, but such contributions are neither automatic nor independent of institutional and human conditions.

Figure 2 synthesizes the empirical themes into an exploratory, perception-based pathway. It proposes that AI-supported academic practices may improve instructional efficiency and digital resource optimization, allowing lecturers to redirect cognitive effort toward reflective teaching and

pedagogical redesign. This perceived pathway toward sustainability-oriented teaching is enabled and constrained by ethical governance, digital infrastructure and institutional readiness, lecturer self-efficacy, and adaptive academic leadership. The model is an interpretive synthesis of the qualitative findings and should not be understood as a statistically tested or causal framework.

Interpretation of Key Findings

The findings indicate that lecturers perceived AI-supported green behavior as a conditional and practice-oriented process rather than as a direct environmental outcome. The empirical pathway begins with the use of AI in academic activities such as preparing learning materials, organizing project ideas, supporting preliminary analysis, and facilitating feedback. These uses were perceived as improving instructional efficiency and digital resource optimization, which may allow lecturers to redirect time and cognitive effort toward mentoring, reflective teaching, critical discussion, and pedagogical redesign.

This interpretation is consistent with research showing that digital technologies can support academic productivity, flexibility, and innovation in higher education (Ertz et al., 2024; Gao et al., 2022). However, the present study extends this discussion by showing that efficiency alone does not constitute sustainability-oriented teaching. The perceived sustainability contribution emerges when efficiency gains are translated into more deliberate, resource-conscious, ethically responsible, and pedagogically meaningful academic practices.

Technology-supported sustainability therefore depends on how digital tools are designed, interpreted, and incorporated into human practice. Research on virtual reality and environmentally sustainable behavior similarly indicates that technology may support behavioral engagement when learning experiences are intentionally designed around sustainability objectives rather than around technological novelty alone (Scurati et al., 2021). Within AI-supported education, recent evidence also suggests that AI-based learning environments may influence students' academic and entrepreneurial development when technological use is integrated with structured educational experiences and human guidance (Yusriani et al., 2025). These studies reinforce the present finding that AI becomes educationally meaningful only when efficiency gains are translated into reflective, responsible, and purposefully designed teaching practices.

The findings therefore clarify the conceptual bridge between AI use and sustainability-oriented teaching. AI-supported academic practices may reduce repetitive work, facilitate digital material organization, and support more focused academic engagement. These changes may create greater cognitive capacity for lecturers to redesign teaching activities and consider how technological use aligns with sustainability values. Nevertheless, the interviews did not measure reductions in energy use, carbon emissions, or other physical environmental outcomes. The findings should consequently be interpreted as lecturers' perceptions of a possible academic and behavioral pathway, not as evidence that AI automatically produces measurable green outcomes.

Ethical Governance and Human Responsibility

Ethical governance emerged as a central condition shaping whether lecturers considered AI use responsible and educationally beneficial. Participants emphasized that AI could support the organization and clarification of ideas, but responsibility for interpretation, authorship, judgment, and decision-making must remain with lecturers and students. This finding suggests that responsible AI use is not determined only by technological capability, but also by the presence of clear academic boundaries and human oversight.

These concerns are consistent with broader discussions emphasizing that technological innovation must be accompanied by institutional governance, accountability, and responsible implementation (Ertz et al., 2024; Taufiqurokhman et al., 2024). Within higher education, governance should therefore address academic integrity, verification of AI-generated information, transparency of AI use, data protection, authorship, and the preservation of independent critical thinking.

The findings further suggest that ethical governance should not be understood merely as restriction or control. Clear institutional guidance may also increase lecturers' confidence because it reduces uncertainty about acceptable and unacceptable uses of AI. Ethical policy can therefore function simultaneously as a protective mechanism and an enabling condition for responsible innovation.

Institutional Readiness, Self-Efficacy, and Leadership

The study also demonstrates that AI-supported academic practice depends strongly on institutional readiness. Participants working in environments with stronger digital platforms, professional support, and opportunities for experimentation described greater flexibility in integrating AI into teaching. In settings where institutional support was less visible, lecturers relied more heavily on personal initiative and informal learning.

This pattern supports research showing that digital transformation in higher education requires more than technological availability. Institutional infrastructure, governance, professional development, and leadership all influence whether digital innovation is adopted meaningfully and consistently (Monzó-Martínez et al., 2024; Sukandi, 2024; Žalėnienė & Pereira, 2021). Consequently, unequal institutional readiness may produce uneven opportunities for lecturers to benefit from AI-supported academic practices.

This interpretation is also consistent with organizational research showing that sustainability-oriented behavior is shaped by institutional systems, human resource practices, and supportive organizational environments. Green human resource management, for example, may encourage employees' green behavior by aligning institutional expectations, technological acceptance, and organizational support with sustainability objectives (Zhang et al., 2019). Research on the sustainability of entrepreneurial activity further suggests that individual commitment is strengthened when social, institutional, and organizational conditions

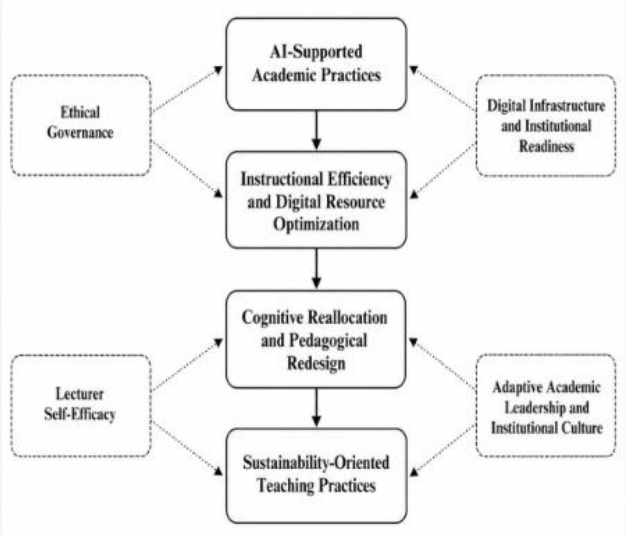

Figure 2. Exploratory Conceptual Model of Lecturers' Perceived Pathways from AI Use to Sustainability-Oriented Teaching Practices (Developed by the authors, 2026).

provide continuing support for responsible practice (Rekarti et al., 2019) Applied to higher education, these insights indicate that lecturers cannot be expected to develop responsible AI-supported practices through individual motivation alone; enabling policies, professional support, and institutional commitment are also required.

Lecturer self-efficacy also emerged as an important psychological enabler. Participants who felt more confident in exploring digital tools were more willing to experiment with AI in teaching, research, supervision, and project development. Those with lower initial confidence described more cautious adoption, although confidence often increased through gradual practice. This finding is consistent with previous research showing that self-efficacy and digital competence influence educators' willingness to engage with technological innovation (Yentür, 2023; Yusriani et al., 2023; Yusriani & Patiro, 2024).

Adaptive academic leadership connects these individual and institutional dimensions. Participants perceived supportive leaders as those who encouraged learning, provided space for experimentation, facilitated professional development, and communicated clear expectations regarding responsible AI use. This interpretation is consistent with research linking leadership, organizational support, and institutional culture with innovation, engagement, and sustainability-oriented behavior (Aboramadan, 2022; Eledora et al., 2024; Faraz et al., 2021; Sukandi, 2024).

Taken together, these findings indicate that AI-supported sustainability-oriented teaching is not driven by technology alone. It emerges through the interaction of lecturer capability, ethical guidance, digital infrastructure, professional learning, and adaptive leadership.

Theoretical Contribution

The theoretical contribution of this study lies in identifying an exploratory lecturer-centered mechanism linking AI-supported academic practice with sustainability-oriented teaching. Existing literature has frequently examined AI adoption, digital learning, sustainability education, green management, or pro-environmental behavior as separate areas of inquiry (Gao et al., 2022; Heeren et al., 2016; Mohammadi et al., 2023; Yanti et al., 2025). The present study connects these areas by focusing on how lecturers interpret the relationship between everyday AI use and responsible academic practice.

The findings suggest a perceived pathway in which AI-supported academic practices may enhance instructional efficiency and digital resource optimization. These perceived gains may then support cognitive reallocation and pedagogical redesign, which can contribute to sustainability-oriented teaching practices. However, the pathway is enabled and constrained by ethical governance, digital infrastructure and institutional readiness, lecturer self-efficacy, and adaptive academic leadership.

This contribution differs from a simple claim that AI, green behavior, and higher education are related. Instead, the study explains how lecturers perceive the relationship to operate and identifies the conditions under which that relationship may become educationally meaningful. Figure 2 therefore represents an exploratory interpretive model derived from qualitative evidence rather than a statistically tested causal framework.

Practical Implications

The findings offer several practical implications for higher education institutions. First, universities should establish clear, accessible, and consistently communicated guidance on responsible AI use. Such guidance should address academic integrity, transparency, verification of AI-generated information, human accountability, data protection, and acceptable uses of AI in teaching, assessment, supervision, and research. Clear communication is important because institutional responses are influenced not only by the existence of information but also by how understandable, timely, and relevant that information is to stakeholders. Although examined in a different service context, Rozet et al. (2024) showed that information provision and perceived service experience can shape satisfaction and subsequent behavioral responses. In higher education, this suggests that AI policies should not remain as technical documents; they should be communicated through practical examples, training, consultation, and continuing academic dialogue.

Second, institutions should provide continuing professional development that moves beyond basic technical demonstrations. Lecturer training should include practical experimentation, ethical decision-making, critical evaluation of AI outputs, pedagogical redesign, and the responsible integration of AI into discipline-specific teaching activities. Professional development should also accommodate lecturers with different levels of digital confidence.

Third, universities should strengthen the infrastructure required for equitable access to responsible AI-supported teaching. This includes reliable digital platforms, technical assistance, access to institutionally approved tools, and support for lecturers who may otherwise depend entirely on personal resources or informal experimentation.

Fourth, academic leaders should promote collaborative learning cultures in which lecturers can exchange experiences, discuss challenges, and jointly develop responsible practices. Communities of practice, peer mentoring, and interdisciplinary workshops may help strengthen self-efficacy while reducing uncertainty and isolated experimentation.

Finally, universities should avoid presenting AI adoption itself as evidence of sustainability achievement. Institutional evaluation should distinguish between technological use, perceived efficiency, sustainability-oriented academic practice, and measurable environmental outcomes. Where sustainability claims are made, institutions should support them with appropriate evidence concerning resource use, digital practices, educational outcomes, or environmental impact.

Limitations and Future Research

Several limitations should be considered when interpreting the findings. First, the study involved seven purposively selected lecturers and was designed to obtain contextual depth rather than statistical representation. The findings therefore cannot be generalized to all lecturers, universities, or higher education systems in Indonesia, Malaysia, Denmark, and Morocco.

Second, the national contexts provided sources of variation but were not examined as systematic comparative cases. Differences described by participants should not be interpreted as fixed characteristics of the four countries. Future studies could employ comparative case designs involving several institutions within each country to examine how policies, infrastructure, and leadership practices shape AI adoption more systematically.

Third, the study relied on self-reported perceptions. Participants' accounts reflect their interpretations of AI use and may not correspond directly with observed teaching practices or measurable sustainability outcomes. Future research should combine interviews with classroom observation, document analysis, institutional policy review, or digital-use data.

Fourth, the study did not directly measure reductions in paper use, energy consumption, carbon emissions, or other environmental indicators. Quantitative and mixed-method studies could test whether the proposed pathway is associated with observable resource-conscious behavior or environmental outcomes.

Fifth, the study focused on lecturers. Future research

should include students, academic leaders, administrators, technology-support staff, and institutional policymakers to provide a broader understanding of responsible AI integration. Longitudinal research would also help explain how lecturers' confidence, institutional policies, and sustainability-oriented practices evolve as AI technologies and university governance systems continue to develop.

Conclusion

This exploratory qualitative study examined how seven lecturers working in higher education institutions in Indonesia, Malaysia, Denmark, and Morocco perceived the role of artificial intelligence in supporting sustainability-oriented academic practices. The findings indicate that AI-supported green behavior should not be understood as an automatic or directly measurable environmental outcome. Instead, lecturers perceived a conditional pathway through which AI-supported academic practices may improve instructional efficiency and digital resource optimization, enabling cognitive reallocation, reflective teaching, and pedagogical redesign.

Five interconnected dimensions shaped this perceived pathway: instructional efficiency and cognitive reallocation, ethical governance, digital infrastructure and institutional readiness, lecturer self-efficacy, and adaptive academic leadership. Together, these findings show that the educational value of AI does not arise from technological availability alone. Its contribution depends on human judgment, responsible governance, lecturer capability, institutional support, and an academic culture that connects digital innovation with sustainability-oriented values.

The study contributes a lecturer-centered exploratory model that explains how AI use may become associated with more organized, responsible, digitally mediated, and resource-conscious teaching practices. However, the research did not measure reductions in paper consumption, energy use, carbon emissions, or other environmental outcomes. The findings should therefore be interpreted as contextually situated perceptions rather than as evidence of causal relationships or nationally representative patterns.

Higher education institutions should develop clear ethical guidance, accessible professional development, reliable digital infrastructure, and collaborative academic cultures that enable lecturers to use AI critically and responsibly. Future research should test and refine the proposed pathway through larger comparative samples, mixed-method or longitudinal designs, classroom observation, institutional policy analysis, and measurable indicators of resource-conscious or environmental practice.

Author contributions

Sri Yusriani contributed to the conceptualization, research design, participant coordination, data collection, initial interpretation of the data, and preparation of the original manuscript draft. Endi Rekarti contributed to the conceptual development, research design, academic supervision, manuscript structure, and critical revision. Haniruzila Hanifah contributed to the literature review, theoretical refinement, interpretation of the higher education context, and manuscript revision. Bendaoud Nadif contributed to the international and cross-contextual framing of the study, conceptual review, language editing, and critical revision of the manuscript. Muji Gunarto contributed to the review of the analytical process, interpretation of the findings, methodological refinement, and manuscript revision. All authors reviewed, revised, and approved the final version of the manuscript.

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References

Aboramadan, M. (2022). The effect of green HRM on employee green behaviors in higher education: The mediating mechanism of green work engagement. *International Journal of Organizational Analysis*, *30*(1), 7–23. https://doi.org/10.1108/IJOA-05-2020-2190

Al-Naqbi, A. K., & Alshannag, Q. (2018). The status of education for sustainable development and sustainability knowledge, attitudes, and behaviors of UAE University students. *International Journal of Sustainability in Higher Education*, *19*(3), 566–588. https://doi.org/10.1108/IJSHE-06-2017-0091

Al-Zawahreh, A., Khasawneh, S., & Al-Jaradat, M. (2019). Green management practices in higher education: The status of sustainable leadership. *Tertiary Education and Management*, *25*(1), 53–63. https://doi.org/10.1007/s11233-018-09014-9

Amin, H., Zaman, A., & Tok, E. (2023). Education for sustainable development and global citizenship education in the GCC: A systematic literature review. *Globalisation, Societies and Education*, 1–16. https://doi.org/10.1080/14767724.2023.2265846

Baker, C., Clayton, S., & Bragg, E. (2021). Educating for resilience: Parent and teacher perceptions of children's emotional needs in response to climate change. *Environmental Education Research*, *27*(5), 687–705. https://doi.org/10.1080/13504622.2020.1828288

Bosnjak, M., Ajzen, I., & Schmidt, P. (2020). The theory of planned behavior: Selected recent advances and applications. *Europe's Journal of Psychology*, *16*(3), 352–356. https://doi.org/10.5964/ejop.v16i3.3107

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Chatterjee, S., & Bhattacharjee, K. K. (2020). Adoption of artificial intelligence in higher education: A quantitative analysis using structural equation modelling. *Education and Information Technologies*, *25*(5), 3443–3463. https://doi.org/10.1007/s10639-020-10159-7

Dwivedi, M. (2025). Opportunities and Challenges of AI Implementation in Human Resource Management: A Systematic Review. *International Journal of Multidisciplinary Research and Growth Evaluation*, *6*(4), 1160–1168. https://doi.org/10.54660/.IJMRGE.2025.6.4.1160-1168

Eledora, A. O., Utomo, K. W., Sultan, Z., & Yusriani, S. (2024). The Influence of Organizational Justice, Grit and Leader-Member Exchange on Employee Engagement. *Ilomata International Journal of Management*, *5*(3), 1011–1025. https://doi.org/10.61194/ijjm.v5i3.1294

Erlande, R., Lubis, B. S., Taufika, R., & Juri. (2025). Bibliometric analysis on global citizenship education in higher education. *Globalisation, Societies and Education*, 1–21. https://doi.org/10.1080/14767724.2025.2513639

Ertz, M., Tandon, U., Sun, S., Torrent-Sellens, J., & Sarigöllü, E. (2024). *The Palgrave Handbook of Sustainable Digitalization for Business, Industry, and Society*. Springer International Publishing. https://doi.org/10.1007/978-3-031-58795-5

Faraz, N. A., Ahmed, F., Ying, M., & Mehmood, S. A. (2021). The interplay of green servant leadership, self-efficacy, and intrinsic motivation in predicting employees' pro-environmental behavior. *Corporate Social Responsibility and Environmental Management*, *28*(4), 1171–1184. https://doi.org/10.1002/csr.2115

Fearon, L. (2024). Integrating Sustainability Into Business School Curriculum: Understanding the Impact. In R. Obexer, D. Wieser, C. Baumgartner, E. Fröhlich, A. Rosenbloom, & A. Zehrer (Eds.), *Innovation in Responsible Management Education* (pp. 63–92). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83549-464-620241005

Gao, Y., Wong, S. L., Md. Khambari, M. N., & Noordin, N. (2022). A bibliometric analysis of online faculty professional development in higher education. *Research and Practice in Technology Enhanced Learning*, *17*(1), 17. https://doi.org/10.1186/s41039-022-00196-w

Heeren, A. J., Singh, A. S., Zwickle, A., Koontz, T. M., Slagle, K. M., & McCreery, A. C. (2016). Is sustainability knowledge half the battle? *International Journal of Sustainability in Higher Education*, *17*(5), 613–632. https://doi.org/10.1108/IJSHE-02-2015-0014

Kallio, H., Pietiälä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, *72*(12), 2954–2965. https://doi.org/10.1111/jan.13031

Khoo, S., & Jørgensen, N. J. (2021). Intersections and collaborative potentials between global citizenship education and education for sustainable development. *Globalisation, Societies and Education*, *19*(4), 470–481. https://doi.org/10.1080/14767724.2021.1889361

Lazaric, N., Le Guel, F., Belin, J., Oltra, V., Lavaud, S., & Douai, A. (2020). Determinants of sustainable consumption in France: The importance of social influence and environmental values. *Journal of Evolutionary Economics*, *30*(5), 1337–1366. https://doi.org/10.1007/s00191-019-00654-7

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. SAGE Publications. https://doi.org/10.1016/0147-1767(85)90062-8

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative Health Research*, *26*(13), 1753–1760. https://doi.org/10.1177/1049732315617444

Mohammadi, Y., Monavvarifard, F., Salehi, L., Movahedi, R., Karimi, S., & Liobikienė, G. (2023). Explaining the Sustainability of Universities through the Contribution of Students' Pro-Environmental Behavior and the Management System. *Sustainability*, *15*(2). https://doi.org/10.3390/su15021562

Monzó-Martínez, A., Ortiz-Cermeño, E., & Martínez-Agut, M. P. (2024). Global Citizenship Education and Its Role in Sustainability at the University Level. *Education Sciences*, *14*(8). https://doi.org/10.3390/educsci14080847

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*, 1–13. https://doi.org/10.1177/1609406917733847

Ojala, M. (2012). Hope and climate change: The importance of hope for environmental engagement among young people. *Environmental Education Research*, *18*(5), 625–642. https://doi.org/10.1080/13504622.2011.637157

Oke, A., & Fernandes, F. A. P. (2020). Innovations in teaching and learning: Exploring the perceptions of the education sector on the 4th industrial revolution (4IR). *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 31. https://doi.org/10.3390/joitmc6020031

Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods: Integrating Theory and Practice* (4th ed.). SAGE Publications.

Peattie, K., & Crane, A. (2005). Green marketing: Legend, myth, farce or prophesy? *Qualitative Market Research: An International Journal*, *8*(4), 357–370. https://doi.org/10.1108/13522750510619733

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). *Artificial intelligence in education: Challenges and opportunities for sustainable development*.

Rekarti, E., Bahari, Z., Zahari, N. M., Doktoralina, C. M., & Ilias, N. A. (2019). The sustainability of Muslim women entrepreneurs: A case study in Malaysia. *International Journal of Financial Research*, *10*(5), 430–439. https://doi.org/10.5430/ijfr.v10n5p430

Rozet, S. J. A., Patiro, S. P. S., Srimindarti, C., Rekarti, E., Yusriani, S., & Muzhaffar, H. Z. (2024). The influence of perceived waiting time and medication information on word of mouth mediated by patient satisfaction. *Ilomata International Journal of Management*, *5*(3), 859–873. https://doi.org/10.61194/ijjm.v5i3.1200

Schelly, C., Cross, J. E., Franzen, W., Hall, P., & Reeve, S. (2012). How to go green: Creating a conservation culture in a public high school through education, modeling, and communication. *The Journal of Environmental Education*, *43*(3), 143–161. https://doi.org/10.1080/00958964.2011.631611

Scurati, G. W., Bertoni, M., Graziosi, S., & Ferrise, F. (2021). Exploring the Use of Virtual Reality to Support Environmentally Sustainable Behavior: A Framework to Design Experiences. *Sustainability*, *13*(2). https://doi.org/10.3390/su13020943

Sonetti, G., Brown, M., & Naboni, E. (2019). About the triggering of UN sustainable development goals and regenerative sustainability in higher education. *Sustainability (Switzerland)*, *11*(1). https://doi.org/10.3390/su11010254

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism. *Human Ecology Review*, *6*(2), 81–97. http://www.jstor.org/stable/24707060

Sukandi, P. (2024). Transformation of higher education through digital leadership: A systematic literature review. *Ilomata International Journal of Management*, *5*(4), 1379–1389. https://doi.org/10.61194/ijjm.v5i4.1239

Taufiqurokhman, Murod, M., Wibisono, D. K., Sasanti, D. N., Chandranegara, I. S., & Akram, M. (2024). Development of the use of artificial intelligence (AI) technology and Jakarta Smart City (JSC). *Ilomata International Journal of Social Science*, *5*(3), 799–817. https://doi.org/10.61194/ijss.v5i3.1203

Varela-Candamio, L., Novo-Corti, I., & García-Álvarez, M. T. (2018). The importance of environmental education in the determinants of green behavior: A meta-analysis approach. *Journal of Cleaner Production*, *170*, 1565–1578. https://doi.org/10.1016/j.jclepro.2017.09.214

Webster, D., Dunne, L., & Hunter, R. (2021). Association between social networks and subjective well-being in adolescents: A systematic review. *Youth & Society*, *53*(2), 175–210. https://doi.org/10.1177/0044118X20919589

Widiantari, N. P. N. A., Utomo, K. W., & Wibowo, M. (2024). Pentingnya Peran Kepuasan Kerja sebagai Jembatan antara Kualitas Hubungan Pemimpin-Anggota dengan Komitmen Organisasional. *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah*, *6*(2), 2329–2347. https://doi.org/10.47467/alkharaj.v6i2.5229

Yanti, P., Gaffar, V., Harisandi, P., Ramadhani, I., Yuliawati, T., & Yusriani, S. (2025). Bibliometric and narrative review of environmental management on green behavior education for sustainable development. *Global Journal of Environmental Science and Management*, *11*(4), 1819–1838. https://doi.org/10.22034/gjesm.2025.04.24

Yentür, M. M. (2023). The Effect of geography teachers' self-efficacy perceptions and attitudes toward teaching on their motivation. *International Journal of Educational Research Review*, *8*(2), 360–367. https://doi.org/10.24331/ijere.1255100

Yulianti, P. D., Sugiharto, D. Y. P., Surjaningrum, E. R., & Hartini, N. (2021). Mental Healthy Literacy of Teachers: A Systematic Literature Review. *Journal of Educational, Health & Community Psychology (JEHCP)*, *10*(2). https://doi.org/10.12928/jehcp.v10i2.20512

Yusriani, S., Hanifah, H., Rekarti, E., Patiro, S. P. S., & Gunarto, M. (2025). What Drives Entrepreneurial Intention in the Digital Era? Insights from Postgraduate Students Experiencing AI-Based Entrepreneurial Education. *Kontigensi: Jurnal Ilmiah Manajemen*, *13*(2), 1124–1146. https://doi.org/10.56457/jimk.v13i2.873

Yusriani, S., & Patiro, S. P. S. (2024). The Role of Digitalization, Self-Efficacy, and Family Support in Shaping Perceived Work-Life Balance Among Public Sector Employees in Indonesia. *5th Asia Pacific Conference on Industrial Engineering and Operations Management*. https://doi.org/10.46254/AP05.20240277

Yusriani, S., Prambudi, I. S., Gunarto, M., Nurbaeti, N., Lusiati, M., & Suhendro, S. (2023). Influence of Self-Efficacy and Peer Support on Learning Enthusiasm and Digital Competence in Online Distance Learning: A Cross-National Study on Workers and MM Program Postgraduate Students. *Proceedings International Conference on Business, Economics & Management*, *1*, 410–427. https://doi.org/10.47747/icbem.v1i1.1333

Žalėnienė, I., & Pereira, P. (2021). Higher Education for Sustainability: A Global Perspective. *Geography and Sustainability*, *2*(2), 99–106. https://doi.org/10.1016/j.geosus.2021.05.001

Zhang, Y., Luo, Y., Zhang, X., & Zhao, J. (2019). How green human resource management can promote green employee behavior in China: A technology acceptance model perspective. *Sustainability (Switzerland)*, *11*(19). https://doi.org/10.3390/su11195408