

CHAPTER THIRTY-ONE

Empowering Sustainable e-Commerce through Digital Education: Bridging Knowledge Gaps for Green Consumerism

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Abstract

Digital education is crucial in promoting sustainable e-commerce since it enables consumers and businesses with the knowledge required in green consumerism. This research filled knowledge gaps regarding ethical consumption and environmentally-friendly business operations via the utilisation of digital education. Secondary data was used to evaluate the effectiveness of digital literacy projects and sustainability-oriented learning platforms. The results indicated that although digital infrastructure is growing, there is lack of sustainability-related material within the digital education in mainstream. The inclusion of such materials, especially by using the AI-based and locally based modes of learning, can greatly promote the awareness of green consumer behaviour and sustainability of supply chains. The research illustrated that policy formulation, curriculum exchange, and local area centered interventions are necessary tools that can enable communities to obtain the digital assessments necessary to support responsible e-commerce.

Keywords: Digital Education, Eco-Friendly Business Practices, Green Consumerism, Sustainable e-Commerce.

Introduction

Over the past twenty years, the world of e-commerce has been changing more rapidly as a result of sky-soaring digitalisation rates, shifts in consumer behaviour, and mobile technology. With the growth of digital marketplaces, the negative impact on the environment also increases, which raises the question of whether online commerce is sustainable. Neither over packaging and energy-demanding logistics nor environmental impact of fast fashion and technology consumption can be neglected, and the consequences of e-commerce on nature are numerous and complicated (Mangiaracina et al., 2015; Lim et al., 2021). To

this end, there has been an increasing uprising of the demand to have sustainable e-commerce as a paradigm which aims at ensuring that the digital retailing business is brought in line with the environmental, social and economic sustainability pursuits. Yet, throughout the process of switching to sustainable models, it is not only the underlying change of systems in supply chains and businesses but also an informed and ecologically conscious consumer that is required. Here digital learning comes in to play.

Green consumerism can be defined as the inclination of consumers to make purchasing choices based on the environmental factors that include biodegradability, eco-labeling, and responsible sourcing. This measure has risen in popularity through the previous 10 years, especially amongst younger, digitally natural populations that require convenience in addition to the conscience in their consuming behaviours (Johnstone & Tan, 2015). Online stores now feel the pressure to provide environmentally friendly substitutes of products and evidence on their green statistics. The availability of such options however does not always translate into uptake. Evidence indicates that the inability to be aware of what is supposed to be branded as a green product, the presence of a disunity in labeling to consumers, a general lack of environmental literacy along with other economic inducements are some of the leading reasons as revealed by research why consumers fail to gain a clear understanding of what it entails to make a product be seen to be green (Testa et al., 2020).

Such disconnect necessitates the educational strategy relying on the use of digital tools to increase consumer knowledge. Online education, campaigning on social media, gamifying sustainability, and eco-influencer platforms can be an essential part of the process of shaping behaviours and instilling sustainable principles (Hessel barth & Schaltegger, 2014). These platforms can also support scalable, inclusive, and context-specific educational interventions, particularly in developing economies where the traditional channels of education could be unavailable.

Governmental, academic, NGO and corporate e-commerce collaboration is however key in development and sharing of effective learning content. Such multi-stakeholder model renders credibility, relevance and scalability of green

education initiatives. The bottom line is that providing consumers with knowledge about sustainability not only encourages them to make greener decisions but also makes the companies innovate, compete, and offer environmentally-friendly products and services. The intersection of the two realities stimulated by climate urgency and the digital revolution, sustainable e-commerce, and green digital learning is the much-needed channel of change. With consumers and business interacting more and more with the online platforms, there is a critical need to integrate sustainability knowledge into digital environments.

Nonetheless, although there is an increasingly diverse international literature pointing out the positive relationship between digital literacy and sustainable behaviours, there are still some research gaps that exist in India (especially in semi-urban and rural districts, such as Ara in Bihar). The majority of the available literature, including those in China and Taiwan (e.g., Zhai et al., 2024; Chen et al., 2024; Lin & Huang, 2023), have strong empirical support on the implications of the digital skills to green behaviour through various ways such as ecological cognition, and self-efficacy, and innovation capability. Nevertheless, a similar study has been conducted in India, mostly among urban dwellers or generational cohorts who mainly cover Gen Y and Z in rural cities (Ghouse et al., 2024). So, there is a major gap in viewing how digital literacy promotes sustainable behaviour in rural or low-income areas. There is another large gap in curriculum and pedagogical content of digital education projects. Although some initiatives have been successful in enhancing digital inclusion, they tend to overlook the concept of sustainability (at least locally) to the extent of training digital inclusion modules at a district or grass-root level. In addition, integration of AI powered teaching technologies with the awareness of sustainable business practices in India is poor. Even though in other regions we have evidence that AI tools, such as predictive models, gameplay modules, and personalised learning systems, may be employed to increase the sustainability of supply chains and engagement in the student bodies (Teixeira et al., 2025; Mokhtar et al., 2023), the usage of these technologies and capabilities is still low within the sustainability education and e-commerce industries. That implies that there is a high-level research and implementation

gap between the concept of using AI to enhance the personalisation of green consumer education and expand awareness levels within regional economies.

Lastly, in spite of the continuous efforts on the digitisation mission, the policy framework of digital literacy is still not localised, especially in learning sustainability. A majority of digital skilling efforts fail to internalise eco-literacy or ethical consumerism among the central elements, thus compromising a chance to develop the capacity to engage in a sustainable lifestyle at the local levels. Educational policy and digital training should be reconsidered so that it would suit the sustainability objectives, particularly in sectors that are underrepresented. This study addressed these white spots by analysing the way digital education (enriched with the content supporting sustainability and intelligence-based customisation) could help to empower consumers and small business owners to embrace green e-commerce. As it aimed at providing insightful work towards scholarly explanations it provided a significant contribution based intervention towards effective policy applications that could facilitate sustainable digital change in underserved areas in India.

Thus, this study examined the role of digital education (especially in the setting of such regions as Ara district of Bihar, India) to overcome major knowledge gaps limiting the implementation of green consumerism and an environmentally friendly business strategy. Based on the secondary sources of data (industry insights and academic studies), the study drew attention to the prospects of the sustainability-driven digital literacy, AI-facilitated learning tools, and policy intervention in facilitating ethical consumption and the involvement of green supply chains.

Research Objectives

1. To examine the role of digital education and how it can be used to increase understanding and awareness of green consumerism by consumers and small businesses in Ara, Bihar.

2. To determine how the introduction of sustainability-oriented courses and digital literacy courses may close the knowledge gap and conduct eco-friendly commerce practices through e-commerce.
3. To investigate how AI based learning platforms and individualised digital methods of education can be used to promote responsible consumption and sustainable supply chain knowledge.

Literature Review

Digital Literacy and Pro-Environmental Behavior

The paper by Hu and Meng (2022) reported two studies that addressed similar issues relating to the role of digital literacy in enhancing green consumption through psychological mechanisms based on social cognitive and self-regulatory roles. The presence of green products was found to increase some of these psychological responses, which support pro environmental decisions. Zhai et al. (2024) examined how having the digital literacy would influence the behaviour of farmers to green production technology in China. Ecological cognition was noted in mediation analysis as a key mechanism that brings digital ability into long-lasting practice (Zhai et al., 2024). In addition, a research in Hainan Province, China (Chen et al., 2024), showed that elevating digital literacy is quite substantial in enlarging eco- friendly policy cognition in the rural population and participation in engagement in eco- friendly activities.

Digital Education and Sustainability in University Contexts

Lin and Huang (2023) investigated the connection between the digital ability and sustainable behaviour of university students in Taiwan. Based on the findings of two case-study samples (students of tourism/hospitality and leisure/recreation), it was established that employability skills, innovation capability, information sharing and involvement are the mediators that could attenuate the relationship between the digital capability and the sustainability behaviour. Such mediators were different concerning different subjects of academic study but they all demonstrated the importance of digital education in promoting sustainable attitudes and practices. The study of Trakoonsanti and Abbas (2025) explored the contributing factors of educators, policymakers, and

teachers of Thailand regarding the influences of TAM and TPB models to determine that environmental awareness, green consumption motivation, perceived usefulness of the digitalised tools, and sustainability knowledge all had a positive effect on green consumer behaviours. A combination of these constructs translated digital interaction to eco conscious behaviour (Trakoonsanti& Abbas, 2025).

AI, Supply Chain Management, and Sustainability Education

A systematic review was carried out by Teixeira, Ferreira, and Ramos (2025) regarding adding Artificial Intelligence to supply chain management. They also examined the major roles of AI in predictive analytics, optimisation and traceability, and stated that explainable AI and digital twins are significant ones in the development of supplying chains sustainability. But barriers to adoption are legacies systems, and data issues and ethics (Teixeira et al., 2025). As shown in the study conducted by Jahin et al. (2023), the current situation with AI/ML models in predicting supply chain risks suggests that the new methods such as XGBoost and hybrid models can considerably enhance the predictive accuracy and robustness of logistics risk prevention.

Educational Technology for Sustainability Learning

Sustainable supply chain management education was also addressed in a study by Mokhtar, Sundram, and Shahrom (2023) which focused on ways in which the process of teaching could be gamified and imbued with augmented reality, as well as which modules to teach people with the assistance of AI. They also registered much more engagement and retention of learners in immersive, interactive educational technology than in static engagements (Mokhtar et al., 2023).

Thematic Synthesis and Identified Gaps

Theme	Key Insights	Gaps Identified
Digital Literacy → Green Behavior	Consistently positive effects mediated by ecological cognition and self-efficacy	Few studies in semi-urban/rural India

Interface Nudges in E-commerce	Environmental information nudges boost sustainable decisions	Lack of Indian/Bihar focus on UI interventions
AI in Supply Chains	Emerging tools boost efficiency and traceability, but require ethical/governance frameworks	Limited integration of digital literacy & skill-building
Digital Education Models	Smart EdTech (IoT/AR/gamification) dramatically improves sustainability knowledge	Need for scalable models in developing regions (e.g., Bihar)
Digital Inclusion Platforms in India	National portals enhance access to learning but lack sustainability-specific courses	Need curricular inclusion for green consumerism in district-level programs

Research Methodology

This study used secondary data-based research approach to find out the role of digital education in the fostering of sustainable e-commerce and green consumerism. The source of data contained government reports, policy paper, academic journal articles, white papers published in the industry, and analytics of digital education platforms in the context of digital literacy and sustainable practices. The insights in these sources were synthesised in a qualitative content analysis format in which patterns, gaps, and correlation between the digital education initiatives and eco-friendly consumer behaviours are identified. This approach facilitated the explication of the context within which available digital framework and educational interventions are manifested in moderating sustainable online shopping and business activities of rural and semi-urban Indian environment.

Data Analysis

This comes out as a detailed analysis to determine the impact of digital education in sustainable e-commerce and development of green consumerism.

Green consumer awareness and Digital Education

Digital literacy in the context of India is also more and more considered as a baseline requirement to participate in the civic life of a country, economic life and environmental awareness. Digital literacy has been limited by such challenges as inadequate access to devices, connection, and the appropriate learning materials in semi-urban and rural places. When environmental literacy is integrated in digital learning, its impact can considerably change consumer awareness about green consumerism (Hu & Meng, 2022). Nevertheless, this is an untapped potential in the Indian rural areas. The district-level economies have a low level of consumer awareness of concepts, including ethical consumption, environment labelling, and reduction of carbon footprints (Confederation of Indian Industry [CII], 2022). The lack of organised digital curricula that can cover these themes creates a continuous knowledge gap on the side of consumer and small-scale internet retailers. There is an increasing role of social media in forming the popular perspectives on sustainability. Informal learning becomes Twitter, YouTube, WhatsApps, and local content-based applications. Yet, how reliable and factual sustainability information is on these platforms is highly diverse. Although such outreach mediums are effective in reaching out to consumers on a greater scale, they are not well poised to change consumer behavior because there are no standardized, evidence-based digital learning materials in place (Vaidya & Kumar, 2025).

Integration of Sustainability-Focused Content in Digital Literacy Programs

Digital education platforms on a national level provide a comprehensive access to open-access education resources. Environmental awareness is normally covered within an overall science course or environmental science course, and it is going to include the topics like e-commerce, green consumerism, etc. Digital education focuses on the infrastructure development as the provision of smart classrooms and digital devices at the expense of a dedicated curriculum on sustainable digital practices. As a result, learners are inadequately prepared to make informed decisions associated with sustainable consumption, ethical sourcing, or circulating e-commerce services. The disconnection between digital literacy and sustainability education is further increased by the absence

of the specific intervention at the local level. The other reports also highlighted the role of providing digital skills to small and medium enterprises (SMEs), which come with the sustainability perspective.

AI-Driven Learning Platforms and Personalized Education for Sustainability

Artificial intelligence (AI) is transforming the education field with personalised learning platform, customised content delivery, and intelligent feedback mechanism. Although some other digital platforms have adopted AI to improve learning performance, little use has been applied to integrate sustainability related content into these systems (Teixeira, Ferreira, & Ramos, 2025). The use of AI-based personalisation is focused mostly on test preparation or skill development in such areas as mathematics and science, whereas the promotion of behavioural learning in terms of sustainability is rather narrow. The world-wide research has also demonstrated that AI can be effective in raising sustainability awareness once the schools use such environmental data in educational algorithms (Hasan, 2024). AI also has a potential in training the local businesses on sustainable supply chaining practices.

Implications for Policy and Practice

The analysis implies a multipronged plan in order to empower sustainable e-commerce with the help of digital learning. The priority of policymakers in ensuring sustainability literacy needs to be embedded in developing the current digital training programs and be customised by regions and inclusive. EdTech platforms should be pushed to integrate environmental themes in their main products, and AI should be used to implement adaptive and personal recommendations of the content. In the conversion of high level environmental ideas to local practice, NGOs and community educators can be important players in this initiative as they help both consumers and small enterprise owners.

Finally, a combination of digital education or a digitally powered learning experience, sustainability awareness, and technological advancement hold the potential solution to encouraging responsible consumption in India. But to create this possibility, we must go out of our way to redesign educational

content, delivery systems and institutional structures that will shape the future of e-commerce and online learning.

Findings

The study analysed how digital education may advance sustainable e-commerce and narrow knowledge gaps in terms of green consumerism. The key findings presented in the background of the three research objectives create crucial understanding of the interdependence between digital literacy, sustainability education, and responsible consumer behavior.

Digital Education and its role in Green Consumerism

The results showed that online learning can certainly be of great value in building and maintaining environmental awareness and consumer environment-friendly behaviour. Nonetheless, this potential has not been used fully utilised in the semi-urban and rural areas. Although initiatives at the national level have helped in enhancing the basic digital literacy, the initiatives are not mostly sustainability-oriented. The subjects like the environmental decision-making, sustainable product choice, an ecological effect of online consumption are not addressed to learners very often. In addition, the prevalence of unstructured digital contents on social media frenzies such as YouTube and WhatsApp indicates that casual avenues are molding the mindset of the people. However, there are no quality controls; hence no evidence-based content to the material to make it educationally viable in promoting change of behaviour. It is evident that the basic digital access does not yet coincide with the level of informed, sustainability-oriented digital engagement that the environmental issue needs to engage in building the green consumerism.

The blending of Digital Education on Sustainable Modules is Insufficient

The most significant gap, which was found in this study, consists in the presence of little sustainability-related content that would be integrated into the mainstream online educational platforms. A majority of the modules offered in terms of sustainability are only theoretical, generic or found in many college programmes in environmental-related sciences, and do not hold application to online buying or green business establishment. Such absence of contextualised and actionable content does not enable learners to attain competencies and take

useful challenge in an enduring digital economy. The study indicated that neighborhood participation and local models can help to make sustainability education less abstract and less theoretical, and more practical.

AI for Environmental Literacy: The Need for Better Integration

Artificial Intelligence (AI) and adaptive learning platforms have transformed the field of delivery of education across a number of areas and their use to sustainability education in India could be more beneficial to all members of society. These platforms have a lot of potential to bring more of a green consumer, or digital ethic, or environmental values into their adaptive learning framework. Though AI is gradually finding its way on the functional fronts in India, especially in the field of agricultural traceability and supply chains optimisation, the innovations have been mostly business based. An opportunity to develop potentially revolutionary potential of holistic sustainability learning could be opening educational facets of these tools. The feather between commercial uses of AI and educational settings would meld the systems towards a more coherent system- a more substantive and pragmatic knowledge of sustainability in the various learning communities.

No Combination of Digital Literacy and Sustainability Goals is Presented in Policy Frameworks

Fragmentation between the digital literacy policies and sustainability education is another important finding. Every nation and state tends to approach these separately as separate entities, and thus opportunities to achieve synergy are also missed. Whereas there has been an increased appreciation by most parts of the globe, sustainability as a fundamental digital competency, the educational policy is yet to respond to this inclusion in rural areas. It is encouraging that the state policy documents have concentrated greatly on digital accessibility and ground training as a major stride to digital empowerment. Nevertheless, it is still a great opportunity to complement these activities with adding the awareness of the environment and the ethics of a good consumer to the set of core learning outcomes. At present, the lack of direct policy and curriculum requirements of digital skills training in undertaking sustainability education translates to a variant of digital literacy whose proficiency in technology is

informative, but yet remains ignorant of environmental awareness. Combining the two issues of digital empowerment and environmental stewardship by filling this policy gap gives a significant chance to make the evolution of a more comprehensive and wider-lensed model.

Localised, Culturally Relevant Content Is Essential for Impactful Learning

The study underlined that specify-related and culturally relevant content enhances participation and understanding between learners to a large extent. The problem with generic digital content is that it does not appeal to learners in semi-urban and rural regions. On the other hand, if the sustainability education is provided in local languages with scenarios, which are close to the learner, it can help him or her internalises the skill and applies it. It is significant to decentralise content development, engage the local educators, NGOs, and learners in co-designing sustainability curriculum. Top-down, one-size-fits-all methods have less potential to effect behaviour change than community-based models that rely on deceptively simple, technology-friendly languages and local case studies of success. This means that green consumerism awareness needs to be embedded on the socio-cultural context of the learners in particular regions.

Conclusion

The study examined the interplay between digital education and sustainable e-commerce, which has been found to be an interesting and quite complicated sphere of study and practice with a narrower focus on the district of Ara in Bihar, India. The main assumption that digital education may become an effective instrument in knowledge transfer in the question of green consumerism was explored with the help of an in-depth analysis of secondary data, which provided the idea of current drawbacks, future opportunities, and the course to go. The study concluded that though there has been enhancement of digital infrastructure and access due to national programmes, policy and support, integration of sustainability related content and courses into digital learning ecosystems are seriously lacking. Even digital literacy may still be mainly functional in its focus in rural and semi-urban areas, failing to reach the level of conceptual knowledge or situational applicability to create

environmental responsiveness in behaviours. This indicates a huge gap between technology access and its capability of making sustainable decision-making. As it has been noted so far, although some of the biggest educational platforms cover the issue of environmental literacy, much can be done to make such material richer and more practice-based. These platforms can provide an effective way to deal with the issues affecting the real world such as daily online shopping, ethical shopping, and conscious consumption, etc. The role of Artificial Intelligence in facilitating sustainability education can be exploited to a great extent. The AI-powered software has already shown impressive progress in providing individualised academic experiences, and there is a good potential in taking into consideration the concept of sustainability. The new generation shopping interface based on environment rating, and adaptive green learning tools, present a useful guideline on future developments in this field. The lack of tools, especially in rural areas, provides an insight into a potential opportunity to create and deploy new AI-based tools devoted to teaching sustainability. This study, in the framework of policy analysis, noted the necessity of closing the existing gap between digital literacy and sustainability concerns that are usually discussed independently both in educational policies and governance. The combination of these areas can play a leading role in revealing the effectiveness of empowering people through digital methods. A broader-based and more interdisciplinary policy that would treat sustainability as a pillar of digital citizenship can be developed to support a more comprehensive and future-forward growth in the learning outcomes of the whole of India. In the real sense, the road map to the sustainable e-commerce in India should always be inclined towards technology but also reformative education. Online learning should also become an instrument of awareness, agency, and action as opposed to access. Such shift is especially acute in such districts as Ara as the digital infrastructure is being developed, and the educational material is not up to date with the social-environmental problems of the 21st century any longer. Through identification of these gaps and opportunities, this study added to the academic discussion and provided practical guidelines that can be pursued by policymakers, educators, and technologists. Sustainable digital education of the consumers and the business cannot be just a developmental requirement but also an indispensable measure

to ensure inclusive, resilient and clean green development of the digital economy of India.

Limitations

Although this study provided many significant details about the position of digital learning in supporting the emergence of sustainable e-commerce and the promotion of green consumerism, it had its own drawbacks. The study relied exclusively on the availability of secondary information including policy reports, literature publications, and industry reports; and hence would not account the life experiences and behavioural peculiarities of local consumers and businesses as well as real time perceptions. The lack of primary data gathering limited the possibility of proving the results with the help of directly asking questions from the stakeholders to specify recent changes in the digital habits. Further, limited generalisability of the results can be also attributed to the specific socio-economic and cultural peculiarities of the region that are unlikely to apply to the rest of the districts. The dynamically changing character of the digital technologies and sustainability models also implies that some of the mentioned platforms or initiatives can radically get changed, which may influence the applicability of the study in the long-run.

References

- Bianchi, C., & Andrews, L. (2012). Risk, trust, and consumer online purchasing behaviour: A Chilean perspective. *International Marketing Review*, 29(3), 253–275. <https://doi.org/10.1108/02651331211229750>.
- Bihar Education Project Council. (2023). *Annual report on digital infrastructure and education*. Patna, India.
- Chen, X., Li, Y., & Zhao, H. (2024). The impact of digital literacy on farmers' pro environmental behavior: A Theory of Planned Behavior analysis. *Frontiers in Sustainable Food Systems*. <https://doi.org/10.3389/fsufs.2024.1432184>
- Confederation of Indian Industry (CII). (2022). *Building a sustainable e-commerce ecosystem in India*. New Delhi: CII.

- Das, S. K. (2025). Investigating circularity in India's textile industry: Overcoming challenges and leveraging digitization for growth. *arXiv*. <https://doi.org/10.48550/arXiv.2501.15636>
- Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64–87. <https://doi.org/10.1525/cmr.2011.54.1.64>
- Digital Empowerment Foundation. (2022). *Rural digital literacy and environmental awareness in India*. <https://defindia.org/>
- Federation of Indian Chambers of Commerce and Industry (FICCI). (2023). *Green retailing and the future of sustainable consumerism in India*. New Delhi: FICCI.
- Filho, W. L., Shiel, C., Paço, A., Mifsud, M., Veiga Ávila, L., & Brandli, L. L. (2018). Sustainable development goals and sustainability teaching at universities: Falling behind or getting ahead of the pack? *Journal of Cleaner Production*, 203, 276–284. <https://doi.org/10.1016/j.jclepro.2018.08.244>
- Ghouse, S. M., Shekhar, R., & Chaudhary, M. (2024). Sustainable choices of Gen Y and Gen Z: Exploring green horizons. *Journal of Consumer Behaviour*. [details pending]
- Hasan, M. R. (2024). AI enhanced decision making for sustainable supply chains: Reducing carbon footprints in the USA. *arXiv preprint*. <https://doi.org/10.48550/arXiv.2501.10364>
- Hesselbarth, C., & Schaltegger, S. (2014). Educating change agents for sustainability – Learnings from the first sustainability management Master of Business Administration. *Journal of Cleaner Production*, 62, 24–36. <https://doi.org/10.1016/j.jclepro.2013.03.042>
- Hilton, T., & Hughes, T. (2013). Co-production and self-service: The

- application of service-dominant logic. *Journal of Marketing Management*, 29(7–8), 861–881. <https://doi.org/10.1080/0267257X.2012.734421>
- Hu, L., & Meng, X. (2022). Digital literacy and green consumer behavior: A psychological perspective. *Journal of Environmental Psychology*, 80, 101761.
- Hu, X., & Meng, H. (2022). Digital literacy and green consumption behavior: Exploring dual psychological mechanisms. *Journal of Consumer Behaviour*, 22(2), 272–287. <https://doi.org/10.1002/cb.2122>
- Islam, M. S., Mahbub, A., Wohn, C., Berger, K., Uong, S., Kumar, V., ... Hoque, E. (2022). SEER: Sustainable e-commerce with environmental-impact rating. *Cleaner Environmental Systems*, 8, 100104. <https://doi.org/10.1016/j.cesys.2022.100104>
- Jahin, M. A., Naife, S. A., Saha, A. K., & Mridha, M. F. (2023). AI in supply chain risk assessment: A systematic literature review and bibliometric analysis. *arXiv preprint*. <https://doi.org/10.48550/arXiv.2401.10895>
- Johnstone, M. L., & Tan, L. P. (2015). Exploring the gap between consumers' green rhetoric and purchasing behaviour. *Journal of Business Ethics*, 132, 311–328. <https://doi.org/10.1007/s10551-014-2316-3>
- Kumar, P., & Rahman, Z. (2016). Buyer behavior in green products: An integration of theory of planned behavior and perceived consumer effectiveness. *International Journal of Consumer Studies*, 40(6), 620–626. <https://doi.org/10.1111/ijcs.12296>
- Leal Filho, W., Salvia, A. L., & Brandli, L. L. (2019). Education for Sustainable development: Challenges and trends. *Sustainability*, 11(24), 7204. <https://doi.org/10.3390/su11247204>
- Lim, S. F. W. T., Jin, X., & Srai, J. S. (2021). Consumer-driven e-commerce:

A literature review, design framework, and research agenda on last-mile logistics. *International Journal of Physical Distribution & Logistics Management*, 51(1), 2–29.

<https://doi.org/10.1108/IJPDLM-05-2020-0169>

Lin, C.-H., & Huang, P.-E. (2023). Digital capability, digital learning, and sustainable behavior among university students in Taiwan. *International Journal of Management Education*, 21(3), 100835. <https://doi.org/10.1016/j.ijme.2023.100835>

Liu, X., Wang, Z., & Han, X. (2024). The impact of digital literacy on farmers' green production behavior: Mediating effects based on ecological cognition. *Sustainability*, 16(17), 7507. <https://doi.org/10.3390/su16177507>

Mangiaracina, R., Marchet, G., Perotti, S., & Tumino, A. (2015). A review of the environmental implications of B2C e-commerce: A logistics perspective. *International Journal of Physical Distribution & Logistics Management*, 45(6), 565–591. <https://doi.org/10.1108/IJPDLM-06-2014-0133>

MdPI. (2024). Digital and sustainable education and social inclusion. *Sustainability*, 17(13), 5677. <https://doi.org/10.3390/su17135677>

Ministry of Electronics and Information Technology (MeitY). (2023). *Digital India progress report*. Government of India.

Mokhtar, A. R., Sundram, V. P. K., & Shahrom, M. (2023). Sustainable supply Chain management education: Employing augmented reality, gamification, and AI for effective learning. *Advances in Social Sciences Research Journal*. <https://doi.org/10.14738/assrj.112.2.16423>

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

- Ramachandran, P., & Sudhir, V. (2023). Green consumption and sustainable lifestyle: Evidence from India. *Emerging Markets Journal*. [details pending]
- Rani, P., & Sachar, R. (2024). Empowering sustainable development through digital transformation: Insights from Digital India. *Journal of Asia Business Studies*. <https://doi.org/10.1108/JABS-07-2024-0408>
- Teixeira, A. R., Ferreira, J. V., & Ramos, A. L. (2025). Intelligent supply chain management: A systematic literature review on artificial intelligence contributions. *Information*, 16(5), 399. <https://doi.org/10.3390/info16050399>
- Testa, F., Iraldo, F., Vaccari, A., & Ferrari, E. (2020). Why eco-labels can be effective marketing tools: Evidence from a study on Italian consumers. *Business Strategy and the Environment*, 29(1), 138–149. <https://doi.org/10.1002/bse.2350>
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press.
- Trakoonsanti, L., & Abbas, Q. (2025). Cultivating sustainable digital literacy by educational pathways to green consumption in Thailand's digital age. *Digital Culture and Education Review*, 1(1), 59–83. <https://doi.org/10.63718/v013v049>
- Vaidya, R., & Kumar, S. (2025). Smart digital education for sustainable development. *Asian Journal of Education and Development Studies*, 14(2), 198–212.
- Vaidya, S., & Kumar, A. (2025). Exploring trends in e-business and sustainable finance. *Frontiers in Sustainable Cities*. <https://doi.org/10.3389/frsc.2025.1549874>
- White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer

behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, 83(3), 22–49.
<https://doi.org/10.1177/0022242919825649>

Zhai, X., et al. (2024). Digital literacy and farmers' adoption of green production technologies: Evidence from China. *Agriculture*, 15(3), 303.
<https://doi.org/10.3390/agriculture150303>