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Editorial Review Board

Outcomes

1. Article 1 “Environmental Consciousness and Social Media Influence: Drivers of Pro-Environmental Behavior”

This article examines the impact of environmental consciousness on pro-environmental behavioral intentions among Indian social media users, drawing on the Theory of Planned Behavior (TPB) as its conceptual framework. At a societal level, the study highlights the capacity of digital platforms to promote environmental awareness and encourage behavioral change, underscoring their broader value as vehicles for targeted sustainability engagement.

2. Article 2 “Adoption of Blended Learning in Management Education: A Bibliometric and Thematic Systematic Literature Review”

The aim of this study is to examine the current trends, explore the opportunities, and evaluate the challenges associated with the adoption of blended learning in management institutions, with the goal to provide insights that can help educators and administrators design effective strategies for blended learning implementation.

3. Article 3 “India’s Role in Global Supply Chain Diversification: From Back Office to Manufacturing Hub”

This study critically examines India’s evolving role in global supply chain diversification, tracing its journey from a service-led to a manufacturing-oriented economy. The research integrates theoretical perspectives on global value chains (GVCs) with empirical data on trade, investment, and policy reforms to assess India’s competitiveness, opportunities, and constraints.

4. Article 4 “Impact of Carbon Pricing Policies on Environmental Sustainability”

This study analyze the effects that the two carbon pricing policies will have on carbon dioxide emissions between the years 1990 and 2024. The empirical approach is followed by the thorough method of diagnostics, and the tests of cross-sectional dependence, slope heterogeneity, panel unit roots, and cointegration.

5. Article 5 “Reflection of Gender Stereotyping on Brand Personality: A Review on Shifting Framework in Brand Advertising”

This study consists of two parts. The first part of the paper reviews marketing studies on the relationship between gender stereotyping and brand personality. The paper also presents scales used to study and measure brand personality. The second part discusses four advertising cases in the Indian context in which gender stereotypes are broken and an alternate brand personality is established. The analysis of the advertisements shows a shift away from traditional branding practices and from stereotypical product portrayals toward a more genderneutral, inclusive depiction.

6. Article 6 “Behavioral Biases & Investment Decisions: A Bibliometric Analysis”

This study provides a bibliometric synthesis of behavioral finance, identifying gaps in the study and future research directions that scholars and policymakers can consider to enhance financial inclusion and decision-making of investors.

Book Review “Business Analytics with R”

After reading Business Analytics with R, readers gain practical skills in using R for data analysis and business decision-making. The book helps them understand how to clean data, create visualizations, and apply statistical and predictive models to solve real-world business problems. By the end, readers develop confidence in turning data into meaningful insights and making informed, data-driven decisions.

Chairperson Message

The latest issue of Anusandhan: NDIM's Journal of Business and Management Research, Volume VIII, Issue 1, February 2026 brings together a diverse set of scholarly contributions that reflect contemporary issues and evolving trends across management, commerce, education, gender studies, and analytics. The **first paper**, "Environmental Consciousness and Social Media Influence: Drivers of Pro-Environmental Behavior," authored by Nupur Bhati and Sr. Prof. Kavita Sharma from the Department of Commerce, University of Delhi, examines the growing role of social media in shaping environmental awareness and responsible behavior. The study highlights how digital platforms act as powerful catalysts in influencing individual attitudes, values, and actions toward sustainability. The **second paper,** "Adoption of Blended Learning in Management Education: A Systematic Literature Review and Thematic Analysis," by Megha Kalia, Anushka Goel and Prof. Udita Taneja of Guru Gobind Singh Indraprastha University, provides an in-depth review of existing literature on blended learning practices. The **third paper**, "India's Role in Global Supply Chain Diversification: From Back Office to Manufacturing Hub," authored by Astha Dhupar, Love Mendiratta and Dr. Mansi Ahuja from Sri Guru Tegh Bahadur Institute of Management and IT, explores India's evolving position in the global supply chain ecosystem. The study discusses India's transition from being primarily a service-oriented back-office destination to an emerging manufacturing and production hub. The **fourth paper**, "Impact of Carbon Pricing Policies on Environmental Sustainability, Online Learning Environments: Challenges and Strategies for Improvement," by Harsha Dugar and Prof. Ashish Kumar from GGSIP University, Delhi

The **fifth paper,** "Reflection of Gender Stereotyping on Brand Personality: A Review on Shifting Framework in Brand Advertising," by Premlata from Lady Shri Ram College for Women, University of Delhi, and Dr. Subhojit Banerjee from Gautam Buddha University, critically examines gender representations in brand advertising. The **sixth paper**, "Behavioral Biases in Working Women: A Bibliometric Analysis," by Deepika Pal and Abhishek Danu from Hemvati Nandan Bahuguna Garhwal University, Srinagar, Uttarakhand, & Rakesh Kumar Pal from Combined (P.G) Institute of Medical Sciences & Research (CIMSR), Dehradun Uttarakhand, India presents a comprehensive bibliometric review of research on behavioral biases affecting working women. The study maps key trends, themes, and research gaps, offering a structured understanding of how cognitive and behavioral biases influence decision-making in professional contexts. Finally, the issue concludes with a **book review** of "Business Analytics with R" by Rajat Kapoor from MJPR University, Bareilly. The review critically evaluates the book's relevance, structure, and practical utility, highlighting its contribution to building analytical competencies using the R programming language for business applications.

Dr. Bindu Kumar
Chairperson, NDIM

From the Editorial Desk

It gives us great pleasure to present the latest issue of Anusandhan: NDIM's Journal of Business and Management Research, Volume VIII, Issue 1, February 2026. This publication reflects NDIM's sustained commitment to fostering innovative thinking, rigorous scholarship, and meaningful dialogue in the domains of business and management studies. The current volume showcases a thoughtfully curated collection of six research articles and one book review that address contemporary challenges and emerging trends shaping the global business landscape. The Journal is now ICSSR Sponsored.

In an era characterized by rapid technological advancements, shifting economic paradigms, and an increasing emphasis on sustainability and ethical practices, the contributions in this issue capture the evolving nature of management research. The articles span a wide range of themes, including digital transformation, emotional dynamics in the workplace, financial performance evaluation, and the behavioral and psychological influences affecting today's youth. Together, these studies provide valuable insights that are both theoretically grounded and practically relevant.

At NDIM, our academic philosophy centers on bridging the gap between research and practice. *Anusandhan* serves as an important platform for encouraging scholarly debate and promoting applied research that can inform policy formulation, strategic decision-making, and effective organizational execution. By connecting academic inquiry with real-world implications, the journal aims to contribute meaningfully to both academic and professional communities.

We are pleased to share that this edition witnessed a significant increase in interest, with manuscript submissions continuing to rise compared to previous issues. This encouraging response reflects the growing recognition of *Anusandhan* as a credible and impactful research outlet. We sincerely thank all authors who submitted their work, as well as our dedicated peer reviewers and editorial team, whose expertise and commitment ensure the maintenance of high academic and ethical standards. While some manuscripts could not be accepted due to plagiarism concerns or unsatisfactory review outcomes, we hope this experience inspires future contributors to adhere to rigorous research methodologies and ethical practices. We invite our readers to engage deeply with the research presented in this volume and to share their insights, feedback, and suggestions. As we continue our journey toward advancing impactful management research, we warmly welcome future submissions and active participation from scholars and practitioners alike. Prospective authors, reviewers, and critics are encouraged to collaborate with us in driving research that creates meaningful societal and organizational impact.

We extend our heartfelt gratitude to Prof. (Dr.) Shubham Agarwal from NDIM for his meticulous proofreading and careful attention to grammatical accuracy throughout the journal. His contribution has significantly enhanced the quality of this publication. We also invite experienced academicians and industry experts to associate with us as members of our advisory board. For queries, suggestions, or manuscript submissions, please contact us at editor@ndimdelhi.in.

Warm regards,
Prof. (Dr.) Madhu Arora
Editor-in-Chief
Anusandhan: NDIM's Journal of Business and Management Research

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Environmental Consciousness and Social Media Influence: Drivers of Pro-Environmental Behavior

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Abstract: This research examines the impact of environmental consciousness on pro-environmental behavioral intentions among Indian social media users, drawing on the Theory of Planned Behavior (TPB) as its conceptual framework. Research Data were collected through a quantitative, cross-sectional survey of 200 active users, and the proposed relationships were tested with Partial Least Squares Structural Equation Modeling (PLS-SEM), incorporating issue involvement as a potential moderator. The results indicate that environmental consciousness significantly shapes both user attitudes and behavioural intentions, with attitudes exerting a strong impact on sustainable online behaviour. Moreover, issue involvement enhances the positive association between attitude and intention. However, the use of self-reported measures and a cross-sectional research design limits definitive casual inferences and may also be influenced by respondent's social desirability tendencies. From a real-world perspective, the findings guide marketers, environmental organizations, and policymakers in developing social media strategies that promote favourable attitudes and perceived behavioural control to encourage environmentally responsible intentions. At a societal level, the study highlights the capacity of digital platforms to promote environmental awareness and encourage behavioral change, underscoring their broader value as vehicles for targeted sustainability engagement.

This study extends TPB by integrating issue involvement as a moderator in the pro-environmental online context. It fills a gap in emerging-market research on digital environmentalism and offers actionable guidance for stakeholders in India and similar contexts.

Keywords: Environmental consciousness, digital influence, social media, pro-environmental behaviour, Theory of Planned Behaviour, India

1. Introduction

The accelerated penetration of social media platforms has transformed the way individuals engage with social and environmental issues. Platforms such as Facebook, Instagram, and Twitter provide not only channels for interpersonal communication but also serve as interactive spaces for shaping awareness, influencing attitudes, and mobilizing behavioral change. In the context of sustainability, social media has emerged as a cost-effective medium for disseminating environmental messages, promoting pro-environmental values, and encouraging eco-conscious lifestyles (Kapoor et al., 2022).

Despite the growing importance of these platforms, a research gap persists in understanding the psychological mechanisms through which **environmental consciousness interacts with digital influence** to shape consumer behavior. Previous studies have examined environmental concern as a predictor of green purchase intention (Joshi & Rahman, 2015); relatively little research has investigated the role of **attitudes toward social media use** in mediating the relationship between environmental consciousness and pro-environmental behavioral intentions.

India presents a unique research context for this inquiry. With its large youth population and rapid digital adoption, social media has become a central arena for health and environmental discourse. Yet, empirical evidence examining how digital platforms interact with consumer consciousness to drive sustainable behavior remains scarce. This study seeks to address this gap by applying the Theory of Planned Behavior (Ajzen, 1991) and Value–Belief–Norm theory (Stern, 2000) to investigate how environmental consciousness influences attitudes toward social media and, consequently, behavioral intention.

By integrating insights from behavioral theories with empirical testing through PLS-SEM, this study contributes to both theory and practice. It expands the understanding of digital influence in sustainability communication and provides actionable implications for organizations and policymakers aiming to foster pro-environmental behavior through social media campaigns.

2. Literature Review

2.1 Theoretical Foundations

Theoretical Explanations of Pro-Environmental Action

The Theory of Planned Behavior (TPB) and the Value–Belief–Norm (VBN) framework are commonly used to understand how values, norms, and attitudes translate into intentions and behavior. In digital contexts, social media serves as both an information environment and a normative marketplace, amplifying information, shaping perceptions of social norms, and creating new pathways for value activation (Ajzen, 1991; Stern, 2000). Recent studies have highlighted that social media characteristics such as interactivity, peer endorsement, and algorithmic exposure strengthen the pathways from environmental concern to intention by increasing exposure, perceived social support, and perceived effectiveness of actions (Liao, 2024; Xie et al., 2024).

According to the Theory of Planned Behaviour, individual's behavioural intentions are shaped by their evaluative attitudes, perceived social pressures, and perceived ability to perform the behavior, which collectively influence actual behavioural outcomes. In green consumption, environmental consciousness shapes (i) favorable attitudes toward green products, (ii) normative beliefs (e.g., what important others expect), and (iii) perceived control (e.g., affordability/availability), thereby raising green purchase intention and behavior. Hypotheses typically specify: Consciousness → (Attitude, Norm, Control) → Intention → Purchase. According to Ajzen (1991), attitudes, subjective norms, and perceived behavioral control shape behavioral intention, which in turn predicts actual behavior. In the context of environmental issues, attitude toward social media can be viewed as a determinant of behavioral intention, influenced by underlying environmental consciousness.

VBN links values (biospheric/altruistic) to ecological beliefs, which activate personal norms (obligation to act), predicting pro-environmental behaviors, including green consumption and activism. In this view, environmental consciousness operationalizes the value/belief substrate that activates the moral obligation to choose greener options—even when they cost more or are less convenient. According to Stern (2000), value-belief theory argues that pro-environmental behavior arises from the activation of personal norms, which are shaped by values and ecological beliefs. Environmental consciousness represents an antecedent belief structure that motivates individuals to act in accordance with environmental norms. When integrated with TPB, VBN helps explain how environmental consciousness translates into moral obligation and positive attitudes toward sustainable behaviors, thereby influencing intention.

2.2 Environmental Consciousness

Environmental consciousness refers to an individual's lasting awareness of environmental issues and the sense of responsibility to reduce harm. In consumer contexts, it has been operationalized through ecological worldviews, such as the Revised New Ecological Paradigm (NEP), and through specific consumption tendencies, like Ecologically Conscious Consumer Behavior (ECCB). The Revised NEP offers a validated 15-item scale commonly used to measure pro-ecological attitudes and predict related behaviors. Meanwhile, ECCB captures purchase and usage behaviors that reflect that orientation. Together, these tools represent the attitudinal and behavioral aspects of "consciousness" in green consumption research.

Environmental consciousness—an individual's awareness, concern, and sense of personal responsibility for ecological issues—remains a reliable predictor of green intentions and behaviors in multiple contexts. Meta-analyses and empirical studies confirm that consciousness typically increases favorable attitudes and perceived moral obligation, but situational constraints and digital echo chambers may moderate whether attitudes become actions. Recent evidence from large samples in Asia and cross-platform studies demonstrates that exposure to credible environmental content on social platforms raises both environmental knowledge and willingness to participate in protective behaviors, though effect sizes vary across platforms and demographic groups (Xie et al., 2024).

2.3 From Consciousness to Green Consumption

Meta-analytic and review evidence consistently show that pro-environmental orientations (concern, values, and consciousness) are positively associated with pro-environmental behaviors, including green purchasing—albeit with small to moderate average effects once situational constraints are considered. Classic syntheses (e.g., Bamberg & Möser, 2007) report reliable links from attitudes and moral norms to behavior, echoing earlier evidence on knowledge/awareness and responsibility. More recent reviews of green purchase behavior identify facilitators (environmental concern, perceived consumer effectiveness, and trust in eco-labels) and barriers (price premiums, availability, and skepticism), which help explain the persistent attitude–behavior gap.

2.4 Social Media and Attitude Formation

Social media platforms have become vital tools for spreading environmental information, shaping opinions, and influencing user behaviors. Attitude toward social media use can be defined as an individual's overall evaluation of using digital platforms for information and interaction related to environmental issues.

Research in digital communication suggests that positive attitudes toward social media use enhance individuals' likelihood to engage with sustainability-related content and adopt environmentally responsible behaviors (Erkan & Evans, 2016; Kapoor et al., 2022). Moreover, social media provides interactive and peer-driven environments where informational support and perceived credibility strengthen attitudes and, subsequently, behavioral intentions (Pelling & White, 2009). Thus, attitude toward social media serves as a key psychological link between consciousness and behavioral intention.

Recent literature have further explored the role of digital platforms i.e social media in influencing pro-environmental behavior. Liao (2024) found that social media exposure positively affects environmental attitudes and subjective norms, which in turn enhance behavioral intentions toward pro-environmental actions. Similarly, Xie et al. (2024) demonstrated that increased engagement with environmental content on platforms like WeChat leads to higher environmental awareness and a greater likelihood of engaging in sustainable behaviors. These findings underscore the importance of social media as a tool for fostering pro-environmental behavior, particularly when users are exposed to credible and relevant content.

2.5 Theoretical Model

Based on the above conceptual grounding, this study proposes a model in which environmental consciousness influences attitude toward social media use, which subsequently affects behavioral intention. Issue involvement is considered as a moderator in the link between attiude to use social media and intention to behave, as highly involved individuals may show stronger or weaker conversions of attitude into intention depending on cognitive overload and situational constraints. The following model has been proposed.

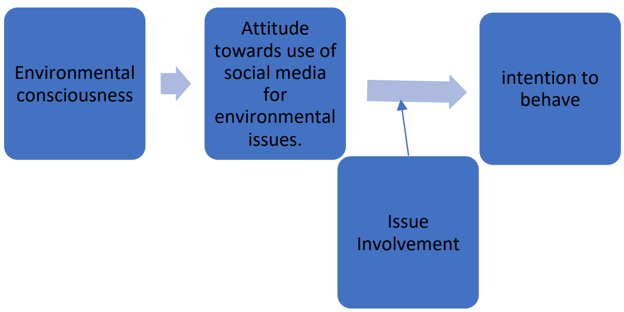

Figure 1: Proposed Model

3. Hypotheses Development

3.1 Environmental Consciousness and Attitude toward Social Media

Individuals who are more environmentally conscious are more aware of ecological problems and have greater motivation to seek and process relevant information. Prior studies suggest that environmentally conscious consumers evaluate digital platforms positively when these platforms provide credible, interactive, and timely information on sustainability (Huang et al., 2014; Joshi & Rahman, 2015). As consciousness shapes evaluative judgments, it is expected to have a significant influence on attitudes toward social media use for environmental purposes.

H1: Environmental consciousness positively influences attitude toward social media usage.

3.2 Attitude and Behavioral Intention

According to the Theory of Planned Behavior, attitude is a key factor influencing behavioral intention (Ajzen, 1991). Research has shown that when individuals develop positive attitudes toward social media platforms, they are more likely to have strong intentions to act in accordance with environmental messages they encounter online (Erkan & Evans, 2016; Kapoor et al., 2022).

Therefore, favorable attitudes toward using social media for ecological content should boost intention to act.

H2: Attitude toward Social Media use has a positive effect on intention to behave.

3.3 Moderating Role of Issue Involvement

Issue involvement refers to the perceived personal relevance and importance of environmental issues. Prior research suggests that highly involved individuals may process information more deeply and display stronger linkages between intention and behavior (Zaichkowsky, 1985; Cho & Boster, 2005). In contrast, low involvement may weaken the translation of intention into behavior.

Therefore, issue involvement is expected to strengthen the relationship between attitude and behavioral intention.

H3: Issue involvement influences the relationship between attitude toward social media use for environmental issues and intention to act on environmental concerns.

4. Research Methodology

4.1 Research Design

The research adopted a quantitative cross-sectional survey design to investigate the associations among environmental consciousness, attitudes towards social media usage, and related constructs. Considering the study's emphasis on latent constructs and predictive modelling, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using SmartPLS 4. This method is particularly suitable for exploratory models, larger multi-construct datasets, and non-normal data distributions (Hair et al., 2019).

4.2 Sample and Data Collection

Primary data were sourced from respondents who regularly use social media and reside in the Delhi–NCR region, through a structured questionnaire distributed via both online and offline channels. Snowball sampling was used to identify participants, ensuring that respondents were active social media users and aware of environmental issues. A total of 200 valid responses were obtained, which is well above the minimum sample size requirement for PLS-SEM analysis based on the "10 times rule" (Hair et al., 2019). The demographic profile of respondents indicated a mix of gender, age groups, and educational backgrounds, reflecting the diversity of urban Indian social media users. The majority of participants were in the 20–35 age group, highlighting the relevance of young adults as primary consumers of digital environmental content.

4.3 Measures

All constructs were measured using established scales from prior literature, adapted to the context of social media and environmental issues. Participant Responses were measured using a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

- Environmental Consciousness was measured using items adapted from Dunlap et al. (2000) and Straughan & Roberts (1999).
- Attitude toward Social Media Use was assessed using items adapted from Erkan & Evans (2016) and Kapoor et al. (2022).
- Intention to behave was measured following Ajzen (1991) and Bamberg & Möser (2007).
- Pro-Environmental Behavior was captured using items adapted from Kaiser et al. (2005).
- Issue Involvement was measured using Zaichkowsky's (1985) personal involvement inventory.

All measures demonstrated acceptable reliability and validity as reported in the results section.

5. Results

5.1 Measurement Model Assessment

The measurement model was first assessed for reliability and validity. Indicator reliability was confirmed as all outer loadings exceeded the recommended threshold of 0.70 (Hair et al., 2019). Internal consistency reliability was established with Cronbach's alpha and composite reliability values above 0.70 for all constructs. Convergent validity was demonstrated as Average Variance Extracted (AVE) values exceeded the 0.50 benchmark, indicating that more than 50% of the variance in indicators was explained by their respective constructs.

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio. The square root of each construct's AVE was greater than its correlations with other constructs, and HTMT ratios were below the conservative cut-off of 0.85. Together, these results confirmed that the constructs were empirically distinct.

Table 1: Reliability and validity statistics of the measurement model

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Attitude towards the use of Social Media for environmental issues	0.894	0.896	0.892	0.509
Environmental Consciousness	0.828	0.832	0.827	0.490
Intention to behave towards environmental issues	0.939	0.941	0.938	0.604
Issue involvement	0.902	0.913	0.902	0.700
Attitude<issue involvement<intention to behave towards environmental issues	0.842	0.881	0.864	0.566

The results of the reliability and validity assessment indicate that all constructs demonstrate satisfactory psychometric properties. Cronbach's alpha values for the constructs ranged from 0.828 to 0.939, exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994), thereby confirming internal consistency reliability. Similarly, the composite reliability values (ρa and ρc) for each construct were found to be above 0.80, which is well beyond the acceptable cut-off of 0.70 suggested by Hair et al. (2019). This provides further evidence of construct reliability.

Convergent validity was evaluated using the average variance extracted (AVE). In line with the guidelines of Fornell and Larcker (1981), an AVE value above 0.50 indicates that a construct explains more than half of the variance of its observed indicators. The constructs "Attitude towards the use of social media for environmental issues" (AVE = 0.509), "Intention to behave towards environmental issues" (AVE = 0.604), "Issue involvement" (AVE = 0.700), and the higher-order construct (AVE = 0.566) all surpassed this threshold, confirming convergent validity. The construct "Environmental Consciousness" recorded a slightly lower AVE (0.490). However, scholars have argued that when composite reliability values are above 0.60, convergent validity can still be considered adequate, even if the AVE falls marginally below 0.50 (Fornell & Larcker, 1981; Malhotra & Dash, 2011). Given that both composite reliability and Cronbach's alpha for this construct are well above the recommended cut-offs, its retention is justified. Overall, the results confirm that the constructs used in the study demonstrate strong reliability and adequate convergent validity, thereby supporting their suitability for further structural model analysis.

5.2 Structural Model Assessment

Following the establishment of measurement validity, the structural model was evaluated. Multicollinearity was not a concern, as all VIF values were below 5. The model's explained variance was satisfactory, with R^2 values indicating that:

- Attitude toward social media use explained a significant proportion of variance in behavioral intention,
- Behavioral intention contributed substantially to explaining pro-environmental behavior.

Predictive relevance (Q^2 values) was above zero for all endogenous constructs, indicating satisfactory predictive accuracy.

Path coefficients (β) and their significance were tested using bootstrapping with 5,000 resamples. The results are as follows:

- **H1**: Environmental consciousness → Attitude towards use of social media for environmental issues (**β = p < 0.001**) — Supported.
- **H2**: Attitude towards use of social media for environmental issues → intention to behave (**β =p < 0.001**) — Supported.
- **H3**: Issue involvement × attitude towards use of social media for environmental issues → intention to behave (**β =p < 0.05**) — Supported (moderating effect).

These results confirm the hypothesized relationships and highlight the mediating role of attitude as well as the moderating role of issue involvement.

Table 2 : Path coefficients, t-values, and p-values for all hypotheses

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Consciousness > Attitude towards_use of the Social Media for environmental issues.	0.335	0.339	0.052	6.407	0.000
Attitude towards_Social Media -> Intention to behave	0.182	0.181	0.039	4.674	0.000
Issue involvement x attitude towards use of social media towards environmental issues > intention to behave	0.168	0.168	0.042	4.007	0.000

The results of the structural equation modeling indicate significant relationships among the constructs. First, environmental consciousness was found to have a positive and significant effect on attitude towards the use of social media for environmental issues ($\beta = 0.335$, $t = 6.407$, $p < 0.001$). This suggests that individuals with higher levels of environmental consciousness are more likely to develop favorable attitudes toward engaging with social media content related to environmental concerns. This finding is consistent with prior studies which highlight that individuals who are environmentally conscious are more receptive to pro-environmental messages disseminated through digital platforms (Biswas & Roy, 2015; Joshi & Rahman, 2019).

Second, attitude towards social media use for environmental issues was positively associated with the intention to behave in an environmentally responsible manner ($\beta = 0.182$, $t = 4.674$, $p < 0.001$). This indicates that favorable perceptions of social media as a source of environmental information enhance individuals' willingness to involve in pro-environmental behaviors. This result aligns with the theory of planned behavior (Ajzen, 1991), which asserts that attitudes significantly shape behavioral intentions, and supports earlier findings where positive attitudes toward online platforms promoted sustainable behaviors (Ham & Han, 2013).

Finally, the moderating effect of issue involvement on the relationship between attitude towards social media and intention to behave was also significant ($\beta = 0.168$, $t = 4.007$, $p < 0.001$). This demonstrates that the influence of attitude on behavioral intention becomes stronger when individuals are more personally involved with environmental issues. In other words, individuals who are highly engaged with environmental concerns are more likely to translate favorable attitudes toward social media into actual behavioral intentions. This is in line with previous evidence suggesting that issue involvement enhances the strength of attitudinal effects on behavioral outcomes (Zaichkowsky, 1985; Wang, 2021). Taken together, these findings suggest that both environmental consciousness and issue involvement play critical roles in shaping individuals' attitudes and behavioral intentions toward environmental issues via social media platforms.

6. Discussion

The findings of this study reinforce the argument that environmental consciousness is a critical antecedent of pro-environmental decision-making. Consistent with prior research (Dunlap et al., 2000; Bamberg &

Möser, 2007), environmentally conscious individuals were found to evaluate social media platforms more positively when these platforms provided relevant environmental content. This supports the premise that consciousness shapes digital attitudes and validates the integration of TPB and VBN frameworks.

The positive influence of attitude toward social media use on behavioral intention further highlights the role of digital platforms in fostering sustainable practices. Similar to the findings of Erkan and Evans (2016) and Kapoor et al. (2022), the results confirm that favorable attitudes toward social media translate into stronger behavioral intentions. Importantly, the path from intention to pro-environmental behavior was significant, echoing Ajzen's (1991) TPB assertion that intention is the immediate antecedent of behavior.

Finally, the moderating role of issue involvement highlights the importance of personal relevance in strengthening the intention–behavior link. This finding extends Zaichkowsky's (1985) argument on involvement by showing that highly involved individuals are more likely to act on their environmental intentions in digital contexts.

7. Implications

7.1 Theoretical Implications

This finding of this study contribute to the environmental communication and consumer behavior research in several ways. First, by integrating TPB and VBN, it demonstrates how consciousness and digital attitudes jointly shape sustainable behavior, advancing theoretical understanding of environmental psychology in digital spaces. Second, it confirms the mediating role of attitude toward social media, providing empirical support to digital influence literature (Kapoor et al., 2022). Third, the identification of issue involvement as a moderator adds nuance to intention–behavior dynamics, addressing gaps noted in previous attitude–behavior research.

7.2 Practical Implications

From a managerial perspective, the findings highlight the potential of social media campaigns in shaping pro-environmental behavior. Policymakers and NGOs can leverage social media platforms not merely as information channels but as behavioral change tools, focusing on building trust, credibility, and interactive engagement. Businesses promoting eco-friendly products can design digital strategies that emphasize environmental values to align with consumer consciousness. Furthermore, campaigns targeting high-involvement audiences may yield stronger behavioral conversions, making involvement a useful segmentation variable.

8. Limitations and Future Research

There are some drawbacks to this study. First, Delhi-NCR's use of snowball sampling restricts the results' applicability to other areas or rural people. Second, future studies may use longitudinal or experimental methods because the cross-sectional design limits the capacity to conclude causality. Third, behavioral tracking studies are necessary because the use of self-reported measures may induce social desirability bias. Finally, although environmental consciousness was the main focus of this study, future research might include digital literacy or health consciousness as additional factors to expand the framework.

9. Conclusion

The study provides evidence that environmental consciousness shapes positive attitudes toward social media use, which in turn foster stronger behavioral intentions and pro-environmental behaviors. The findings reinforce the relevance of TPB and VBN in digital contexts and highlight issue involvement as an important moderator. Beyond theoretical contributions, the study underscores the transformative role of social media in promoting sustainability, offering insights for policymakers, practitioners, and scholars.

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Adoption of Blended Learning in Management Education: A Bibliometric and Thematic Systematic Literature Review

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Abstract: The aim of this study is to examine the current trends, explore the opportunities, and evaluate the challenges associated with the adoption of blended learning in management institutions, with the goal to provide insights that can help educators and administrators design effective strategies for blended learning implementation. For this study, a systematic review of 214 articles was undertaken. Using Scopus, literature published between 2000-2024 was analysed through visualisation techniques. Using Biblioshiny and VOSviewer, the performance and intellectual structure of the extant literature was examined. Additionally, a thematic analysis was performed to further explore this growing academic field. The review presents a broad overview of the existing literature by focusing on the current understanding about implementation of blended learning in management institutions. By using thematic analysis, several themes were identified namely: Digital Transformation in Education, Student Engagement and Satisfaction with Blended Learning, Institutional Strategies for Blended Learning and Its Effectiveness, Impact of Blended Learning on Learning Outcomes and Blended Learning and Higher Education. These themes present opportunities for academicians to explore in future researches. With the advancement of technology, there has been an unparalleled growth in the adoption of blended learning pedagogy within management institutions. Institutions increased the implementation of blended learning over the years for improving student engagement in comparison to traditional methods. This has generated abundant research opportunities and expanded the existing literature. This study offers a comprehensive overview of current trends, opportunities, and challenges related to technology adoption in management education, thereby guiding future research.

Keywords: Blended Learning, Management Education, Systematic Literature Review, Bibliometric Analysis, Thematic Analysis, Cluster Analysis

1. Introduction

The rapid advancement in technology is making the education sector undergo a major transformation. In the era of Information and Communication Technology (ICT), the educational process is changing from teacher centred to a student centred method. Generation Z wants more control over their learning experiences and aspire to become self-administered learners. This has made the higher institutions make strategic decisions to have the right mix of in-person and remote education as well as invest in technologies that can support students' learning outcomes. According to Babu et al., (2015), higher education being one of the most important institutions, therefore has a bigger responsibility towards the education system in a society. Post the pandemic, students have been giving top-most priority to increased flexibility in learning and skills development (Deloitte, 2022).As per the report of World Government Summit, Covid-19 has led to a change in the traditional learning paradigms and has further accelerated the hybrid learning models, in the higher education (Mc.Kinsey, 2023). Though the lecture method has been the most commonly used approach in traditional teaching, but now higher educational institutes are being compelled to incorporate the change in the methodology required to meet the demands of the prospective students in order to remain competitive. This change is important for the institutes in order to keep pace with the technological revolution-taking place. If technology is used well, then it can provide personalized learning for students, and support teachers as well in their teaching pedagogy (Mc.Kinsey, 2023). As per Transforming Education Summit convened by United Nations Secretary-General, United Nations is committed to achieving the Sustainable Development Goal 4 (SDG4) for transforming education and with its support lot of countries have been working on digitalization, sustainability, and inclusivity in education (UNESCO, 2022).

Blended Learning, a pedagogical approach, which combines synchronous and asynchronous learning and provides instructors with innovative ways of delivering the content, has become one of the most feasible methods of teaching in higher education (Hung Wei Tseng, 2016).

As per Hamad, Shehata and Al Hosni, (2024), students have a favourable attitude towards blended learning and are quite likely to choose it in future. So, it is imperative to integrate technology with the traditional method of teaching so that learning environment can be made more interactive and provides meaningful learning outcomes (Okaz, 2015). As per (Dunbar, 2004), students prefer taking classes online than a live instructor and that they showed satisfaction with the web-based learning methods used. According to Mohammadi, (2015) E-learning benefits teachers and students by having a positive impact on their attention span, learning and training persistence, and thereby fostering a favourable attitude towards collaboration and interaction. After investigating the perception of thirteen lecturers at a higher education institute, Sanders and Mukhari, (2024) concluded that lecturers are willing to make more extensive use of a blended learning approach, as they feel the numerous advantages associated with blended learning can result in more successful teaching outcomes for them. There have been numerous studies exploring the use of blended learning in management education, the challenges faced by teachers and students, effectiveness in student engagement, learning outcomes, and pedagogical strategies. This study advances the existing literature by combining bibliometric and thematic analysis to methodically map the growth of blended learning research in management education. This study can help management institutions in adopting and implementing sustainable blended learning models and also provide insights to scholars for future researches.

The objective of this research is to examine the publication trends on blended learning in higher education across different perspectives in recent years and thereby uncover gaps in the existing literature, which can further guide future researches.

Our research objectives are:

1. To systematically review and analyze the current body of literature on blended learning in management education.
2. To identify critical factors and challenges that influence blended learning adoption.
3. To identify the future research avenues.

This paper is structured as follows. The subsequent section outlines the research methodology and process used for article selection It is followed by a bibliometric analysis and, thereafter, a thematic analysis.

2. Methodology

This study reviews the blended learning literature through a systematic literature review (SLR).This type of review methodology helps in exploring the extant literature through a step-by-step methodology which helps in avoiding duplication and establish rigor while conducting the review. For this study, the authors have conducted a systematic literature review following the guidelines of the PRISMA framework (Prisma, n.d.). PRISMA framework lays down the guidelines for conducting a SLR where the inclusion and exclusion criteria is explicitly stated and screening steps are explained. For this study, we extracted the articles from Scopus database, as it is one of the most credible e-database with a vast number of articles in the field of management. The main keyword query was "Blended Learning". Figure 1 illustrates the search process explaining the criteria for inclusion and exclusion of articles.

The Boolean search phrase for the database was:

TITLE-ABS-KEY= (Blended Learning)

For this study, our inclusion criteria included those articles, which were published between Jan 2000 – December 2024. The results for this study were retrieved on 20th January 2025 from Scopus database. The articles published in journals were included and language chosen was English. A total of 215 articles were screened on the basis of abstract, keywords, and title. After the preliminary screening, one article was removed, as they did not align with the research objectives. We used bibliometric tools like VOSviewer, Biblioshiny, and MS Excel for analysing and reporting these 214 articles. These tools helped the authors in exploring this field's extant literature, performance depth, and intellectual structure.

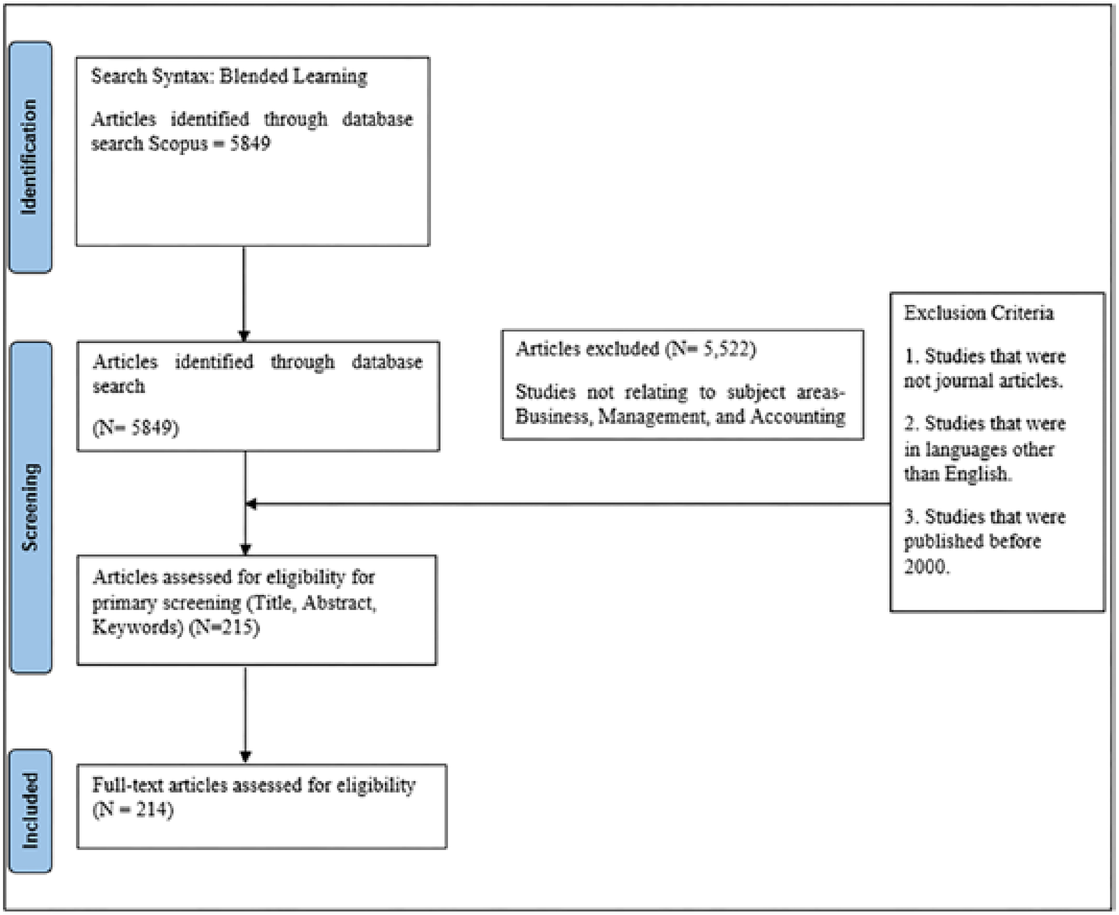

Figure 1: *PRISMA* diagram on the search strategy

3. Results

This section explains the result of this study, we have used 3W1H framework for analysing and reporting the results along with cluster and thematic analysis.

When was the research conducted?

The included 214 articles were published from 2000-2024. 124 articles were published between 2019-December 2024, whereas only 90 were published from 2000-2018. This shows a steady increase in the publications overtime and can be considered as an indicative measure of the potential and interest in this domain. Figure 2 depicts the year-wise publications trends of this area.

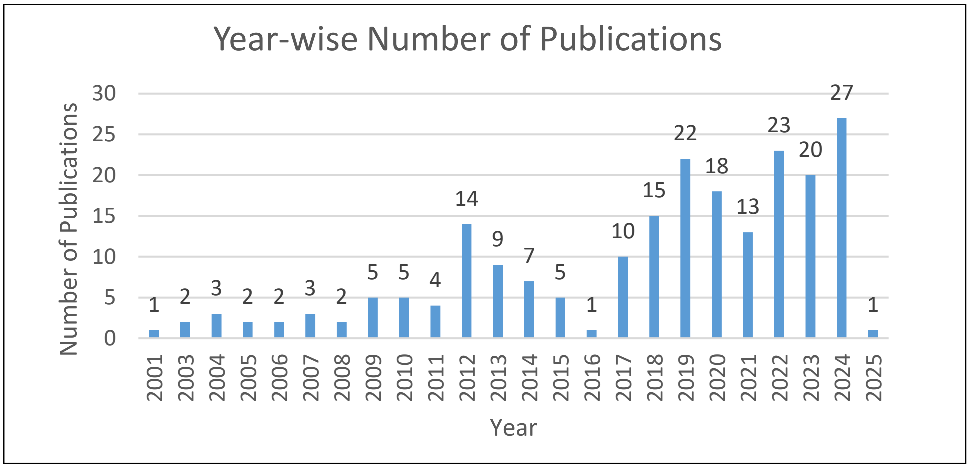

Figure 2: Year-wise number of publications

Where is the research happening?

Figure 3 displays the regional context of selected studies. Most publications are from United Kingdom, followed by the China, and USA. This country-wise trend of publications is derived from author affiliations. Since a single paper may include authors from multiple countries, the cumulative count can exceed the total number of publications.

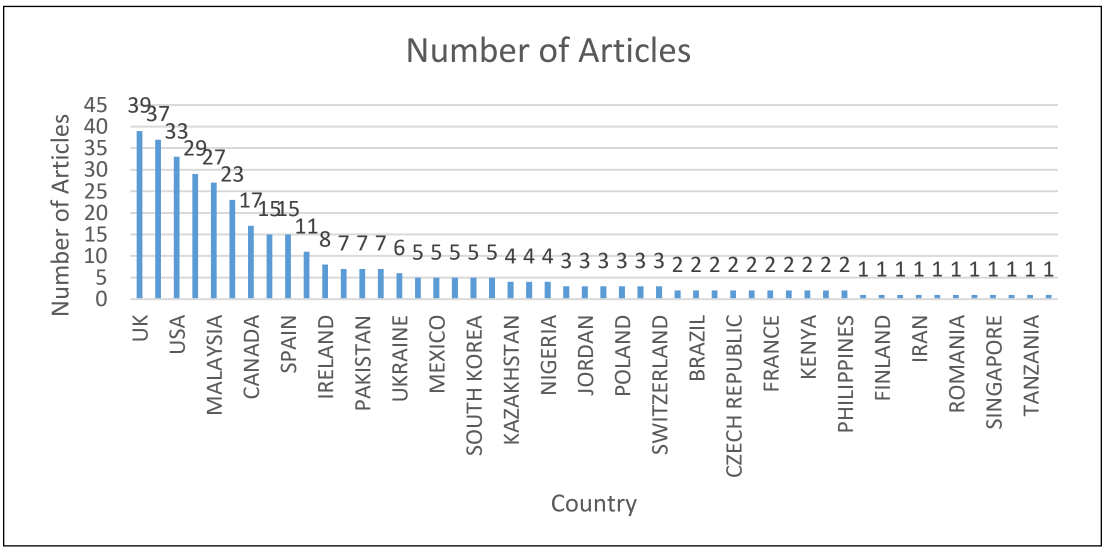

Figure 3: Country-wise number of publications

Source Impact

The analysis of citation shows the most relevant journal in this emerging area. The most relevant journal source was International Journal of Innovation and Learning with 15 documents, followed by International Journal of Management Education with 12 documents. Figure 4 displays the most relevant sources with number of documents published.

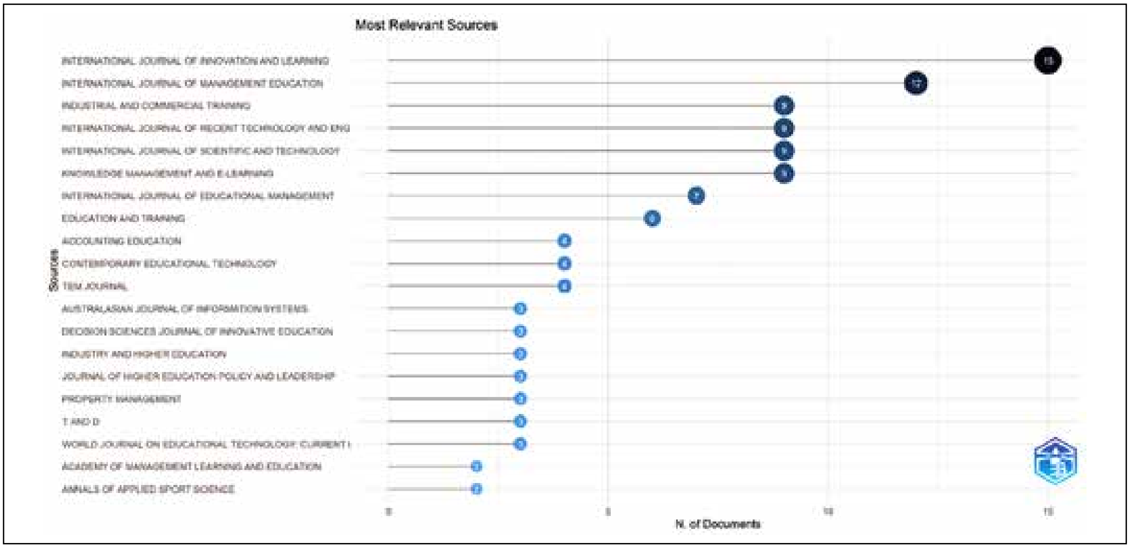

Figure 4: Journal-wise number of publications (Source: Bibliometrix)

Keyword Frequency Analysis

Figure 5 displays the word cloud extracted from Biblioshiny for Blended Learning area. Frequently used words display learning, blended learning, student, and e-learning.

Figure 5: Word cloud (Source: Bibliometrix)

Keyword Co-occurrence analysis

Figure 6 is a **bibliometric network visualization** generated using **VOSviewer**, mapping research themes related to "Blended Learning" based on co-occurrence of keywords. The clusters are grouped by color, representing different thematic areas in the research domain. For this study, we clustered the articles based on keywords frequency in VOSviewer. The minimum keywords occurrence threshold was three as it included the maximum number of articles in the clusters.

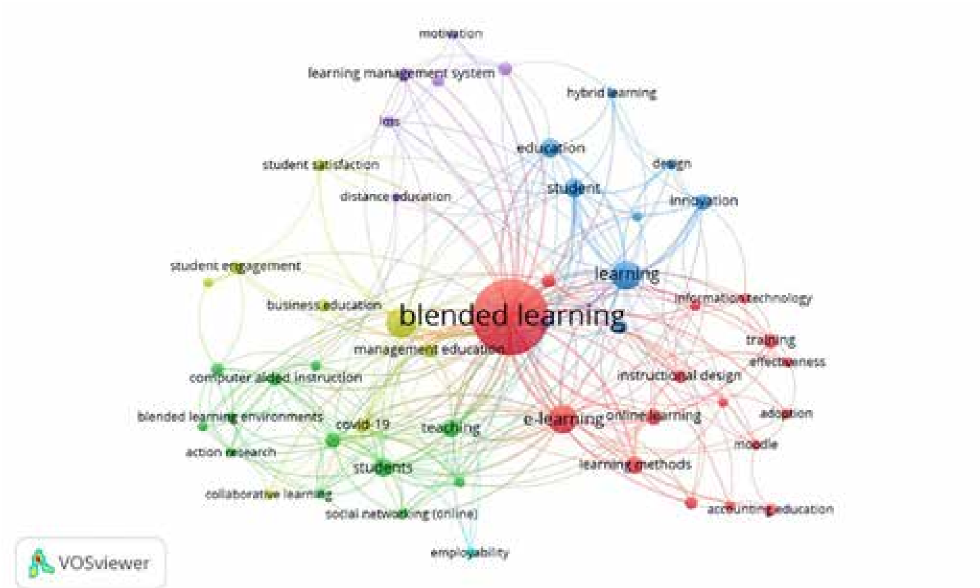

Figure 6: Keyword co-occurrence (Source: VOSviewer)

Table 1 gives information about the five clusters that we have identified through co-occurrence map which are namely 'Digital Transformation in Education', 'Student Engagement and Satisfaction with Blended Learning' , 'Institutional Strategies for Blended Learning and Its Effectiveness' , 'Impact of Blended Learning on Learning Outcomes' and 'Blended Learning and Higher Education'.

Table 1: Keyword Clusters

S.No	Cluster	Name of Cluster	Keywords
1	Cluster 1	Digital Transformation in Education	E-Learning, Instructional design, Information Technology, Online Learning, Moodle, Adoption, Accounting Education, Training, Effectiveness
2	Cluster 2	Student Engagement and Satisfaction with Blended Learning	Education, Hybrid Learning, Innovation, Design, Motivation

S.No	Cluster	Name of Cluster	Keywords
3	Cluster 3	Institutional Strategies for Blended Learning and Its Effectiveness	Blended Learning Environments, Action Research, Collaborative Learning, Employability, Social Networking (online), COVID-19
4	Cluster 4	Impact of Blended Learning on Learning Outcomes	Student Engagement , Student Satisfaction, Business Education, Management Education, Distance Education
5	Cluster 5	Blended Learning and Higher Education	Learning Management System (LMS), Motivation

4. Digital Transformation in Education

With the technology transforming all the sectors, the education sector is also getting transformed specifically with technologies integrating into the various aspects like teaching, learning and the operations carried out in the educational institutions. This transformation in the management institutions is inevitable and the pedagogical practices need to be revamped for enabling the millennial excel in this volatile world (Gupta and Garg, 2021). According to Fleck (2012), the online activities will become more prevalent and would be widely used in supporting the conventional methods of teaching. With the shift towards digital technologies, both educators and learners have been empowered with a more flexible and data driven teaching as well as learning experience. The digital transformation in education is giving rise to an opportunity for the people residing in the rural areas get education through a method that comes with comfort and convenience in an eco-friendly learning environment (Yao, 2019) . The institutions are now responding to the evolving demands of the 21st century learners and at the same time preparing them to become part of digitally driven global workforce.

5. Student Engagement and Satisfaction with Blended Learning

Student engagement and satisfaction are critical indicators of the success of blended learning models in higher education. After studying 42 students, Tan and Neo, (2015) concluded that students are finding blended learning environments very relevant in their learning and that it makes them more engaged with the content. The interactive and flexible elements of the blended learning environment through features such as interactive multimedia content, discussion forums and flexible learning schedules play a key role in keeping students actively involved. After conducting a survey with Gen Z as the sample, Nayar and Koul, (2020) indicated that students feel more engaged with the use of blended learning tools and enjoy the experiential classroom that is created by the educators with the help of those tools. It was also found by them that blended learning tools improve learning effectiveness in comparison to the traditional tools. Similarly, Onofrei and Ferry, (2020) found that the students who were taught though blended learning performed better in the exam-term exams in comparison to the students who were taught through traditional face-to-face teaching methods. Their study further highlighted that blended learning enhances students' learning behaviour, engagement and knowledge retention. Pye et al., (2015) suggested that learning materials and assessment tasks must be well organized around the established curriculum structure and they should be made accessible in formats which enable students to study online or download and use study material offline across different desktop and mobile devices. Furthermore, Pye *et al. (*2015) also indicated that the student engagement and satisfaction depends on the behavior of the teaching staff and the level of attention that is given to the requirements of the students. This theme mainly emphasizes on the students' perspective about blended learning and suggests that student engagement enhances satisfaction, which further contributes to academic success.

6. Institutional Strategies for Blended Learning and Its Effectiveness

For institutions to realise the full potential of blended learning in higher education it is imperative for them to focus on the digital infrastructure, structured training for the educators, administrative support, curriculum design and continuous assessment. Based on three action research case studies in African universities, (Ngoasong, 2021) concluded that management institutions need to work on certain key operational requirements for an effective blended learning pedagogy. These include staff development, updating the existing content, creation of new audio-visual resources, and the integration of digital tools inside the chosen Learning Management System, all of which demands considerable investment in internet connectivity and IT infrastructure. Conversely, Abusalim et al., (2020) found that faculty training exerts a greater influence on student satisfaction than IT infrastructure, which further indicates that institutions should prioritize enabling instructors adopt student-centered pedagogies prior to large-scale IT investments. Ashleigh et al., (2012)indicated that blended learning pedagogy needs to be flexible enough to accommodate the vast variations in the profiles of students and their unique learning preferences. This theme highlights that institutional readiness along with a thoughtful strategy is required for making blended learning more effective.

7. Impact of Blended Learning on Learning Outcomes

By integrating face-to-face teaching with online learning, blended learning positively influences students' engagement and learning outcomes, leading to improved understanding, retention, and knowledge application. In management education, blended learning enhances the outcomes by providing access to diverse resources and interactive content and more engaging learning experiences. Blended learning contributes to effective entrepreneurial learning by building students' ICT capacity and assisting them in understanding how to apply the generic concepts to real life situations by practical exercises (Wong, Tatnall and Burgess, 2014). Furthermore, blended learning approach combined with experimental laboratory raises the likelihood of passing the final exams (Manuel et al., 2019).

8. Blended Learning and Higher Education

Blended learning is transforming higher education, by combining the strengths of both traditional teaching and digital learning tools. The higher education institutions are adapting to the technological advancements along with the changing learner expectations by reshaping pedagogical strategies. According to (Soncin et al., 2022), the program which includes the most intensive usage of online learning is also the most effective in terms of student cognitive gain but it is not the most lucrative pedagogy. One of the major benefits of blended learning is that it has the ability to improve participation and effective learning for postgraduate students across various disciplines (Margaryan, Collis and Cooke, 2004). According to

(Chen et al., 2022), resource support, management strategies and technology infrastructure have positive and significant impact on the readiness to spread the use of blended learning in an institute.

9. Future Research Directions

This section outlines potential directions for future research based on the five identified research categories.

9.1 Research Direction for Digital Transformation in Education

Based on our analysis and review of publications discussing the digital revolution taking place in the education sector, it's been observed that it has become imperative for both the educators as well as the learners to be empowered with a more flexible and data driven teaching as well as learning experience. The reviewed literature also emphasizes a shift from conventional to blended pedagogical models, where both online and face-to-face methods are effectively used to deliver meaningful learning experiences. The future research needs to focus on how educational institutes can manage this transformation for adopting digital tools by ensuring sufficient resource allocation for it. In future, research should be conducted on how faculty needs to adapt to digital teaching tools so that the institutes can provide the required support system. Also, researchers can conduct longitudinal studies to assess the long term impact of the digital initiatives in the management institutes.

9.2 Research Direction for Student Engagement and Satisfaction with Blended Learning

Our analysis of the studies reviewed showed that students find blended learning tools more engaging and they feel that using digital tools with traditional pedagogy improves their knowledge retention as well as their academic performance. Gen Z believes that the use of experiential learning tools contributes to higher enthusiasm and academic commitment. The future research should focus on understanding the perception of student population across variety of age, disciplines and cultural contexts so that institutes can personalize the blended learning pedagogy to suit the different learner groups. Future studies can also take up studies to understand how the quality of faculty interaction along with the use of digital tools influence student engagement which further impacts student satisfaction.

9.3 Research Direction for Institutional Strategies for Blended Learning and Its Effectiveness

Our analysis suggested that only making large investments in IT infrastructure is not enough for management institutions to make blended learning effective. They need to work on critical operational requirements such as staff training, infrastructural support and comprehensive institutional planning. Future researches can focus on how the institutions can plan to develop and implement blended learning along with studying the success factors and barriers involved. Studies should also examine the cost effectiveness of incorporating blended learning in management institutions. Such researches would help institutions develop their strategies for this pedagogical transition.

9.4 Research Direction for Impact of Blended Learning on Learning Outcomes

Our Analysis highlighted that blended learning has a significant impact on student learning outcomes. Several studies emphasize the fact that blended learning helps in applying theoretical concepts to real life scenarios which is required in the management education where critical thinking and innovation are prioritised. Blended learning is also cultivating entrepreneurial competencies among students and at the same time having a positive impact on their academic performance. Future researches can have longitudinal studies to gauge the impact of blended learning over time on the retention and application of knowledge by the students. The different blended learning tools can also be compared in future studies to understand the suitability of different tools for different learning outcomes. Researchers can also study the correlation between blended learning and employability in professional management courses, which can help institutes to work on course curriculum accordingly.

9.5 Research Direction for Blended Learning and Higher Education

Our analysis of the articles reviewed showed that through incorporating blended learning, the higher education is working on meeting the evolving needs of the learners of the 21st century. but this shift comes at a cost where the institutes need to do a cost benefit analysis between pedagogical benefit and economic viability. Future researchers can conduct studies to evaluate the cost effectiveness of different blended learning models comparing the investment needed with the institutional benefits. Comparative studies can also be done to compare the adoption level of blended learning across various countries at different level of development. Research can also be conducted for examining the faculty resistance or readiness towards technology adoption in management institutions.

10. Conclusion

This study, reviewed 214 articles related to blended learning and its adoption in management institutions along with the challenges or concerns, from the Scopus database. The previous literature was investigated to study the intellectual and conceptual framework of the field. Using bibliometric analysis, the annual scientific production, number of citations, influential authors and sources were examined. The most prominent themes in this field were identified through keyword co-occurrence analysis. The main clusters identified were Digital Transformation in Education, Student Engagement and Satisfaction with Blended Learning, Institutional Strategies for Blended Learning and Its Effectiveness, Impact of Blended Learning on Learning Outcomes and Blended Learning and Higher Education.

Though there is a growing presence of this field in academic research, there aren't many studies on the actual use, efficacy and viability of blended learning pedagogy in management institutions. Although the intention to employ blended learning is expanding, the actual adoption rate is still low, according to the authors. There are several critical barriers that put constraints on successful implementation of this pedagogy. The inadequate training of faculty, infrastructural deficiencies and diverse student population pose major challenges to implement blended learning effectively. There is a need for a strategic approach to blended learning adoption that considers and works on both technical as well as human factors. By using insights from this review, institutions can develop the criteria for monitoring institutional readiness, faculty capability, learning effectiveness and student engagement when adopting blended learning.

This study has a few limitations. We used the Scopus database; the future researchers can broaden the scope by incorporating additional databases. The review included only English-language articles, excluding all others. A comparative research on the usage of blended learning across various countries, along with their respective challenges or barriers, would be valuable.

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India's Role in Global Supply Chain Diversification: From Back Office to Manufacturing Hub

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Abstract: Over the last decade, the global economy has witnessed unprecedented volatility driven by geopolitical tensions, pandemic-induced disruptions, and a shifting emphasis on supply chain resilience. Multinational corporations (MNCs) are now strategically reconfiguring their global production networks to mitigate risks arising from overdependence on China. India, with its robust digital infrastructure, favorable demographics, and evolving industrial ecosystem, has emerged as a strong alternative in this diversification process. This paper critically examines India's evolving role in global supply chain diversification, tracing its journey from a service-led to a manufacturing-oriented economy. The research integrates theoretical perspectives on global value chains (GVCs) with empirical data on trade, investment, and policy reforms to assess India's competitiveness, opportunities, and constraints. Further, it discusses India's potential to emerge as a resilient and sustainable manufacturing hub amid the global "China+1" strategy.

Keywords: Supply Chain Diversification, India, Manufacturing Hub, Global Value Chains, China+1 Strategy, Industrial Policy

1. Introduction

Global supply chains have undergone significant structural transformation over the past two decades. The combined shocks of the US–China trade conflict, the COVID-19 pandemic, and subsequent geopolitical disruptions revealed the vulnerabilities of highly concentrated production networks. In response, global firms are prioritising diversification, redundancy, and risk mitigation over pure cost efficiency. India, now the world's fifth-largest economy, has increasingly featured in corporate and policy discussions as a strategic destination within this rebalancing process. Historically characterised as the "back office of the world", India's integration into the global economy was driven largely by services such as information technology, business process outsourcing, and knowledge-based services. While this services-led growth model generated foreign exchange and employment, it did not significantly embed India within global manufacturing value chains. The post-pandemic restructuring of global trade, however, presents India with a renewed opportunity to reposition itself as a manufacturing and supply chain hub.

Policy initiatives such as *Make in India*, the Production Linked Incentive (PLI) scheme, the National Logistics Policy, and PM Gati Shakti indicate a strategic shift towards strengthening domestic manufacturing capacity and export competitiveness. Recent global assessments further highlight India's growing relevance in supply chain reconfiguration amid persistent geopolitical and climate risks (World Bank, 2025; UNCTAD, 2026). This paper analyses whether these initiatives are sufficient to move India from peripheral participation towards deeper integration in global value chains.

The objective of this study is threefold:

1. To analyze India's evolving role in global supply chain diversification and its comparative advantages.
2. To evaluate policy, infrastructure, and institutional enablers shaping India's manufacturing competitiveness.
3. To identify structural challenges and propose actionable pathways for India's sustainable GVC integration.

2. Literature Review

2.1 Global Value Chains and Supply Chain Resilience

The concept of global value chains (GVCs) explains how production activities are geographically fragmented across countries based on comparative advantage, coordination costs, and governance structures. Seminal work by Gereffi et al. (2005) emphasised governance mechanisms and inter-firm linkages that determine value creation and capture. Earlier theories of competitiveness focused on factor endowments and scale economies (Porter, 1990; Krugman, 1995), while Baldwin's (2011) "second unbundling" highlighted the role of digital technologies in fragmenting production stages across borders.

Following the global financial crisis and subsequent disruptions, academic focus shifted towards resilience, flexibility, and sustainability.

2.2 India's Participation in Global Value Chains

Empirical studies consistently show that India's participation in manufacturing GVCs remains lower than that of East Asian peers. OECD Trade in Value Added (TiVA) data indicate that India's foreign value-added share in exports is significantly below that of Vietnam and Malaysia. While India has achieved global leadership in services value chains, its manufacturing exports remain concentrated in medium-skill segments (ADB, 2022).At the same time, India's digital advantage is widely recognised. NASSCOM (2024) notes that India accounts for over half of global IT outsourcing, creating opportunities to integrate digital capabilities into manufacturing and logistics. Scholars increasingly argue that India's services strength could enable a hybrid model of digitally enabled manufacturing rather than a purely labour-intensive pathway.

2.3 Policy and Institutional Perspectives

The role of industrial policy in shaping GVC participation has been widely debated. Panagariya (2019) and Ghosh (2021) stress the need to move from protectionist approaches towards facilitative ecosystems that lower transaction costs. Infrastructure and logistics reforms have also gained prominence, with improvements in India's Logistics Performance Index reflecting gradual efficiency gains (World Bank, 2024).

2.4 Recent Literature (2025–2026): Supply Chain Diversification and India

The World Bank (2025) highlights that geopolitical fragmentation and climate-related disruptions are reshaping manufacturing location decisions, with firms increasingly favouring politically stable and digitally capable economies. Similarly, OECD (2025) argues that future GVCs will be characterised by regionalisation, digital coordination, and sustainability compliance rather than hyper-globalisation. UNCTAD's World Investment Report (2026) identifies India as one of the few large economies combining market scale, policy stability, and digital infrastructure conducive to diversified manufacturing investment. McKinsey Global Institute (2025) notes that while India's cost competitiveness remains attractive, its long-term advantage lies in integrating manufacturing with digital public infrastructure, enabling transparency and traceability across supply chains. IMF working papers (2025) further suggest that India's policy-driven manufacturing expansion could mitigate global concentration risks if supported by trade facilitation and skill development.

3. India's Manufacturing Evolution: From Services Dominance to Industrial Ambition

3.1 Historical Context

India's economic liberalization in 1991 marked a pivotal shift from a protectionist, license-based economy to one embracing globalization and private enterprise. Between 1995 and 2015, the manufacturing sector's contribution to GDP averaged 15–17%, significantly lower than China's 30% during the same period (World Bank, 2022).

3.2 Make in India and Production Linked Incentives

Launched in 2014, *Make in India* sought to revitalise manufacturing across key sectors. Although initial outcomes were mixed, the initiative laid the groundwork for subsequent reforms. The PLI scheme, introduced in 2020 across 14 sectors, directly links incentives to incremental output and investment. Mobile phone exports and electronics manufacturing have shown notable growth, signalling early success in embedding India within selected global supply chains.

4. Policy and Institutional Enablers

4.1 Infrastructure Modernization

- 56 multimodal logistics parks under development.
- The National Highway network expanded from 97,000 km in 2014 to 146,000 km in 2024.
- Dedicated Freight Corridors (DFC)-Western and Eastern-are reducing transit times by 40–60%.

4.2 Regulatory and Trade Reforms

India's Ease of Doing Business ranking improved from 142 in 2014 to 63 in 2020 (World Bank). Introduction of GST (2017) and Insolvency and Bankruptcy Code (IBC, 2016) has simplified compliance and improved investor confidence.Trade facilitation measures-such as electronic customs clearance and Authorised Economic Operator (AEO) certification-have reduced dwell times at major ports by nearly 30%.

4.3 Skill Development and Human Capital

India's demographic dividend-over 65% of its population below 35 years-offers an unparalleled labor advantage. However, skill alignment remains a challenge. Initiatives like the Skill India Mission, PMKVY, and Digital Skilling Framework (2022) aim to bridge this gap. A report by McKinsey (2024) estimates that India will require 90 million skilled workers in manufacturing and allied sectors by 2030.

4.4 Green and Sustainable Manufacturing

Global supply chains are increasingly prioritizing ESG (Environmental, Social, and Governance) compliance. India aims for 50% of its energy from renewables by 2030 and Over 300 industrial clusters have adopted zero-liquid discharge and green certification frameworks.

5. Comparative Analysis: India vs. Other Emerging Manufacturing Hubs

5.1 India and China: The Inevitable Benchmark

China's dominance in global manufacturing-accounting for 28% of global output (UNIDO, 2023)-is driven by economies of scale, robust infrastructure, and a deeply integrated supplier network.

Table 1: Comparative Analysis: India vs. Other Emerging Manufacturing Hubs

Indicator	China (2024)	India(2024)	Vietnam(2024)
Manufacturing share of GDP	28%	17%	24%
Labor cost/hour (USD)	6.5	1.9	3.1
Logistics Performance Index rank	19	38	43
FDI inflows (USD bn)	189	71	36
Export value-added share	40%	18%	35%

Source: World Bank, OECD TiVA, UNCTAD (2024).

India's cost competitiveness and large domestic market are clear advantages. However, achieving supply chain manufacturing, tooling, and R&D integration-remains a critical gap.

5.2 Vietnam, Indonesia, and Mexico: Competing in the "China+1" Race

Vietnam's agile trade policies and preferential trade agreements (e.g., RCEP, EVFTA) make it a top destination for electronics and apparel manufacturing. Indonesia leverages natural resource advantages (nickel, aluminum) to attract electric vehicle supply chains. India, while late to the race, compensates with its market scale, policy stability, and technological talent base. The success of Apple's supply chain shift to India underscores this trend. Foxconn's plans to invest USD 1.5 billion in Tamil Nadu and Karnataka illustrate deepening confidence in India's ecosystem (Reuters, 2024).

5.3 Key Challenges in Comparative Context

- Fragmented supply base: India lacks the integrated industrial clusters seen in China or Vietnam.
- Logistics cost (13–14% of GDP) is significantly higher than the global average (8–9%)
- Regulatory uncertainty at state levels often deters long-term investment.
- Export competitiveness: India's average export-to-GDP ratio (22%) lags behind Asian peers (~45%).

6. Integration into Global Value Chains (GVCs)

6.1 India's Current Position in GVCs

India's participation in GVCs remains relatively low compared to other major Asian economies. According to the OECD TiVA Database (2024), India's foreign value-added content in exports is around 18%, whereas Vietnam's exceeds 35% and Malaysia's is above 40%. This indicates that India still exports largely domestically produced goods, with limited integration into cross-border supply chains. India's participation in Regional Comprehensive Economic Partnership (RCEP) was limited due to domestic concerns, but subsequent bilateral trade agreements with Australia, UAE, and the EU (under negotiation) are expanding trade corridors.

6.2 Supply Chain Reconfiguration Post-COVID-19

The COVID-19 pandemic accelerated the diversification of global supply chains as companies sought alternatives to China. Terms such as *China+1, Friendshoring, and Resilient Supply Chains* have since become strategic imperatives.

India emerged as a natural beneficiary due to Its political stability and large domestic market, Competitive labor costs and improving ease of business and Strategic geographic location, enabling access to both ASEAN and Middle Eastern markets.

The Quad alliance (India, US, Japan, Australia) and the Supply Chain Resilience Initiative (SCRI) between India, Japan, and Australia have further emphasized India's role in developing a balanced, multi-polar manufacturing ecosystem. Recent studies (OECD, 2025; IMF, 2026) suggest that GVC diversification is no longer cyclical but structurally embedded due to persistent geopolitical and climate risks.

6.3 Key Enablers for GVC Integration

- Trade Agreements and Market Access:

  Recent FTAs, such as India–UAE CEPA (2022) and India–Australia ECTA (2023), include tariff concessions, rules-of-origin flexibility, and technology collaboration-encouraging global firms to use India as a manufacturing base.

- Export Infrastructure:

  The Sagarmala and Bharatmala projects aim to enhance port and road connectivity, while Industrial Corridors (Delhi-Mumbai, Chennai-Bengaluru) are attracting anchor investors.

- Customs Digitization:

  The rollout of ICEGATE 2.0 and Paperless Customs has reduced clearance time by 60% at key ports like Nhava Sheva and Chennai.

- Financial and Trade Incentives:

  Schemes such as RoDTEP (Remission of Duties and Taxes on Export Products) and TMA (Transport and Marketing Assistance) have enhanced export competitiveness.

7. Technological Transformation and Digital Supply Chains

7.1 Industry 4.0 and Smart Manufacturing

India's manufacturing ecosystem is embracing Industry 4.0, characterized by automation, IoT, AI, and advanced analytics. Government-backed programs such as SAMARTH Udyog Bharat 4.0 have established Centres of Excellence for digital manufacturing in partnership with industry and academia.

According to NASSCOM (2024), over 45% of large Indian manufacturers have adopted at least one element of smart factory solutions-ranging from digital twins to predictive maintenance. Adoption is particularly strong in sectors like automobiles, aerospace, and electronics.

Table 1: Adoption rate and key impact

Technology	Adoption Rate (2024,%)	Key Impact
Industrial IoT	48	Real-time asset tracking, downtime reduction
Robotics & Automation	42	Enhanced precision, reduced labor dependency
Predictive Analytics	37	Improved demand forecasting
Additive Manufacturing	22	Customization, reduced prototyping time
Blockchain (supply chain)	15	Improved transparency and traceability

Source: NASSCOM Manufacturing Report, 2024

7.2 Digital Public Infrastructure and Supply Chain Visibility

India's experience in building Digital Public Infrastructure (DPI)-including Aadhaar, UPI, and ONDC (Open Network for Digital Commerce)-is now being leveraged to create transparent, interoperable B2B and logistics ecosystems.

- ONDC for B2B logistics enables supplier discovery and order fulfillment through open APIs, reducing dependence on proprietary e-commerce platforms.
- The ULIP (Unified Logistics Interface Platform) connects data across transport ministries, improving multimodal freight visibility.
- The integration of AI-driven demand planning with e-invoicing systems ensures better cash flow and compliance for MSMEs.

7.3 Emerging Technologies and Innovation Ecosystem

India's startup ecosystem plays a key role in enabling supply chain innovation. Over 350 logistics-tech startups are addressing challenges in last-mile delivery, route optimization, cold chain tracking, and B2B warehousing.

Notable examples include: Delhivery, which uses AI-based predictive modeling to optimize transit routes,Stellapps, a dairy supply chain platform integrating IoT devices for real-time milk quality monitoring, LogiNext, offering SaaS-based delivery and workforce management solutions across 25+ countries.

8. Sectoral Case Studies: Lessons from Transformation

8.1 Electronics Manufacturing: The Apple and Foxconn Effect

The electronics sector exemplifies India's transition from assembly to value addition. Companies such as Foxconn, Pegatron, and Wistron have expanded operations to assemble iPhones in India.

8.2 Automotive and Electric Mobility

India's automotive industry-valued at over USD 150 billion-is rapidly transitioning toward electric mobility (EVs). The FAME II policy and PLI for Advanced Chemistry Cells (ACC) are creating a local EV supply chain ecosystem. Such as- Tata Motors, Ola Electric, and Mahindra are scaling EV production domestically also Hyundai and BYD have announced plans to manufacture battery components and electric drivetrains locally so India's EV exports grew from USD 40 million in 2021 to USD 380 million in 2024 (DGFT, 2024).

8.3 Pharmaceuticals and Healthcare Manufacturing

India's pharmaceutical sector already contributes 20% of global generic medicine supply and launched the PLI for APIs and Bulk Drugs (2020), covering 53 critical molecules. As of 2024, 35 greenfield API units have been established, reducing dependency by 20%.This diversification aligns India with global healthcare supply chains seeking reliability and compliance under new post-COVID standards.

8.4 Renewable Energy and Green Manufacturing

- India is the world's third-largest solar power producer, with 80 GW installed capacity (MNRE, 2024).
- Domestic production of solar modules and battery cells under the PLI scheme has attracted investments from Adani, Reliance, and First Solar.
- Export of renewable energy components rose 180% between 2020 and 2024, positioning India as a critical player in sustainable manufacturing supply chains.

9. Strategic Outlook and Emerging Challenges

9.1 Balancing Scale and Sustainability

While India's manufacturing sector has achieved notable expansion, sustainable scalability remains a concern. The country's ambition to become a USD 1 trillion manufacturing economy by 2030 depends not just on investment inflows but also on energy security, environmental compliance, and social equity. India faces dual pressures one is that Global ESG compliance: Western buyers now demand verifiable sustainability disclosures and carbon footprint data and secondly Domestic constraints: High logistics costs (≈13% of GDP) and infrastructure gaps in Tier-2 cities could offset cost advantages.

To address this, the government's National Green Hydrogen Mission and Carbon Credit Trading Scheme (2023) aim to align industrial growth with climate commitments. Several Indian exporters have begun obtaining ISO 14001 and RE100 certifications to meet European Union Carbon Border Adjustment Mechanism (CBAM) requirements.

9.2 Labor Productivity and Skills Gap

India's labor force is young but unevenly skilled. The Manufacturing Skill Council of India (MSCI) estimates that only 48% of industrial workers possess job-relevant technical training.
Bridging this gap requires:

- Modernization of ITIs (Industrial Training Institutes) under Skill India 2.0.
- Corporate partnerships for dual apprenticeships (e.g., Siemens, Bosch).
- Embedding *micro-credentials* and digital certifications in vocational curricula.

9.3 Geopolitical and Trade Risks

India's rise as a manufacturing hub is also influenced by evolving global geopolitics .US-China tensions have encouraged diversification but may expose India to secondary sanctions or technology transfer barriers. India's response lies in developing strategic partnerships with mineral-rich nations (e.g., Australia, Chile, and Namibia) and deepening domestic exploration under the Critical Minerals Mission (2024).

10. Policy Recommendations

10.1 Deepening Manufacturing Ecosystems

To sustain its ascent, India must strengthen industrial clusters beyond assembly to high-value manufacturing. Recommendations include:

- Sector-specific industrial clusters: Expand electronics clusters in Tamil Nadu and Gujarat to include precision engineering and component manufacturing.
- Shared infrastructure models: Public-private industrial parks with ready utilities, R&D centers, and logistics hubs.
- Integration of MSMEs: Use platforms like ONDC for B2B to digitally integrate MSMEs into larger OEM supply chains.

10.2 Strengthening Trade Competitiveness

- Logistics cost reduction: Implement the National Logistics Policy (NLP) with measurable KPIs to reduce logistics costs from 13% to 8% of GDP by 2030.
- Customs modernization: Adopt AI-based risk management for faster clearance and integrate customs systems with trade finance portals.
- Comprehensive trade diplomacy: Balance FTAs with strategic manufacturing incentives to attract technology-intensive sectors.

10.3 Encouraging Innovation and R&D

India's R&D expenditure remains below 1% of GDP, compared to 2.4% in China and 2.8% in South Korea.

10.4 Green and Digital Supply Chains

Future supply chains will be carbon-efficient and digitally transparent. India should Promote green logistics corridors powered by renewable energy ,Mandate carbon disclosure reporting for export-oriented industries and Integrate blockchain traceability for textiles, food, and pharmaceuticals.

10.5 Education-Industry Convergence

Academic institutions must evolve from theoretical teaching to applied problem-solving.

- National Centres of Excellence in Supply Chain Studies, linked to universities.
- Inclusion of real-time industrial data in business curriculation.

11. Conclusion

India's journey from a service-oriented "back office of the world" to a credible "manufacturing and supply chain hub" represents one of the most significant structural transformations in modern economic history.

India's success in global supply chain diversification will depend not merely on cost efficiency, but on its ability to build trust, traceability, and technology-driven transparency. The next decade offers India an unparalleled window of opportunity-if navigated with foresight, inclusivity, and institutional agility.

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Impact of Carbon Pricing Policies on Environmental Sustainability

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Abstract: Carbon pricing is a policy tool that has become one of the most significant tools in the global effort to address the problem of climate change through the internalisation of the externality of greenhouse gas emissions. Carbon taxes (CT) and emissions trading schemes (ETS) are two phenomena that have become key instruments in supporting the global campaign against climate change. Despite this fact, empirical research disregarded the role played by these instruments in mitigating carbon emissions by expressly considering the countries that have CT and ETS in place. In this paper, the author will analyze the effects that the two carbon pricing policies will have on carbon dioxide emissions between the years 1990 and 2024. The empirical approach is followed by the thorough method of diagnostics, and the tests of cross-sectional dependence, slope heterogeneity, panel unit roots, and cointegration. The results show that ETS has better performance in reducing emissions compared with CT whose effects are less and statistically unimportant in the long term. This paper can be seen as a contribution to the literature as it connects the policy, providing viable insights to policymakers striving to effect net-zero changes.

Keywords: Carbon Pricing, Carbon Taxes, Carbon Emissions, Emissions Trading Scheme, STIRPAT Model

1. Introduction

Among the most urgent problems of the modern world is climate change, which causes serious economic, environmental, and social implications due to increased carbon emissions. Carbon pricing is becoming one of the most influential tools with policymakers, regulators and researchers targeting the strategy to reduce carbon emissions. Carbon pricing policies encompassing the use of carbon taxes (CT) and emission trading schemes (ETS) aims at promoting low-carbon substitutes and minimizing energy use (Tamasiga et al., 2024). The policy is intellectually inspired by Pigouvian taxes (1920), and was developed over the 1990s period of the Montreal Protocol, as the tradable permits, to contemporary schemes. Where CT accords a set amount of money to one unit of emissions, an ETS is an incentive that maintains a limit on the overall quantity of emissions emit and produces settlements, or trade permit of emissions (Ahmad et al., 2024). Carbon policies do get mentioned as an effective method to help reduce climate change, as they offer households and businesses economic incentives to cut emissions at a cost-effective level (Khan & Johansson, 2022). There are 75 carbon pricing programs, comprising 36 ETS and 39 CT, covering approximately 24 per cent of global GHG emissions operating in the world today. These national and subnational programs are yielding 104 billion dollars in revenues in 2024, which are usually recycled into green investments or rebates. This raises important questions relating to the effectiveness of these policies. Do CT and ETS policies work in minimizing GHG emissions? What policy has had the most successful results?

CT still is the policy instrument of choice of economists to restrain emissions, yet it is commonly attacked by the general population as ineffective and harmful to the economy. In G7 countries, environmental taxes drive down the levels of carbon emissions, and thus the policy makers can target these policies in order to reach carbon neutrality (Safi et al., 2021). On the same note, the rate at which the carbon emissions in China change is negatively related to the rate of CT (Safi et al., 2021). The level of CT in China is more regressive in rural but urban regions, and therefore, policy responses to reduce income disparity among income groups and between rural and urban regions are necessary (Guo et al., 2022). That is why one should pay attention to the policy of CT and the economic growth of the GDP of a country. Conversely, other studies have also reported no impact of a CT on the level of emissions (Widianingsih, 2024).

Laing et al. (2014) discovered that the EU ETS decreased emissions by an average of 40–80 million t/year. Similarly, in China, ETS significantly negatively impacts low-carbon development (Zhang & Zhang, 2019). According to Jia et al. (2025), the government must initially make ETS more effective by establishing explicit and foreseeable emission caps that progressively become stricter with time so as to ensure that high energy-intensive sectors are adequately motivated to cut emissions. According to a study by Wang & Kuusi (2024), the total carbon embodied in trade has risen as a result of EU ETS because the carbon leakage has balanced the rates of reduction in the exported carbon content of countries of the EU ETS. The conflicting results encourage us to establish the influence of the policy on emissions.

The motivation for this analysis stems from two key gaps in the literature. First, while numerous studies evaluate carbon pricing's direct effects using quasi-experimental designs (e.g., difference-in-differences), few integrate these with decompositional models like STIRPAT to isolate pricing's role amid confounding factors like population growth or technological diffusion. The use of the "Fixed effects regression with Driscoll-Kraay" approach improves the methodological strength, which helps in dealing with the issues related to cross-sectional dependence and autocorrelation in panel data. Secondly, the research studies a noteworthy gap in the recent domain of environmental studies by explicitly examining the countries that have CT and ETS in place. The findings of this study have substantial implications for stakeholders and policymakers who aim to address environmental concerns.

1.1 Objectives of the Study

The study seeks to fulfil these objectives –

1. This study aims to evaluate the impact of CT and ETS on the environment within the STIRPAT framework, accounting for factors such as population, affluence and technology.

2. Secondly, the performance is compared in countries that have CT and ETS in place.

3. Thirdly, this study utilizes fixed effects regression with Driscoll-Kraay standard errors, which is robust to cross-sectional dependence and autocorrelation of the panel data.

The remaining sections of the paper are structured as follows: Section 2 reviews the related literature. Section 3 presents data and the methodology employed in the paper. The results of the findings are provided in section 4. Section 5 concludes the findings and policy implications. Limitations are provided in section 6.

2. Literature Review

Early adopters like Sweden, with a CT of \$127/tCO2e since 1991, achieved 25% lower emissions relative to counterfactuals by fostering fuel switching and efficiency gains (Andersson, 2019). Pretis (2022) focused on British Columbia, estimating a semi-elasticity of -0.15, implying a 15% reduction for a 100% price hike, using synthetic controls to address confounding factors. Tshiaba & Liao (2025) emphasized the importance of effectively structured and consistent CT policies to attain the goals of carbon neutrality in China. Panel data analyses extend these findings globally. Best et al. (2020) examined 142 countries from 1990–2016, finding CT slows emission growth by 1–2 percentage points annually, robust to endogeneity via instrumental variables Another study showed that in the long run, high carbon emissions will force the firms to pay more taxes and consequently, they will gradually change to low-carbon (Rokhmawati et al., 2024).

ETS literature showed that ETS adoption significantly reduces overall carbon emissions per capita compared to other global events, such as oil crises (Jung & Song, 2023). Another study indicates that the effect of ETS in reducing emissions is related to trading scale and hence, each million tons of carbon trading volume reduces emissions by an average of 1.69 million tons (Li et al., 2026). Early evaluations (2023) confirm reductions of 2–3% in covered sectors, but low prices (\$8/tCO2e) limited the broader impacts (Narassimhan et al., 2018). ETS has a larger effect in reducing income inequality in urban areas with higher per capita GDP and higher carbon emissions (Yu et al., 2021). The impacts of ETS are heterogeneous on the cities with different orientations in urban agglomeration (Liu et al., 2024) .

This literature review synthesises empirical evidence on the impacts of CT and ETS on CO2 emissions, drawing from panel data studies across diverse jurisdictions. It emphasises methodological advancements, such as addressing cross-sectional dependence, heterogeneity, and non-stationarity in panel analyses, while incorporating control variables like urbanisation, renewable energy consumption, and GDP per capita. The review highlights comparative effectiveness, providing a foundation for analyses of 29 CT-implementing countries and 39 ETS jurisdictions. The literature on carbon pricing's impact on CO_2 emissions is voluminous, spanning theoretical models, computable general equilibrium simulations, and ex-post econometrics. However, this paper contributes to the literature by providing empirical analysis of the effects of both CT and ETS separately on carbon emissions, for a broad sample of countries that have adopted these polices.

3. Methodology and Data

3.1 Methodology

This paper studies the impact of CT and ETS on carbon emissions using the STIRPAT model. Urbanisation (URB), renewable energy (REC), GDP per capita (GDPPC), CT, and ETS are all identified as determinants of carbon emissions (CO_2). URB is a proxy for population(P), REC is a proxy for Technology, and GDPPC is taken as a proxy for Affluence (A). As a result, equations (1) and (2) provide the empirical model to examine how CT and ETS cause carbon emissions

Model 1: (1)

Model 2: (2)

Before establishing a relationship among variables, the study first determines the effects of these factors on CO_2 emissions using the Driscoll-Kraay fixed effects method. Driscoll & Kraay (1998) approach is used to resolve the problem of cross-sectional dependency, autocorrelation, and heteroscedasticity. Moreover, the technique provides consistent estimates for both temporal and cross-sectional dependence in both balanced and unbalanced panels (Hoechle 2007).

3.2 Data

This study uses balanced panel data of 29 and 39 countries from 1990 to 2024 for model 1 and model 2, respectively. The dependent variable is CO_2 emissions measured in metric tons taken from the World Development Indicators (WDI) of the World Bank. The main independent variables are CT and ETS, both of which are coded as dummy variables that take a value of 0 in years without CT and ETS and 1 in years with CT and ETS. Three control variables are included. Firstly, urbanization, measured as a percentage of the total population, is taken. Secondly, renewable energy consumption is used as the share of renewable energy in total final energy consumption. Lastly, GDP per capita is measured to determine the level of economic development of countries. The World Bank's WDI offers the data on renewable energy usage and GDP per capita, while data on CT and ETS are taken from the Our World in Data database. Table 1 presents the data which is used in both the models while Tables 2 and 3 provide the descriptive statistics of the variables and the correlation matrix for models 1 and 2, respectively.

Table 1: Data used in both the models

Variable	Definition of variable	Measure	Source
CO_2 emissions	CO_2 emissions stem from the use of fossil fuels and the production process.	Metric tons	WDI
Urbanization	Means people living in urban areas as defined by national statistical offices"	% of the total population	WDI
Renewable energy consumption	REC means the share of renewable energy in the total final energy consumption.	% of total final energy consumption	WDI
GDP per capita	GDP (in constant 2010 U.S. dollars) divided by population	US dollars per capita	WDI
CT and ETS	Carbon taxes and the emission trading scheme	0 or 1	Our world in data

Source: Authors own work

Table 2: Descriptive statistics and correlation matrix for model 1

Variable	lnce	lnurban	lnrec	lngdppc	ctdummy
Obs	1,015	1,015	929	980	1,015
Mean	17.92867	4.254787	2.539433	10.51749	0.442365
Std. Dev.	1.851628	0.343091	1.21689	0.61348	0.496912
Min	11.76241	2.660469	-1.60944	9.174304	0
Max	20.99472	4.60517	4.417635	11.83991	1
	lnce	lnurban	lnrec	lngdppc	ctdummy
lnce	1				
lnurban	0.5069	1			
lnrec	-0.4678	-0.207	1		
lngdppc	-0.1861	0.2008	-0.0884	1	
ctdummy	-0.0914	-0.0559	0.3438	0.2447	1

Source: Authors own work

Table 3: Descriptive statistics and correlation matrix for model 2

Variable	lnce	lnurban	lnrec	lngdppc	etsdummy
Obs	1,365	1,365	1,222	1,322	1,365
Mean	17.83326	4.212776	2.460859	10.45665	0.487912
Std. Dev.	1.935992	0.31879	1.182774	0.62268	0.500037
Min	11.76241	2.660469	-2.30259	7.418737	0
Max	23.23197	4.587251	4.417635	11.83991	1
	lnce	lnurban	lnrec	lngdppc	etsdummy
lnce	1				
lnurban	0.3186	1			
lnrec	-0.3181	-0.2136	1		
lngdppc	-0.2341	0.3056	0.0023	1	
etsdummy	-0.0953	0.0926	0.2209	0.4586	1

Source: Authors own work

4. Results and Discussion

This section presents the results of the findings. The cross-sectional dependence, heterogeneity, and panel unit root tests are shown initially. The "Panel cointegration test" table expresses the results of the panel cointegration test, whereas the "Long-run estimations results" table shows the results of long-run estimates.

4.1 Results of cross-sectional dependence, heterogeneity, and panel unit root tests

The cross-sectional dependence test is used in order to avoid the problem of cross-sectional dependence, which leads to biased results. The results presented in Table 4 indicate that at the level of significance of 1% the null hypothesis of cross-sectional independence is rejected. Further, Table 4 at the bottom gives the results of the heterogeneity test. The findings reveal that the slope homogeneity hypothesis is not accepted at the 1% level of significance, which means that panel has a certain heterogeneity. Also, cross-sectional augmented Dickey Fuller (CADF) tests are utilized to test the stationary of the data. The findings in Table 5 show that the variables rec, gdppc, dummy variables and CO2 emissions are not stationary at level but stationary at the first difference.

Table 4: Cross-sectional dependence, and heterogeneity tests

	Model 1	Model 2
Pesaran CD test		
Pesaran CD statistic	-3.282 (0.0010)	22.577 (0.000)
Heterogeneity test		
Delta	37.576 (0.000)	43.407 (0.000)
Adjusted delta	41.687 (0.000)	48.283 (0.000)

Source: Authors own work

Table 5: Unit root test results

CADF unit root test	Model 1		Model 2	
	level	First difference	level	First difference
Lnce	-0.768	-11.943***	-0.632	-13.639***
Lnurban	1.776	1.285	5.884	3.435
Lnrec	-0.745	-11.154***	-0.181	-11.407***
Lngdppc	-2.395	-8.068***	-0.818	-9.289***
Ctdummy	4.322	-4.661***		
ETSdummy			-10.166***	-13.323***

Source: Authors own work

The Pedroni cointegration test determines whether there is a long-term link between the variables. There is evidence of a long-term relationship between CO2 emissions, urbanisation, consumption of renewable energy sources, per capita GDP and CT/ETS as shown in the results presented in Table 6. All statistics reject the null hypothesis that there is no cointegration.

Table 6: The results of the Pedroni panel cointegration test

	Model 1		Model 2	
Modified Phillips-Perron t	2.5496	0.0054	1.8714	0.0306
Phillips-Perron t	-5.7778	0.0000	-7.6178	0.0000
Augmented Dickey-Fuller t	-5.0343	0.0000	-7.2699	0.0000

Source: Authors own work

Table 7: Long-run estimations results

	Model 1		Model 2	
Lnurban	.8279232	0.000	.7473699	0.000
Lnrec	-.3033993	0.000	-.2013475	0.000
Lngdppc	.2762108	0.000	.2850633	0.000
Ctdummy	-.0240953	0.198		
Etsdummy				0.010
Constant	12.45118	0.000	12.44402	0.000
Observations	896		1189	

Source: Authors own work

This study employs the Fixed effects Driscoll–Kraay estimator approach to examine the effects of CT and ETS on CO_2 emissions, while controlling for urbanization, renewable energy consumption, and economic growth. The long-run estimation results are reported in Table 7.

The results indicate that urbanization exerts a positive and statistically significant effect on CO_2 emissions across both model specifications. The positive coefficient of urbanization suggests that increases in the urban population are associated with higher levels of carbon emissions. Due to urbanization, increasing population density and concentration of economies leads to increase in the consumption of fossil fuels, thereby heightening the pressure on the environment. This observation aligns with the STIRPAT framework and supports previous studies that urban expansion is a source of environmental degradation, particularly in the setting of weak environmental regulations.

On the other hand, renewable energy consumption shows a negative and statistically significant relationship with CO_2 emissions in both models. This result indicates that increased proportion of renewable energy in total final energy consumption leads to a reduction in carbon emissions. This finding signifies the role of renewable energy sources in curbing climate change and aligns with previous studies highlighting the emissions-reducing potential of renewable energy deployment.

The coefficient of GDP per capita exhibits a positive and statistically significant value, and therefore, it means that economic growth results in increasing CO_2 emissions in the long term. Economic growth enhances income levels but it also increases energy demand, which shows that growth in itself does not necessarily translate into environmental improvements without related policy support (Ahmad et al., 2024).

Turning to the key policy variables, the results reveal that CT has a negative but statistically insignificant effect on CO_2 emissions. While the coefficient suggests that the introduction of CT is associated with a reduction in emissions, the lack of statistical significance shows that the effectiveness of CT varies across countries and time. The findings are in line with the study by Lin & Li (2011), which found that the effects of CT in Denmark, Sweden and the Netherlands are negative but not significant. The reason is that the mitigation effects of CT are weakened due to the tax exemption policies on certain energy-intensive industries in these countries.

In contrast, the findings show that ETS have a statistically significant impact on CO_2 emissions, indicating that market-based cap-and-trade mechanisms are more effective in controlling emissions. ETS frameworks introduce an emissions cap and establish economic incentives for firms to decrease emissions through cost-effective abatement or technology. This result supports the evidence that ETS can become central in meeting climate mitigation targets when well-designed and implemented effectively (Li et al., 2025).

5. Conclusion and Policy Implications

This paper estimates the long-run effect of carbon pricing instruments on CO 2 emissions in the STIRPAT model using balanced panel data on countries that may have adopted CT and emissions ETS between the years 1990 and 2024. The findings demonstrate that urbanization and economic growth are related to increased CO_2 emissions, thus demonstrating the environmental issues related to the fast urbanization and development of energy requirements based on urbanization. The use of renewable energy, on the other hand, is very crucial in lowering the emission-causing system, which highlights the significance of clean energy transitions. When it comes to pricing of carbon, the results show that the ETS are more effective in terms of minimizing CO 2 emissions compared to the CT, whereas the effect of the latter seems to be statistically insignificant in the long term (Al-Abdulqader et al., 2025).

There are significant policy implications of these findings. First, governments ought to enhance the structure and application of a price mechanism on carbon, especially an ETS, through sufficient coverage of the sector and strong enforcement of the carbon price. A properly operating ETS has the potential to generate powerful incentive to the firms to use cleaner technologies and to be more energy efficient. Second, the policymakers must realize that CT cannot be effective only when the rates are low or ineffective. In order to improve effectiveness, the level of CT ought to be established in a way that effectively internalizes the social cost of carbon and is supplemented by enabling regulatory and institutional frameworks. Third, the beneficial effect of renewable energy on the reduction of emissions indicates that there is a necessity to further invest in renewable energy infrastructures, such as funding, subsidies, and favourable regulatory measures. By increasing the capacity of renewable energy, this will be able to decouple economic growth and carbon emissions and enable a sustainable development pathway. Fourth, since urbanisation increases emissions, governments are advised to encourage sustainable urbanisation policies, including green buildings, low-carbon transport infrastructure, compact cities, and intelligent infrastructure. The inclusion of climate in urban policy is vital in curbing the environmental impact of urban development. Altogether, the paper indicates that carbon pricing policy, especially ETS, in conjunction with renewable energy development and sustainable urban development, can be instrumental in creating long-term emissions cuts. These policy tools play an important role in achieving national and global climate goals as well as economic growth.

6. Limitations

There are also certain limitations of this study. To begin with, the price of taxes, the price of emissions, and free allowances could also be included in the equations, instead of dummy variables. Second, more econometric methods that address the dynamics of the policies in the future are advised.

7. Statements and declarations

Data Availability

Data will be made available by the authors upon request.

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Conflicts of Interest

The author(s) declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

8. Contribution

Conceptualization and writing of the original draft: Harsha Dugar, Ashish Kumar. All authors have read and agreed to this version of the manuscript.

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Reflection of Gender Stereotyping on Brand Personality: A Review on Shifting Framework in Brand Advertising

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Abstract: Brand personality is the intentional personification of brands, intentionally crafted by marketers to align with the overall marketing strategy and the consumer segment they are targeting. Marketers also associate gender-specific traits with products to create a brand's personality. The study consists of two parts. The first part of the paper reviews marketing studies on the relationship between gender stereotyping and brand personality. The paper also presents scales used to study and measure brand personality. The second part discusses four advertising cases in the Indian context in which gender stereotypes are broken and an alternate brand personality is established. The analysis of the advertisements shows a shift away from traditional branding practices and from stereotypical product portrayals toward a more gender-neutral, inclusive depiction.

Keywords: Gender Stereotype, Brand Personality, Brand Advertising

1. Introduction

As humans, we naturally personify the things around us. Marketers have long capitalised on this tendency, associating products with human traits to resonate with their target segments. For instance, some brands may use masculine traits, such as strength and dominance, to attract male consumers, and feminine traits, such as beauty and sensitivity, to appeal to female consumers. However, when brands present themselves this way, society expects both genders, potentially leading to gender stereotyping. This practice, known as 'Brand Personality' (Aaker, 1997), can reinforce gender stereotypes, limiting individuals' self-perception and potential. This societal impact of gender stereotyping in brand advertising should concern us all and motivate us to strive for change.

Conversely, some brands may consciously or unconsciously defy gender stereotypes and advocate for gender equality. The presentation of non-stereotypical content in advertising can influence societal norms and encourage more progressive thinking. For instance, brands that depict men performing traditionally feminine tasks, such as cooking or cleaning, can help disrupt traditional gender roles and foster greater equality in household responsibilities.

In traditional societies, the roles of men and women were compartmentalised, i.e., fixed for each gender. Marketers have also been using similar standards to create a product image, favouring general market sentiment. However, with changes in economic conditions and lifestyle, there is a paradigm shift in the gender-specific attribution of brands. This paper presents a systematic review of the literature that showcases the different research on brand personality and stereotyping. The concluding section also highlights four cases of a shift in brand personality from masculine to feminine. "A set of human characteristics associated with the brand is known as brand personality" (Aaker, 1997)

2. Objectives of the Study

A review study of gender stereotyping and brand personality can have several objectives. The objectives of this study are:

(i) To explore the relationship between gender stereotypes and brand personality: One of the main objectives of this study is to investigate the extent to which gender stereotypes build brand personality. The study analyses how brands are marketed and how gender stereotypes are reinforced through branding.

(ii) To examine the various dimensions of brand personality and the scales developed to measure it.

(iii) To identify the effects of branding that have broken away from conventional Gender Stereotypes. The study explores the advantages and disadvantages of gender-neutral branding and how it can help break gender stereotypes.

3. Research Methodology

The study is based on an analysis of previous literature on brand personality and gender stereotyping to identify the effect of gender stereotyping on brand personality. The research methodology chosen integrates the findings of different studies to address the objectives of this paper, as stated above.

A thematic literature review was conducted for the first two objectives, yielding 70 papers. Of these, 18 related to gender stereotyping, while 51 related to brand personality. Of the documents related to brand personality, 14 pertained to dimensions and scale development, while the rest addressed behavioural aspects of brand personality.

For the third objective, four previously aired television commercials featuring prominent gender stereotypes are contrasted with those currently airing with a gender-neutral approach. Subjective analysis and discussion from a social and economic perspective have been done.

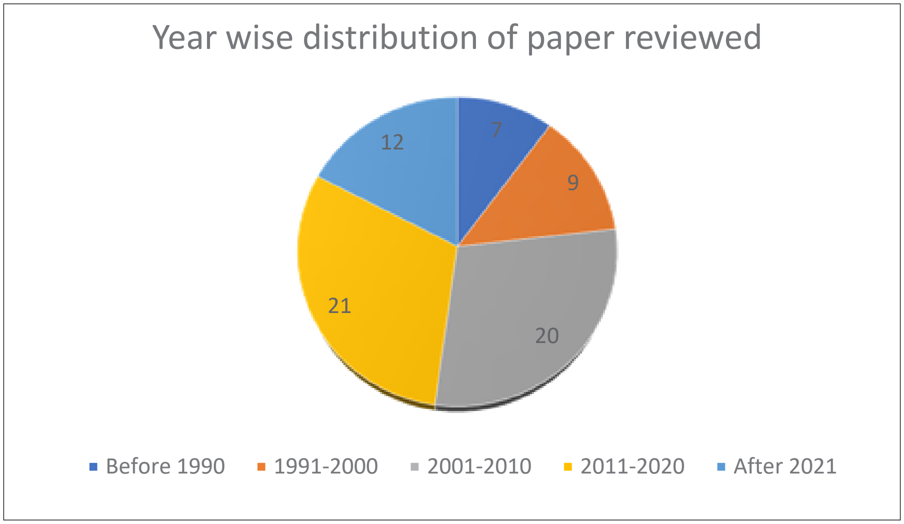

Figure 1: Year wise distribution of paper reviewed

4. Theoretical Concept

Stereotypes are beliefs that persist permanently in the mind. They consist of broad assumptions about how individuals behave in various situations and what is considered right or wrong conduct. Gender stereotyping has its origins in traditional gender roles that have existed in societies throughout history. These roles were often based on biological differences between men and women, such as women being responsible for bearing children and men providing for their families through physical labour. The media has played a significant role in reinforcing gender stereotypes.

This study will examine the evolution of gender stereotypes in brand advertising and their influence on brand personality. According to existing research, customer reactions to gender-bending brands—i.e., the dilution and revision of companies' gender identity connotations—can vary significantly between men and women (Sandhu, 2017). Women often prefer companies with a masculine personality, whereas men tend to favour brands with a strong masculine identity (Alreck, 1994). Male consumers' hesitation towards gender-bending brands is related to a desire to maintain traditional masculine traits. Consequently, firms that seek to redefine their gender identity may encounter resistance from customers who view this as a challenge to their sense of masculinity.

Digital brand storytelling has evolved as an effective way for firms to shape their gender identity and engage with customers more directly. By creating compelling narratives that challenge gender stereotypes, brands can cultivate a more inclusive, progressive brand personality and appeal to a diverse consumer base. Advertising, movies, TV shows, and other media often portray men and women in stereotypical ways; Putrevi (2001 reinforced the idea that certain traits and behaviours are appropriate for one gender but not the other. According to Rudman et al. (2012), men and women perform specific societal roles, and both would be penalised if they go beyond stereotyped traits. Stereotypical traits are performed by women, e.g., supportiveness, compassion, expression, and warmth, whereas stereotypical traits are performed by men, e.g., ambition, assertiveness, competitiveness, and action. According to Rayaprol (2011), gender stereotyping is not only raised through advertising; the role of the teacher is also essential when implementing feminist pedagogy in teaching.

Chaudhary (2004) states that print media, through advertisements and gender images, prominently shows a shift from traditional women homemakers and mothers to women in corporate leadership. Both women and men have embraced new ideas of masculinity, including different definitions of success and power. This aligns with the new Indian economy's advocacy of globalisation and the economic policies of the new Indian state.

5. Gender stereotyping

Research on gender stereotypes in advertising has been conducted for over five or six decades. It became necessary when researchers recognised that women were affiliated with a disadvantaged group within our society. Television representations and advertisements often demean their roles within their homes and cultures. In India, the feminist movement was initiated in the 19th century by Savitribai Phule. Subsequently, numerous reformers discussed women's rights and education. In the late 1920s, the roles of men and women evolved as the labour force changed. A woman's gender identity is influenced by her physical body, body image, and experiences of embodiment, with media and literature serving as significant socialisation instruments (Dube, 1988; Lateef, 1990; Thapan, 2004). Compared to their potential and capabilities, women were portrayed negatively. Nonetheless, data indicate a gradual shift towards more positive role depictions. Previous research (Lysonski, 1985; Cortez, 1999; Kilbourne, 1999; Lazar, 2006; Plakoyiannaki & Zotos, 2009) suggests that advertising perpetuates inequality and distorted body image symbols as legitimate and acceptable, thereby exacerbating gender disparities. Since then, substantial changes have occurred in women's roles and representations.

Deaux and Lewis's (1984) research identifies a generally accepted set of gender-stereotype traits, including trait descriptors, role behaviours, occupations, and physical appearance, each with masculine and feminine versions. These categories include trait descriptors (e.g., superiority, sympathy), role behaviours (e.g., leader, nurturing family members), physical characteristics (e.g., hair length, body weight), and occupations (e.g., doctor, truck driver, teacher, housewife).

Stereotypes in advertising can influence customers' views and interests; they are often a topic of concern (Giaccardi, 1995; Pollay & Gallagher, 1990). Stereotypes about gender roles can be reinforced by content related to gender, where male characters are more likely than female characters to be active, dominant, and in control (Bakir & Palan, 2010). It is noted that, to promote products and services, brands typically choose gender-stereotyped traits to shape their brand personality. It would be easy for brands to divide products into masculine and feminine categories.

6. Brand personality

Aaker (1997) defined Brand personality as a set of human characteristics associated with the brand." Brands choose certain traits that directly influence their target population. For example, according to Sikka and S Kumar (2021), Apple's brand personality is competent, sincere, and excited. Apple products are always launched with new models, demonstrating its competency and earning the trust of its consumers. The brand tries to satisfy its customers with the latest technology and exciting features.

According to Japutara et al. (2018), a brand resonates with an ideal version of the human self, facilitating easier emotional and intentional connections with the target audience. Brands can cultivate relationships with customers both before and after purchases, nurturing ongoing feelings of attachment. For instance, Nokia initially succeeded by leveraging brand qualities such as trustworthiness, reliability, and intelligence. However, they eventually lost market share because they failed to keep pace with competitors. Even now, customers still trust the brand, but they are reluctant to buy products without the latest technology. Brands consistently deliver their messages through appropriate content, which can significantly influence customer perception.

Aaker outlined five scales of brand personality: sincerity, competence, excitement, sophistication, and ruggedness. Aaker (2001) offers a detailed discussion of each scale. For example, sincerity denotes a brand that demonstrates honesty and warmth; excitement denotes a brand with high energy; competence denotes an intelligent and competitive brand; sophistication denotes charm and class; and ruggedness denotes masculinity and toughness. A brand's personality sets it apart from competitors (Park & John, 2010; Phau & Lau, 2000) and allows for consumer self-expression (Aaker, 1997). These traits tend to be distinctive and consistent over time, helping forge a strong, unique brand identity (Batra et al., 1993). As a result, marketers and advertisers continuously monitor market trends, as these influence the development of specific brand personalities. Successful brands strive to reduce resistance to change by strategically planning and adapting their actions to align with societal norms, customs, beliefs, and standards.

7. Gender Stereotypes and Brand Personality Implications on Marketing Strategies

Gender stereotypes and brand personality significantly influence marketing strategies, shaping how consumers perceive and engage with brands. The brand representative or advertiser intentionally develops the brand's personality to reflect masculine or feminine traits. Grohman created a scale based on two dimensions: masculine and feminine brand personality, which directly indicate how consumers perceive or identify with the brand. Researchers use the Grohmann scale to analyse consumers' perceptions of these gendered brand personalities (Grohmann, 2008). Lieven et al. (2015) highlighted how advertisers use fonts, colours, and different names to influence consumer perceptions and reinforce masculine and feminine brand identities. They concluded that gender-specific brands clearly showcase masculinity and femininity, thereby boosting brand value. Kennedy, E., & Ind, N. (2022) proposed that both genders participate in co-creating brand activities when the brand aligns with their values, and they advised brand managers to adopt strategies that motivate and influence male and female consumers.

Humans perceive brand gender as two distinct dimensions: masculine and feminine brand personalities. A masculine brand has high masculinity and low femininity, whereas a feminine brand has low masculinity and high femininity. A bi-sexual brand exhibits low levels of both masculinity and femininity (Azar, 2015; Grohmann, 2009; Lieven et al., 2014). According to Pogacar et al. (2021), feminine brand names are perceived as more sincere, warm, and down-to-earth, which makes them more appealing and contributes to better brand performance and consumer choices. Recognising that gender plays a key role in shaping brand personality helps companies develop feminine and masculine brands by using gender stereotype traits. Brands employ various marketing strategies to create the brand personality they aim to convey to their target audience.

8. Brand personality dimensions

The commonly recognised Big Five personality traits—conscientiousness, extraversion, agreeableness, neuroticism, and openness—have become a comprehensive, empirically supported model for describing significant interpersonal personality differences (Fiske, 1949). Aaker (1997) proposed a five-factor structure for brand personality, of which three are related to the Big Five personality traits outlined by Fiske (1949). Sincerity correlates with conscientiousness and agreeableness. Like extraversion, excitement is characterised by friendliness, energy, and activity. Competence is based on traits associated with extraversion and conscientiousness. Sophistication and Ruggedness, the other two traits, are not connected to any Big Five dimensions. Aaker's brand personality framework is largely replicated by Aaker (2000), Aaker et al. (2001), and Kim et al. (2001). Several other researchers developed somewhat different versions (e.g., Smit et al., 2002; Sung & Tinkham, 2005), but none succeeded in replicating the Big Five structure. This is not surprising, as most of these studies started with Aaker's definition of brand personality. Caprara, Barbaranelli, and Guido (2001), Bosnjak et al. (2007), and Milas and Mlačić (2007) used only Big Five personality traits (see Table 1).

(Fiske 1949) The Big Five personality traits are Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness. These traits are easily related to individual personality and influence human behaviour (Costa & McCrae, 1992). Aaker (1992) laid the foundation of the brand personality scale using the Big Five personality traits and provided a new definition of brand personality as "a set of human characteristics associated with the brand." According to Epstein (1977), human and brand traits are perceived similarly; however, they differ only in how they are shaped. Perceptions of individual personality are based on physical characteristics, attitudes, demographic features, and beliefs (Park, 1986). Conversely, the perception of brand personality traits can be easily shaped through direct and indirect contact with customers (Plummer, 1985).

Brand personality includes gender (whether the brand targets males or females), age (since brands are sensitive to age indicators and aim to appeal to different age groups), and class (whether the brand sells luxury or non-luxury products). Brands may use demographic traits to position and promote their products. For example, based on gender, brands develop gender-specific personalities: Royal Enfield is seen as masculine, while Prestige is viewed as feminine. Similarly, according to pricing strategies, Fab India is considered a premium brand, whereas V Mart is perceived as a value brand.

9. Brand personality scales by a different author

Table 1: Summary of Brand personality traits by different authors

S. No.	Brand Personality Theory Authors	Country	Trait
1.	Aaker (1997)	US (Brands)	Sincerity, Excitement, Competence, Sophistication, Ruggedness
2	Aaker, Benet, and Garolera (2001)	Japan (brands)	Sincerity, Excitement, Competence, peacefulness Sophistication
3.	Aaker, Benet-Martinez, and Garolera (2001)	Spain (brands)	Sincerity, Excitement, Peacefulness, Passion Sophistication
4	Caprara, Barbaranelli and Guido (2001)	Italy (brands)	Markers of 1 (Agreeableness and emotional stability) Markers of 2 (Extroversion and openness)
5.	Smit, Van Den Berge and Frazen (2002)	Netherlands (brands)	Competence, Excitement, Gentle, Distinction, Annoyance

S. No.	Brand Personality Theory Authors	Country	Trait
6.	Sung and Tinkham (2005)	US (brands)	Likeableness, Trendiness, Competence, Traditionalism
7.	Venable, Ros, Bush, and Gilbert (2005)	US (non-profit)	Integrity, Nurturance
8.	Hosany, Ekinici and Uysal (2006)	UK (destination personality)	Sincerity, Excitement Conviviality
9.	Bosnjak, Bochmann, and Hufschmidt (2007)	Germany (Brands)	Drive, Consciousness, Emotion Superficiality
10.	Milas & Mlacic (2007).	Croatia (brands)	Conscientiousness, Extraversion, Agreeableness, Intellect, Emotional Stability
11.	Ferrandi J.M., Valette-Florence P. and Fine-Falcy (2015)	France (Brands)	Sincerity, Dynamism, Robustness, Conviviality
12.	Ahmad, A., & Thyagaraj, K. (2015)	Indian Brands	Sophistication, Excitement, Popularity, Competence, Trendiness, Integrity
14.	Bishnoi & Kumar 2016	Indian Brand (two-wheeler)	down to earth, family-oriented, small town, feminine, smooth, sincere, western, successful, sentimental and independent
13.	Kumar & Sikka 2023	Indian Brands (Apparel)	Vigorous/Excitement, Integrity, Charismatic, Uniqueness/Versatility

Table 1 presents the brand personality scale used globally. Aaker (1997) defined the brand personality scale based on the Big Five personality traits. Following these scales, various other authors have developed different brand personality scales in their respective countries. The scales created by different authors are typically tailored to their populations and sample statistics used in their studies. However, they are generally based on Aaker's brand personality scale or the Big Five personality traits.

10. Relevance of Brand Personality in the assessment of the target segment and positioning segment

Specific human or gender traits help shape a brand's distinct personality. Through methods like segmentation, targeting, and positioning, brands choose specific characteristics to establish their unique identity. When asked questions such as 'For whom are we creating the product?'—the actual user may still be unknown—and 'How do customers perceive and remember the product?', these require thorough research. For example, when scooters first entered the Indian market, their slogan, "Hamara Bajaj," along with most ads, featured male actors. As a result, the Bajaj brand primarily appeals to men and seeks to reinforce its image through the slogan "Hamara Bajaj." It is seen as a symbol of aspiration for the middle class, mainly targeting men in traditional jobs from morning to night. The advertisement indicates that owning a Bajaj scooter helps start daily tasks and makes life easier. The company created multiple ads with the same tagline—"Hamara Bajaj" and "family vehicle"—to support its positioning strategy. Consumers connect these products with memorable music and lyrics in commercials. Therefore, using conventions allows a brand to effectively craft its personality by properly positioning and targeting its products.

11. Influence of Gender Stereotyping on the Assessment of Brand Personality

A common idea originates from the human mind, whether the product targets males or females, or how humans directly connect with the brand. This terminology refers to stereotyping when consumers associate products with a specific gender, class, or status. Certain preconceptions or attribute associations are linked to males or females, known as gender stereotyping. According to Deaux and Levis (1984), gender stereotypes are influenced by traits such as physical characteristics, role behaviour, occupational status, and trait descriptors. Each of these includes masculine and feminine statements, like trait descriptors—e.g., superiority (generally linked to males) and sympathy (more linked to females); role behaviour—e.g., leader (more associated with males) and caring and nurturing family members (more associated with females); physical traits like hair length—long hair associated with females and short hair with males; body weight preferences—females generally preferring a slim figure, males a more macho personality; and occupation—jobs like doctor and truck driver are more associated with males, while school teachers and homemakers are more linked to females. Additionally, brands select specific attributes or characteristics in their advertising. Before targeting and positioning, it is crucial to understand your target customer and choose personality traits that best fit their audience — based on shared emotions, attitudes, and perceptions — then focus on that group. According to Brassington & Pettitt (2000), advertising is considered a direct tool that consumers easily relate to in terms of products and services.

12. Cases of brand personality and gender stereotyping

After several decades of observation, the advertising landscape has evolved considerably. Advertisements have played a crucial role in shaping viewers' perceptions. Advertisers use various methods to portray their products, which naturally suggest whether the product targets males or females. They craft tailored messages and ads for both genders, and audiences perceive these differently. Stereotypical portrayals reflect society's expectations of male and female behaviour; these roles promote unrealistic assumptions about one gender (Grau & Zotos, 2016). Gender stereotypes are rooted in the belief that specific characteristics, attributes, and behaviours distinguish genders (Eisend, 2010). Reactions to gender stereotypes in advertising can differ across cultures and change over time, as they are influenced by evolving cultural factors (Eisend, 2010, 2019). Despite this, advertising still frequently features stereotyped images of men and women, reflecting a longstanding industry practice (Grau & Zotos, 2016; Eisend, 2019; Knoll et al., 2011).

During the 1990s, many advertisements depicted women in subordinate roles, such as relying on their partners or family members, serving decorative purposes, being used as sex objects, or being placed alongside household appliances. However, there has been a significant change in how women are portrayed in advertising over the past thirty years. Today, companies focus more on promoting women's empowerment through their advertising campaigns. Over time, women's roles in society have evolved. Past and current advertisements can be seen as both reflections and influences. From a reflection perspective, advertisements mirror the values and beliefs dominant in society. This view also reveals stereotypical portrayals that have persisted for many years. Consequently, advertising shapes stereotypical images that reflect current socioeconomic and cultural norms, emphasising traditional roles for men and women. Conversely, the influence perspective suggests that advertising reflects society's prevailing values and norms. This view underscores behaviours or patterns that people have followed over the years. The following are examples of how companies have adjusted their advertising strategies over time.

Case 1 Popular International Chocolate Brand

It is a popular international chocolate brand that children and young people enjoy using to celebrate special moments. In the 1980s advertisements, female spectators sat in stadiums watching cricket matches while holding chocolate. The jingle “Asli said zindagi ka” plays in the background as she rushes past security to celebrate with her cricket-playing male friends after they hit a winning six. In this ad, women’s roles are limited to watching cricket matches, presenting a stereotypical view of their roles. It reflects a common advertising theme, and a later advertisement from the same brand, released two decades later, shows the opposite. It depicts the striker’s boyfriend sitting in the stands, holding a chocolate bar. The same jingle plays as he goes onto the pitch to recreate the famous dance after his girlfriend hits the winning six. In this ad, women’s roles are portrayed as empowered, energetic, and confident. The role of women is celebrated on social media through this reversal of the trend. This advertisement challenges typical advertising stereotypes.

Table 2: Summary Table for case-1 advertisement analysis

Gender Stereotype traits Deaux and Lewis's (1984)	**Old Advertisement**	**New advertisement**
Trait descriptor	The role of men is superior.	The role of women is superior.
Role behaviour / Occupation	The role of a man as a leader is depicted as playing cricket, whereas the role of a woman is described as nurturing and caring.	A woman's leadership is shown through playing cricket, whereas a man's leadership is shown through caring.
Physical Characteristics	Man, more competent and empowered	Women are more competent and empowered.

Case 2 Premium Detergent Powder

Premium washing detergent powder is used for washing clothes, although it has traditionally been considered a household job. Advertisements during the 80s depict women’s concern for their girl child’s dress, reflecting their typical household responsibilities—caring for family and children—and ultimately portray this role as one performed only by women. This presents a mirror argument in advertisements that reflects societal norms, beliefs, values, and customs prevailing at the time. After two decades, the brand offers a different perspective, with an ad showing a mother teaching her son how to wash clothes. The brand introduces the tagline “share the loads.” This campaign sparked conversations about the unequal division of domestic chores and encouraged more men to #share the load. It promoted the idea of men as equal partners, playing equal roles in household responsibilities. Consequently, the campaign challenges stereotypical representations in advertisements, moving away from traditional gender roles and showcasing a more balanced view.

Table 3: Summary Table for case-2 advertisement analysis

Gender stereotype traits	Old Advertisement	New advertisement
Trait descriptor	The role of women is superior in household chores.	The role of man is also portrayed in household chores.
Role behaviour / Occupation	A woman's role as a leader is to care for her family and others.	A man's role as a leader is to care for his family and others.
Physical Characteristics	Women are more concerned about their family responsibilities.	Men also contribute to their families and children.

Case 3 Famous Off-road Sports Vehicle

Off-road sports vehicles are generally used by young people and those who enjoy vintage and off-roading capabilities. The brand's advertisement, launched 20 years ago, portrayed women primarily in decorative roles — tall, slim, fair women — while men drove and women waited passively. This ad depicted stereotypical representations and reflected societal norms. However, the ad released by the same brand in 2022 shows society's changing beliefs, norms, and customs. It features both men and women driving, rejecting the stereotype that only men can drive. The ad presents driving as an activity anyone can do, regardless of gender. As a result, the product's market value increased, indicating that consumers now recognise the importance of gender representation in advertising. It demonstrates an acknowledgement of gender equality and participation. In this way, the brand challenges the myth that women are not drivers. The new ad, launched in 2022, avoids stereotypical imagery that previously appealed to the audience. Through this advertising, the brand subtly conveyed that women can drive cars, challenging old stereotypes.

Table 4: Summary Table for case-3 advertisement analysis

Gender stereotype traits	Old Advertisement	New advertisement
Trait descriptor	The role of men is superior	The role of women is superior
Role behaviour/ Occupation	The role of a man as a leader is driving a car.	Role of women as leaders in driving a Car.
Physical Characteristics	The portrayal of man is more masculine.	Portrayal of women as more feminist.

Case 4 Popular Spice Brand

Households in India use the country's most famous spice to enhance the flavour of their dishes. The masala brand is a leading spice brand and is highly trusted by customers. Two images depict different representations of Indian society's culture, norms, and beliefs. The brand has become a symbol of culture, standards, and values in India. Its well-known tagline is "Taste me best mummy aur ------" (meaning "mummy becomes the best as she chooses this brand of masala for cooking"), suggesting that women primarily prefer the brand. The advertisement also shows a woman happily cooking for her family and being appreciated for her taste, reinforcing the idea that women are expected to cook and manage the kitchen as their duty. This type of advertisement reflects the societal norms, beliefs, and customs of traditional Indian society. After two decades, another ad shows a shift in the thinking and beliefs of a more modern Indian culture, which reverses traditional values. The new ad features a group of men enjoying cooking in the kitchen. They ask their wives, "Mausam h suhana mood aaj biryani h khanna" ("Today, the weather is pleasant, let us have biryani"), indicating men participating in cooking. Interestingly, women also express a desire to cook as their male counterparts enjoy making biryani with the masala. By the end, the men are also seen serving their wives food, thereby reversing traditional gender roles. This reflects a change in societal attitudes, showing an evolving perspective on gender roles.

Table 5: Summary Table for case-4 advertisement analysis

Gender stereotype traits	Old Advertisement	New advertisement
Trait descriptor	The role of women is superior.	The role of men is superior.
Role behaviour/ Occupation	The role of women as leaders while cooking food.	The role of men as leaders while cooking food.
Physical Characteristics	The Portrayal of women as homemakers.	The portrayal of men as more supportive and caring for their families.

13. Discussion

The relationship between gender stereotypes and brand personality in advertising is complex—the industry constantly adapts to societal and cultural norms, as this paper highlights. However, studies have shown that gender stereotype portrayals in advertisements have evolved over the past two decades. (The different gender role portrayals in Television advertising across the globe, 2020) The varying intensities of stereotypical depictions in different countries and cultures are important topics for future research.

Complexity increases when a brand uses stereotypical advertisements. According to Moorthi et al. (2014), Indian TV advertisements have evolved in how they depict women. Increasingly, women pursue careers that boost their accessibility, confidence, and independence. The industry also faces challenges when it does not align with society's culture and norms. Making products unisex can make them more accessible to other genders, such as women. The industry accurately portrays the role of women in advertising.

Given the changing environment, the essence of brand advertising must evolve. Brands should actively challenge stereotypes by leveraging emerging societal norms and culture to move away from traditional approaches. It is important for brands to carefully consider how to present alternative viewpoints in their messaging and communication in a way that questions stereotypical norms.

The brand must think about these critical questions:

1. What advertisement encourages societal change about gender norms and roles?
2. What strategy can advertisers use to make gendered advertisements in non-stereotypical portrayals?
3. What campaigns does the company use to banish gender portrayals and encourage more diversity in advertisements?

Brands should consider these key questions to connect with diverse and modern customers. By exploring various contemporary approaches to gender-stereotypical portrayals in advertisements or campaigns, brands can foster more favourable representations in the media. Simultaneously, they are refining their identities and strengthening their bonds with customers.

Over the last several decades, researchers have examined how gender is portrayed in advertising and its influence on stereotypes and gender representation in TV commercials (Grau & Zotos, 2016). Many studies indicate that stereotypes prevail in advertising across various countries (Matthes et al., 2016; Maree, 2014; Moorthi et al., 2014).

Matthes et al. (2016) concluded that some studies show males playing a central role in advertisements, while others find females to be more prominent. Additionally, research on the influence of a nation's cultural context—such as the masculinity index—yields conflicting results regarding stereotypical representations in advertising (Odekerken-Schröder et al., 2002; Grau & Zotos, 2016). These indices present mixed opinions on gender stereotyping, highlighting the need for further research. The researcher concluded that women's roles have changed over time, and this warrants investigation because many changes in how their roles are depicted in advertisements and how these roles evolve in society have been observed (Moorthi et al., 2014).

As the field of advertising evolved, it is crucial to understand how gender stereotyping is reflected in brand personality and how there is a shift from mirror to mould advertisement (Grau & Zotos, 2016). The dynamic nature of gender stereotypes and the ways culture and societal norms shape advertising practices necessitate an ongoing examination of this research area to understand better the impact of gender stereotyping on brand personality and consumer perception.

14. Conclusion and Limitation

Our review finds that the brand advertises its product in a way that shapes people's self-created perceptions. This paper highlights how brands form certain perceptions, such as masculine or feminine brand personalities. Brands intentionally showcase specific characteristics, attributes, or roles associated with a particular gender, targeting a specific society. When the target audience can easily differentiate products based on gender, it indicates that brands are creating gender stereotypes. They conduct thorough research before marketing, considering societal trends that can help sell their product. Advertising according to gender-based characteristics or roles leads to gender stereotyping. Therefore, brands can develop a brand personality internationally, aiding in self-promotion. A brand can easily establish a masculine or feminine personality. This review shows how brands change their market perception over time. Traditionally, they advertise with stereotypical representations, such as men being more dominant or superior, while women are portrayed as more decorative and responsible for the family. Thus, historically, brands tend to reinforce stereotypical roles.

Over time, brands change their advertising patterns to align with current culture, norms, and societal beliefs. Due to an open economy culture, countries must adapt to global standards. New norms, laws, and policies have been introduced to empower women in society. Femvertising is a marketing and communication tool brands use to inspire and encourage women of all ages by promoting their products. Since consumers are the kings of the market, which includes both men and women, advertising a product for a specific gender could reduce its market share.

Aaker (1997) identified five brand personality dimensions applicable across all countries. However, many researchers have conducted studies in different nations and developed scales tailored to their specific cultures, norms, and contexts. Due to economic conditions and lifestyle changes, society and its people have gradually shifted their thought processes, moving from gender-specific advertising to gender-inclusive approaches. The brand, which previously relied on mirror-style advertising, now depicts more diverse representations as societal views evolve; this shift is supported by the move from stereotypical to less stereotypical portrayals.

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Behavioral Biases & Investment Decisions: A Bibliometric Analysis

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Abstract: Behavioral bias research in investment has increasingly become the center of interest, especially regarding behavioral approaches to investment. The purpose of the current bibliometric analysis is to chart the academic territory of studies on behavioral biases in investors with the help of data retrieved in the Scopus database in 1999 and 2025. The bibliometric indicators standards, such as the publication trends check, top authors, the most prominent journals, and the institutional contributions, were deployed using 169 research documents. The review indicates that academic production has grown significantly in recent years, especially since 2020, and the outlets leading the scholarly output in the field of research are journals like Qualitative Research in Financial Markets and Review of Behavioral Finance. Some of the significant themes are overconfidence, risk perception, herding behavior and financial literacy. This research is unique in that it provides a bibliometric synthesis of behavioral finance, identifying gaps in the study and future research directions that scholars and policymakers can consider to enhance financial inclusion and decision-making of investors.

Keywords: Bibliometric analysis, Behavioral bias, Investors, financial markets, financial educator

1. Introduction

Behavioral finance has made it clear how traditional economic theory premises rational decision-making in financial behavior, but in real life, cognitive and emotional bias play a vital role (Barberis & Thaler, 2003; Ricciardi & Simon, 2000). The study of behavioral biases, especially regarding investment decision-making of investors, has become one of the emerging strands in this field. The level of learning about finance, including social norms of behaviour, psychological inclination, and the reluctance to take risks, all contribute to how a female responds to investment opportunities (Lusardi & Mitchell, 2008; Charness & Gneezy, 2012).

Although the proportion of investors engaged in the workforce in both the developed and developing economies is increasing, research on the behavior of investors is usually deficient in investors specific behavioral biases, including sure inadequate overconfidence, herding, loss aversion, and mental accounting (Barber & Odean, 2001; Bhandari & Deaves, 2006). These biases may significantly impact wealth-building, wealth management, and spending. With the equally pronounced democratization of access to financial markets through digital channels and transformation through fintech and other solutions, modern and updated behavior of investors their investment behavior becomes not only a topical issue, but also an essential one in the development of inclusive financial markets and the creation of gender-sensitive policies (OECD, 2021; World Bank, 2020).

To understand the intellectual landscape of this new research field, this study undertakes an intellectual mapping of the field using a bibliometric approach to the study, a quantitative assessment of the scientific publications of a given research field to detect the publication patterns, the productivity of authors and sources, and their prevailing themes (Donthu et al., 2021). It aims to present an extended survey of scholarly coverage of behavioral investment bias in investors by pointing out current sources of contributions and areas of unresolved research that should be filled. Through the bibliometric analysis of the behavioral biases of investors, one can obtain a general picture of the research area, revealing the main contributions, and determining the possibilities of future work supporting the study of behavioral biases of putative investment. To begin with, evaluating articles between 1999 and 2025, the study illuminates that investors display behavioral biases regarding investment. It suggests that future studies combine behavioral biases like herding behavior, overconfidence, momentum effect, emotional decision making, and demographic factors. Second, the bibliometric study over three decades (1990 - 2020) suggests that the herding behavior has been an area of intensive research at the time with growing interest over time and singles out major contributors, influential journals, and recurrent topics, where the focus shifted to the influence of various types of investors, instead of focusing on the previous definition of the informational cascade, (Choijil et al., 2023).

Such a bibliometric study concerning the behavioral bias of investors, yet the research attempts to present a bibliometric study, particularly of investors, for 1999 - 2025.

2. Literature Review

Behavioral Finance, Overconfidence, herding, loss aversion & Emotional decision making

Behavioral finance studies have grown considerably in the last decade, particularly in individual investor behavior and investment choices. The factors studied by researchers on the effect on investor outcomes include cognitive biases like overconfidence, herding, loss aversion and emotional decision-making.

The article by Joshi et al., (2022) in the SCMS Journal of Indian Management focuses on the influence of different behavioral biases on investor decision-making. It concludes that predispositions such as overconfidence and disposition effect have caused irrational excesses in people regarding finances. In the same respect, Gupta & Shrivastava (2022) discussed herding and loss aversion in the stock markets. They disclosed that social influence influences investors' investment decisions to a great extent (International Journal of Emerging Markets). The study by Saltik et al., (2024) was devoted to the influence of the pandemic on behavioral finance. Their article about Humanities and Social Sciences Communications states that fear and uncertainty caused by COVID-19 increased emotional biases and lowered risk tolerance among inexperienced investors. Yahya et al., (2025) express the same by commenting on how attention and sentiment play a role in market volatility against the pandemic (Global Business Review). Sathya & Prabhavathi (2024), examined the use of social media in the decision-making process to finance investments. Based on their studies in the International Journal of System Assurance Engineering and Management, these social media sites, such as Twitter and Facebook, intensify herd behavior, especially among youth and general investors. In a recent Edelweiss Applied Science and Technology journal article, Yuana et al., (2024) also stressed the correlation of behavioral biases with demographical variables such as age, gender, and income. They came back to support their hypothesis that investors are more risk-averse and emotion-driven than their male counterparts. Banerjee et al., (2025) discussed Robo-advisory systems and their capacity to minimize such behavioral bias in the Journal of Risk Finance. They indicated that autonomous platforms can assist in reducing cognitive impressions by giving straightforward, scientific information about investment recommendations. Besides, in a review published in Review of Integrative Business and Economics Research, Angeles (2025), discussed the joint influence of risk tolerance, behavioral biases, and financial knowledge on investment attitude. The article points out financial education's heightened importance in reducing behavioral traps. The studies reveal, in outcome, that behavioral biases continue to exist across investor populations, although their effects can differ depending on education, and those who engage with digital. That is why more investors-specific research and focused financial literacy programmers are needed.

3. Research Gap

The studies analyzed reveal that significant progress has been made in understanding behavioral biases, such as overconfidence, herding, and risk aversion, in making investment choices. Nevertheless, the bulk of research remains restatements, which are region-focused and empirical, with minimal effort to synthesize the intellectual domain. Additionally, few bibliometric studies have been conducted on investors, with specific studies examining investors as a population of interest. This disparity necessitates an extensive bibliometric survey to identify trends in research, key participants, and emerging themes, which directly inform the research questions of the current study. So, the purpose of the research paper is to explore current tendencies in studying the behavioral preferences of investors about investment through conducting a bibliographic search and answering the research questions as follows:

RQ1: What are the trends of behavioral bias towards investment publications on investors?

RQ2: Which authors, journals, institutions, and countries contribute the most to the studies on behavioral bias among investors?

RQ3: What is this research's state of the art for investors?

RQ4: What are the emerging and trending themes in the field of behavioral bias towards investment by investors?

RQ5: Which way should future studies in this area go?

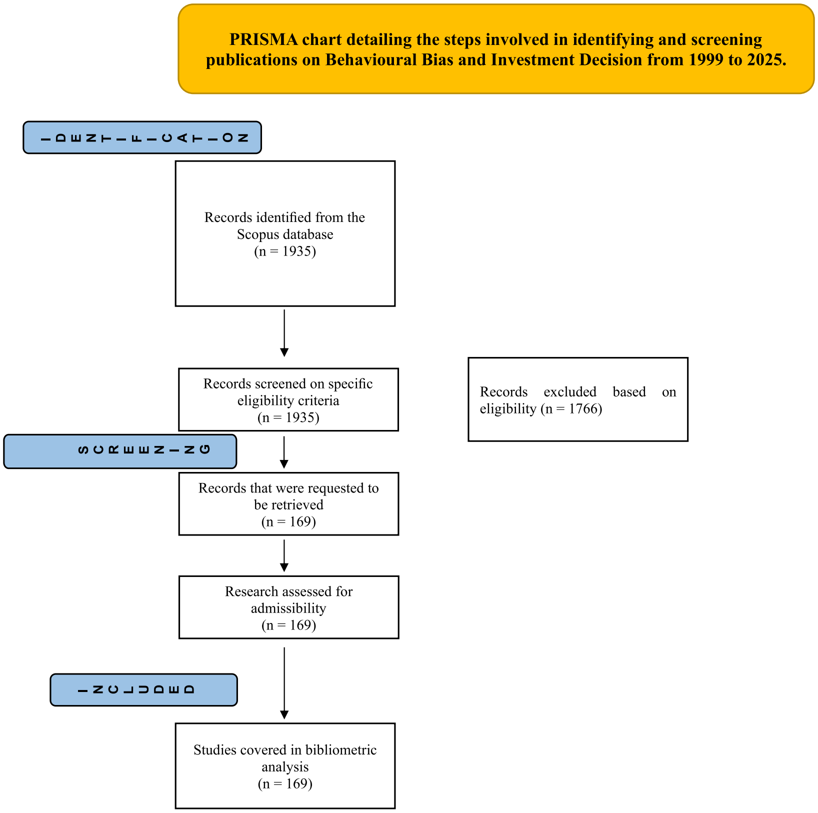

Figure 1: The study's flow diagram

Figure 1 presents the PRISMA flow diagram that outlines the systematic process for selecting the studies included in the bibliometric analysis. First, a total of 1,935 records were identified in the Scopus database of publications between 1999 and 2025 related to behavioral biases and investment decision-making. The identities of all identified records were reviewed on a preliminary basis by comparing them against the inclusion and exclusion criteria. At this stage, 1,766 records were filtered out for irrelevance, language constraints, or nonalignment with the study objectives. The remaining 169 records were searched and evaluated for eligibility by performing a thorough review of titles, abstracts, and the full text. Following assessment of the researchers' eligibility, all 169 articles met the criteria and were incorporated into the final bibliometric review. Such an organized and transparent selection process will ensure that the methodology is rigorous, that selection bias is minimized, and that the reliability and validity of the obtained findings are high, in line with the best PRISMA standards for systematic reviews and bibliometric studies.

4. Material and Methods

The research follows a bibliometric analysis of scientific works on behavioral biases of investment choices of investors. Bibliometrics is a quantitative method of measuring the scholarly productivity of a given field assessed through the analysis of publications, citation patterns, author output, performance of journals, and co-occurrence of terms and keywords (Donthu et al., 2021). The Scopus database was used to obtain the data because it is one of the broadest abstract and citation databases of peer-reviewed literature that spans various disciplines and specialties (Elsevier, 2024). Relevant records were retrieved with a well-constructed search string. The following terms were used to search for them: "Behavioral bias" and "Investment decision". It was limited to the English language sources of publications between 1999 and 2025, only included published articles from journals. The subject areas were limited to "Economics, Econometrics and Finance", "Business, Management and Accounting", "Social Sciences" and "Decision Sciences".

5. Data Collection

A total of 169 documents were retrieved in .csv format from Scopus and analyzed. The fields included in the dataset were Title of the publication, Authors and affiliations, Year of publication, Source title (journal/ conference), Keywords and Citation counts.

6. Results and Findings

Graphical representations of the bibliometric data were extracted from the Scopus database using its built-in analysis feature. For visualization of bibliometric data (Co-authorship network, Institutional affiliation of authors, Country-wise distribution of publications, and Co-citation network), a popular tool, VOS viewer, was deployed (Aria & Cuccurullo, 2017). Such a systematic approach provides an opportunity to capture the field's overall picture in its development and orientation, as well as to identify areas lacking adequate literature.

Table 1: The articles published about behavioral biases among investors for the last 26 years, spanning from 1999 to 2025.

Year	Documents by year
2025	40
2024	27
2023	25
2022	20
2021	8
2020	12
2019	7
2018	7
2017	1
2016	8
2015	4
2014	1
2013	1

Year	Documents by year
2012	2
2011	1
2010	2
2009	1
2008	0
2007	1
2006	0
2005	0
2004	0
2003	0
2002	0
2001	0
2000	0
1999	1

Source: The authors (from the Scopus database)

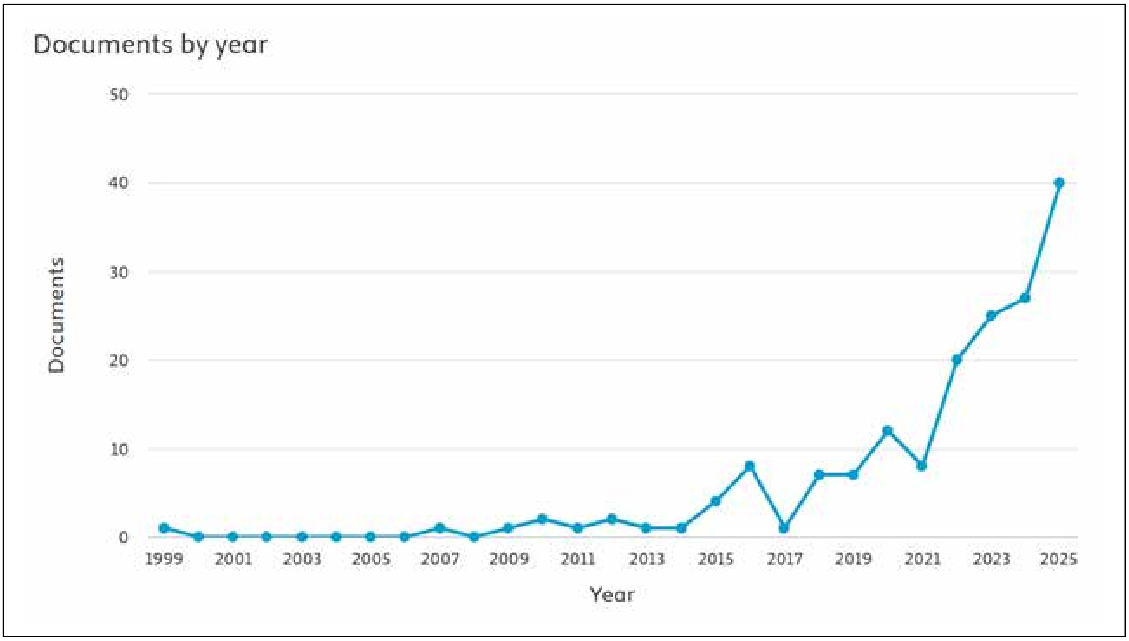

Figure 2: Number of Articles published over the years 1999 to 2025

The distribution of publications on behavioral prejudices among investors in 1999 and 2025 is provided in Table 1. The findings show that there was a long period of insignificant research output in the early years. Between 1999 and 2008, little was published, with only one study in 1999 and another in 2007. There were a small number of publications from 2009 through 2013, with 1 to 2 publications in that period, indicating sluggish scholarly activity. The trend is observed with a gradual increase since 2014: there was one publication in 2014, then it increased to eight in 2016, and then, in the middle of 2017, publications decreased. The upward trend has remained constant since 2018, with seven publications in 2018 and 2019 and twelve in 2020. The most notable growth occurs after 2020, when it reaches 20, 25, and 27 publications, respectively, and then attains the highest number of 40 publications in 2025. Here, the trend shows an increasing focus among academics on behavioral finance and female investment behavior.

Table 2: Top 10 Journals (Documents per year by source)

Source	Document
Qualitative Research in Financial Markets	8
Review of Behavioral Finance	7
Indian Journal of Finance	6
International Journal of Housing Markets and Analysis	5
Investment Management and Financial Innovations	4
Scms Journal of Indian Management	4
International Journal of Emerging Markets	3
Journal of Behavioral and Experimental Finance	3
Journal of Risk and Financial Management	3
Risk	3

Source: The authors (from the Scopus database)

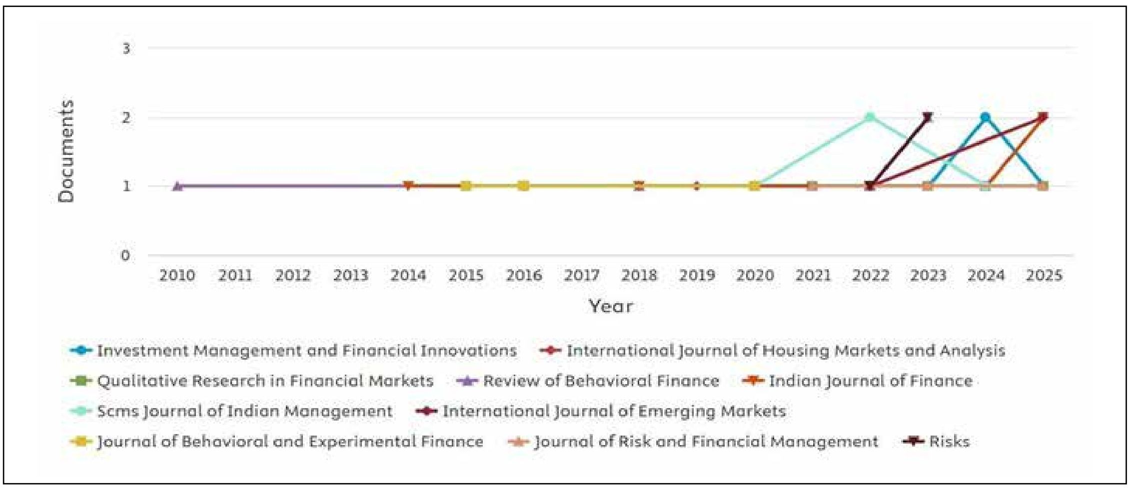

Figure 3: Top 10 journals that published papers on behavioral biases of investors

Table 2 shows the leading academic journals that contributed to the study of behavioral biases in the investor population, along with the number of publications on the topic. The most noticeable source is Qualitative Research in Financial Markets, with 8 articles, followed by the review of Behavioral Finance, with 7 articles. The Indian Journal of Finance ranks third with 6 publications, indicating that research on finance with an Indian focus has made a significant contribution. The International Journal of Housing Markets and Analysis publishes 5 articles, whereas Investment Management and Financial Innovations and SCMS Journal of Indian Management publish 4 articles each. Besides, 3 articles have been published in journals such as the International Journal of Emerging Markets, Journal of Behavioral and Experimental Finance, Journal of Risk and Financial Management, and Risk. On the whole, the range of journals indicates that the topic is multidisciplinary, drawing on perspectives from behavioral finance, risk analysis, investment management, and the study of emerging markets.

Table 3: Top 10 Authors (Documents by Author's)

Authors	Document
Jain, J.	7
Goyal, N.	4
Kumar, S.	4
Sharma, M.	4
Walia, N.	4
Firoz, M.	3
Gupta, S.	3
Jessica, V.M.	3
Pandey, R.	3
Singh, S.	3

Source: The authors (from the Scopus database)

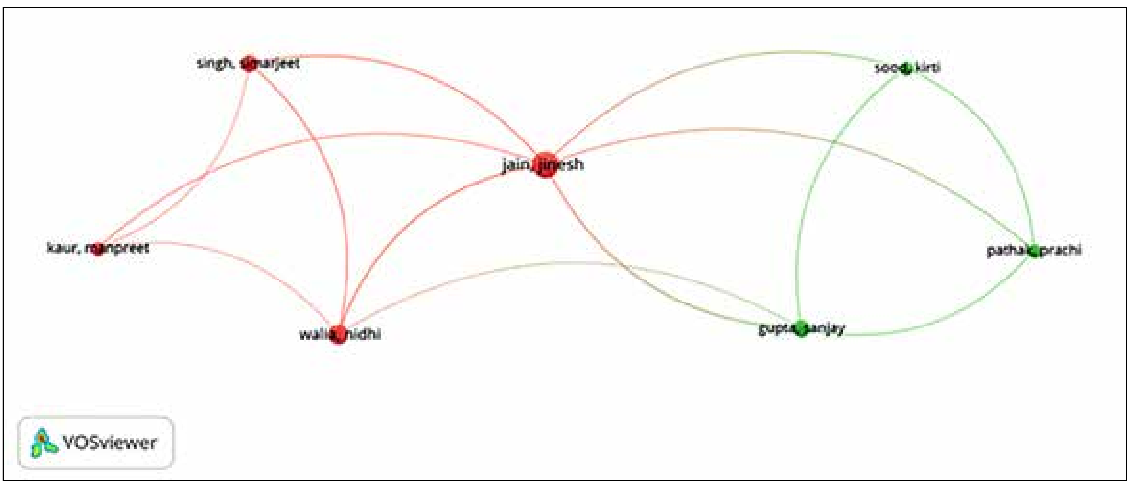

Fig 4: Co-authorship analysis network showing influential studies and thematic clusters in behavioral finance research

Table 3 depicts the most productive scholars in the domain of behavioral biases involving investors. It should be noted that Jain, J. is the most productive scholar with seven publications, which means that this topic has been a focus of intense and sustained effort on the part of this scholar. Four other authors, Goyal, N., Kumar, S., Sharma, M., and Walia, N., come next with four publications each, showing that these authors are largely involved and regular contributors in the field of research. Several additional researchers, such as Firoz, M., Gupta, S., Jessica, V.M., Pandey, R., and Singh, S., have made three publications, which enhanced the literature. There is a higher density in the concentrated output set in the few writers, leading to the notion of a core research community in this narrow field of knowledge development.

Table 4: Top 10 Affiliation (Documents by Affiliation)

Documents by Affiliation	Documents
Amity University	9
Sri Aurobindo College of Commerce and Management	5
Vellore Institute of Technology	5
Siksha O Anusandhan Deemed to be University	5
Symbiosis International Deemed University	5
Punjabi University	4
Malaviya National Institute of Technology Jaipur	4
ILMA Academy Institute of Technology	3
National Institute of Technology Kurukshetra	3
Beijing Normal University	3

Source: The authors (from the Scopus database)

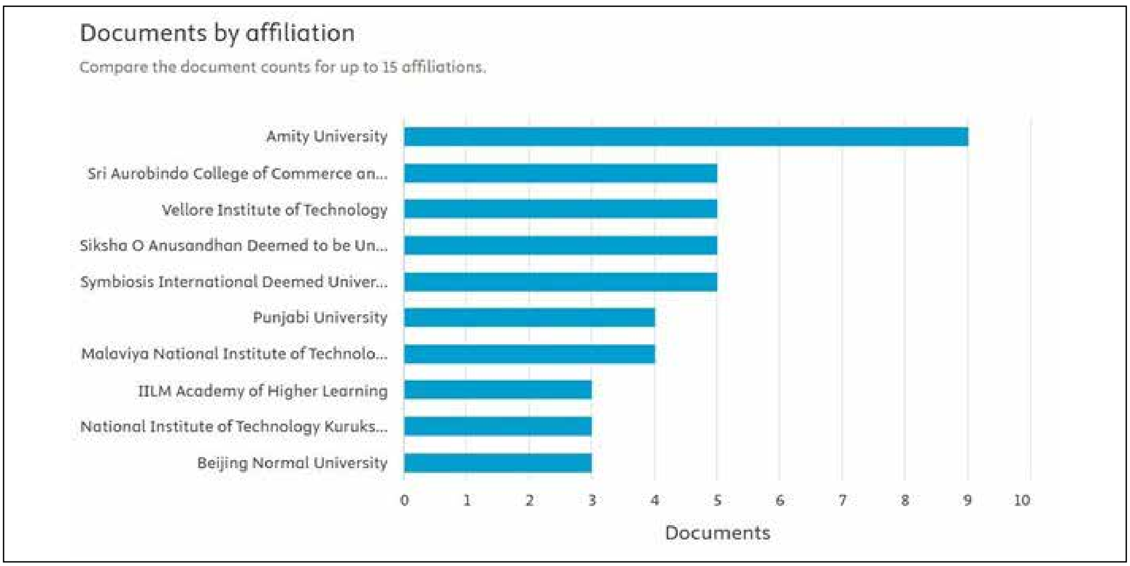

Figure 5: Top affiliation work on behavioral biases

Table 4 shows the top 10 institutional affiliations that make their contributions in the field of research publications in the chosen field. Amity University has the highest number of 9 documents, indicating that it conducts extensive research in the field. Sri Aurobindo College of Commerce and Management, Vellore Institute of Technology, Siksha O Anusandhan Deemed to be University, and Symbiosis International Deemed University have contributed 5 publications each; this regular research output is reflected in these institutions. Malaviya National Institute of Technology Jaipur, and Punjab University are close behind with 4 documents each. In addition, 3 publications were submitted by ILMA Academy Institute of Technology, National Institute of Technology Kurukshetra, and Beijing Normal University. In general, the representation of academic institutions in India is high, whereas international research intensity is low, indicating that the research topic in question is highly concentrated in India.

Table 5: Top 10 Influential Countries (Documents by country/ territory)

Country/Territory	Documents
India	74
Pakistan	17
United States	13
China	11
Germany	6
Indonesia	6
Malaysia	6
United Kingdom	6
Australia	5
Morocco	4

Source: The authors (from the Scopus database)

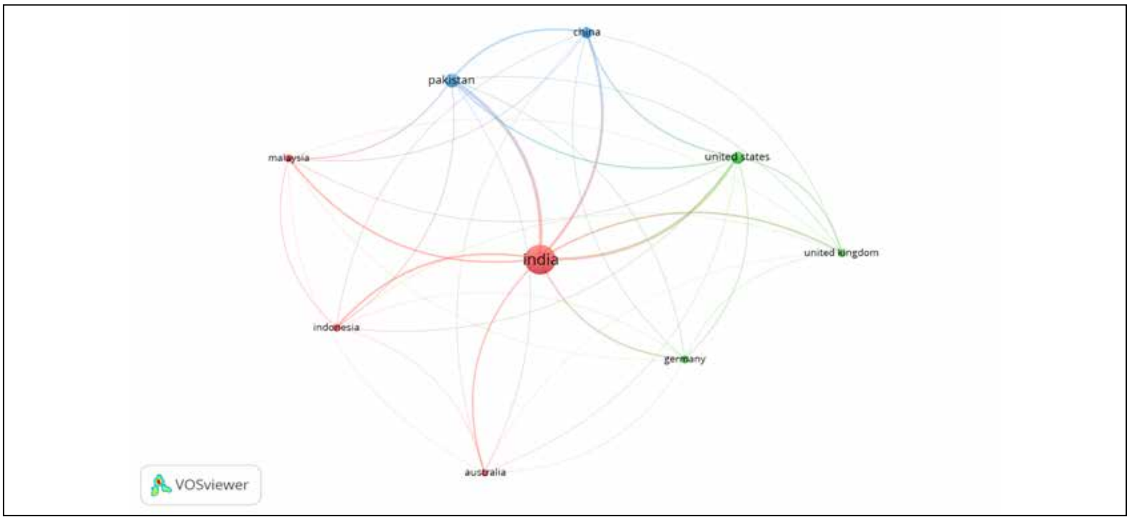

Figure 6: Most Prolific Countries

The country-wise distribution of publications on behavioral biases among investors is set out in Table 5. The number of publications in India based on the research amounts to 74, which denotes a good academic orientation in terms of behavioral finance and investors related studies about investments. Pakistan is second with 17 publications, followed by the United States (13) and China (11). A cluster state in the research article consisted of Germany, Indonesia, Malaysia, and the United Kingdom, which had six publications each, which means moderate research by each country. Australia contributed five papers, and four papers were published in Morocco. The distribution shows that the topic is global. Still, there is high academic production in South Asia, in which India is the most interesting concerning the intersection of behavioral biases and investment behavior among investors.

7. Author Co-citation Network in Behavioral Biases Research among Investors

Figure 7 presents the author co-citation network generated using VOS viewer, illustrating the intellectual structure of research on behavioral biases in investors. The size of each node reflects the citation impact of an author, while the links indicate the strength of co-citation relationships. Different colors represent distinct research clusters, highlighting key thematic areas and influential contributors shaping the literature.

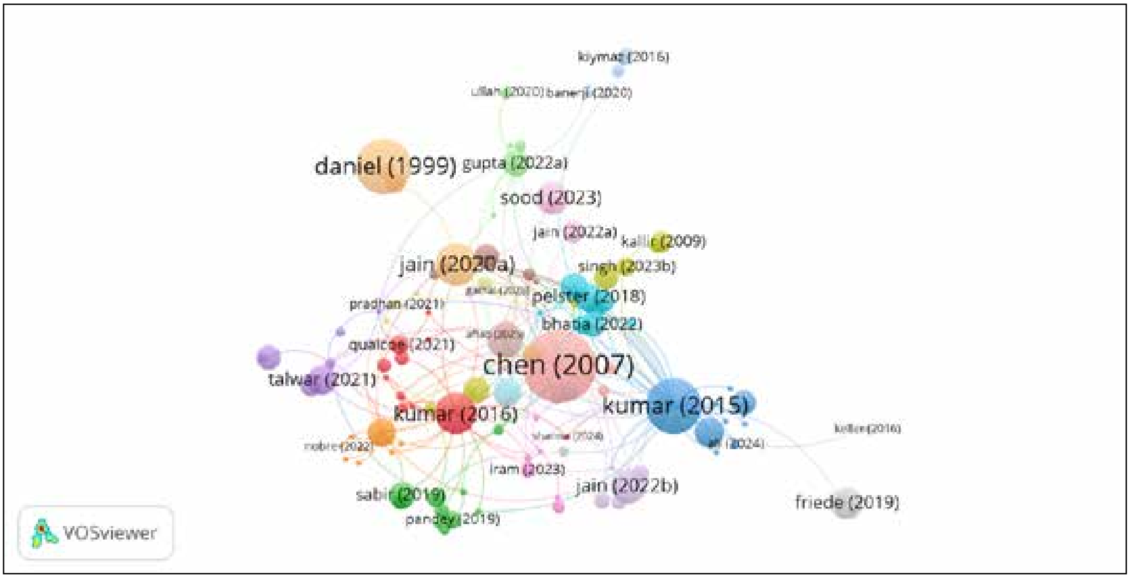

Fig 7: Author Co-citation Network in Behavioral Biases

8. Conclusion

This bibliometric study provides a fundamental understanding of the study area involving behavioral biases among investors over the last 26 years. These results indicate that the period in which the scholarly interest in the topic started to become prominent has been around the early years. However, the following publication count has been shown to grow drastically after 2014, with the sharpest growth spikes being seen after 2020. The recent increase during the last few years is part of an increasing awareness of investors behavioral patterns in investment decision-making, especially about behavioral finance. Qualitative Research in Financial Markets and Review of Behavioral Finance can be considered the significant sources of publication, and a limited number of prolific individuals have contributed to the area of study the most, with Jain, J., the most noticeable contributor. Amity University proves to be the most productive institutionally speaking, and India, country-wise, dominates the research results, implying that South Asian countries are the focus of scholarly activity in the field. Overall, the findings demonstrate the multidisciplinary aspect of the research and its increasing internationalization, although contributions in specific areas still dominate it.

The research questions are systematically answered in the findings, as the authors identify trends in publications, key contributors, and the most prevalent behavioral themes in the literature on investors. The bibliometric mapping highlights both established and emerging areas of research, offering detailed insights into the intellectual development of this field. In the future, research should widen geographical exposure, add a cross-cultural outlook, and seek to understand new behavioral biases engendered by changes in the socio-economic environment, technological adaptation, and global market realities. In this way, the academic community will be able to introduce more inclusive and effective investment plans that reflect the peculiarities of the behaviors of investors.

9. Limitations and Future Scope

Although the given study provides an excellent bibliometric overview of the existing research on behavioral biases in investors and does not include the gender perspective in investment decisions, several limitations were identified. The analysis was performed using a single bibliographic database and specific inclusion criteria, which may result in less comprehensive literature coverage. Additionally, differences in how publications are conducted across various areas and fields can affect the visibility of specific studies. Further studies can employ a multi-database strategy and utilize complementary bibliometric solutions, as well as gender-specific or qualitative analyses, to gain a more comprehensive understanding of this emerging field of study.

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Book Review

Book Name: Business Analytics with R

Reviewed by:

Rajat Kapoor

MJPRU, Bareilly

ORCID: 0009-0008-9286-643X

Date of receiving the manuscript: 15 Oct, 2025 **Date of publication: 28 Feb, 2026**

Business Analytics with R is a well-structured and comprehensive textbook that addresses the growing need for data-driven decision-making in modern organizations. Written with a clear academic orientation, the book successfully bridges foundational concepts of business analytics with practical tools and techniques, making it suitable for senior undergraduate and postgraduate students, as well as early-career professionals entering the analytics domain. The book is organized into seven logically sequenced chapters that guide the reader from basic concepts to applied analytics. The opening chapter provides a strong conceptual grounding by defining business analytics and explaining its four major approaches—descriptive, diagnostic, predictive, and prescriptive analytics. The use of a relatable case illustration helps demystify abstract ideas and demonstrates how analytics supports managerial decision-making in real-world scenarios. This chapter also clearly differentiates between the roles of data scientists, data engineers, and business analysts, which is particularly valuable for students exploring career paths in analytics. The second chapter introduces the R programming language, highlighting its features, advantages, limitations, and applications. The step-by-step explanation of installing R and RStudio enhances the book's practical utility, especially for beginners. By emphasizing R's open-source nature and its relevance in data science and analytics, the authors justify its selection as the primary analytical tool throughout the text. The middle chapters focus on core technical pillars of analytics—data warehousing, data mining, data visualization, and data modelling. The discussion on data warehousing and the ETL process is clear and conceptually sound, with adequate coverage of architectures, schemas, and tools. The chapters on data mining and visualization extend the analytical toolkit by explaining techniques, applications, and challenges across industries such as retail, healthcare, banking, and e-commerce. The inclusion of Tableau for visual analytics reflects current industry practices and enhances the applied orientation of the book. The final chapters on data modelling and types of analytics consolidate learning by connecting analytical techniques with optimization, simulation, and decision support. The structured presentation, supported by examples, figures, and end-of-chapter exercises, reinforces conceptual clarity and encourages critical thinking. Overall, the book stands out for its clarity, logical flow, and balanced integration of theory and practice. While advanced mathematical depth is limited, this is appropriate for its intended audience. The book serves as a reliable introductory text and reference for business analytics courses, particularly in management, commerce, and computer applications, and contributes meaningfully to analytics education in emerging economies.

AUTHORS: Dr. Eisha Khan & Dr. Shubham Agarwal, **PUBLISHER:** New Delhi Publishers

Submission and Format Requirements

A typical manuscript should be between 3,000 and 4,000 words, excluding references, tables, and figures. However, longer submissions may be accepted if they are of exceptional quality.

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Manuscripts may be submitted in either single or double spacing, with a preference for Times New Roman, 12-point font. Once accepted, all articles will be properly formatted for publication by the journal.

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  - Example: Hamel (2000) suggests... or A study by Nelson and Winter (1982) found...
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