PAVANATMA COLLEGE
MURICKASSERY

PROCEEDINGS OF THE NATIONAL SEMINAR ON LEVERAGING NEP AND AI TO REVITALIZE ACADEMIC WRITING AND RESEARCH PRACTICES

Organized by
Research and Post Graduate Department of Commerce,
Pavanatma College, Murickassery
In association with
Pavanatma College Library

11th and 12th February 2025
Pavanatma College,Murickassery

Pavanatma College Publications

Proceedings of the National Seminar on

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Research and Post Graduate Department of Commerce, Pavanatma College, Murickassery

and

Pavanatma College Library

In association with

College Development Council, Mahatma Gandhi University, Kerala

February 11-12, 2025

PAVANATMA COLLEGE

Murickassery P.O., Idukki District - 685604

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2024-25

Proceedings of the National Seminar on

Leveraging NEP and AI to Revitalize Academic Writing and Research Practices

Dr. B. Sindhu	Dr. Jins Mathew	Ms. Joycy P.D	Mr. Anoop Joseph
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Date of Seminar : 11 & 12, February 2025

©by Publisher

ISBN : 978-81-993134-0-8

Publication Date: 01/12/2025

Published by :

Pavanatma College Publications
C/o
Principal
Pavanatma College,
Murickassery, Idukki- 685604
Phone No.: 04868 - 263235
A Government Aided & NAAC Accredited College, Affiliated to Mahatma Gandhi University, Kerala
Website: https://pavanatmacollege.org/public/Index
E-Mail: pavanatmacollegem@gmail.com, mail@pavanatmacollege.org

Published and Printed at :
Pavanatma College
Murickassery, Idukki- 685604

Message from the Principal

It gives me immense pleasure to present the Proceedings of the National Seminar on *Leveraging NEP and AI to Revitalize Academic Writing and Research Practices*. This publication stands as a valuable academic record of the deliberations, discussions, and scholarly contributions made during the seminar organized by the Research and Post Graduate Department of Commerce, Pavanatma College, Murickassery.

The National Education Policy (NEP) and Artificial Intelligence (AI) have emerged as transformative forces in the fields of education, research, and academic writing. The seminar provided a meaningful platform for educators, researchers, and students to reflect upon these developments and to explore their implications for strengthening academic practices and research quality.

I sincerely appreciate the efforts of the resource persons, authors, editors, and organizing committee members whose dedicated contributions ensured the success of the seminar and the timely publication of this proceedings volume. The insights shared and discussions generated during the sessions will undoubtedly serve as a source of inspiration and guidance for the academic community.

Prof. Saji K. Jose
Principal
Pavanatma College, Murickassery

Murickassery
01/12/2025

Message from the Head of the Department

It gives me great pleasure to present the Proceedings of the National Seminar on *Leveraging NEP and AI to Revitalize Academic Writing and Research Practices*. This publication is a meaningful academic outcome of the scholarly deliberations and research contributions made during the seminar organised by the Research and Post Graduate Department of Commerce, Pavanatma College, Murickassery.

The National Education Policy (NEP) and Artificial Intelligence (AI) have emerged as transformative forces in higher education, particularly in the areas of academic writing and research. The seminar provided an effective platform for scholars, researchers, and educators to reflect upon these developments and to explore innovative approaches for strengthening academic quality and research practices.

I sincerely acknowledge the contributions of the resource persons, authors, editors, and participants whose collective efforts ensured the academic success of the seminar and the timely publication of this proceedings volume. I am confident that the ideas and insights presented herein will serve as a valuable reference for the academic community and inspire further research and collaboration.

Dr. B. Sindhu
Head, Research and P.G. Department of Commerce
Pavanatma College, Murickassery

Murickassery
01/12/2025

Acknowledgments

The Organizing Committee extends its heartfelt gratitude to all those who contributed to the successful conduct of the National Seminar on *Leveraging NEP and AI to Revitalize Academic Writing and Research Practices*.

We place on record our sincere thanks to the Management of Pavanatma College for their constant encouragement and institutional support. We express our sincere appreciation to the distinguished resource persons, who generously shared their knowledge and expertise during the seminar. Their insightful presentations and scholarly deliberations significantly enriched the academic discourse. Special thanks are due to Dr. Dineshan Koovakkai and J.S. Ananthakrishnan, whose contributions set a strong intellectual foundation for the seminar.

Our heartfelt thanks are extended to all participants for their active involvement and valuable research contributions. Their engagement in paper presentations, discussions, and interactive sessions added academic rigor and diversity to the seminar proceedings.

We also acknowledge with deep appreciation the efforts of the volunteers and organizing committee members, whose dedication and coordinated efforts ensured the smooth planning and execution of the seminar. The support extended by the technical team and non-teaching staff was instrumental in the seamless conduct of the event. We gratefully acknowledge the support of the Pavanatma College Library for providing essential facilities, resources, and logistical assistance during the seminar.

We express our special gratitude to Prof. (Dr.) Bennichan Scaria, who served as the Principal of Pavanatma College at the time of the seminar, for his leadership, guidance, and support in organizing the event. We also thank Prof. Saji K. Jose, the present Principal of Pavanatma College at the time of publication of these proceedings, for his encouragement and support in bringing out this scholarly volume.

A special mention is due to the Internal Quality Assurance Cell (IQAC) for its continuous guidance and quality oversight. The IQAC played a vital role in ensuring that the seminar adhered to academic standards and quality benchmarks in terms of content, execution, and documentation.

Finally, we thank all those who attended the seminar and contributed to meaningful academic interactions. Their enthusiasm for learning and commitment to academic excellence truly made the seminar and this proceedings volume a success.

Organizing Committee

Organising Committee

The successful planning and execution of the National Seminar on *"Leveraging NEP and AI to Revitalize Academic Writing and Research Practices"* were made possible through the dedicated efforts and collective commitment of the Organising Committee. The committee worked diligently at every stage of the seminar, from conceptualisation and coordination to implementation and documentation, ensuring academic quality and smooth conduct of all sessions.

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From the Desk of the Editors

It is with great pride and immense satisfaction that we present the Proceedings of the National Seminar on *"Leveraging NEP and AI to Revitalize Academic Writing and Research Practices"*. This volume is a collective academic effort that reflects the scholarly deliberations, intellectual engagements, and research contributions made during the seminar.

The seminar provided a meaningful platform for educators, researchers, and students to explore the transformative role of the National Education Policy (NEP) and Artificial Intelligence (AI) in redefining academic writing and research methodologies. The papers compiled in this volume represent diverse perspectives, innovative ideas, and emerging research trends that are highly relevant to the contemporary academic landscape.

As editors, we have made sincere efforts to ensure that all contributions are presented with academic rigor, clarity, and uniformity. We deeply appreciate the cooperation extended by all authors, reviewers, and organizers in bringing out this publication in a systematic and timely manner.

We place on record our heartfelt gratitude to the Management, Principal, Internal Quality Assurance Cell (IQAC), the Organizing Committee members, our colleagues and all contributors whose unwavering support made this publication possible.

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1 Introduction

The National Seminar on "Leveraging NEP and AI to Revitalize Academic Writing and Research Practices" aimed to explore the transformative potential of two key factors shaping the future of education: the National Education Policy (NEP) and Artificial Intelligence (AI). As the world becomes increasingly interconnected and digital, education systems must evolve to meet the challenges of the 21st century. The NEP, implemented by the Government of India, has laid the foundation for rethinking educational structures, emphasizing critical thinking, creativity, and technology integration across disciplines. Similarly, AI is revolutionizing the way academic content is generated, researched, and analyzed. The seminar sought to investigate the synergies between these two pillars of educational advancement and to explore their implications for improving academic writing and research practices.

Throughout the seminar, esteemed speakers, researchers, and scholars from diverse fields shared their insights on how AI can be utilized to enhance various aspects of academic work, from writing and content generation to research methodology and data analysis. These discussions provided an opportunity for participants to engage with cutting-edge tools and methodologies, helping them adapt to the changing landscape of academic scholarship. The seminar fostered a collaborative environment where attendees could exchange ideas, raise questions, and share experiences related to the integration of AI into academic research and writing.

The primary objective of the seminar was to address the growing need for academic writing and research practices that are not only aligned with the goals of the NEP but also leverage the capabilities of AI to improve productivity, ensure academic integrity, and foster innovation. By bringing together educators, students, and researchers, the seminar created a platform for learning and discussion on the practical applications of AI in academia. It also aimed to provide actionable solutions for overcoming the challenges that scholars face in adapting to new technologies while ensuring the quality of academic work.

This document presents the proceedings of the National Seminar held on February 11-12, 2025, which brought together a diverse group of thinkers and practitioners to discuss these critical issues. Through keynotes, technical sessions, panel discussions, and workshops, the seminar explored the opportunities and challenges of integrating NEP and AI into academic practices, ultimately aiming to contribute to the ongoing efforts to modernize and strengthen academic writing and research in India.

2 Rationale for the Seminar

The National Education Policy (NEP) 2020 and Artificial Intelligence (AI) are two pivotal forces that are reshaping the educational and research landscapes. As India strives to improve the quality of education and research in a rapidly changing global environment, it is essential to understand the transformative potential of these innovations. The NEP 2020 emphasizes critical thinking, interdisciplinary learning, and the integration of technology, while AI is revolutionizing the way research is conducted, data is analyzed, and academic content is created.

This seminar aims to explore the intersection between the NEP and AI, focusing on how they can collectively enhance academic writing and research practices. With a vision to empower educators, researchers, and students, the seminar seeks to address key challenges in academic writing and provide practical solutions through AI-driven tools and methodologies. By engaging scholars and experts from various disciplines, the seminar will facilitate a deeper understanding of how AI can be harnessed for content generation, plagiarism detection, and research analysis while maintaining academic integrity.

In light of these advances, the seminar is designed to provide a platform for knowledge sharing, collaboration, and innovative thinking. It will explore the role of AI in addressing current academic challenges, improving research productivity, and ensuring the quality of academic writing in alignment with the goals of NEP 2020. This is an essential step toward preparing the academic community for the future of education and research, equipping participants with the tools and strategies needed to leverage NEP and AI for academic excellence.

3 Sessions of the Seminar

Day I - 11/02/2025

Inaugural Session at 10.00 AM - Programme Schedule

1. **Prayer**
2. **Welcome Speech:** Dr. B. Sindhu (Head, Research and P.G. Department of Commerce)
3. **Presidential Address:** Prof.(Dr.) Bennichan Scaria (Principal)
4. **Inaugural Address:** Dr. Dineshan Koovakkai (Former Senior Assistant Librarian and Head, University Library, University of Calicut)
5. **Keynote Address:** Rev. Dr. Philip Mattam (Bursar)
6. **Felicitation:** Dr. Jins Mathew (Assistant Professor and Co-ordinator)
7. **Vote of Thanks:** Ms. Joycy PD (UGC Librarian, Joint Co-ordinator)
8. **Tea Break**

Technical Sessions

- **Session I (11 AM - 1 PM):** *Academic Writing* presented by Dr. Dineshan Koovakkai.
- **Session II (1:30 PM - 3:30 PM):** *National Education Policy* presented by Dr. Dineshan Koovakkai.

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Day II - 12/02/2025

Technical Sessions

- **Session III (10 AM - 1 PM):** *Use of Artificial Intelligence in Academic Writing* presented by J.S. Ananthakrishnan (Senior Research Fellow, Department of English, Sri Sankaracharya University of Sanskrit, Kalady).
- **Session IV (1:30 PM - 2:30 PM):** *Hands-on Training on AI in Academic Writing* by J.S. Ananthakrishnan.
- **Session V (2:30 PM - 3:30 PM):** *Paper Presentations and Valedictory Session.*

4 Profile of Resource Persons

Dr. Dineshan Koovakkai

- **Designation:** Former Senior Assistant Librarian and Head, University Library, University of Calicut
- **Profile:** Dr. Koovakkai holds a Ph.D. in Library and Information Science and has published 52 research papers and 3 books. He has been a key figure in academic librarianship and has organized numerous national seminars and workshops.

J.S. Ananthakrishnan

- **Designation:** Senior Research Fellow, Department of English, Sri Sankaracharya University of Sanskrit, Kalady
- **Profile:** J.S. Ananthakrishnan specializes in AI's impact on Arts and Humanities. He was awarded the PM YUVA fellowship and is the founder and editor of the literary journal "The Wordwatch."

5 Paper Presentation

The Paper Presentation session of the seminar served as a platform for scholars, researchers, and educators to present their research and innovative ideas related to the themes of the seminar. This session provided an opportunity for participants to showcase their work, engage with peers, and receive feedback from experts in the field. The papers presented covered a wide range of topics, including the role of the National Education Policy (NEP) in reshaping academic practices, the impact of Artificial Intelligence (AI) on academic writing, and the integration of technology in educational research.

Each presentation was followed by a Q&A session, where the audience had the chance to ask questions, clarify doubts, and discuss the potential applications of the research in real-world educational settings. This interactive format allowed for an enriching exchange of ideas and fostered deeper intellectual engagement among participants. The diversity of topics presented highlighted the interdisciplinary nature of the seminar, as attendees from various academic backgrounds brought unique perspectives to the discussions.

The paper presentations not only provided valuable insights into the evolving academic landscape but also showcased the innovative approaches being developed by researchers to tackle the challenges faced by modern education systems. Whether focusing on AI's role in automating research processes, enhancing the quality of academic writing, or exploring the implications of NEP for higher education, each paper contributed to a greater understanding of how these forces can work together to revitalize academic writing and research practices.

In addition to presenting their research, authors were encouraged to share their findings and ideas with a wider audience, fostering collaboration and creating opportunities for future research projects. The paper presentation session was a key part of the seminar, offering both intellectual stimulation and practical takeaways for participants who are looking to advance their research in the context of NEP and AI.

Paper Presentation Themes

The paper presentations during the seminar covered a wide range of topics related to academic writing, research, and education. These themes reflect the seminar's interdisciplinary approach and its focus on integrating modern technologies like Artificial Intelligence (AI) with traditional academic practices. The following themes were explored in the paper presentations:

- **Commerce**
- **Management**
- **Marketing**
- **Ethics in Academic Writing**
- **Human Resources**
- **Online and Digital Education**
- **Industry Collaborations**
- **Tourism**
- **Recent Trends in Higher Education**

These themes collectively addressed some of the most pressing issues in modern education, academic writing, and research, offering innovative solutions and new perspectives that will shape the future of academia.

 ISBN: 978-81-993134-0-8

Articles

The following are the list of papers presented.

No	Title of Article	Author(s)
1	THE NEGATIVE IMPACT OF AI TOOLS IN THE EDUCATION SECTOR: A SYSTEMATIC REVIEW	DR SHAJI THOMAS
2	TRANSFORMING EDUCATION IN THE DIGITAL AGE: A COMPREHENSIVE ANALYSIS OF TECHNOLOGICAL ADVANCEMENTS	SURABHI SADAN
3	SOCIAL SUPPORT AND EMPLOYEE WELL-BEING: EXAMINING THE ROLE OF WORKPLACE POLICIES AND SUPPORT SYSTEMS	ALEENA SIBI[1], ANOOP JOSEPH[2], JOSMY VARGHESE[3]
4	GREEN HR REVOLUTION: TRANSFORMING TRADITIONAL HUMAN RESOURCE PRACTICES FOR SUSTAINABILITY	DIVYA C.K.[1], DR. NIMMY A. GEORGE[2]
5	BANK MERGERS: A REVIEW AND RESEARCH AGENDA	LAKSHMI PRIYA K S[1], PROF. (DR.) SURESH V N[2]
6	A THEORETICAL PERSPECTIVE ON THE GLASS CEILING AND PROFESSIONAL GROWTH	CILLA JOSEPH K[1], DR.SWAPNA R[2], VINEETHA SHIBU[3]
7	DIGITAL BANKING – AN OVERVIEW	MERIN JOSE
8	CONCEPTUAL VIEW OF GREEN MARKETING STRATEGIES FOR SUSTAINABLE BUSINESS PRACTICES	JOSMY VARGHESE[1], DR. NIMMY A. GEORGE[2], ANOOP JOSEPH[3]
9	THE IMPACT OF SENSORY MARKETING ELEMENTS ON CONSUMER BUYING BEHAVIOR: A STUDY ON CONSUMER PRODUCTS	GEETHUMOL SHAJI
10	A REVIEW ON SUSTAINABLE PATHWAYS FOR ECO-TOURISM DESTINATIONS	ANOOP JOSEPH[1], DR. SWAPNA R[2], JOSMY VARGHESE[3]
11	REVOLUTIONIZING MARKETING MANAGEMENT: THE POWER OF ARTIFICIAL INTELLIGENCE	Dr. JINS MATHEW
12	UNEMPLOYMENT AMONG EDUCATED WOMEN IN DEVELOPING REGIONS: THE CASE OF IDUKKI DISTRICT, INDIA	NEETHU MATHEW
13	AN ANALYSIS OF RURAL HOUSEWIVES' PARTICIPATION IN INCOME-GENERATING ACTIVITIES: EVIDENCE FROM IDUKKI TALUK	RESHMA JOSE
14	STUDY ON THE INFLUENCE OF CELEBRITY ENDORSEMENT ON PURCHASING DECISION	AKHILA BIJU
15	TRACKING THE RAILS: SHORT-RUN INTERDEPENDENCE AND PRICE DYNAMICS IN INDIA'S RAILWAY FIRMS	Dr.BOBY THOMAS

 ISBN: 978-81-993134-0-8

The Negative Impact of AI Tools in the Education Sector: A Systematic Review

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Abstract

The rapid evolution of Artificial Intelligence (AI) technologies used in education has both positive developments and adverse outcomes. Even though AI ensures that each student receives the best learning experience possible through personalized learning, it also helps administrators to do their jobs quickly. It, therefore, enables data-based decision-making, so this study focuses more on the apprehensive impacts of AI Tools in the education sector. This holistic examination of the existing research informs teachers, policy-makers, and stakeholders about the negative impacts of using these technologies. This paper seeks to delineate the current state of knowledge on the issues of AI tools in educational environments, especially regarding their consequences for students, teachers, and educational systems.
Key Words: Artificial Intelligence, Education, Learning, Technologies.

1 Introduction

The emergence of AI technology in education is an important topic that has also provoked considerable thought and discussion on its effects. AI has shifted the usual way of education and learning. While proponents support this technology that will bring few advantages, there are also many warnings of its potentially negative consequences (Selwyn, 2019; Luckin et al., 2016). The latest AI solutions to make education more effective involve intelligent teaching systems, automated markers administration software to make life easier, and many others (Luckin et al., 2016). Although technology may improve the learning environment, whether ethical, social, and pedagogical problems worsen is still controversial. AI-incorporated teaching resources like intelligent tutoring systems, digital exams, and software for plagiarism detection systems are gradually superseding traditional ways

 ISBN: 978-81-993134-0-8

of education (Schmelzer, 2021). Along with these positive sides, there are certain drawbacks that AI has brought due to primary ethical dilemmas, privacy issues, and students' inability to develop independent skills (Selwyn, 2020). The given paper explores AI's long-term effects on the education sector, starting from the downward trends of AI and its potential long-term impact on students and educators.

2 Review of literature

Since the early 2000s, AI has gradually made its way into education to incorporate its use in machine learning, natural language processing, and adaptive learning systems (Luckinet al., 2016). AI chatbots, virtual assistants, and automatic grading systems can be used to redesign the whole pedagogical system (Woolf, 2010). The employment of AI-driven essay generators and paraphrase software is increasing the frequency of academic dishonesty (Maurer et al., 2018). The distrust of AI and education is reflected in the fact that it is one of many factors that can bring teachers under doubt concerning test authenticity (McCabe et al., 2012).

One of the most significant risks with AI technology is cheating academic integrity. With the launch of AI authors for essays and plagiarism checkers worldwide, academic misconduct will undoubtedly skyrocket. Xie (2021) highlighted how 'some students might rely on these easy ways to learn in order to write infrequently and not to learn to think' and, thus, completely neglect the learning process. New age has done more damage than good to students' intellectual development and literacy skills. These students colloquially will dance perfectly, discuss their problems, and work the issues out.

The particular transformation to the tech-driven will be to make AI the tool, not the tutor; this will instil traditional learning experiences and ensure that students keep practising their verbal skills along with written ones (Selwyn, 2019). Heffernan et al. (2018) They observed that students accustomed to AI-formulated generated feedback could not critique their work, thus hindering the learning process. Imitating AI and not using our brains to think may lead to the failure of humans to be independent and develop this skill (Carr, 2010). The obstruction of the AI trend in teaching is the diminished direct teacher-student interaction in class and collaboration among teachers in the entire learning process, which is generally associated

with the traditional way (Miller, 2018).

AI tools can contribute more to the already divided educational system. Modern AI tools' availability primarily depends on economic status, as some institutions can buy them while others cannot. Warschauer (2019) stated that the inability of low-income students to get quality instructional materials adds more to the gap in student achievement. AI tools can, therefore, help persecute the already marginalized students and, thus, fail the principle of providing equal educational opportunities for all. Algorithmic discrimination practised through AI-based technology is capable of even worse harm to the already susceptible populations. Researches reveal that AI-based grading applications and adaptive learning systems reinforce the bias in the training data, and as a result, the disparity in educational success worsens (Binns, 2018).

Privacy regarding data collection and monitoring remains the most important issue for AI technologies to implement. One of the problems they may encounter is that these educational solutions may need to deal with an exhaustive lack of data on students' personal information or their learning preferences before applying the Appropriate Withholds process. Stoilova et al. (2020) Shed light on the issue of data gathering, storage, and possible misuse in the procedures used by data processing companies should be transparent to the fullest. If not, students and parents may feel that they are being tricked, thereby causing anxiety in the teaching environment. Sometimes, AI applications request a lot of personal data, leading to concerns about students' privacy and security (Williamson & Piattoeva, 2020). Conversely, the untrained people handling of sensitive data will likely cause students and staff much unnecessary trouble (Regan & Jesse, 2019).

By using AI to monitor the activities and performance of the students, a surveillance culture is created in which students constantly feel they are being watched (Harris, 2020). This happens without seeing that students may be affected negatively by their psychological and learning experiences (Bennett & Maton, 2010). The rising concerns for AI technologies are about teachers' classroom use. The fear is that more intelligent AI systems will usurp teachers' roles altogether, causing job insecurity. "The use of AI can make teacher's work easier by helping teachers in administrative work; but on the other hand, it can lead to the loss of the human connection and the teacher and learner will not be effective anymore" (Arntzen et al., 2022). This fear might distract the teachers from their jobs, thus lowering

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their motivation and performance.

These include ethical considerations such as bias and fairness regarding using AI technologies in education. AI algorithms will hypothetically avoid prejudices; hence, there are valid concerns about how these biases the decisions made in the educational domain (O'Neil, 2016). For instance, AI-based admissions or testing systems built on biased data sets may reproduce pre-existing discrepancies and propagate discriminatory outcomes. In this way, ethical considerations would require properly scrutinising algorithms in the name of educational technologies that assure equity and fairness.

The contribution of human factors to education cannot be overemphasized in the cultivation of critical thinking, emotional skills, and creativity. As the literature indicates, students utilizing AI-based tutoring systems exhibit cognitive engagement and retention much less than others (Brown et al., 2022). Incorporating AI in learning environments can expand the digital divide, especially for students from lower socioeconomic backgrounds with insufficient access to technology (Warschauer, 2003; van Dijk, 2020). Institutions that heavily depend on AI instruments stand to exclude individuals with few technological resources, thus deepening learning inequalities (Hohlfeld et al., 2008).

Bias and fairness are significant challenges because AI systems can mirror and even enhance biases in training data (O'Neil, 2016). The challenge has significant implications for equity in education because AI-based tests or recommendations could disproportionately disadvantage certain groups based on factors like gender, race, or socioeconomic status (Holmes et al., 2019).

Many AI educational tools claim to have compelling educational experiences. However, the effectiveness of such applications remains vague and inconsistent (Nye, 2020). Not every tool marketed under the name AI can claim any valid academic testing; therefore, a very high risk exists of spreading misinformation or providing less than adequate education (Bias & Mayock, 2018). Moreover, too much reliance on such technology has a misconception that deprives teacher-student interaction of meaning—interaction that indeed counts for successful learning outcomes (Turkle, 2015). When personalized teaching approaches are replaced with automated systems, crucial aspects of education become socially and emotionally compromised. This kind of replacement may cause demotivation

 ISBN: 978-81-993134-0-8

and disengagement for the learners (Klein, 2020).

3 Findings of the study

In this study, the key variables identified the negative impacts of AI tools in education sectors are directed in Table 1

Table 1: Variables identified and Authors

Variable identified	**Author**
Academic Integrity and Plagiarism	(Kim et al., 2022) (Xie's , 2021)
Equity and Access Concerns	(Warschauer, 2003; Van Dijk, 2020) (Hohlfeld et al., 2008), (O'Neil, 2016), (Holmes et al., 2019).
Over Dependence on Technology	(Selwyn, 2019), (Heffernan et al. 2018) (Carr 2010).(Miller, 2018)
Socioeconomic Disparities	(Warschauer,2019) (Binns, 2018), (Kirkpatrick, 2016), (West et al., 2019) (Selwyn, 2019)
Privacy and Data Security Concerns	(Raji & Buolamwini, 2019), (Stoilova et al. 2020), (Williamson & Piattoeva, 2020), Regan & Jesse, 2019), (O'Neil, 2016)
Teacher Roles and Job Security	(Arntzen et al., 2022)
Reduced Critical Thinking and Creativity	(Brown et al., 2022) (Frey & Osborne, 2017), (OECD, 2021).
Teacher-Student Relationship Deterioration	(Fullan, 2018), (Darling-Hammond, 2020).
Surveillance and Control	(Bennett & Maton, 2010), (Harris, 2020)
Unreliable Quality of AI Tools	(Nye, 2020),(Bias & Mayock, 2018), (Turkle, 2015) ,(Klein, 2020)

1. Erosion of academic integrity: One of the major concerns is the promotion of dishonest academic behaviour using AI tools. Students often submit AI-generated content without modification or acknowledgement, prioritizing submission over genuine comprehension.

2. Equity and access problems: AI in education can unintentionally perpetuate disadvantages from its training data, leading to unfair outcomes for marginalized groups. Additionally, unequal access to

 ISBN: 978-81-993134-0-8

AI tools may worsen the digital divide, further impacting students from low-income families who are already at a disadvantage.

3. Technology dependence: Others worry that growing dependence on technology in education will erode critical thinking and intellectual abilities. While some are certain that it will weaken and disempower the latter, others confirm that over-reliance on computer-related technologies will erode the value of those qualities since students will be more inclined to rely on machinery to regurgitate pre-cooked answers at their fingertips.

4. Social economic disparity: The review found differences in access to AI technologies, which would further increase existing disparities in learning. The growing shift of AI in education further increases the digital divide, as disparities in access to technology and digital literacy discourage equal participation in AI-enhanced learning environments.

5. Ethical and privacy concerns: The literature mostly raised serious concerns about collecting and utilizing student information to ensure privacy. Incorporating this body of practice and knowledge in education has raised serious concerns about privacy and ethics.

6. Disruption of the teacher-student relationship: Classroom AI will devalue the teacher-student relationship by removing face-to-face human interaction, weakening social and emotional learning. This change could equate to less student engagement and loneliness due to the inability to connect with a human instructor on a human level.

7. Surveillance and Control: Using AI in education has already raised serious issues about surveillance and control, mostly about students' privacy. AI algorithms, which involve collecting vast amounts of data on personal information, i.e., records of students' grades, online behaviour, and even normative behaviours, can be a window for abuse or weak protection mechanisms and lead to privacy violations.

8. Teachers' roles and job insecurity: The emergence of AI as a teacher stirred a furore over its potential influence on teachers' roles and job security. AI has the potential to simplify teachers' work by automating batches of administrative tasks like grading and lesson planning.

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9. Effect on Students' Thinking: Overdependence on AI in learning threatens to diminish students' capacity for critical thinking and creativity because they might rely on an untested solution in what would otherwise be an ordinarily independent problem-solving and imagination-engagement environment.

10. Uncertain Quality of AI Tools: The discourse on AI in education has raised serious issues around the quality and validity of AI tools. Moreover, AI tools' performance is heavily dependent on data quality; low-quality data (e.g., incompleteness, inaccuracy, or obsolescence) produces unreliable AI performance.

4 Conclusion

Artificial Intelligence innovations have redesigned the educational sector; on the other side, their integration can result in the appearance of problems that require detailed inspection. Problems like academic dishonesty, consideration of mental health, algorithmic bias, and privacy violations may appear. The extreme inclusion of AI tools in the educational process creates several chief stumbling blocks for educators, policymakers, and researchers. This analysis encourages carefully selecting well-evidenced studies as evidence of AI inclusion in educational settings. In the course of these technological changes, it is essential to ensure that fairness and the quality of education stay high while addressing the human facets vital to the teaching and learning processes.

Future studies should emphasise creating moral AI models meant to develop academic integrity, promote all types of students, and focus on establishing guidelines and ethical standards that can counterbalance the ill effects of AI and utilise its constructive advantages. Regardless of the prospect that AI technologies offer a more enriching learning experience, this review illustrates many ill effects worthy of notice. The prime concerns are loss of academic integrity, over-reliance on technology, exacerbating socioeconomic inequalities, privacy invasion apprehensions, and hazards related to discriminatory decision-making. In order to prevent these complications, all stakeholders must have proper discussions concerning the ethical utilisation of AI in educational settings. There is a need to push for equitable access while ensuring an integrated approach synchronising technological progress with human touch. Continued research needs to

investigate numerous implications associated with AI technologies in education; findings procured can inform policy development and encourage enhanced ethical practice within this critical field.

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 ISBN: 978-81-993134-0-8

Transforming Education in the Digital Age: A Comprehensive Analysis of Technological Advancements

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Abstract

Technology has transformed education in many ways, making learning easier, more enjoyable, and more effective. For many students and working professionals across the globe, learning and teaching procedures naturally involve it. This review discusses some of the technologies, such as online learning, artificial intelligence, virtual and augmented reality, learning through games, cloud computing, smart classrooms, and mobile learning. Technologies enable learners to learn in new dimensions, making lessons enjoyable and appropriate. Notwithstanding, issues like inequities in access to technology, threats in the cyber sphere, and providing training to teachers still prevail. Schools must set mechanisms through which technology is protected and accessible to everyone. The swift progress in digital technology has revolutionized the educational arena entirely, so e-learning has become the norm. With more advanced technology, education has to catch up to derive maximum benefits from the new technology. Innovative technologies, data analytics, and virtual learning are revolutionizing the future of education, and students are getting more options and flexibility. Technology must be blended with conventional teaching to realize complete development. This review will examine the significant technological progress, its advantages, obstacles, and the outlook for education in the digital era.
Keywords: Adaptive Learning, Artificial Intelligence, Augmented Reality, Cloud Computing, Technology in Education, Virtual Learning.

1 Introduction

Technology innovations have revolutionized teaching and learning processes. Digital technologies have enhanced access, participation, and efficiency of knowledge transfer. The convergence between Artificial Intelligence (AI) and new technologies in the interactive, mobile, and remote computing in

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physical and/or virtual environments constitutes the obvious trend towards the shaping of the smart classroom concept. Most of the technologies that are being applied in the smart class are rooted in AI that facilitates the interactive, adaptive, and intelligent use of the technologies throughout the learning process. From smartboards and web-based learning platforms to blockchain credentialing and AI, educational institutions and universities around the world are leveraging technology innovations to improve the performance of the students and the functioning of the institutions.

One of the most dramatic shifts is the rise of e-learning and distant learning, driven by the worldwide COVID-19 pandemic. Virtual classrooms, digital learning platforms, and AI-powered adaptive learning have allowed students to receive quality education from any corner of the globe. Furthermore, immersive technological advancements like virtual reality, augmented reality, cloud computing have revolutionized educational practices by delivering interactive simulations along with real-world applications of abstract concepts.

Despite all these developments, there are still problems. Digital divides, cybersecurity concerns, and the potential for reduced human interaction in learning environments question equitable access and the quality of technology-based learning. The need for teacher training, infrastructure development, and ethical considerations of AI and data privacy also makes it difficult to incorporate technology into education.

This paper discusses recent developments in education technology, whereby their influence on pedagogy, student learning, and organizational structure is investigated. In the discussion of the advantages and disadvantages, this review strives to have an overall appreciation of how technology is transforming education and how it can be leveraged and overcome flaws.

2 Review of Literature

The COVID-19 pandemic prevented learners from conducting the learning process face-to-face. In such conditions, the e-learning was performed virtually as an exit option. The application of WhatsApp and other digital tools has made a difference in the attainment of learning content. Age did not make a big difference in comprehension of the material. Moreover, gender did not create any difference in the material understanding,(Claresta Defa Ranti et al.(2018)).

The potential of e-learning to revolutionize education is rooted in the con-

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vergence of strong pedagogical models and advanced technologies. Achieving this vision, though, requires addressing systemic issues like the digital divide, privacy of personal data, environmental conservation, and promoting multidisciplinary collaboration,(Elias Dritsas & M. Trigka, 2025).

In early 2023, Educators and academic policymakers again focused on how technology is used in education after the sudden popularity and accessibility of generative AI tools based on large language models, such as OpenAI's ChatGPT. (Yan et al., 2023). Generative AI technologies are among the most revolutionary technologies created in the past few years. Their application in education is an up-and- coming field of research and practice with much potential to revolutionize various facets of teaching and learning.(Michail N. Giannakos et al., 2024).

Integrating adaptive learning with AI or ML (Machine Languages) in e-learning can transform traditional educational approaches. Adaptive learning systems can boost student engagement, promote self-directed learning, and enhance learning outcomes by utilising data-driven personalisation, timely feedback, and dynamic content delivery.(Ilie Gligorea et al., 2023).

Control group experimental studies have shown that students have shown a favourable attitude and have formed a strong affinity for haptic-based AR devices and AR-based games as optimal learning tools compared to conventional classroom lessons. (Furió, D et al 2015).

Understanding better how educators view AI systems is important because educators are ultimately the end users in this context. Even an ideal system that is reliable, accurate, and fair in its practice will fail if the educators have concerns related to usability, errors, and algorithmic biases (René F. Kizilcec, 2023).

New technology has explored new possibilities for customized instruction, elevated feedback, and personalized learning experiences for learners that foster a more effective, fair, and engaging learning environment. GAI (generative artificial intelligence) is changing teaching and learning with new channels to work through longstanding challenges and offering new opportunities to improve the experiences of learners of all ages. (Zied Bahroun et al., 2023).

The potential of AI in education is immense, and it has the power to reinvent the educational space completely. Various forms of collaboration among key stakeholders must be built. The goal of AI is not to replace stakeholders but to empower them. (Shubham Ojha et al., 2023).

According to Esther Ololade Adekunle et al. (2021), the evolution of

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technology in education worldwide presents both challenges and possibilities.

3 Objectives of the Study

1. To examine and categorize various technology innovations implemented in learning settings.
2. To understand the significant relationship between the usability and efficiency of digital learning resources used in education.

4 Research Methodology

The research employs both primary and secondary data and an analytical design. The study collected a sample from 100 respondents selected through convenience sampling. A survey was conducted using a questionnaire designed to gather data from students attending various colleges in the Idukki district. Secondary data from websites and journals were also employed. Data analysis employed a chi-square test, descriptive statistics, and pie charts.

5 Data Analysis and Interpretation

Objective 1: To identify and categorize the different digital technological advancements implemented in academic settings.

Table 1: The Different Digital Technological Advancements

Variables	**No of respondents**	**Percentage**
Artificial Intelligence (AI)	10	10
Virtual and Augmented Reality (VR/AR)	8	8
Online Assessment Tools	15	15
E-Books	27	27
Flipped Classrooms	12	12
Collaborative Tools	23	23

Cloud Computing and machine learning	5	5
Total	**100**	**100**

Interpretation: As the above Table shows, most of the respondents are using E-books and collaborative tools, while fewer respondents consider cloud computing and augmented reality. Figure 1 shows a graphical presentation.

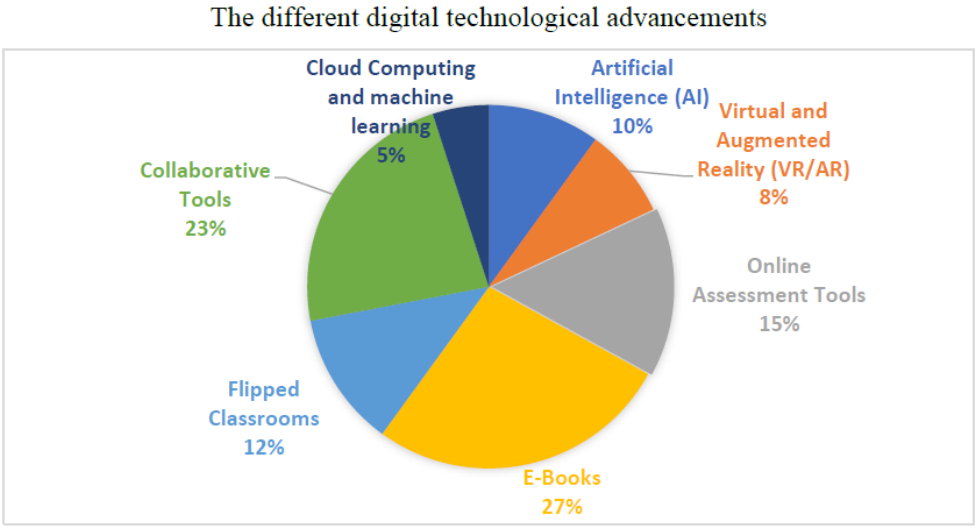

Figure 1: Digital technological advancements

Objective 2: To understand the significant relationship between the usability and efficiency of digital learning resources used in education.

Hypothesis Test

H0: There is no significant relationship between the usability and efficiency of digital learning resources used in education.

Chi-Square Test Results:

- Calculated Chi-Square Value $(\chi^2) = 5.63$
- Table (Critical) Value $(\chi^2) = 3.84$
- Significance Level $(\alpha) = 0.05$

Interpretation: Since $(\chi^2) = 5.63$ is greater than $(\chi^2) = 3.84$, so reject the null hypothesis. This indicates that there is no significant relationship

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between usability and efficiency of digital learning resources used in education. The usability of digital tools is not solely dependent on their quality—other factors such as accessibility, technical support, or user preferences may influence satisfaction.

6 Result and Discussion

The research indicates that technological innovations have revolutionized education to a great extent by increasing accessibility, interaction, and individualized learning. The categorization of various technological advancements – such as online learning, AI, VR/AR, cloud computing, and smart classrooms, E-books etc—indicates their various uses in contemporary learning environments. All of these technologies play a specialized role in defining teaching practices and enhancing learning processes.

For usability and quality of digital technology, the research provides mixed evidence. the usability of digital tools is not solely dependent on their quality—other factors such as accessibility, technical support, or user preferences may influence satisfaction. Although the majority of digital learning environments have intuitive interfaces and personalized experiences, system inefficiencies, technology breakdowns, and teacher training gaps often are obstacles to their full potential. Student and teacher feedback shows that well-designed education technologies improve learning outcomes, but poorly executed technology can become an obstacle instead of an enabler.

The analysis of technology adoption challenges identifies persistent problems, including uneven availability of digital resources, cyberattacks, resistance to change, and the digital divide. Institutions, particularly those in the developing world, are confronted with inadequate infrastructure, slow internet, and teacher training. These are the problems that are slowing down the seamless incorporation of technology into education systems and generating disparities in learning opportunities.

The study shows that technological innovations in education have transformed learning, but only when strategically implemented. Digital equity is essential to maximizing the utilization of education technology. Institutions ought to close the digital divide by investing in infrastructure, teacher training, and providing it to everyone. Second, the research calls for equilibrium between technology and traditional instruction. While computer aids provide an interactive component, they need to enhance—and not take the place of—student-teacher interaction and basic learning principles. Incorporat-

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ing technology along with traditional education can provide a best-practices learning experience.

Security concerns are also a major concern. The institutions must adopt robust cybersecurity measures to safeguard students' data and provide secure virtual learning environments. Ongoing research and innovation in education technology must also be undertaken to enhance and advance existing technology to make them more effective, inclusive, and responsive to various learning needs.

In brief, the research focuses on the fact that although technology possesses tremendous potential to revolutionize education, it needs to be tackled for its weaknesses. With the implementation of holistic policies, enhanced digital literacy, and ensuring accessibility, institutions of learning can realize the true potential of technology developments to establish a more efficient and equitable system of learning.

7 Conclusion

Technology has transformed education by making it more accessible, interactive, and personalized. Some of the technological advancements such as online learning, artificial intelligence, virtual and augmented reality, cloud computing, and smart classrooms have been explored in this study. These technologies have greatly enhanced the learning experience of students, and education has become more interactive and responsive. Yet, their success relies on their proper implementation, accessibility, and institution readiness.

While these advantages are recognized, challenges such as the digital divide, cyber security threats, untrained teachers, and opposition to change make wide adoption problematic. Students in underdeveloped regions lack ready access to technology, thus have less than adequate access to online educational materials, causing disparities in access to educational materials. Further, although technology supplements learning, it is impossible to entirely supplant conventional methods of instruction. An amalgamated method using both technology and traditional teaching techniques is important in achieving optimal results with students. To effectively integrate technology into education, institutions and policymakers need to prioritize digital infrastructure, teacher training, and access for all at the very top of the agenda. Cybersecurity and the right use of AI are also essential. Future studies must be targeted at making education technology more adaptable and inclusive. By introducing strategic intervention, education systems can

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leverage technology to produce more effective, inclusive, and future-ready learning environments.

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 ISBN: 978-81-993134-0-8

Social Support and Employee Well-being: Examining the Role of Workplace Policies and Support Systems

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Abstract

Employee well-being is a main factor in organizational success, influencing job satisfaction, productivity, and retention. This study examines the impact of social support, work-life balance policies, and organizational care on employees' time management, resilience, and work-life balance strategies. Drawing from existing literature, the study explores how colleagues and supervisor support mitigate workplace stress and enhance resilience, while work-life balance policies and organizational care initiatives improve employees' ability to balance personal and professional responsibilities. Findings from previous research emphasize that a supportive work environment, flexible policies, and strategic interventions significantly contribute to employee well-being and performance. This study provides insights for organizations on optimizing policies and fostering supportive work environments to enhance employee engagement and productivity.

Keywords: Social Support, Work-Life Balance, Organizational Care, Time Management, Employee Resilience, Workplace Well-being, Supervisor Support, Colleague Support.

1 Introduction

Employee well-being is an essential factor influencing organizational performance, job satisfaction, and overall productivity. As workplaces evolve with increasing demands and dynamic work environments, the role of social support systems, work-life balance policies, organizational care, etc. has gained prominence in shaping employees' ability to manage their work and personal

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lives effectively. A growing body of research suggests that when employees receive adequate support from colleagues and supervisors, along with organizational initiatives that promote work- life balance and flexibility, they develop greater resilience, enhanced time management skills, and effective work-life balance strategies (Allen et al., 2013; Haar et al., 2014). These factors contribute not only to employee well-being but also to organizational success, as they reduce burnout, absenteeism, and turnover while fostering a productive and engaged workforce (Halbesleben, 2006).

Social support in the workplace plays a fundamental role in mitigating workplace stress and promoting job satisfaction. Employees who experience strong support from their colleagues and supervisors tend to cope better with job-related stressors and exhibit higher levels of psychological resilience (Beehr et al., 2003). Work-life balance policies further complement these support systems by offering flexibility and reducing conflicts between professional and personal responsibilities (Kossek, Valcour, & Lirio, 2014). Additionally, organizational care initiatives, such as wellness programs, mentorship opportunities, and mental health resources, create an environment where employees feel valued and supported, leading to greater job commitment, and reduced emotional exhaustion (Eby et al., 2008).

This study aims to examine the impact of colleague and supervisor support, work-life balance policies, organizational care, etc. on employee time management, resilience, and work-life balance strategies. By analyzing these relationships, the study seeks to provide valuable insights for organizations looking to enhance employee well-being through supportive workplace environments and policies.

1.1 Importance of the Study

The well-being of employees is a fundamental determinant of organizational success, as it influences job satisfaction, performance, and retention rates (Allen et al., 2013). In today's dynamic work environments, the presence of strong social support systems, well-structured work-life balance policies, and organizational care initiatives has become increasingly crucial in helping employees manage work demands effectively. Research indicates that organizations that prioritize employee well-being through supportive policies and flexible work options experience higher levels of productivity and engagement, while also reducing burnout and turnover (Kossek, Valcour, & Lirio, 2014; Haar et al., 2014).

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Social support, particularly from colleagues and supervisors, plays a significant role in mitigating workplace stress and enhancing employees' coping mechanisms and resilience (Beehr et al., 2003). Employees who perceive high levels of workplace support report greater psychological well-being, lower emotional exhaustion, and improved job satisfaction (Halbesleben, 2006). Work-life balance policies, including flexible work arrangements and paid leave policies, have been shown to reduce work-family conflict and enhance employees' overall well-being (Eby et al., 2008). Additionally, organizations that invest in wellness programs, employee assistance initiatives, and mental health support foster a positive work culture that enhances job commitment and organizational loyalty (Kelliher & Anderson, 2010).

This study is particularly important for professionals, mentors, and policymakers, as it provides insights into how workplace support systems and policies influence employee well-being, resilience, and productivity. By understanding these relationships, organizations can design evidence-based interventions that foster a healthier, more productive workforce while ensuring sustainable organizational growth (Sloan, 2012).

1.2 Objectives

1. To analyze the impact of colleague and supervisor support on employee time management and resilience.
2. To assess the influence of work-life balance policies on employees' ability to manage work and personal responsibilities.
3. To explore the role of organizational care initiatives in enhancing resilience and promoting better work-life balance strategies.

2 Literature Review: Social Support and Employee Well-being

Employee well-being has gained significant attention in organizational psychology, with researchers emphasizing the role of social support, work-life balance policies, organizational care, and remote work options in shaping workplace outcomes. Studies suggest that social support from colleagues and supervisors acts as a critical resource in helping employees manage stress and enhance resilience (Ng & Sorensen, 2008). This support can take the form of emotional encouragement, instrumental help, or informational guidance, all

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of which contribute to improved psychological well-being and job satisfaction (Viswesvaran, Sanchez, & Fisher, 1999). A meta- analysis by Halbesleben (2006) highlights that workplace support reduces emotional exhaustion, improving overall employee engagement and retention.

Social Support and Employee Resilience

Social support, particularly from supervisors and peers, is crucial for fostering resilience among employees. Research indicates that employees who receive consistent workplace support experience lower job-related stress and higher motivation levels (Brough et al., 2014). Additionally, social support networks contribute to positive coping mechanisms, enabling employees to manage workplace challenges more effectively (Hobfoll, 2002). According to a study by Beehr, Farmer, Glazer, Gudanowski, and Nair (2003), employees who perceive high levels of social support exhibit better resilience, reduced absenteeism, and increased productivity.

Work-Life Balance Policies and Employee Well-being

Work-life balance (WLB) policies are increasingly recognized as essential for organizational success. Several studies show that flexible work schedules, parental leave, and paid time-off improve employees' ability to balance personal and professional responsibilities, thus reducing burnout (Kossek, Valcour, & Lirio, 2014). Research by Allen, Johnson, Kiburz, and Shockley (2013) found that organizations implementing effective WLB policies experience higher employee satisfaction and lower turnover rates. Furthermore, a systematic review by Haar, Russo, Suñe, and Ollier-Malaterre (2014) emphasizes that work-life balance strategies positively correlate with job performance and emotional well-being.

Organizational Care and Employee Support Programs

Beyond policies, organizational care initiatives play a significant role in shaping a supportive work environment. Companies that prioritize mental health programs, mentorship initiatives, and wellness resources experience higher employee engagement and loyalty (Eby, Allen, Evans, Ng, & DuBois, 2008). Research suggests that employees working in organizations with a strong culture of care exhibit higher job commitment and resilience (Kelliher & Anderson, 2010). Studies also highlight that workplace interventions, such as

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counseling services and stress management training, mitigate burnout and enhance job satisfaction (Sloan, 2012).

Time Management

The shift towards remote work options has transformed workplace dynamics, with time management emerging as a critical factor. Studies indicate that employees with the autonomy to work remotely report higher productivity, better time management skills, and improved work-life integration (Gajendran & Harrison, 2007). However, challenges such as digital fatigue, blurred work-life boundaries, and isolation can hinder effectiveness if remote work is not managed properly (Eurofound, 2020). A study by Golden and Veiga (2005) found that remote employees who receive adequate organizational support experience higher job satisfaction and lower stress levels.

The literature specifies the importance of social support, work-life balance policies, organizational care, and remote work options in fostering employee well-being. Organizations that invest in these dimensions enhance resilience, time management, and overall work-life balance strategies, leading to higher job satisfaction, reduced stress, and improved productivity. Future research should explore how technological advancements and evolving workplace structures further influence these relationships.

2.1 Research Questions

- How does colleague/supervisor support influence employee resilience and time management?
- What is the relationship between work-life balance policies and work-life balance strategies among employees?
- How does organizational care contribute to employees' resilience and well-being?

3 Conceptual Framework

The conceptual framework for this study is based on the premise that social support and organizational policies play a main role in shaping employee well-being, resilience, and work-life balance strategies.

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1. Colleague/Supervisor Support

- Social support at work is a crucial resource that helps employees manage stress, maintain job satisfaction, and enhance resilience (Beehr et al., 2003).
- Supervisor support provides employees with guidance, encouragement, and emotional backing, which improves their ability to balance work responsibilities and personal well-being (Halbesleben, 2006).
- Colleague support fosters a collaborative work environment, enhancing teamwork, motivation, and stress coping mechanisms (Kossek et al., 2014).

2. Work-Life Balance Policies

- Organizational policies that support flexible work arrangements, paid leave, and family-friendly benefits contribute to reducing work-life conflicts (Allen et al., 2013).
- Employees with access to flexibility in work schedules are more likely to engage in effective time management and stress-reducing strategies (Haar et al., 2014).
- Clear and supportive policies enable employees to establish better boundaries between work and personal life, leading to higher productivity and well-being (Kelliher & Anderson, 2010).

3. Organizational Care

- Organizational care initiatives, such as mental health programs, employee assistance services, and wellness initiatives, significantly contribute to job satisfaction and overall well-being (Eby et al., 2008).
- Companies that emphasize employee well-being experience lower turnover rates and higher job engagement (Sloan, 2012).
- Investments in mentorship programs, stress management workshops, and workplace support networks enhance employee resilience and adaptability (Eurofound, 2020).

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4. Time Management

- Employees with adequate workplace support and flexible work policies tend to exhibit better time management skills, enabling them to meet deadlines efficiently (Allen et al., 2013).
- Work-life balance policies and remote work options impact employees' ability to allocate time effectively between work and personal responsibilities (Haar et al., 2014).

5. Resilience

- Psychological resilience is enhanced when employees receive support from supervisors and colleagues, allowing them to better cope with workplace challenges (Beehr et al., 2003).
- Organizational care programs, including mental health resources and stress management initiatives, positively influence employees' capacity to adapt and recover from setbacks (Sloan, 2012).

6. Work-Life Balance Strategies

- Employees who experience work-life balance policies and flexible work options develop effective strategies to manage professional and personal responsibilities (Kossek et al., 2014).
- Support from supervisors and organizational care initiatives fosters better integration of work and life, reducing stress and increasing satisfaction (Eby et al., 2008).

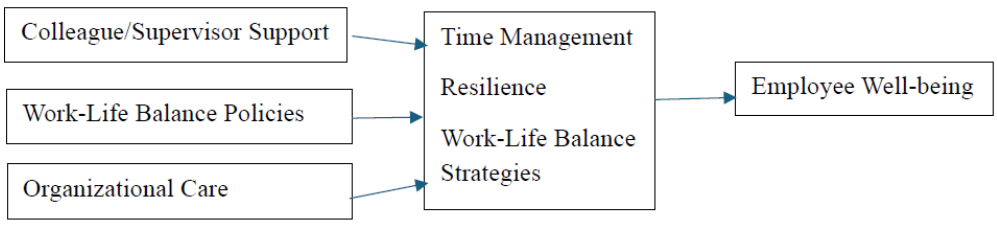

Figure 1: Conceptual framework of workplace support systems and employee well-being

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This framework serves as the foundation for examining the relationships between workplace support systems and employee well-being, offering insights into how organizations can design policies that enhance resilience, improve time management, and promote better work-life balance strategies.

4 Hypotheses

H01: Colleague/Supervisor support does not positively influence employee time management.

H02: Work-life balance policies do not enhance employees' ability to implement work-life balance strategies.

H03: Organizational care programs do not positively impact employee resilience and well-being.

5 Research Methodology

5.1 Research Design

This study adopts quantitative survey-based research to analyze the relationship between social support, work-life balance policies, and organizational care, and time management, resilience, and work-life balance strategies. A structured questionnaire was used to collect primary data, allowing for the quantification of responses and statistical analysis of relationships between variables. Additionally, a mixed-method approach was considered to gather qualitative insights wherever necessary, enhancing the depth of the findings.

5.2 Population and Sample

The study was conducted among staff members of educational institutions in the Idukki district, representing diverse educational institutions. The target population included teachers, administrative staff, and other school employees who experience various levels of social support and organizational policies. A total of 202 responses were collected through a Google Form survey, ensuring accessibility and ease of participation. Purposive and convenience sampling methods were used to gather responses, focusing on individuals who have direct experience with workplace support systems and work-life balance policies.

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5.3 Data Collection

Primary data were collected using a structured questionnaire designed to measure key variables in the study. The questionnaire included Likert-scale items (ranging from 1 = Strongly Disagree to 5 = Strongly Agree) to assess the following:

- Social Support: Perceived support from colleagues and supervisors.
- Work-Life Balance Policies: Awareness and effectiveness of policies such as flexible work hours and leave benefits.
- Organizational Care: Availability of wellness programs, mental health initiatives, and mentoring.
- Time Management: Employees' ability to prioritize tasks and meet deadlines.
- Resilience: Adaptability and coping mechanisms in challenging work situations.
- Work-Life Balance Strategies: Employees' approaches to balancing personal and professional responsibilities.

The Google Form was shared through email, WhatsApp groups, and professional networks, ensuring a broad and representative sample of school staff across the district.

5.4 Data Analysis

Collected data were analyzed using quantitative statistical techniques to establish relationships between independent and dependent variables. The following analytical methods were used:

- Descriptive Statistics: To summarize the demographic characteristics of respondents and overall trends in survey responses.
- Reliability Testing: Cronbach's alpha was used to assess the internal consistency of Likert-scale items.
- Correlation and Regression Analysis and One-way ANOVA: To determine the influence of social support, work-life balance policies, organizational care, etc. on employee time management, resilience, and work-life balance strategies.

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6 Discussions and Results

6.1 Descriptive Statistics

Many respondents were female (54.5%), followed by male (45%), with a very small fraction preferring not to disclose their gender (0.5%). The survey of 202 respondents shows that the majority are single (65.8%) and have no children (72.8%). Married respondents make up 32.2% of the total, with the most common family size being two children (12.9%).

Perceived Support from Colleagues and Supervisors: Mean = 3.57, suggesting respondents generally perceive moderate support from their colleagues and supervisors.

Existence of Work-Life Balance Policies: Mean = 3.30, indicating that respondents tend to agree that work-life balance policies exist.

Organization Care: Mean = 3.12, showing a moderate level of perceived organizational care.

Time Management (Personal Resource): Mean = 3.18, suggesting that respondents moderately utilize time management as a personal resource for work-life balance.

Resilience (Personal Resource): Mean = 3.25, indicating a moderate tendency towards resilience as a personal resource for work-life balance.

Work-Life Balance Strategies (Personal Resource): Mean = 3.32, showing a moderate level of utilization of work-life balance strategies as a personal resource.

On a scale of 1 to 5, respondents reported the highest perceived support from colleagues and supervisors (M = 3.57, SD = 1.253), while organizational care received the lowest rating (M = 3.12, SD = 1.277), suggesting a potential area for improvement. All measured variables related to support and personal resources for work-life balance had mean scores above 3, indicating generally positive perceptions or utilization.

6.2 Reliability Testing

The reliability statistics show a Cronbach's Alpha of 0.847 for the scale, indicating good internal consistency among the six items. "Perceived Support from Colleagues and Supervisors" has a corrected item-total correlation of 0.609, while "Existence of Work-Life Balance Policies" shows a higher correlation of 0.722 with the overall scale. "Resilience" has the lowest corrected item-total correlation at 0.574, but deleting this item would not improve the

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scale's reliability. All corrected item-total correlations are above 0.57, demonstrating that each variable contributes meaningfully to the overall work-life balance scale.

6.3 Hypotheses Testing

H01: Colleague/Supervisor support does not positively influence employee time management.

Correlation Analysis:

- Spearman's correlation coefficient = 0.363
- p-value = 1.0997×10^{-7} (which is very small)

Interpretation: A correlation of 0.363 suggests a moderate positive relationship between Colleague/Supervisor support and Time Management. Since the p-value < 0.05, the relationship is statistically significant, meaning there is a very low probability that this correlation happened by chance.

Regression Analysis:

$$\text{Time Management} = 2.03 + (0.389 \times \text{Colleague/Supervisor Support})$$

- Intercept (constant): 2.03
- Regression coefficient for support: 0.389 (positive)
- p-value for support: 1.10×10^{-7} (significant)
- R-squared: 0.158

Interpretation: The positive coefficient (0.389) means that higher Colleague/Supervisor support is associated with better Time Management. Since the p-value < 0.05, the effect is statistically significant. The R-squared value (0.158) suggests that 15.8% of the variation in Time Management is explained by Colleague/Supervisor support, which is moderate.

ANOVA (One-way)

- F-statistic: 10.78
- p-value: (very significant)

Interpretation: There is a significant difference in Time Management scores across different levels of Colleague/Supervisor Support.

Since the correlation is positive and statistically significant, and regression results also show a significant positive effect, we reject the null hypothesis (H01). This means we have evidence to support the alternative hypothesis (H11): "Colleague/Supervisor support positively influences employee time management." It can be concluded that Colleague/Supervisor support has a significant positive influence on employee time management.

H02: Work-life balance policies do not enhance employees' ability to implement work-life balance strategies.

Correlation Analysis:

- Spearman's correlation coefficient = 0.385
- p-value = 0.000 (very significant)

Interpretation: A correlation of 0.385 suggests a moderate positive relationship between Work-life balance policies and Work-life balance strategies. Since the p-value is 0 (very small), the correlation is statistically significant, meaning the relationship is unlikely to be due to chance.

Regression Analysis:

- Intercept (constant): 2.22
- Regression coefficient for Work-life balance policies: 0.361 (positive)
- p-value for policies: very small (significant)
- R-squared: 0.1499 (14.99%)

Interpretation: The positive coefficient (0.361) indicates that higher Work-life balance policies lead to better Work-life balance strategies. Since the p-value < 0.05, the effect is statistically significant. The R-squared value (0.1499 or $\approx$ 15%) means that 15% of the variation in Work-life balance strategies is explained by Work-life balance policies.

ANOVA (One-way)

- F-statistic: 9.22
- p-value: (very significant)

Interpretation: There is a significant difference in Work-Life Balance Strategies across different levels of Work-Life Balance Policies.

Since the correlation is positive and statistically significant, and regression results confirm a significant positive effect, we reject the null hypothesis (H02). This means we have strong evidence supporting the alternative hypothesis (H12): "Work-life balance policies enhance employees' ability to implement work-life balance strategies." It can be concluded that Work-life balance policies significantly enhance employees' ability to implement work-life balance strategies.

H03: Organizational care programs do not positively impact employee resilience and well-being.

Correlation Analysis:

- Spearman's correlation coefficient = 0.289
- p-value = 0.000029 (very significant)

Interpretation: A correlation of 0.289 suggests a weak to moderate positive relationship between Organizational care and Employee resilience/well-being. Since the p-value is very small (< 0.05), the correlation is statistically significant.

Regression Analysis:

- Intercept (constant): 2.61
- Regression coefficient for Organization Care: 0.237 (positive)
- p-value for Organization Care: very small (significant)
- R-squared: 0.0759 (7.59%)

Interpretation: The positive coefficient (0.237) indicates that higher Organizational care is associated with better Employee resilience/well-being. Since the p-value < 0.05, the effect is statistically significant. The R-squared value (7.59%) suggests that only 7.59% of the variation in Employee resilience is explained by Organizational care programs, indicating a weak predictive strength.

ANOVA (One-way)

- F-statistic: 5.19

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- p-value: (statistically significant)

Interpretation: There is a significant difference in Employee Resilience across different levels of Organizational Care.

Since both correlation and regression show a statistically significant positive relationship, we reject the null hypothesis (H03). This means we have evidence supporting the alternative hypothesis (H13): "Organizational care programs positively impact employee resilience and well-being." It can be concluded that Organizational care programs significantly impact employee resilience and well- being, but the effect size is weak.

7 Findings

1. There is a nearly equal distribution of males and females, with a slight majority of female respondents.
2. Most respondents are unmarried or in the early stages of relationships.
3. Most respondents have one or two children.
4. Employees who receive strong support from their colleagues and supervisors tend to manage their time more effectively.
5. Organizations with clear and well-implemented work-life balance policies help employees develop better strategies to balance their work and personal lives.
6. Organizational care programs positively contribute to employees' resilience and well- being, although the effect is not as strong as other factors.
7. Employees with higher levels of colleague and supervisor support demonstrate significantly better time management skills than those with lower support.
8. Employees working in organizations with better work-life balance policies adopt more effective work-life balance strategies.
9. Employees in organizations with strong organizational care programs report higher resilience levels compared to those in less supportive environments.

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8 Suggestions and Recommendations

1. Encourage a mentorship and peer support system to help employees improve their time management skills.
2. Provide leadership training to supervisors, focusing on creating a supportive work environment.
3. Implement regular feedback and recognition programs to strengthen workplace relationships and motivation.
4. Develop and enforce clear work-life balance policies, such as flexible work hours and remote work options.
5. Promote employee assistance programs (EAPs) that help workers manage stress and personal responsibilities.
6. Conduct work-life balance training sessions to help employees implement effective strategies for managing work and personal life.
7. Establish mental health and well-being initiatives, such as wellness programs, counseling services, and mindfulness sessions.
8. Create a supportive work culture by offering stress management workshops and open communication channels.
9. Ensure fair workload distribution to prevent employee burnout and enhance overall resilience.
10. Invest in workplace well-being initiatives, as they contribute to employee productivity and job satisfaction.
11. Encourage work-life balance practices by allowing employees greater flexibility and autonomy.
12. Monitor employee feedback to continuously improve support programs and organizational policies.

9 Conclusion

This study shows that social support, work-life balance policies, and organizational care play an important role in employee well-being. Employees who receive strong support from colleagues and supervisors manage their time

better and feel more confident at work. Work-life balance policies, such as flexible hours and leave options, help employees balance personal and professional roles more effectively. Organizational care programs, like wellness and counseling, improve resilience, though their effect is smaller compared to other factors. A supportive work environment reduces stress, prevents burnout, and increases job satisfaction. Organizations that invest in employee well-being also benefit from higher productivity and lower turnover. The findings suggest that well-designed workplace policies and support systems are good for both employees and employers.

10 Scope for further Research

Further research should explore how technological advancements influence employee time management and well-being. Future studies can integrate psychological and behavioral models to better understand the motivation behind employees' adoption of work-life balance strategies.

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 ISBN: 978-81-993134-0-8

GREEN HR REVOLUTION: TRANSFORMING TRADITIONAL HUMAN RESOURCE PRACTICES FOR SUSTAINABILITY

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Abstract

The business landscape is shifting from a conventional financial focus to one centered on environmental sustainability in the current period. Green issues are becoming popular nowadays because they focus more on environmental, economic, and social aspects. Nowadays, traditional human resource practices have been turned into green practices. Green human resource practices mostly emphasize environmentally friendly initiatives supporting sustainable development. This paper's main goal is to examine the evolution of conventional HR roles into Green HR activities and to address the idea of green HR practices from a theoretical perspective. This study covers key green HR practices, including green recruitment, training and development, eco-friendly workplace management, and green performance reviews. The goal is to examine the obstacles faced by the human resources department in transitioning from traditional to green methods. The report emphasizes the importance of HR professionals developing sustainability competencies and integrating green practices into their core activities. This paper aims to provide tentative scholars with a better understanding of the fundamentals of Green HRM practices from a literary perspective.

Keywords: Human Resource Practices, Green HR practices, Sustainable development, Green Hiring, Green Training and Development, Eco-friendly workplace, Green Performance Appraisal, etc.

 ISBN: 978-81-993134-0-8

1 Introduction

As organizations become increasingly concerned about environmental sustainability, the HR department has selected Green HRM as a critical strategy for environmental management. The beginning of the Green HR Revolution, which tries to create an environmentally friendly and sustainable work atmosphere, is featured by the incorporation of green HR practices into traditional HR functions. The idea of "green human resource practices" is transforming conventional HR functions by integrating sustainability into the core functions of HR.

This approach holds a strong focus on framing HR procedures and policies that promote sustainable business growth. The Green HR Revolution aims to transform traditional HR procedures that support sustainability goals, which further focus on business's long-term environmental strategy. This paper examines the essence of Green HR, its need and importance, and the tactical procedures required to place sustainability at the core of HR practices. And it also discusses the challenges faced by the organization to implement green practices.

2 The Importance and Need for Green HR Practices

1. **Environmental Accountability:** Climate change, pollution, and resource depletion are so serious, organizations need to use sustainable practices. By including sustainability as a part of their core operations, green HRM helps businesses lower their environmental impact.

2. **Adherence to regulations:** Governments all over the world are making stricter environmental laws and rules. Green HR practices help companies follow these rules, which keeps them from getting fined and makes them look like responsible businesspeople.

3. **Corporate Image and Reputation:** Companies that are more environmentally responsible can greatly improve their brand image and corporate reputation. More and more stakeholders want to do business with companies that care about the environment.

4. **Employee Engagement and Retention:** The company which follows sustainable HR practices can gain the employee confidence and

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can improve employee retention ratio and employee morale by making sure that the company's values are in alignment with employees green behavior.

5. **Efficiency and Cost Savings:** Green practices often improve operational efficiency and judicious use of resources. For example, reducing waste and efficient energy usage can boost profitability and lower operational costs.

3 Concept of Green HRM

"Green HRM" has become a key slogan within the business field at present, and its importance is manifold with the passage of time. As sustainable development and environmental management gain traction worldwide, this term has secured a hot topic since the awareness on environmental management and sustainable development has been increasing day by day all over the world. The term "green HRM" typically refers to the use of HRM practices and policies that support the broader corporate environmental agenda.

Green HRM is the application of human resource management policies to promote the sustainable use of resources inside companies and, more generally, advance the objectives of environmental sustainability. Green HRM is the application of ecologically friendly human resource management strategies to support Green HRM. It comprises the wise use of resources in companies and environmentalism, both of which raise employee morale and happiness (Mampra, 2013).

It aims to create an environmentally conscious workforce and to implement HR practices that promote sustainable use of resources within an organization. To match their HR strategy with environmental sustainability goals, businesses are increasingly implementing green human resource management, or sustainable HRM, techniques. Green human resource practices cover a great spectrum of steps meant to connect human resource management with environmental sustainability. Establishing a green team that understands, appreciates, and carries out green projects falls under direct control of GHRM. The team focuses on its green objectives throughout the recruitment, employment, and training HRM processes. The following are the critical components of Green HR practices followed by the firms:

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3.1 Green Recruitment and Selection

Green recruiting and selection is the process of hiring and choosing candidates using environmental management ideas. HRM policies promote the responsible and judicious use of corporate resources, hence advancing environmental sustainability within companies. The following are some green recruitment practices:

- Online advertisements and online submission of applications.
- Job advertisements should reflect environmental values and criteria.
- Virtual Interviews through telephone or video conferencing.
- Employers can ask environment-related questions during interviews.

3.2 Green Training

"Green training" is the educational program developed and used to educate staff members on their duty in preserving and protecting the environment. The following are some of the green training practices adopted by the firms:

- Virtual training, Training materials are made available online to educate employees about sustainable practices conducted in the firms, such as energy conservation and waste management, and to educate employees on how to maintain a green office environment, such as reducing paper usage, managing e-waste, etc. It forms internal Green Armies or committees focusing on sustainability initiatives.
- Use green technologies for training, such as renewable energy sources, energy-efficient systems, and sustainable manufacturing processes.
- Encouraging employees to obtain certifications in environmental management systems (e.g., ISO 14001), LEED (Leadership in Energy and Environmental Design), and other sustainability-related areas.
- Organizing competitions that encourage employees to develop innovative green solutions and practices.

3.3 Green Performance Management and Reward

Emphasizing the need of employee skill development, participation incentives, engagement, and organizational involvement possibilities as a means

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of boosting performance, the Ability, Motivation, and Opportunity theory (AMO theory). In the Green Human Resource Management (GHRM) context, the theory suggests that recruiting environmentally aware employees, providing green training, and inspiring motivation through green performance management can improve green performance.

The theory highlights the essential role of ability, motivation, and opportunity in driving employee performance and can be applied to enhance environmental sustainability practices within organizations. Developing green employee abilities, motivation, and opportunities outstandingly improves ecological performance by integrating the dimensions of green innovation and culture in GHRM practices (Muisyo & Qin, 2021).

The central green performance appraisal and rewarding strategies the firms follow to attain sustainable development goals are:

- Encouraging workers to express their opinions on their professional responsibilities and the workplace to implement green HR practices.
- Provide rewards (financial and non-financial) for employees based on green performance appraisal.
- Employee engagement with the green agenda is aided by green rewards offered in the form of eco-friendly lifestyle and workplace advantages, such as free bicycles, carbon credit offsets, and pollution-free cars for commuting to and from work.

3.4 Green Employee Relations

The employer-employee relationship must be improved for increased productivity. It aids employers in increasing productivity and involving workers with company objectives (Bombiak & Kluska, 2018). Organizations can adopt green employee relationships in the following ways:

- Since employees are directly in charge of implementing corporate ethical behavior in the organization's daily operations, the HR department must establish a participatory work environment where they can express their ideas about green issues (Guerci et al., 2016).
- Promoting eco-entrepreneurs, who are more knowledgeable about environmental sustainability within the company, is crucial to improving employee relations (Kramar, 2014).

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- Organizations can move to a carpooling system, utilizing public vehicles for business travel, thereby reducing carbon emissions and incentivizing green cars, such as electric vehicles and bicycles, with the purpose of connecting with employees in a green plan through transportation to the workplace.

4 Benefits of Green HRM in the Organisation

Achieving fundamental goals like corporate social responsibility, green talent acquisition and management, and competitive advantage all depend on green human resource management. It offers the following advantages:

- It increases the morale of employees.
- It lowers absenteeism and labor turnover. And helps in employee retention.
- It offers a prosperous opportunity for quality human capital.
- It helps raise an organization's image and attract good human resources.
- Enhances the reputation of the business.
- Additionally, it may be used as a promotional strategy.
- It improves the company's relationship with its stakeholders.
- It reduces the total expenditure of the company because expenses are mostly determined by the size of the business and the environmental initiatives implemented.
- It gives the business a competitive edge in the market and industry.
- As global challenges grow, more business firms are paying attention to their actions and how they affect the environment.
- Green management approaches also help businesses save costs and reduce adverse environmental effects, therefore avoiding several government measures.

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- It advances methods and processes, encourages invention, improves quality, and boosts progress.
- It fosters a green learning environment in the workplace and enhances risk management. It advances the prudent usage of resources.
- It enhances employee behavior to encourage environmentally friendly habits in both their personal and professional life.
- It helps to satisfy an employee's self-esteem needs.
- It helps to create employment opportunities.

5 Transforming Traditional HR Practices into GHRM

The proposed conceptual framework outlines the critical dimensions and activities in transforming traditional HR into Green HR practices. This transformation is divided into five dimensions.

5.1 Green Recruitment and Selection

Traditional Practices: Emphasising qualification, experience, skills.
Green Transformation:

- Adding environmental factors to the hiring advertisements.
- Evaluating candidates' environmental consciousness in interviews.
- Preference in selection should be given to those who have green knowledge (Opatha, 2013).
- Use the candidate's environmental concerns and interests as a criterion for selection.

5.2 Green Training and Development

Traditional Practices: Focus on enhancing job-related skills and knowledge.
Green Transformation:

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- Provide training to learn or adapt sustainable best practices (e.g., reducing long-distance business travel and cycling) (Jackson et al. 2013).
- Providing every employee with the knowledge and skills needed to be environmentally friendly through a dedicated training program.
- Virtual training, Training materials made available online educate employees about sustainable practices conducted in the firms, such as conservation of energy and waste management, and educate employees on how to maintain green office management, such as reducing paper usage (Longoni et al., 2018) and managing e-waste.

5.3 Green Performance Management

Traditional Practices: Performance appraisals based on productivity and efficiency.
Green Transformation:

- Integrating green factors into appraisals or using green-related criteria to assess workers' job performance (Saifulina, 2020).
- Incorporate environmental goals and sustainability metrics into performance evaluations. Example: Setting targets for reducing carbon footprints and recognizing employees' contributions to environmental initiatives.

5.4 Green Employee Relations

Traditional Practices: Performance appraisals based on productivity and efficiency.
Green Transformation:

- Foster a culture of sustainability through active employee engagement in green initiatives.
- Creating green teams, promoting eco-entrepreneurs in organizations to attain sustainability goals.
- Organizing sustainability workshops and encouraging employee participation in environmental projects are green employee engagements.

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6 Challenges Faced by the Human Resource Department for Adopting Green Practices in Organisations

Due to a number of obstacles, implementing green HR practices in a company might be difficult. Here are some of the major issues that human resources faces.

1. **Absence of knowledge and comprehension:** The concept and advantages of green HR practices must be well understood by both employees and management. There can be resistance from the part of employees since they need to be more cautious about environmental sustainability. Organizations should give comprehensive education and training programs as its top priority in order to address this challenge. To give employees a thorough understanding of the environmental impact of their daily work schedule and the part they can play in reducing it, these awareness programs may include workshops, seminars, and training programs etc. A culture of receiving employees ideas and suggestions for Green practices is essential. This can be made easier by creating opportunities for open communication, like online forums or placing suggestion boxes, and by honoring and rewarding Green employees to demonstrate a commitment to environment sustainability.

2. **Limited Resources and Budget Constraints:** Implementing Green HR practices requires heavy investment in updated technology and this can be costly. Companies may require assistance and funding in allocating the required budget, especially small and medium-sized businesses (SMEs) (Jabbour, 2008).

3. **Cultural Resistance:** For the active implementation of Green HR practices Organisational culture is an important factor. The changes needed to implement green HRM policies into effect could be resisted by management as well as workers. Pessimism about the benefits of sustainability initiatives, a desire for traditional methods, or a fear of the unknown (Paillé et al. 2014).

4. **Lack of expertised knowledge and training:** HR professionals might require the expertised know-how and capabilities to properly

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apply and administer green HR policies. Programs of training and development may be needed to develop this knowledge, it increases the initial implementation cost. To offer enough environmental sustainability education and development programs, HR departments might need support. An underprepared staff to help meet the green objectives of the company could result from this (Saifulina, N. 2020).

5. **Insufficient Assistance from Top Management:** Strong support and dedication from Top level management are essential for the successful adoption of green HR practices. It can be difficult to successfully adopt green practices when top management puts other business objectives ahead of environmental sustainability (Govindarajulu et al.; B. F., 2004).

6. **Assessing and Tracking Effectiveness:** To evaluate the effectiveness of Green initiatives on environmental performance and its outcomes, standardised metrics and evaluation tools are required (Renwick et al., 2016). It can take its own time and work to set up metrics that gauge the influence and efficacy of green HR practices.

7. **Participation and Engagement of Employees:** For an organization's sustainability initiatives to be successful, employees must actively involve in Company's green initiatives. Effective communication and engagement tactics are necessary to promote employee involvement in green initiatives. Green HR practices are unlikely to succeed if employees do not actively participate.

8. **Issues with Regulation and Compliance:** Managing legal and compliance problems relating to environmental sustainability can be difficult. Employees must be hired and trained by the HR department to adhere to environmental policies and make sure internal processes are compliant with legal requirements. Companies need to ensure their green HRM policies meet local, national, and global environmental regulations, which can be difficult and time-consuming (Brio et al., 2007).

9. **Keeping Green Activities:** Adopting a stable and long term sustainable Green practices can be challenging. Addressing these issues requires a strategic approach, including raising awareness, securing top

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management support, investing in training, and developing clear policies and metrics to guide and measure the implementation of green HR practices.

7 Conclusion

The most important resource of a firm that is vital to its operations is its human resources. Given the present trend in corporate social responsibility, modern human resource managers now have the additional responsibility of advocating Green HR values in the organization's HR policy and mission statement, stressing making the company more ecologically friendly. Changes to policy statements, environmental job descriptions, marketing plans, capital expenditures, auditing procedures, new product development, and production processes are some examples of corporate viewpoints on environmental activities (Molina-Azorín & Tarí, 2009).

The Green HR Revolution is a call to action for HR departments to embrace sustainability and transform traditional HR practices for the betterment of the environment and the organization. By adopting green HR initiatives, organizations can create a sustainable workplace that benefits the planet, enhances employee well-being, reduces costs, and improves overall business performance. As we move forward, the HR function must evolve to become a catalyst for environmental stewardship, leading the way toward a greener, more sustainable future. A significant role for the human resources department is to support the company's green efforts and play a key role in encouraging and assisting employees in adopting environmentally responsible business practices.

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 ISBN: 978-81-993134-0-8

Bank mergers: A review and research agenda

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Abstract

The strength of a nation is highly dependent on the strength of financial institutions in the country. Banking institutions play a vital role in ensuring a nation's economic health. In these highly competitive and uncertain times, companies worldwide are adopting mergers and acquisitions as a medium for continued survival and growth. In this study, the researcher conducted a bibliometric analysis of 171 articles on bank mergers published in ABDC A* and A-rated Web of Science-indexed journals. The study identified the most cited article, the most prominent researchers in the field, and the important journals publishing articles on bank mergers.
Keywords: Bank merger, performance, consolidation

1 Introduction

The financial health of a nation is highly dependent on the financial health of the important financial institutions in the country. Banking institutions play a vital role in ensuring the financial health of a nation. In this globalized era of increased competition and uncertainty, banks worldwide are engaged in consolidation activities to ensure their survival and growth. Researchers have been interested in bank mergers for decades. Most studies on bank mergers have focused on bank mergers in the USA, Europe, and other developed nations. However, studies on bank mergers in China, India, Japan, and Taiwan are also increasing. The studies on bank mergers have mainly focused on the post-merger performance of merging banks, determinants of bank mergers, and the effect of bank mergers on multiple factors.

 ISBN: 978-81-993134-0-8

This study conducts a bibliometric analysis of studies conducted on bank mergers and identifies the seminal papers related to bank mergers, significant themes researched related to bank mergers, and the avenues for future research on bank mergers. By conducting the bibliometric analysis, the researcher aims to answer the following research questions:

- What are the significant research areas on bank mergers?
- What are the avenues for future research on bank mergers?

By conducting a bibliometric analysis of 171 articles on bank mergers published in ABDC A* and A-rated journals, this study found that bank merger research is a growing body of knowledge with high article production and an average annual growth rate of 4.39%. Fig. 1 shows the article production on bank mergers over the years.

This paper is structured as follows. The first part introduces the research methodology and search protocol, the second part presents the overview of the selected publications and bibliometric analysis, and the final part provides a conclusion and states the avenues for future research.

2 Methodology

This study uses bibliometric analysis to identify the seminal papers on bank mergers, major research themes related to bank mergers, and future avenues for research on bank mergers. The analytical software used in the study are Biblioshiny and VoS Viewer.

Web of Science database was selected to identify articles on bank mergers. The following query was used in the title field to search for articles on bank mergers:

> ((merger) or (acquisition) or (takeover)) and ((bank) or (banking))

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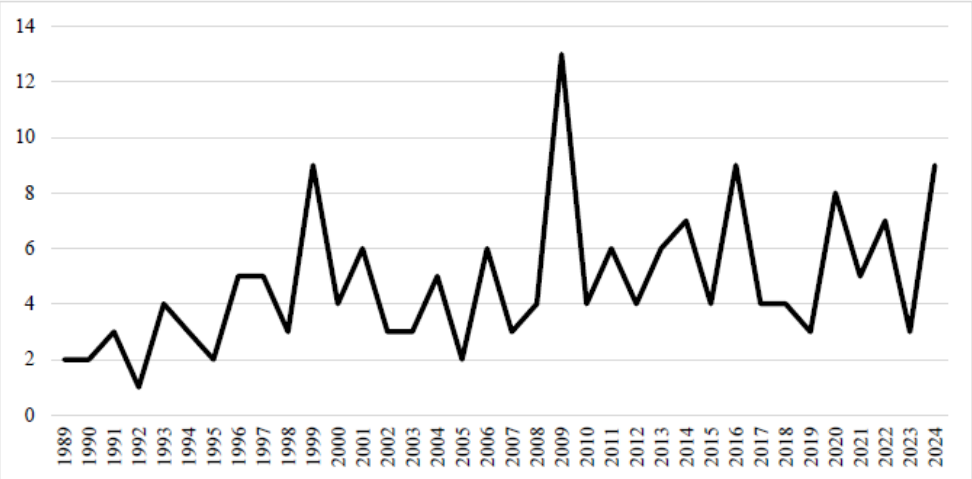

Figure 1: Article production over the years

The query yielded 669 results. Only English research and review articles published in ABDC A* and A-rated journals in the Business economics field were retrieved from these. From this, only articles related to bank mergers were selected for bibliometric analysis. Articles published in 2025 were not considered for analysis. Thus, the final number of articles selected for bibliometric analysis is 171. Fig. 2 depicts the article selection process used in the study.

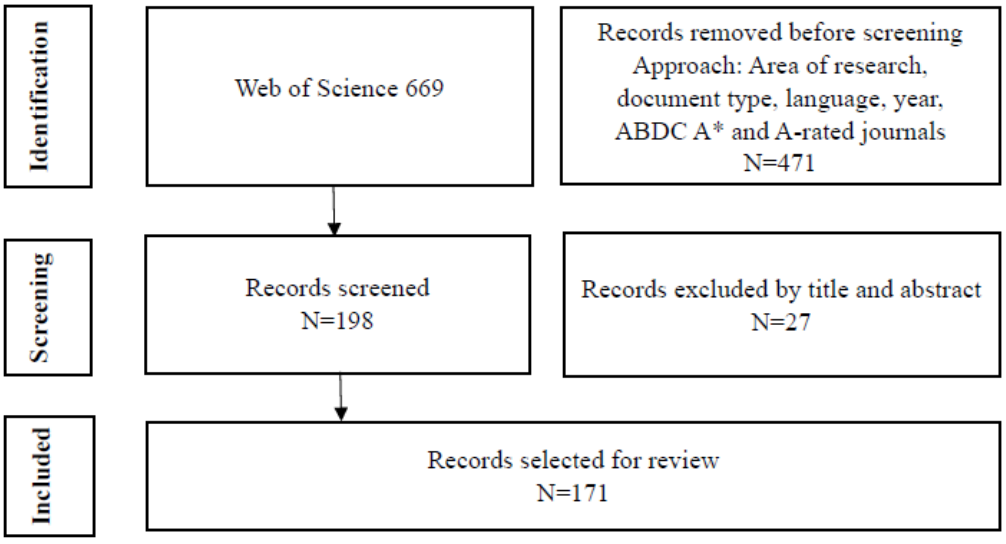

Figure 2: Flow diagram for article selection

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3 Findings

General information

General information about the articles selected for bibliometric analysis is given in Table 1. Articles published from 1989 to 2024 are considered for this study. 171 articles from 70 journals were selected for the analysis. This includes 170 research articles and one review article.

Table 1: General information of selected articles

Description	**Results**
MAIN INFORMATION ABOUT DATA	
Timespan	1989:2024
Sources	70
Documents	171
Annual Growth Rate %	4.39
Document Average Age	16.2
Average citations per document	41.23
References	5484
DOCUMENT CONTENTS	
Keywords Plus (ID)	387
Author's Keywords (DE)	384
AUTHORS	
Authors	369
Authors of single-authored documents	30
AUTHORS COLLABORATION	
Single-authored documents	31
Co-Authors per document	2.42
International co-authorships %	30.99
DOCUMENT TYPES	
Article	158
Article-early access	1
Article-proceedings paper	11
Review	1

Essential sources for articles on bank mergers

This study considered 171 articles published in 70 ABDC A* and A-rated journals in the field of business economics. Of the 70 journals, the *Journal of Banking & Finance* is the most important source, with 34 articles on bank

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mergers published over the years. Other important sources for articles on bank mergers are given in Fig. 3.

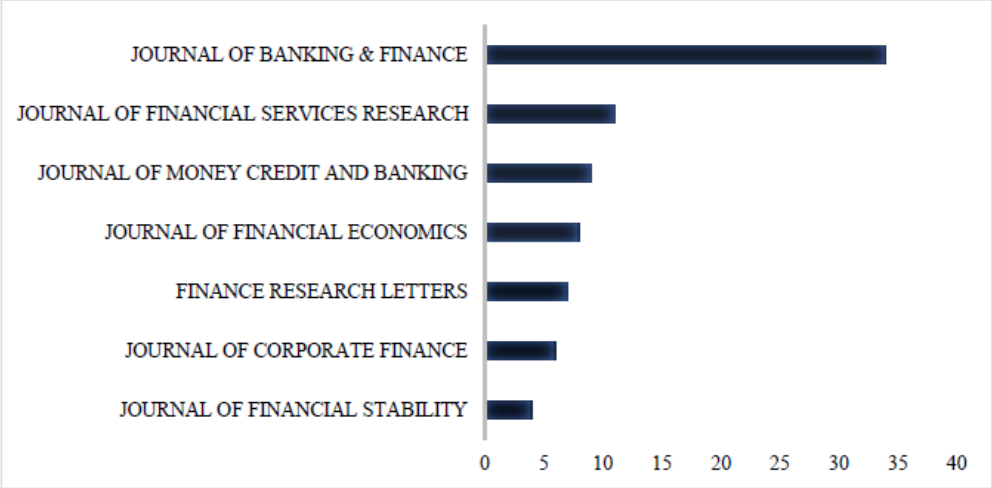

Figure 3: Essential sources for articles on bank mergers

Most cited article

Deliberate Learning in Corporate Acquisitions: Post-acquisition Strategies and Integration Capability in US Bank Mergers (Zollo & Singh, 2004), published in the *Strategic Management Journal*, has the highest citations on bank mergers with 633 citations. There are 39 articles with over 50 citations and 19 with over 100 citations. Fig. 4 shows the most cited articles.

 ISBN: 978-81-993134-0-8

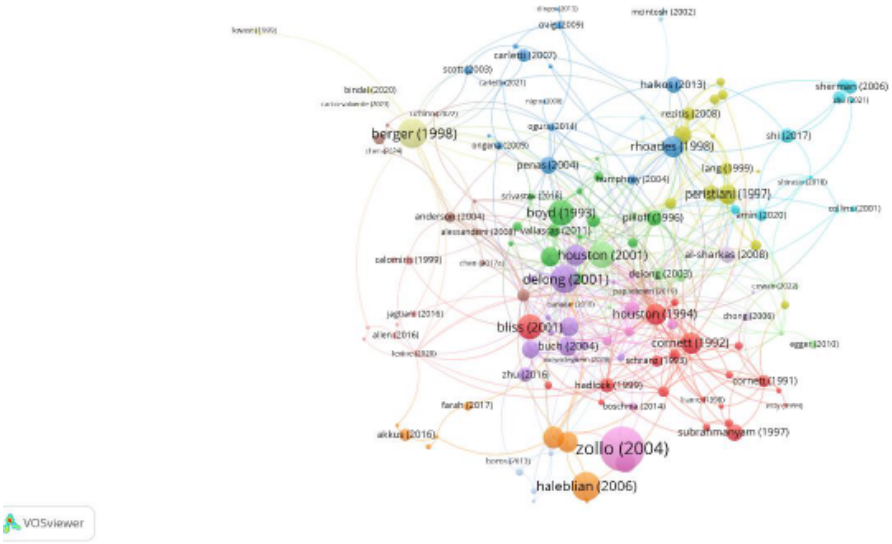

Figure 4: Most cited articles

Most researched themes on bank mergers

Researchers have been interested in multiple aspects related to bank mergers. Fig. 5 shows that most of the research on bank mergers concentrates on the post-merger performance of banks. Studies on determinants of bank mergers and human resource aspects related to bank mergers have also been widely studied.

The expected gains arising from mergers are studied by (Amin & Ibn Boamah, 2020), (Shi et al., 2017). (Olson & Pagano, 2005) studied the post-merger performance of merging banks in the USA. The efficiency effects of merging banks in Taiwan were studied by (Lin, 2005). (Fixler & Zieschang, 1993) found out that mergers did not result in increased efficiency of merging banks.

(Koetter et al., 2007), (Kwon et al., 2024) studied the major determinants behind bank mergers. The effect of bank mergers on customers is also a much-researched theme. (Montgomery & Takahashi, 2020) studied the effect of bank mergers on bank customers in Japan. The impact of bank mergers on rural financing was studied by (Bowles, 2000).

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Figure 5: Word cloud of major research themes

4 Direction for future research

The bibliometric study and content analysis on bank mergers revealed that most studies focus on bank mergers in the USA. Though studies on bank mergers in Europe and Asia are increasing, the number of studies is limited. Studies on bank mergers have mainly focused on the post-merger performance of merged banks and the effect bank mergers will have on varied factors. Most studies focus on mergers between banks, but there is scope for studying the acquisitions and mergers made by banking firms with non-banking entities. A study on the effect of human resource aspects on bank mergers in emerging economies has scope for future research. The influence of bank mergers on rural financing and financing of small businesses also provides avenues for further research.

5 Conclusion

Banks play a vital role in ensuring nations' financial health and stability. Banks worldwide are engaged in consolidation activities to ensure their survival and growth. In this article, a bibliometric analysis of studies conducted on bank mergers was undertaken to identify the seminal papers in the field, the major themes related to bank merger research, and avenues for future

research. The study considered 171 articles on bank mergers published in 70 ABDC A* and A-rated journals and found that most of the studies on bank mergers focused on the post- merger performance of banks in the USA. Though studies on bank mergers in Europe and Asia are increasing, there is scope for studying bank mergers from multiple aspects. The study of bank mergers from emerging economies is a promising research avenue. The study on the influence of human resource aspects in bank mergers and the effects of bank mergers on multiple stakeholders holds promise for further research. Thus, this study helped to identify the research gap in bank mergers and recommend avenues for future research.

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 ISBN: 978-81-993134-0-8

A Theoretical Perspective on the Glass Ceiling and Professional Growth

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Abstract

Workplace inequality remains a persistent challenge affecting various dimensions of professional life, such as pay gaps, career progression, and organizational inclusion. Gender equalization is considered as an important goal of sustainable development as it is the fundamental human right which distributes each and every resource equally among men, women and minorities. But in the current scenario representation of women in decision making is nominal which is evident from the statistical data published by reliable sources. This paper tried to present a theoretical framework for understanding workplace inequality by analyzing its causes, manifestations, and changes on employees and their professional growth. The study synthesizes existing literature, identifies key factors contributing to glass ceiling and professional growth, and suggests avenues for addressing these disparities.

Keywords: Glass ceiling, organisational justice, professional growth

1 Introduction

The "glass ceiling" refers to a hidden yet impassable barrier that impede certain groups, particularly women, racial minorities, and other marginalized individuals, from reaching the high level management within organizations (Morrison & Von Glinow, 1990; Sashi & Rajiv, 2019). This term was first conceived by Ann Morrison in the 1980s later on attained importance

 ISBN: 978-81-993134-0-8

through *The Wall Street Journal's* corporate women column in 1983, still the situation remains the same in many areas.

According to the report of the International Labour Organisation in 2021–22, 32.8% of women of working age (15 years and above) were in the labour force in India, which was a 9.5% increase from 2017–18, but the women's representation remains imbalanced against total women labour in force. The Global Gender Gap Report 2024 by the World Economic Forum states that women's participation in the total labour force is 42% and only 31.7% in leadership roles, termed it as "drop to the top". India falls at 129th position among 146 countries, where women participation in the labour force is only 37%. The report also states that it will take another 134 years to build a complete gender equality (World Economic Forum, 2024).

Even though companies continuously strive to support diversity and inclusion, the glass ceiling still exists based on gender, race, income level, and other factors. Employees face barriers in career advancement, wage disparities, and limited access to leadership roles. This study points out the root causes and effects of glass ceiling on professional growth.

2 Objectives

- To explore the theoretical perspective of glass ceiling.
- To identify key factors contributing to glass ceiling.
- To propose a model for the relationship of glass ceiling and professional growth by identifying organisational justice as a moderating variable.

3 Methodology

In this study an extensive literature synthesis is conducted through reviewing the existing literature which helps to identify the common variables, factors and consequences. Theoretical analysis helps to get an insight into the key theories relevant to the topic, which motivates to develop relations between variables in the proposed conceptual model.

 ISBN: 978-81-993134-0-8

4 Review of Literature

According to Thushar Agarwal (2013), Delrose Noronha (2019), Bombuwela P.M. and De Alwis (2012), P. V. Nilufer (2018), Dr. Jojo K Joseph and Jikky P Shaji (2021), individual factors, family factors, cultural factors, gender stereotype, organisational factors play important role to decide the existence of glass ceiling and all these antecedents have negative influence on the professional growth of women employees.

Rajvir Kaur (2019), María Paz Espinosa and Eva Ferreira (2022), Sewon Min and Borham Yoon (2021) found that the major consequences of glass ceiling on women employees are turnover intention, job dissatisfaction, increase in job stress leading to health issues, and reduction in work engagement and performance.

In the current scenario women employability increased a lot but their representation in the decision making role is limited (Sharjeel et al., 2017; Kiaye & Singh, 2013). According to Fortune 500 data (June 2024), only 10.4% of companies are led by women CEOs, while women constitute 46.1% of the workforce.

Brenda J. Wrigley (2002) developed the concept of negotiated resignation analyzing the psychological consequences of encountering a glass ceiling. Valerie Randle (1999) observed that women and minorities suffer drastically from glass ceiling barriers in the workforce.

Several studies further established the persistent existence of discrimination (Fapohunda, 2018; Sharjeel Saleem et al., 2017; Rabia Naguib & Muznah Madeeha, 2023).

5 Background Theories

Background theories According to Social Role Theory, men and women in the society are assigned different spaces to perform and how these role plays affect the organizational structure (Eagly et al., 1981). The theory suggests that all human beings are believed to have natural qualities that make them better suited for specific roles. Eagly (1997) explain how gender differences shape their roles in society and influence their behavior. This theory states that, these gender-based expectations lead to men being seen as the primary providers, making it more acceptable for them to hold higher positions in organizations, which act as an obstacle for women

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when trying to advance in their careers (Schneider &Bos, 2019).Women's performance is negatively affected by gender stereotype. They are often considered as less competent, which results in them receiving fewer opportunities, resources, and support for professional growth (Scalambrino& Lowery, 2017). Theory of Justice formulated by Rawlsian (1958), was to this study adopts because of its relevance in selecting moderating variable as organizational justice this theory put forward the three main aspects such as procedural justice, distributive justice, and interactive justice all this helps in maintaining ethical considerations in an institution. According to Rawls (1973), the nutshell principle of this theory is that all should be treated fairly and ensures them equal opportunities. So the institution is required adopt anti-discriminant strategies for all. It also emphasizes women's representation in leadership; they should be empowered to key decision-making processes. The taxonomy of organizational justice theory proposed by Greenberg's (1987) is also relevant in this context of this study. Organizations often focus on procedural justice while overlooking distributive and interactive justice (Fia & Sacconi, 2019). Organizations that implement all three aspects of justice are more likely to reduce barriers such as the glass ceiling (Nesarat & Mathew, 2017). Therefore, this theory played an important role in selecting organizational justice as the moderating factor in this study.

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6 Proposed Conceptual Model

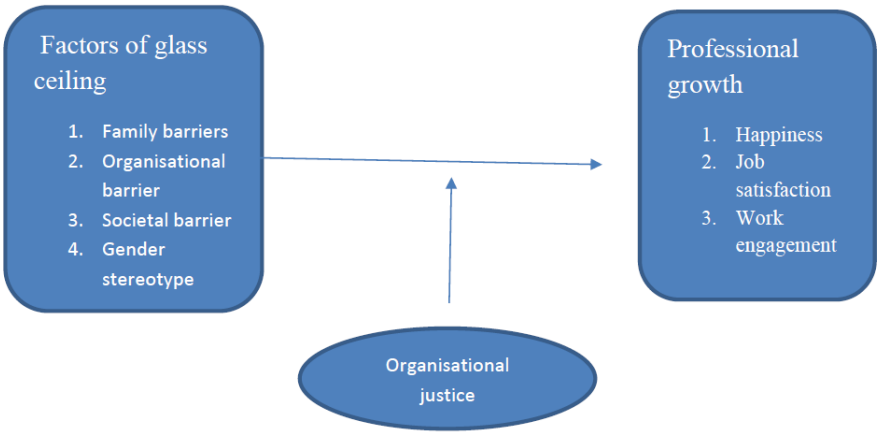

Figure 1: Proposed conceptual model of glass ceiling and professional growth

7 Discussion

Women and minorities in various fields continues to face a major barrier to their professional growth is termed the glass ceiling. Even though women in workforce increase, their representation in executive and executive roles remains limited (Sharjeel et al., 2017; Kiaye & Singh, 2013). Rajvir Kaur (2019) identified key obstacles such as unequal treatment, a hostile work environment, and discrimination on the basis of gender, biased company policies, family obligations, and an imbalanced work-family schedule as factors preventing women from reaching leadership roles. Further studies (Agarwal, 2013; Noronha, 2019; Bombuwela & De Alwis, 2012; Nilufer, 2018; Joseph & Shaji, 2021) highlighted multiple factors contributing to glass ceiling. It includes individual limitations, family responsibilities, cultural expectations, gender stereotypes, and organizational biases, all of which negatively impact the career prospects of women employees. Family responsibilities, challenges in work-life balance, and traditional gender roles are the major societal barriers that lead to glass ceiling. Women always continue to bear the primary responsibility for childcare and household duties, it result limitations in the career progression. Therefore family

commitments act a significant obstacle to their professional growth (Eghlidi & Karimi, 2020; Da Silva et al., 2022). The primary bread winners of the family is perceived as men and fewer family related roles, focused skill development and advanced leadership make them prefer for the higher levels. (Mkhatshwa & Genc, 2022; Wolfgram et al., 2020). Organizational barriers arise as a results of unfair workplace policies, hiring, promotion practices, performance assessments, and training programs (Ramos et al., 2022). Lack of understanding of women's experiences, biases in promotion criteria contributes to the "glass ceiling," and which is preventing women from reaching in executive positions (Mahal, 2014). The effect of the glass ceiling have been extensively studied, by the researchers like Kaur (2019), Espinosa & Ferreira (2022), and Min & Yoon (2021) linking it to higher turnover intentions, job dissatisfaction, increased work stress, health issues, and lower work engagement and the performance. All these independent factors lead to negative professional growth which can be decreased by moderator: organisational justice, which contribute positively to career advancement (Greenberg's 1987, Colquitt 2001, Watanabe, K. S., & Kwarteng, A. H. 2024). Organizational justice can be classified in to Distributive Justice, Procedural Justice Interactional Justice. Distributive justice is deals with the fair allocation of organizational resources, outcomes, and career opportunities. Equal distribution and fairness in dealings results have equal access to women in resources, empowering them to enhance their skills and professional growth.(Wesarat & Mathew, 2017). When organizations adopt the equitable resource distribution, both men and women got equal treatment, thereby it reducing societal barriers to professional growth (Foley et al., 2002). Distributive justice applies in financial and non-financial rewards, such as bonuses linked to performance goals. Equitable distribution ensures that the women receive fair recognition and opportunities for development (Qu et al., 2020). In addition, distributive justice can helps in minimize organizational barriers, including gender-biased policies and the lack of institutional support for women's leadership progression (Akpebuadjah & Van der Walt, 2019). Procedural justice indicate fairness in decision-making processes within every organization. It ensures that all employees have equal access to promotions, training, and leadership opportunities without any kind of discrimination (Brown et al., 2010). True application of procedural justice ensured, the women to acquire the skills, resources, and knowledge necessary to progress

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into top management positions. So every organization must implement six key principles to maintain fairness in both decision-making procedures (Yunita & Darma, 2020). Fairness in interpersonal treatment and communication between employees and management results interactional justice and it consists of two main aspects such as Interpersonal justice and Informational justice. To respect and courtesy in workplace interactions is known as the interpersonal justice. Informational justice, which means the adequacy and timeliness of information provided by management (Colquitt, 2001). The phenomenological study by Fapohunda, Tinuke, M. (2018), and Amakye, Chimhutu & Darkwah (2022) covered the understanding about glass ceiling of women who cracked the same. Their findings suggested that age, workplace perceptions, discrimination, sexism, and prejudices influenced career advancement. In addition, gender composition in boardrooms, training and development opportunities, and stereotypical attitudes were identified as critical factors affecting women's selection, promotion, and effectiveness in leadership roles (Sharjeel Saleem, Asia Rafiq, & Saquib Yusaf, 2017).

8 Conclusion

Even though women's workforce participation has increased, their professional growth remains disproportionately slow, and even much lower in leadership roles (Davidson & Burke, 2012; Sashi & Rajiv, 2019). According to the data published by Fortune 500 (June 2024) revealed that only 10.4% of companies are led by women CEOs, despite women constituting 46.1% of the U.S. workforce. This significant gap underscores the existence of the glass ceiling despite gender equity policies and diversity initiatives.The study provides critical insights into the factors contributing to the glass ceiling and its consequences on the professional growth based on the theoretical frameworks. Which provides a basis for understanding its complexities, and empirical evidence underscores the need for systemic change.

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 ISBN: 978-81-993134-0-8

Digital Banking – An Overview

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Abstract

Digital banking represents a significant shift in the financial services industry, where traditional banking functions are automated and provided through digital and online platforms. This change allows customers to perform various financial tasks, such as transferring funds, paying bills, applying for loans, and managing investments, without visiting physical bank branches. This paper explores the evolution, technological advancements, opportunities, and challenges of digital banking, focusing on the Indian banking sector. The research examines key milestones in India's digital banking progress, including the introduction of MICR technology, computerization of banking processes, and the launch of services like NEFT, IMPS, UPI, and BHIM as part of the Digital India initiative. The analysis highlights the positive impact of digitalization on financial inclusion, customer convenience, and operational efficiency, while also addressing ongoing challenges like cybersecurity threats, privacy issues, limited digital literacy, and infrastructure constraints. Additionally, the study investigates emerging trends such as open banking, mobile financial services, and AI-driven innovations that are shaping the future of banking. The conclusions suggest that while digital banking has improved service delivery and accessibility, its sustained success hinges on enhancing security measures, fostering consumer trust, and narrowing the digital divide.

Keywords: Digital Banking; Financial Technology (FinTech); Online Banking; Digital Transformation; Unified Payments Interface (UPI); Mobile Banking; Cybersecurity; Financial Inclusion; Open Banking; Digital India; Banking Innovation; E-Governance.

1 Introduction

Digital banking is the automation of traditional banking services through digital and online platforms, enabling customers to handle their finances without needing to visit a bank branch physically. This encompasses vari-

 ISBN: 978-81-993134-0-8

ous tasks like money transfers, cheque deposits, bill payments, investment management, and loan access, all conducted through websites or mobile apps. Digital banking is known for its convenience, quickness, and round-the-clock availability, usually providing services 24/7. The move towards digital channels is fueled by technological progress and evolving consumer demands, prioritizing efficiency and easy access to financial services.

Digital banking is a recent advancement in the financial services sector. Digital banking users enjoy the convenience of conducting financial transactions using digital technology. Digital banking offers various services, including accessing financial information through mobile devices, making online purchases with credit cards, managing accounts remotely, transferring funds to other banks, and efficiently conducting online banking transactions without visiting a physical bank. The evolution of digital banking has been promising, evident in the increasing number of users embracing this technology (Tran et al., 2023).

Digital banking refers to technology-driven initiatives within the banking industry that utilize electronic channels like telephones, mobile phones, and the Internet to deliver banking services and products. This term encompasses many digital services that have revolutionized traditional branch banking. Through secure online networks, customers can now conveniently conduct banking activities from various locations, including their homes and offices. Digital banking enables customers to perform routine transactions such as account transfers, balance inquiries, bill payments, and stop-payment requests, with some platforms even offering online loan and credit card applications (Singh, 2018).

Digital banking offers services that allow users to access financial information through mobile phones, make online purchases with credit cards, transfer funds to other banks, manage accounts remotely, and conduct online banking transactions without visiting a physical branch. The convenience of digital banking includes streamlined transactions, time savings, reduced costs, and paperless operations. Transactions can be quickly completed with a few clicks on a computer, tablet, or mobile device at the user's convenience. Technological advancements have facilitated quicker access to new banking products and services at lower costs.

However, digital banking poses security risks, such as fraud and cyber-attacks, leading to potential vulnerabilities. Issues like phishing, hacking, malware, and difficulties in accessing customer support may arise. Tech-

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nical glitches, infrastructure deficiencies, and security concerns can impact service quality and customer satisfaction. The shift towards digitalization in banking may reduce the need for physical branch personnel, potentially leading to unemployment as automation decreases the demand for human labour in the sector (Suluk, 2023).

2 Evolution of Digital Banking in India – Major Landmarks

The traditional banking system in India has historically been branch-based. Magnetic Ink Character Recognition (MICR) technology was introduced for cheque processing in the late 1980s. The computerization of bank branches began in the late 1980s with the introduction of Ledger Posting Machines (LPMs) and Advanced Ledger Posting Machines (ALPMs), followed by network-based systems and, more recently, core banking solutions. The computerization of government industries in the late 1990s facilitated the computerization of all bank branches handling government business.

The Institute for Development and Research in Banking Technology (IDRBT) was established in the mid-1990s in Hyderabad as a research and technology centre for the banking sector. The Indian Financial Network (INFINET) was established as a closed user group network in 1991 with advanced safety and security measures exclusively for the banking sector. IDRBT began its Certification Authority (CA) functions to protect electronic banking transactions legally under the Information Technology Act of 2000. Guidelines for Information Systems Audit (IS Audit) were formulated to ensure audit compliance in banks.

The National Financial Switch (NFS) was established to interconnect shared ATMs and payment settlement across banks, and it is now managed by the National Payments Corporation of India (NPCI). The implementation of Electronic Payment and Settlement Systems (EPSS), Negotiated Dealing System (NDS), Centralized Funds Management System (CFMS), and other systems followed. The Digital India program was launched in 2017 to provide high-speed Internet, mobile access, and bank accounts to enable individual participation in the digital and financial space (Sharma & Piplani, 2017).

3 Trends and Innovations in Digital Banking

Automated Teller Machines (ATMs), or automated banking machines (ABMs), are electronic telecommunications devices that allow customers of a bank or financial institution to conduct various financial transactions, such as cash withdrawals, without the assistance of a human cashier or teller. ATMs can also perform functions like cheque deposits, printing receipts, balance inquiries, generating PINs, and printing passbooks.

Electronic Clearing Services (ECS) is an electronic method for inter-bank transactions involving high volumes of repetitive and periodic payments and receipts. It is commonly utilized by institutions for mass payments such as interest, salary, pension, and dividend distribution, as well as for bulk collections like telephone bills, electricity bills, tax payments, loan repayments, mutual fund investments, insurance premiums, etc. ECS enables the transfer of funds in bulk from one bank account to multiple accounts or vice versa. This system also encompasses transactions processed through the National Automated Clearing House (NACH), operated by the National Payments Corporation of India (NPCI). ECS consists of two main types: ECS Credit and ECS Debit.

Institutions utilize ECS Credit to provide credit to numerous beneficiaries (such as employees, investors, etc.) who have accounts at bank branches in different locations within an ECS centre's jurisdiction. This involves debiting the user institution's bank account with a single transaction. ECS Credit facilitates the user institution's payment of dividends, interest, salaries, pensions, etc. Figure 1 illustrates ECS credit transactions, including National Electronic Clearing Service (NECS).

ECS Debit, on the other hand, is used by institutions to debit a large number of accounts (such as utility service consumers, borrowers, mutual fund investors, etc.) maintained at bank branches in various locations within an ECS centre's jurisdiction for a single credit to the user institution's bank account. ECS Debit is beneficial for making payments for bills, tax collections, loan repayments, mutual fund investments, insurance premiums, etc., that are periodic or recurring and are due to the user institution from many customers.

The National Automated Clearing House (NACH) is a centralized system aiming to consolidate multiple national ECS systems. It harmonizes

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standards and practices, removing local barriers. The NACH system has a national footprint, covering all core banking enabled bank branches across the country. It can be used for bulk transactions such as distributing subsidies, dividends, interest, salary, pension, and collecting payments for services like telephone, electricity, water, loans, mutual fund investments, and insurance premiums.

National Electronic Funds Transfer (NEFT): National Electronic Funds Transfer (NEFT) is the most widely used electronic funds transfer system in India, facilitating nationwide bank-to-bank transfers for individuals, firms, and corporates. It allows the transfer of funds from any bank branch to any other bank branch within the country through the Reserve Bank of India (RBI), using structured and secure message formats (SFMS). NEFT transactions were initially processed in hourly batches but have now moved towards near real-time settlement, enhancing customer convenience and speed of transactions.

Immediate Payment Service (IMPS): Immediate Payment Service (IMPS) is an instant, inter-bank electronic fund transfer service. Launched by the National Payments Corporation of India (NPCI), it allows customers to transfer funds through mobile phones, ATMs, and Internet banking, 24/7 throughout the year. IMPS supports P2P (person-to-person) and P2M (person-to- merchant) payments using mobile numbers, MMID, account numbers, and IFSC codes. IMPS has played a key role in promoting real-time digital payments in India.

Prepaid Payment Instruments (PPIs) – Mobile Wallets and PPI Cards: Prepaid Payment Instruments (PPIs) – mobile wallets and PPI cards – are payment tools that enable the purchase of goods and services, as well as financial services and remittance facilities, using the stored value on the instruments. PPIs issued in the country are categorized under three categories:

1. *Closed system:* PPIs issued by an entity, including individuals, proprietorship firms, partnership firms, etc., for facilitating the purchase of goods and services from that entity only.

2. *Semi-closed system:* PPIs which can be used for purchase of goods and services, including financial services, at a group of clearly identified merchant locations/establishments which have a specific contract with the issuer to accept the payment instruments.

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3. *Open system:* PPIs which can be used for purchase of goods and services, including financial services like funds transfer at any card-accepting merchant locations (point-of-sale terminals) and also permit cash withdrawal at ATMs/business correspondents.

While banks and non-banks can issue closed and semi-closed PPIs, only banks can issue open- system PPIs. Some of the largest non-bank issuers of PPI wallets include Paytm, Mobikwik and ItzCash. As of March 2017, Paytm had 218 million wallet users and Rs. 899.11 crores as the total balance in the wallet. Mobikwik had 55 million wallet users. In September 2016, ItzCash had 110 million registered users. The PPIs have been registering impressive growth in the recent past.

Mobile Banking: Mobile banking allows customers to conduct banking transactions and access information using a mobile phone or tablet without assistance from the bank's customer relationship management system. Initially, mobile banking was limited to SMS banking. However, technological advancements now enable customers to download the bank's mobile application to access various services. The mobile app lets customers view statements, receive alerts, manage accounts, transfer funds, and perform other banking activities. This convenience provides customers with a virtual bank on their mobile devices, offering a seamless banking experience.

Unified Payments Interface (UPI): Unified Payments Interface (UPI) is a user-friendly financial transaction interface introduced on August 23, 2016. UPI enables quick and easy money transfers anywhere via mobile devices. It simplifies managing multiple bank accounts by consolidating various banking services into a single mobile application with a secure two-factor authentication system. Each bank offers its own UPI app for different operating systems, such as Android, iOS, and Windows.

BHIM (Bharat Interface for Money): BHIM is a mobile application that enables easy, secure, fast, and dependable payment transactions through the Unified Payments Interface (UPI). It allows for instant bank-to-bank payments and offers Pay and Collect options using only a mobile number and Virtual Payment Address (VPA).

AADHAAR Enabled Payment System (AEPS): The AADHAAR Enabled Payment System (AEPS) allows for transactions at the point of sale through authentication by AADHAAR. It enables balance enquiry, cash deposit/withdrawal, and interbank transfers using the AADHAAR

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number linked to the bank account. This system utilizes a unique issuer identification number to identify the bank associated with the AADHAAR number.

Bharat Bill Payment System (BBPS): Bharat Bill Payment System (BBPS) is an integrated and unified bill payment system that offers interoperable bill payment services to customers online and through a network of offline agents. BBPS supports multiple payment modes, including cards (credit, debit, and prepaid), account transfer, IMPS, Internet banking, UPI, wallets, AEPS, and cash, providing instant payment confirmation for each transaction.

Bharat QR: Bharat Quick Response Code Solutions (Bharat QR) is a QR code solution developed in collaboration with major card companies such as RuPay, MasterCard, Visa, and American Express. Merchants can display these QR codes at their establishments, allowing customers to pay by scanning them using a Bharat QR-enabled application. This eliminates customers' worries about their cards not being accepted at specific merchant locations.

Social Media Banking: Social Media Banking is a new trend in the banking industry. Major banks now use social media platforms like Facebook and Twitter to engage with customers. According to a 2014 report by Capgemini, customers from Generation Y are increasingly expecting their banks to have a presence on social media. Banks that use traditional or Internet banking methods risk losing out on this trend. Social media banking was first introduced by banks like Commonwealth Bank of Australia and Deniz Bank of Turkey, which allowed customers to check account balances and make transfers through Facebook. In India, Kotak Mahindra Bank has launched its "#Banking" service, where digital customers can link their Twitter handles to their bank accounts (Sharma & Piplani, 2017).

4 Advantages of Digitalization

Digitalization in banking offers numerous benefits for both customers and financial institutions. Some of the key advantages include:

- **Customer service:** The Internet is widely accessible, so customers can easily connect and access their accounts from anywhere. This

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saves time and money by eliminating the need to visit the bank in person. Customers can conveniently manage their accounts from the comfort of their homes or while travelling, without waiting in long queues.

- **Time constraint:** Some bank services have set time limits. Banks often display signs at their branches indicating the hours for specific services, such as cashing a cheque, which can be time-consuming. However, digital banking offers instant transactions without any time constraints.
- **Online bill payments:** With the start of online payments, customers can save their time and money by paying online. They no longer need to carry cash and stand in queues to pay bills.
- **Lower heads:** Digital banking has significantly decreased a bank's operating expenses, leading to reduced service fees and, in some cases, better interest or service terms for customers.
- **Banking benefits:** The rise of online banking has led to an increase in customers. This has resulted in a decrease in human errors in calculations and record-keeping. Electronic records allow for easy report generation and comparison when needed.
- **Reduction in counterfeit currency:** The prevalence of digital banking and digital currency has decreased the circulation of fake money as physical notes are used less frequently.
- **The gap between rural and urban:** Prior to digitalization, only urban areas had access to most banking services, while rural areas did not. With digitalization, both rural and urban areas can now access services from wherever they are, decreasing the gap between them.
- **Customer growth:** Government support for electronic wallets has led to a significant increase in technology adoption in financial services. This trend suggests that more individuals will likely use debit/credit cards and digital payment tools.
- **AI-based customer service:** Many banks have already implemented AI-based chatbots in their customer service operations. Customers can expect to encounter more advanced chatbots that offer

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faster responses, improved interaction quality, and enhanced service quality.

- **Mixed digital and physical processes:** Banks today offer their customers both digital and physical services. Customers can visit a bank branch and conduct transactions using their electronic devices. This trend is expected to grow, particularly in rural areas (Mr. Naveen Chinni et al., 2021).

- **Convenience:** With just an Internet connection and a few clicks on the screen, personal and business bank accounts can be accessed from any device. This allows customers to easily manage their profile information and monitor their account balance, leading to increased customer satisfaction. Customers can also update their mailing address, email, phone numbers, etc. Cheques or statements can be quickly requested without needing to visit the bank.

- **24/7 Service:** Online banking services are available at all times, including weekends, throughout the year. Customers can access these services around the clock without waiting in line or for the bank to open.

- **Time-saving:** Another advantage is accessing the account from home, saving significant time. Tasks that previously took an hour or more at the bank can now be swiftly completed from home or any location with an Internet connection.

- **Automated transfers:** Direct banks can provide an unlimited number of automated transfers, including transfers to other financial institutions, such as accepting payroll deposits or enabling automatic bill payments, at no additional cost.

5 Disadvantages of Digitalization

While digitalization has transformed the banking industry by improving convenience and accessibility, it also comes with several drawbacks that affect both customers and financial institutions. One major disadvantage is the lack of human interaction, as customers no longer have the personalized assistance and trust that was traditionally provided through in-person

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banking. Additionally, the complexity of digital platforms can be challenging for users who are not tech-savvy, making it difficult for them to navigate online transactions. Security issues also exacerbate these challenges, with threats like phishing, hacking, and data breaches eroding consumer trust in digital banking systems. Therefore, despite the benefits of efficiency and speed that digital banking offers, it is important to recognize the importance of human interaction, digital literacy, and strong cybersecurity measures to maintain trust and inclusivity in the digital financial landscape.

- **Lack of human interaction:** Despite the rise of online services, customers still value their local bank branches for the personal touch and customized service provided by branch staff. Direct contact and personal consultations are preferred for sensitive banking services, and physical branches are necessary for tasks like signing contracts and providing advice. Establishing relationships with branch staff can be advantageous for obtaining loans or specialized services. Personal connections with bankers can expedite loan approvals, access to exclusive services, and provide valuable financial advice. Certain transactions, such as notarization and bank signatures, require in-person visits to the branch. Face-to-face meetings help bankers efficiently understand customers' needs and address complex issues.

- **Complexity:** Complexity is linked to the ease of completing a transaction. Some customers lack computer proficiency, and digital platforms can be challenging for new users. Therefore, customers who are not computer literate may need to visit a branch for assistance.

- **Fear of insecurity:** Customers are concerned about data hacking and the security risks associated with digital banking services. Many individuals hesitate to use online banking due to security concerns, especially with the prevalence of cybercrime in the media. The main weakness of Internet banking is perceived to be its lack of security, with vulnerabilities such as phishing, hacker attacks, malware, and unauthorized activity. Security is a significant fear for customers using Internet banking as cybercrimes and hacking continue to rise. Despite advanced security software, hacking remains a constant threat in the cyber world, with common issues like phishing, hacker attacks, malware, and unauthorized activities.

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- **Security concerns (practical):** Despite advanced security measures, accounts remain vulnerable to scams, phishing attacks, hackers, and other threats. Not all banks offer comprehensive online services, with some requiring in-person visits to traditional branches for specific activities.
- **Limitations on transactions:** Complex transactions may require in-person attendance at the bank office. Furthermore, some digital banks do not support certain types of international transactions (Karthick et al., 2023).

6 Opportunities in Digital Banking

Digital banking offers significant opportunities for customers and financial institutions by transforming the delivery and experience of banking services. It improves customer satisfaction with personalized, faster, and more convenient services available 24/7. The use of technology enhances operational efficiency, cuts costs, and allows banks to reach untapped markets. Additionally, advancements like open banking and mobile banking foster collaboration, product expansion, and financial inclusion. In essence, digital banking enables banks to enhance customer relationships, broaden their market reach, and stay competitive in the digital financial landscape.

- **Improved customer experience:** Digital banking offers enhanced customer experience by providing faster, more convenient, and personalized services. Banks offer 24/7 access for transactions, account checks, and loan applications through mobile apps and online platforms. This convenience boosts customer satisfaction and strengthens customer relationships. Additionally, data analytics helps banks understand customer preferences, enabling personalized financial products and services that enhance loyalty and repeat business.
- **Enhanced operational efficiency:** Digital banking cuts operational costs by eliminating some physical branch functions, reducing the need for in-person staff, and lowering infrastructure expenses. Banks can allocate resources more effectively, prioritize innovation, and enhance customer services. Automation in digital platforms streamlines tasks like account management, payment processing, and

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loan approvals, reducing errors and speeding up processes for quicker customer service and improved efficiency.

- **Access to new markets:** Digital banking allows traditional banks to reach untapped markets that were previously underserved. Geographical limitations that once restricted physical branch locations are no longer a barrier, as digital platforms allow banks to offer their services to customers regardless of location. This means that even individuals in remote areas or developing regions can access financial services through mobile banking without the need to visit a physical branch. By expanding into new markets, traditional banks can attract a wider customer base and increase their revenue streams.

- **Embracing open banking:** Open banking, a system in which banks share customer data with third-party service providers (with customer consent), presents a significant opportunity for traditional banks. Banks can expand their service offerings through open banking to include personalized financial advice, budgeting tools, and integration with third-party apps. By partnering with fintech companies, traditional banks can improve their product range and maintain competitiveness in the digital banking sector. Open banking can also drive innovation by enabling developers to create new financial products and services that seamlessly integrate with existing banking systems. Traditional banks that adopt open banking can establish themselves as frontrunners in the evolving financial landscape.

- **Harnessing the power of mobile banking technology:** Mobile banking plays a crucial role in the digital banking landscape. With the growing popularity of smartphones, more and more consumers are turning to their mobile devices to handle their financial affairs. For traditional banks, developing advanced and easy-to-use mobile banking applications presents a chance to improve customer involvement and retention. Banks can cultivate deeper connections with customers and encourage more frequent engagements by providing seamless mobile banking services. Moreover, mobile banking allows banks to incorporate innovative features like instant notifications, biometric verification, and mobile payment solutions, thereby boosting the convenience and safety of digital banking (Kataria, 2019).

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7 Challenges in Digital Banking

Despite the rapid expansion of digital banking, there are still several obstacles that prevent its full potential and widespread adoption. Security concerns and a lack of trust are significant barriers, with customers worried about fraud, data breaches, and the misuse of personal information. Limited customer awareness and digital literacy also hinder the effective use of online banking services, especially in developing regions like India. Furthermore, challenges such as inadequate infrastructure, increasing non-performing assets, and fierce competition present operational difficulties for banks. Therefore, it is crucial to address these issues through enhanced security measures, public awareness campaigns, and technological advancements to ensure sustainable growth and consumer trust in the digital banking sector.

- **Security concern:** Security issues have emerged as a significant worry for banks, leading many customers to avoid digital banking services due to apprehensions about uncertainty and security.
- **The trust factor:** Many customers find trust the main obstacle to online banking. They prefer traditional banking due to concerns about online security and the perceived risk of fraud in online transactions. When using digital banking services, customers often have doubts and questions about the transaction process, such as whether the transaction was successful or if they accidentally pressed the transfer button multiple times. Trust influences customers' willingness to conduct transactions with online merchants.
- **Customer awareness:** In the Indian context, consumer awareness regarding digital banking services and processes remains low. Banks struggle to effectively communicate information about the advantages and functionality of Internet banking. Limited knowledge about new technologies and their advantages is a significant obstacle to the growth of e-banking.
- **Privacy risk:** The fear of identity theft and the potential disclosure of private information are significant concerns that deter consumers from using Internet banking services. Many consumers are apprehensive about identity theft when using online banking. Research shows that consumers are concerned about their privacy and worry

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that banks may use their information for marketing or other purposes without their consent.

- **Enhancing public support:** Historically, in developing nations, many e-finance initiatives have been collaborative efforts between the private and public sectors. If the public sector lacks the resources to execute these projects, it is crucial to establish partnerships between the public and private sectors and with multilateral organizations such as the World Bank to garner public backing for e-finance initiatives.

- **Personnel services availability:** Currently, banks are expected to offer a range of services such as social banking with financial options, targeted upgrades, computerization and advanced automation, improved customer service, efficient management practices, internal oversight and control, satisfactory profitability, and a strong organizational culture. As a result, banks need to ensure they can deliver comprehensive personnel services to meet customer expectations.

- **Implementation of global technology:** Developing countries must establish sufficient infrastructure and build human capacity before effectively adopting global technology to meet their local needs. In many developing countries, consumers lack trust or access to the necessary infrastructure to facilitate e-payments.

- **Non-performing assets (NPA):** Non-performing assets are another challenge to the banking sector. Vehicle loans and unsecured loans increase NPAs which, as a part of banks' retail portfolios, have also been hit due to upward movement in interest rates, restrictions on collection practices, and soaring real estate prices. Every bank has to take care of regular loan repayment and sound credit appraisal to contain NPAs.

- **Competition:** Nationalized and commercial banks compete with foreign and new private sector banks. Competition in the banking sector presents various challenges, including product positioning, innovative ideas and channels, adapting to new market trends, cross-selling, and managing assets while containing risks. Banks are streamlining their operations by shifting from manual to automated

 ISBN: 978-81-993134-0-8

processes, utilizing skilled and specialized workforce to achieve targeted results.

- **Managing technology:** The key to achieving and maintaining high service and efficiency standards while remaining cost-effective and delivering sustainable returns to shareholders is developing or acquiring the right technology, deploying it optimally, and leveraging it to the maximum extent. Early adopters of technology gain significant competitive advantages. Therefore, managing technology is a crucial challenge for the Indian banking sector.

8 Conclusion

Today, digital banking has transformed the industry by embracing technology over traditional methods. The adoption of digital innovations has revolutionized banking services, leading to significant changes and challenges in the sector, particularly in India. In the digital age, smartphones have made digital banking services easily accessible to everyone, anytime and anywhere. The convenience and comfort of using digital banking services have made it more popular than traditional banking. The competitive landscape of the banking sector has been reshaped by digitization, with initiatives like the Digital India program aiming to enhance customer service and promote a cashless economy. The shift towards cashless and paperless banking is a direct result of the industry's digital transformation.

However, cybersecurity threats and challenges such as low Internet connectivity and lack of awareness need to be addressed to ensure the security and success of digital banking. To achieve sustainable growth, banks must invest in robust security systems, digital literacy programs, and infrastructure development. Balancing innovation with security, inclusivity, and trust will be critical for digital banking to continue serving as a powerful engine for financial inclusion and economic development.

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 ISBN: 978-81-993134-0-8

Conceptual View of Green Marketing Strategies for Sustainable Business Practices

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Abstract

Green marketing has emerged as an indispensable element of contemporary business strategies in light of heightened consumer cognizance of environmental concerns and the mounting significance of sustainable practices. This conceptual paper explores the theoretical foundations, consumer behavior implications, and real-world applications of green marketing practices in business. It points out case studies of successful green marketing initiatives and the challenges and opportunities in this domain. It examines the theoretical foundations of green marketing. Consumer behavior takes center stage and examines how attitudes, perceptions, and motivations influence environmentally friendly purchasing decisions and brand loyalty. Companies analyse green marketing practices by focusing on ecologically conscious product design, environmentally responsible packaging solutions, sustainable brand development strategies, and optimised green supply chain management. Case studies reinforce successful examples such as Tesla Motors, IKEA, Patagonia, and Seventh Generation and address how these companies have used green marketing practices to improve their financial performance and corporate image. The paper further examines the challenges associated with green marketing, including greenwashing, consumer skepticism, economic constraints, and regulatory complexities. It also explores prospective directions and opportunities in green marketing, including innovation, circular economy practices, eco-labeling, green tourism, digital integration, and multi-stakeholder collaborations. This paper contributes to understanding green marketing by summarising theoretical perspectives, empirical evidence, and practicable insights for businesses seeking to align competitiveness with environmental responsibility.

 ISBN: 978-81-993134-0-8

Keywords: Green Marketing, Sustainability, Consumer Behaviour, Business Practices, Environmental Responsibility.

1 Introduction

The rise of green marketing, a strategic approach where businesses incorporate ecological concerns into their marketing practices, results from the growing emphasis on environmental sustainability on a global scale. This method substantially impacts both customer behavior and the company's reputation and addresses the direct ecological impact of these goods and services. Growing environmentally conscious customers expect more sustainability and openness from their patronage brands (Ottman, 2011; Peattie & Peattie, 1995). Green marketing "refers to the development and promotion of products that are presumed to be environmentally safe (i.e., designed to minimize negative effects on the physical environment or to improve its quality)" (The Definition of Marketing—AMA, n.d.).

When discussing environmental sustainability, "green" refers to actions, goods, and regulations that lessen their adverse environmental impacts. It includes waste reduction, energy efficiency, preserving natural habitats, and applying renewable resources. The main objectives of green initiatives are to guarantee sustainable development, promote biodiversity, and alleviate carbon footprints. The description includes sustainable business practices, green technologies, and eco-friendly products. Using green principles to secure and preserve the planet for future generations requires individual actions, corporate responsibility, and government regulations (Leonidou et al., 2010; Polonsky, 2011; Rennings, 2000).

Marketing encompasses the multiple tactics, plans, and techniques businesses exert to advertise, close deals, and offer their goods and services to customers. "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large" (The Definition of Marketing—AMA, n.d.). In the context of green marketing, this value creation extends beyond customers to include environmental and social benefits. It combines products, pricing, promotion, and distribution to satisfy demands and help businesses to compete in the marketplace successfully.

Several vital models form the theoretical basis of green marketing. The Triple Bottom Line framework highlights the importance of establishing a balanced equilibrium between economic, environmental, and societal ele-

 ISBN: 978-81-993134-0-8

ments in evaluating an enterprise's performance (Jeurissen, 2000). Stakeholder Theory, introduced by Freeman in 1984, underscores the relevance of considering all stakeholders' interests in decision making (Freeman, 1984; Freeman & McVea, 2001). Consumer behavior models explore how environmental awareness and attitudes impact purchasing decisions and provide essential insights to businesses hoping to market green products successfully (Peattie, 2001, 2010).

Within marketing, environmentally conscious principles transcend the mere provision of products. They encompass a comprehensive array of strategic initiatives. These initiatives include designing eco-friendly products, using eco-labels and certifications, and maintaining transparent communication with consumers. Renowned organizations such as Patagonia, Tesla, and Unilever exemplify how the seamless integration of green marketing practices into their core business strategies has enhanced their brand reputation and bolstered customer loyalty.

In the realm of business strategy, green marketing stands as an extensive and multifaceted approach. It entails deliberately promoting products or services with environmental benefits and encompasses a broad spectrum of actions. These actions include modifying the design of products, altering production processes, employing sustainable packaging solutions, and adapting advertising approaches to align with environmental consciousness. On a broader scale, green marketing represents an organization's comprehensive and holistic endeavor to design, promote, price, label, brand, and distribute products to minimize environmental impact. It encompasses the entire management process, considering the needs of both customers and society. Since sustainability and profitability are closely related in today's business environment, green marketing strongly emphasizes both (Porter & van der Linde, 1995).

Evolution of Green Marketing

Green marketing has evolved from reducing the impact of products to including ethical marketing, social responsibility, and broader environmental and societal concerns. It now takes a comprehensive approach, integrating ecological factors into all aspects of business. Since its beginnings in the 1970s, the idea of green marketing has substantially developed. Over time, ethical marketing techniques and social responsibility have become central to the more significant sustainability issues that green marketing addresses. This

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development reflects a growing awareness that environmentally friendly business practices are just as crucial to long-term company viability and success as they are to the environment (Peattie & Peattie, 1995; Ottman, 2011).

2 Theoretical Models

Green marketing is supported theoretically by several models, including the Triple Bottom Line, stakeholder theory, and consumer behavior models.

2.1 The Triple Bottom Line

The Triple Bottom Line (TBL), a vital tool for corporate sustainability, consists of three linked components. John Elkington founded TBL in 1994, contending that companies should evaluate their performance using criteria beyond income. They also should consider how their activities affect human populations and their surroundings. Elkington's Triple Bottom Line approach emphasizes balancing economic, environmental, and social aspects for sustainable corporate practices (Elkington, 2002; Jeurissen, 2000).

2.2 Stakeholder Theory

According to stakeholder theory, businesses have to take into account how their choices could impact their customers, suppliers, employees, local communities, and other groups apart from their shareholders. One has to understand the ideas of stakeholder theory (Freeman, 1984; Freeman et al., 2004) to grasp corporate social responsibility (CSR) and green marketing. Firms that integrate stakeholder interests into their green strategies are more likely to build lasting legitimacy and trust.

2.3 Consumer Behaviour Models

Consumer behaviour models look at how consumer decisions are influenced by attitudes and environmental knowledge (Kollmuss & Agyeman, 2002), providing an analysis of the factors driving individuals to select environmentally friendly products. These models examine how customers' buying behaviour is shaped by their awareness of environmental issues, perceptions about sustainability, and personal values (Schwartz, 1994; Stern, 2000). Such insights help marketers position green products effectively and design communication that resonates with eco-conscious consumers.

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3 Consumer Behavior and Green Marketing

3.1 Environmental Awareness

Consumer awareness of the environment drives green marketing most of the way. Along with media coverage, public knowledge of issues including resource constraints, pollution, and changing climatic patterns has grown. Public awareness campaigns and school curriculum, among other education-related projects, have strengthened this knowledge and raised consumer awareness of their environmental influence. This increasing awareness has fundamentally affected consumer behavior; many now search for sustainable products and services. Businesses are adapting green practices into their marketing plans and business models. This trend demonstrates a shift in consumer preferences and emphasizes the importance of increasing corporate responsibility and promoting a more sustainable market (Peattie, 2001; Roberts, 1996; Leonidou et al., 2010).

3.2 Green Consumers and Segmentation

Green consumers are those who knowingly and consciously base their purchases on environmental considerations. However, not all green consumers are the same. Researchers have identified several segments: highly committed "true greens" who consistently make eco-friendly choices; mid-level consumers who sometimes choose green products; and "green laughers" who show interest in sustainability but may only occasionally purchase green products. In between, there are varying degrees of green consumers, each with different motivations and levels of engagement. Identifying and targeting these segments allows businesses to tailor marketing strategies to meet each group's specific needs and preferences (Straughan & Roberts, 1999).

3.3 Psychological Drivers

Psychological factors impact green consumer behavior and drive demand for sustainable products and practices. Environmental knowledge (Kollmuss & Agyeman, 2002), or one's awareness and comprehension of ecological issues, is one crucial component. This information significantly influences consumer behavior since people aware of resource depletion are more likely to make environmentally conscious purchases. Well-informed consumers favor sustainable options.

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Another essential consideration is perceived consumer effectiveness. Customers are more inclined to adopt eco-friendly products when they believe their decisions have an impact. This sense of efficacy strengthens their environmental values and reinforces sustainable behavior. Personal beliefs about protecting the environment and making ethical choices drive consumers to prefer sustainably sourced, ethically produced, and environmentally friendly products. These principles affect not just what consumers purchase but also how they view businesses and brands, favoring those that show a sincere, uncompromising dedication to sustainability (Stern, 2000; Schwartz, 1994).

4 Green Marketing Strategies for Companies

Green marketing is the set of strategies used by companies to minimize their effect on the surroundings, advertise eco-friendly products, and run sustainable businesses. These methods serve to lessen the influence on the surroundings and align companies with rising customer demand for sustainability. Supporting pertinent references, below are some key green marketing techniques.

4.1 Eco-Friendly Product Development

Sustainable product development is the creation of products with the smallest possible negative environmental impact over their lifetime. It involves using recycled or renewable resources, designing durable and repairable products, and reducing emissions and waste in manufacturing. Companies like Tesla and Interface have integrated eco-design principles to reduce emissions, improve resource efficiency, and develop products that align with low-carbon and low-waste futures (Tesla, n.d.; Our Mission — Interface, n.d.).

4.2 Green Supply Chain Management

Green supply chain management incorporates environmental considerations into each stage of the supply chain, from sourcing to distribution and disposal. It includes practices such as sustainable sourcing, energy-efficient logistics, reverse logistics, and recycling systems. Firms implementing green supply chains can reduce costs, improve resource utilization, and enhance reputation while contributing to environmental protection (Pagell & Shevchenko, 2014; Seuring & Müller, 2008).

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4.3 Eco-Friendly Packaging

Green marketing relies heavily on sustainable packaging materials, such as recyclable, biodegradable, or reusable options. Using this technique significantly decreases the environmental impact of packaging waste. Employing biodegradable, recyclable, or reusable materials ensures that packaging contributes less to landfills and reduces resource depletion. Companies that implement these sustainable practices can reduce their ecological footprint and appeal to consumers who value eco-friendly products. Businesses that use sustainable packaging can enhance their brand image and differentiate themselves from rivals, as eco-conscious consumers are more likely to be brand loyal.

4.4 Green Branding and Communication

Effective green branding communicates a company's commitment to sustainability by means of honest and transparent messages. Companies have to deliver accurate and clear information. It means revealing the environmental impact of operations and products, obtaining credible certifications, and demonstrating real efforts to lower environmental impact. By appealing to the values of environmentally minded consumers, authentic green branding helps a company stand out in a crowded market and generates consumer confidence (Charter & Polonsky, 2017).

4.5 Certifications and Eco-Labels

Eco-labels and certifications provide vital information about the environmental impact of items and help consumers evaluate firms' environmental claims and guide their buying decisions. Labels such as Fair Trade, Energy Star, USDA Organic, and other credible certification schemes indicate whether goods satisfy particular ethical and environmental criteria. By displaying these certificates as proof of their dedication to sustainability and transparency, businesses can raise awareness of themselves and draw environmentally minded consumers. This strategy helps to build consumer confidence and drives businesses to maintain strict environmental standards in their operations.

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4.6 Consumer Education and Engagement

Consumer education and engagement are fundamental to green marketing. Businesses can create campaigns that draw attention to the environmental effects of consumer decisions and the benefits of choosing sustainable goods and methods. By arming individuals with open information and promoting customer interaction, businesses may help individuals to make environmentally conscious choices. Through ongoing education and communication campaigns, companies that give sustainability priority in their marketing can foster advocacy, loyalty, and consumer trust.

4.7 Green Innovations

A trailblazing green marketing approach is introducing new technologies and solutions that lower environmental impact (Charter & Polonsky, 2017). This strategy calls for using sustainable manufacturing techniques, investing in renewable energy sources, and including green technologies throughout the product life cycle. Using sustainability innovations helps businesses reduce their environmental impact, demonstrate commitment to environmental preservation, and position themselves as leaders in sustainable business models.

5 Successful Green Marketing Case Studies

In the modern world marked by growing environmental consciousness, commercial businesses adopt green marketing techniques more and more to draw in and keep consumers. Including sustainability in daily operations and communications helps companies to bring about positive changes. This collection of case studies looks at how businesses have used sustainable practices to inspire development and build brand loyalty, thereby illustrating the effectiveness of green marketing across many sectors.

5.1 Patagonia: Environmental Responsibility and Ethical Practices

Patagonia's primary business strategy has effectively incorporated environmental responsibility. The company's efforts, like its use of recycled materials and the Worn Wear program, have enhanced its reputation as a pioneer in

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sustainability. Patagonia's leadership role in sustainability has garnered numerous accolades and awards. Its "Don't Buy This Jacket" campaign, investment in repair and reuse, and commitment to 1% for the planet demonstrate a deep integration of environmental values into its marketing and operations (Chouinard et al., 2011; Corporate Social Responsibility—Patagonia, n.d.; Sheppard, 2017).

5.2 Tesla: Electric Mobility and Clean Energy

Tesla represents one of the most prominent examples of green innovation in the automotive sector. By focusing on electric vehicles, battery storage, and renewable energy solutions, Tesla has positioned sustainability at the core of its brand identity. The company's impact reports highlight reductions in emissions, growth of charging infrastructure, and contributions to accelerating the global transition to sustainable energy (2021 Tesla Impact Report, n.d.; Tesla, n.d.; Lambert, 2021).

5.3 IKEA: Sustainable Everyday Living

IKEA has embedded sustainability into its product range, sourcing, and store operations. Through initiatives such as using renewable and recycled materials, promoting energy-efficient products, and committing to climate-positive goals, IKEA leverages green marketing to create value for customers while supporting environmental goals. Its sustainability communications emphasize "sustainable everyday living" and transparency about progress (Sustainability—IKEA, n.d.).

5.4 Seventh Generation: Household Products

Seventh Generation, known for sustainability and transparency, offers plant-based, toxin-free household products. It advocates for safer, eco-friendly alternatives and uses clear labeling and advocacy campaigns to educate consumers. Through initiatives like "Made to Matter" and its focus on bio-based ingredients, Seventh Generation has earned consumer trust and loyalty (Home — Seventh Generation, n.d.).

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5.5 Interface: Carpet Industry

Central to Interface's "Mission Zero" endeavor is an unwavering commitment to renewable energy sources and closed-loop production, propelling advancements toward an ecologically sound future. The company has substantially invested in solar and wind power generation and redesigned carpet tiles to reduce waste and emissions. By embracing innovation, transparency, and collaboration, Interface has demonstrated that it is feasible to operate a successful business while minimizing environmental impact. Interface's leadership in sustainable carpeting is a beacon of how green marketing and strategy can drive a greener future (Our Mission — Interface, n.d.).

6 Challenges in Green Marketing Initiatives

Despite its potential, green marketing faces several obstacles.

6.1 Greenwashing

The spread of false or exaggerated environmental claims is known as greenwashing. Businesses that exaggerate or fabricate their environmental efforts risk eroding consumer confidence in sustainability. When consumers feel misled, trust in green labels and claims declines, affecting even genuinely sustainable brands (Polonsky, 2011).

6.2 Cost and Accessibility

Sustainable products often come with higher price tags due to the investments required in eco-friendly materials and processes. This can deter price-sensitive consumers from choosing green options, especially in regions where eco-friendly alternatives are less accessible or affordable. The perception that green products are premium-priced can limit their market penetration.

6.3 Market Education

Many customers are not fully aware of the environmental consequences of their purchase decisions and may lack knowledge about the value of selecting greener solutions. Businesses, governments, and advocacy groups must work together to overcome this educational obstacle by increasing understanding

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and supporting informed choice through awareness campaigns, labeling, and education.

6.4 Consumer Skepticism

Past incidents of greenwashing and inconsistent claims have increased consumer skepticism. Even when companies take genuine steps toward sustainability, consumers may doubt their intentions or impact. Overcoming skepticism requires consistent transparency, third-party verification, and long-term demonstration of environmental performance (Kollmuss & Agyeman, 2002; Leonidou et al., 2010).

6.5 Economic and Market Constraints

Economic constraints can limit both firms and consumers. For firms, investing in green technologies and processes demands upfront capital and may involve uncertain payoffs. For consumers, higher prices and limited availability of sustainable alternatives make adoption difficult. Often the extra expense of sustainable items exceeds their perceived worth, which results in more reasonably priced, traditional solutions being chosen.

6.6 Infrastructure and Limited Supply Chains

Infrastructure and supply chain issues affect the availability and placement of green products, especially in developing regions. To guarantee the acceptance and scalability of sustainable practices, more infrastructure for waste management and recycling as well as for effective, low-carbon supply chains is required.

6.7 Regulatory Compliance and Enforcement

Although regulatory systems are in place in many countries to encourage environmental sustainability, enforcement mechanisms may need to be strengthened to guarantee adherence to green criteria and laws. Uneven application of environmental regulations can lead to unfair advantages, persistent externalities, and a lack of corporate responsibility (Rennings, 2000).

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7 Prospective Directions and Opportunities in Green Marketing

In an ecologically conscious society, green marketing helps to match consumer values with corporate operations. It presents chances for environmentally friendly items, brand reputation building, and creative development inside the green marketing terrain. Using green marketing techniques will help companies become competitive and support worldwide environmental projects.

7.1 Originality and Innovation

Companies that embrace sustainability can create originality and innovation to differentiate themselves from rivals. Establishing and applying sustainable practices helps businesses develop a competitive edge, especially when they pioneer new technologies, business models, or circular solutions (Charter & Polonsky, 2017).

7.2 Development of Trust and Loyalty

Open and real green marketing campaigns can help companies foster customer loyalty and trust. By proving a real commitment to sustainability and keeping green commitments, businesses may build long-term relationships with environmentally minded consumers. Transparency, regular reporting, and authentic engagement strengthen loyalty.

7.3 Multi-Stakeholder Collaboration

Working with environmental organizations, industry partners, and suppliers can inspire creativity and propel collective efforts toward sustainability objectives. By collaborating, businesses can share best practices, leverage resources, and amplify their impact on environmental issues.

7.4 Integration with Digital Marketing

Integrating green marketing with digital marketing strategies can magnify the reach and impact of sustainability messages. Businesses can leverage social media platforms, influencer partnerships, and online communities to

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promote green products and practices, share sustainability stories, and engage consumers in campaigns.

7.5 Circular Economy

Favoring the principles of the circular economy—such as recycling, reusing, refurbishing, and remanufacturing—can further enhance the sustainability of business operations and products (Towards a circular economy, n.d.). Circular strategies reduce waste, extend product life, and create new value streams.

7.6 Consumer Empowerment

Empowering consumers with the information and tools to make sustainable choices is essential. Transparency in product information, eco-labeling, and sustainability certifications can aid informed decision making. When consumers are equipped to evaluate environmental performance, they can reward genuinely sustainable firms, reinforcing positive change.

7.7 Green Tourism

Sustainable tourism, sometimes referred to as green travel, aims to help nearby communities and preserve the surroundings. It includes ecotourism and nature-based travel that seeks to inform guests on cultural and natural resources while supporting preservation. Green travel works with nearby populations to make sure that their customs are respected and that travel benefits them. Among the main benefits are cultural interaction, economic growth, protection of biodiversity, and sustainable development. Ensuring local community benefits, balancing tourism development with environmental preservation, and educating visitors present key challenges (Honey, 1999; Chengcai et al., 2017).

8 Methodology

The type of study used in this academic paper consists of a thorough review of green marketing techniques based on literature. Academic publications, book chapters, and full-text papers, among other online and offline resources, are covered in this review. The references guarantee the inclusion of pertinent and modern sources since they are taken from respected and reliable web

resources. Moreover, the library search covers a wide range of materials to grasp the issue holistically (Chea, 2024).

9 Conclusion

A dynamic and changing field vital in promoting environmental sustainability and impacting consumer behavior is green marketing. Understanding the theoretical bases, practical applications, and possible future directions of green marketing helps businesses create sustainable strategies that guarantee interesting and responsible future operations. This whole understanding helps companies to match their operations with environmental objectives, satisfy customer demand for eco-friendly products, and provide a competitive edge in a market going more and more sustainability-oriented.

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 ISBN: 978-81-993134-0-8

The Impact of Sensory Marketing Elements on Consumer Buying Behavior: A Study on Consumer Products

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Abstract

Sensory marketing is a new technique that deploys the five human senses like sight, sound, smell, taste, and touch to develop engagement experiences that inspire consumer perceptions and buying habits. Sensory marketing differs from conventional marketing tactics that rely mainly on information and persuasion by trying to build emotional relationships through multi-sensory interaction, generating brand loyalty and customer satisfaction. With time, companies have moved toward this experiential strategy, using consumer psychology and neuroscience findings to better shape their marketing tactics. Food and beverage, retail, cosmetics, and hospitality are some of the industries that have effectively incorporated sensory aspects to brand themselves and enhance customer experiences. This research delves into the complex influence of sensory marketing features on consumer purchase behavior in the consumer goods industry. It examines how vision, hearing, olfaction, taste, and touch affect different phases of the consumer process, from first product awareness and buying to post-purchase satisfaction, repeat purchase behavior, and brand loyalty. Nevertheless, the study also identified some drawbacks of sensory marketing.

Key words: Sensory marketing, Consumer buying behavior, Consumer products.

1 Introduction

In the saturation marketplace of today, brands are always competing for attention from consumers. Time-honored marketing techniques tend to rely on rational appeals, but more and more companies are discovering the impact of sensory marketing as a means to make deeper, more emotive connections with consumers. Through effectively targeting the five senses—sight, sound, smell, taste, and touch—the consumer is impacted, attitudes are shaped, and ultimately buying decisions are initiated.

By creating multisensory experiences, brands can provide lasting and effective impressions that engage customers on a more emotive level, which leads to in-

creased brand loyalty and sales. This research goes into the influence of sensory marketing factors on consumer purchase behavior specifically in the consumer goods category.

It attempts to know how various sensory signals, like the visual attractiveness of packaging, the auditory sound of a jingle, the olfactory scent of a product, the gustatory flavor of a sample, or the haptic texture of a material, shape consumer attitudes and buying behavior. By studying the interactions among these sensory inputs and consumers' reactions, this research intends to contribute significant knowledge to marketers looking to utilize the power of sensory marketing in crafting better brand strategies and becoming competitive players.

2 Review of Literature

(Soars, 2009) examined how sensory stimuli in retail environments influence shopper experiences and behavior, often subconsciously. The paper reviews research on optimizing store layouts, understanding shopper movement, using neuro-imaging, and applying virtual reality. The findings highlight the significant impact of sensory marketing on shopper decisions, store preferences, and spending, suggesting that retailers should prioritize enriching shopper experiences, especially during economic challenges, while also considering sustainability.

(Erenkol, 2015) discussed how companies, as heavy competitors among themselves, are moving away from traditional marketing, and how sensory marketing practices affect consumer behavior by influencing them through their five senses. Sound, taste, and touch emerged as the most important influences on purchasing decisions in this restaurant-based study.

(Krishna et al., 2016) explored the role of sensory marketing in improving advertising effectiveness. It examined how visual elements evoke mental imagery and simulation to improve ad impact. The study highlighted olfaction as a driver of ad recall and response, and auditory elements, particularly music, as key to enhancing consumer memory and ad evaluations.

(Aljumah et al., 2022) examined how visual, auditory, and tactile sensory factors influence customer satisfaction and loyalty in UAE restaurants. Survey data, analyzed using PLS-SEM, confirmed that these sensory elements significantly enhance both satisfaction and loyalty, with satisfaction mediating the link between sensory factors and loyalty. The findings provide valuable insights for academics and policymakers seeking to improve customer experience and retention in the restaurant industry.

(Yang, 2023) investigated how sensory marketing (visual, olfactory, auditory, and tactile experiences) impacts customer enjoyment, satisfaction, and future be-

 ISBN: 978-81-993134-0-8

havior. Survey results confirm that sensory marketing influences customer emotions and perceived value, subsequently affecting their behavioral intentions.

3 Objectives

- To identify the sensory elements used in the marketing of consumer products.
- To measure the influence of sensory marketing on product satisfaction and repeated purchase.
- To investigate consumer expectations generated by sensory marketing.
- To investigate the potential drawbacks of sensory marketing.

4 Methodology

This research is descriptive and analytical. The study aims to describe the sensory marketing elements used by brands and analyse their influence on consumer buying behavior. The researcher has employed both primary and secondary data. Primary data were obtained from the customers by questionnaire. Primary data are in the form of raw material to which statistical methods are used for the sake of analysis and interpretation. The secondary data were obtained from books, magazines, journals, and websites for the purpose of conceptualization of theories.

5 Limitations of the Study

- The time duration for conducting the study was a limiting factor.
- Lack of knowledge in answering the questionnaire was also a constraint in conducting the study.

6 Analysis and Interpretation

1. Which sensory element is most likely to influence your first-time purchase of a product?

In first-time purchase decisions, sight is the most influential sensory element (52.86%), followed by smell (20%). Taste (7.14%) and touch (11.43%) are moderately important, while sound (5.71%) has the least impact. A small percentage

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(2.86%) is attributed to other, less common sensory factors. Essentially, visual appeal is the primary driver of initial purchases.

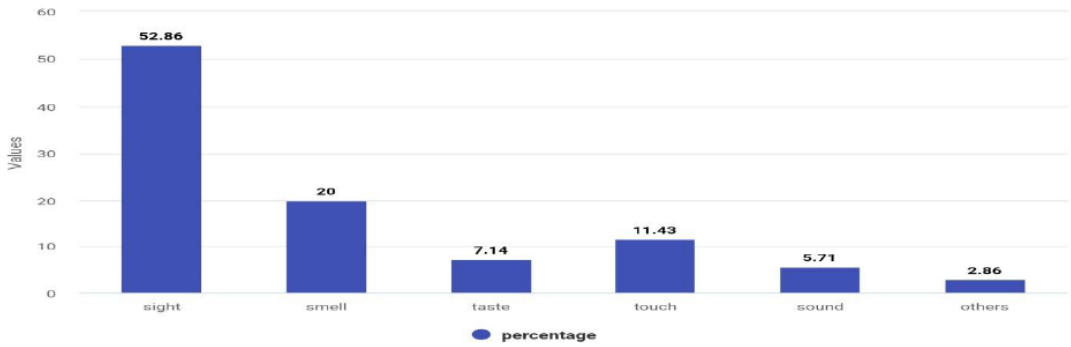

Figure 1: Influence of sensory elements on first-time purchase

2. How likely are you to get the same level of satisfaction in a repeated purchase as you did in the initial purchase based on sensory experience?

A majority (70%) of respondents expect to derive the same high level of satisfaction in repeat purchasing as was derived from earlier sensory experience (15.7% extremely likely, 54.3% very much likely). Only 2.4% expect little to no satisfaction while the remaining 28.6% are moderately likely to experience satisfaction with the repetition of purchases. Thus, it can be said that sensory experience is strongly responsible for satisfaction resulting from repeat purchases.

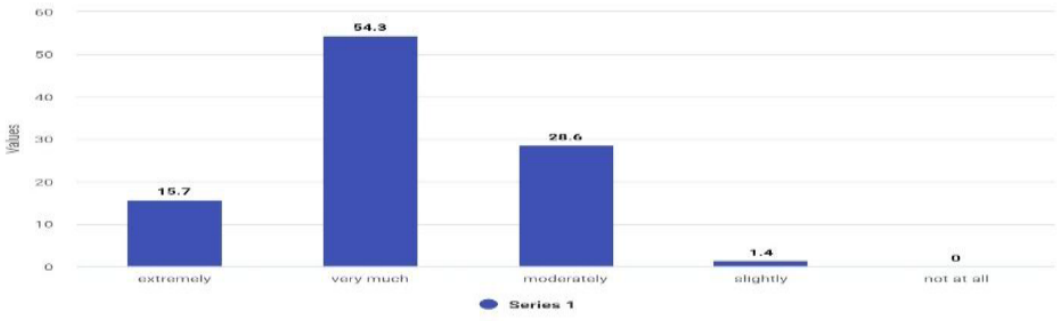

Figure 2: Likelihood of satisfaction in repeat purchase based on sensory experience

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3. Rate the extent to which sensory marketing influences your product satisfaction

Sensory marketing has a clear impact on product satisfaction: a combined 81.4% of respondents feel it influences their satisfaction either "very much" (61.4%) or "extremely" (20%), with another 18.6% reporting a "moderate" influence. Importantly, no one indicated that sensory marketing had little to no impact on their satisfaction.

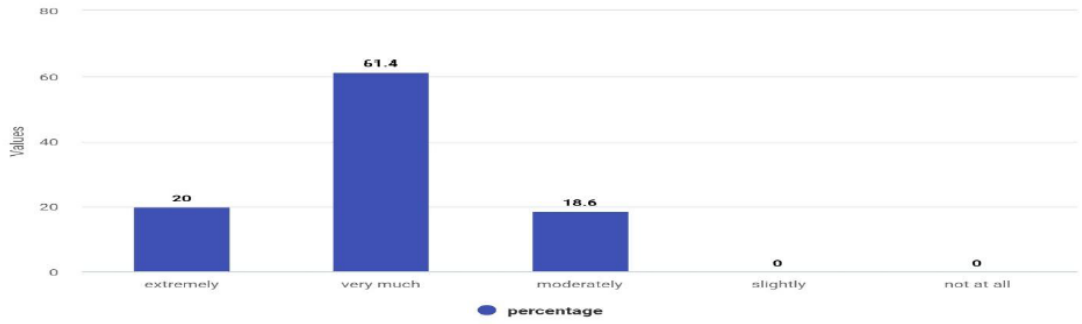

Figure 3: Extent to which sensory marketing influences product satisfaction

4. Which sensory element creates the highest expectations for you as a consumer?

Color or design is the most influential sensory element (51.4%) in setting consumer expectations, followed by texture (18.6%) and taste (17.1%). Scent plays a smaller role (7.1%), while sound and "none of the above" have minimal influence (2.9% each).

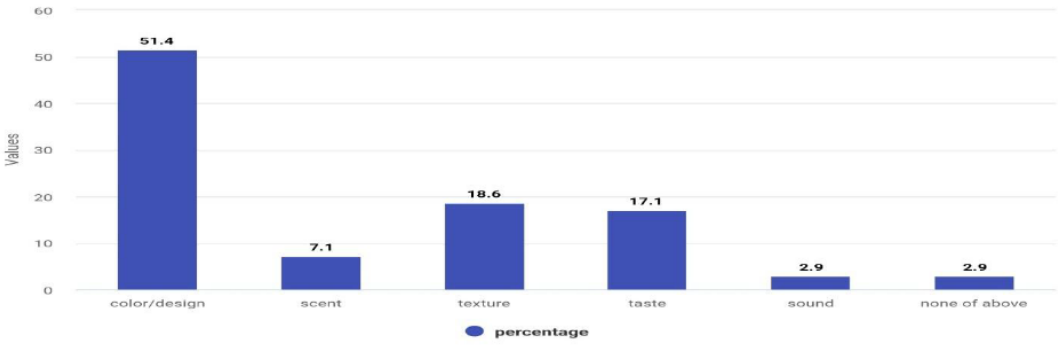

Figure 4: Sensory elements that create the highest consumer expectations

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5. What are the main drawbacks of sensory marketing?

The main drawbacks of sensory marketing identified in the study are unrealistic expectations, high cost, and perceived low quality. These indicate that while sensory marketing is effective, it can sometimes create inflated expectations or cost-related concerns for consumers.

7 Findings

- The most influencing sensory element for first-time purchase decisions is sight.
- About 70% of the respondents are likely to experience satisfaction in repeat purchases based on sensory experience.
- The results show that 61.4% of the respondents believe that sensory marketing has a great influence on their satisfaction, which reflects the role of sensory marketing in influencing consumer satisfaction.
- Color or design is the most influential sensory element in shaping consumer expectations.
- The main drawback of sensory marketing is unrealistic expectations, followed by high cost and perceived low quality, indicating that while effective, it can sometimes create inflated expectations or cost-related concerns for consumers.

8 Conclusion

This research affirms the important influence of sensory marketing on consumer purchasing behavior in the consumer goods market. Visual aspects, specifically packaging and design, are important to inspire first-time purchases, whereas taste and aroma play a more significant role in influencing repeat purchases and overall satisfaction with a product. The current results emphasize strategic, customized strategies of sensory marketing, considering the differentiated motivational levels and requirements of consumers at various phases of the buying process.

Sensory marketing can easily impact consumer perception and foster positive impressions of the brand, but it is full of problems as well. The potential for building unrealistic expectations is a primary concern since mismatches between sensory promises and product experience can result in disappointment and damage to brand trust. In addition, cost factors and product quality perceptions

continue to be relevant for consumers. Brands need to balance sensory enhancements with affordability and true product value carefully to avoid the impression of manipulative marketing practices.

Ultimately, effective sensory marketing involves a balanced approach that blends sensory stimuli with product quality harmoniously, effectively manages consumer expectations, and provides genuine and lasting experiences that engage target markets.

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 ISBN: 978-81-993134-0-8

A Review on Sustainable Pathways for Eco-Tourism Destinations

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Abstract

The article reviews sustainable strategies for the development and management of eco-tourism destinations. It emphasizes the pillars such as environmental conservation, community involvement, and economic viability to ensure long-term sustainability. While identifying prospects through technical breakthroughs and legislative assistance, the report notes obstacles including regulatory hurdles, excessive visitor traffic, and insufficient market demand. It combines case studies and worldwide best practices to give interested parties a practical understanding. The document also provides strategic policy suggestions meant to support environmentally friendly travel habits. It also underlines how environmentally friendly tourism helps to achieve Sustainable Development Goals (SDGs). Emphasizing community implications, climate adaptation techniques, and technological integration for sustainable tourism, the paper ends with recommendations for future avenues of research.
Keywords: Sustainable Eco-Tourism, Environmental Conservation, Community Involvement, Economic Viability, Sustainable Development Goals (SDGs), Policy Recommendations, Technological Innovations.

1 Introduction

Ecotourism, also known as environmentally responsible travel to natural destinations, is widely viewed as an important instrument for the attainment of sustainable development goals (Bala, 2025). It seeks to reduce the adverse impacts of tourism while maximizing its benefits to the environment and the host society (Kurniawan, 2024). With an emphasis on environmental preservation, community involvement, and cultural respect, eco-tourism presents an alternative to mass tourism (Arica, 2021). This type of tourism supports

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environmental initiatives and attempts to boost local economies without significantly harming the natural environment (Apriani et al., 2024). The method used is anchored on providing guests with knowledge of their destinations and encouraging them to respect the environment (Humaira, 2024). Eco-tourism attempts to foster ethical travel practises by promoting responsible tourist behavior that preserves local cultures and the environmental features of the tourist destinations (Serba et al., 2022).

2 Importance of the Study

The study is significant as it emphasizes the need for sustainable ecotourism for ensuring financial sustainability, boosting community involvement, and thus encouraging environmental preservation. It underlines how, when managed properly, ecotourism may offer economic opportunities and raise local communities' quality of living while simultaneously helping to preserve natural resources (Rahman & Baddam, 2021). It also emphasizes the role of strategic planning, conservation initiatives, and community-based tourism in obtaining long-term sustainability. The results help environmentally friendly tourism procedures that strike a balance between visitor needs, local community interests, and environmental protection. This underlines the role that sustainable ecotourism plays among increasing environmental treaties and agreements that contribute to global efforts aimed at environmental preservation and sustainable development (Dasgupta et al., 2007). The research also addresses the role of stakeholder cooperation in ensuring the success of sustainable eco-tourism programs (Macharia et al., 2010). It underlines how coordinated efforts by governments, non-governmental organizations, local populations, and private businesses are essential to implementing sustainable environmental policies. This investigation emphasizes how sustainable ecotourism supports the Sustainable Development Goals (SDGs), particularly those about poverty eradication, responsible use of natural resources, and climate change mitigation (Serba et al., 2022).

3 Objectives

1. To identify and evaluate sustainable strategies for eco-tourism destinations.

2. To provide insights and recommendations for policymakers, tourism

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operators, and stakeholders aimed at enhancing sustainable eco-tourism development.

4 The Concept of Sustainable Tourism

Sustainable tourism is a concept that aims to address the environmental, social, and economic constituents that surround tourism, as well as making sure that the productive mission is attainable in the long term (Chen, 2024). It seeks to avoid adverse effects on the environment and host societies while bringing favourable socioeconomic results (Chikamai et al., 2009). The main idea behind sustainable tourism is that tourism development should respond to the requirements of the present without jeopardizing the capacity of future generations in their efforts to pursue their interests (Martini et al., 2020). Sustainable tourism seeks a balance between tourism growth and resource preservation using practices that safeguard ecological integrity, cultural assets, and local wealth (Sarac et al., 2019). It accomplishes this by highlighting part of people in the field of development of the sustainable tourism industry and supporting tourism models that are inclusive of all the people involved (Sachani & Vennapusa, 2017). Building on more comprehensive sustainability ideas and realizing the importance of the role of tourism in tackling global environmental and economic problem areas such as climate change, biodiversity loss, and cultural disintegration (Patunru & Haryoko, 2015), sustainable tourism holds that campaigns aimed at ensuring sustainable development are irrelevant or at best limited where tourism damages the environment and communities. That is why sustainable tourism stands for a change in providing travel and hospitality services towards more sustainable and ethical practices (Acharia, 2023). It integrates tourism policies with community development, environmental preservation, and financial sustainability (Kurniawan, 2024). Its basis is in the principle of sustainable development and its aim is to create a morally and environmentally responsible industry which at the same time provides economic benefits and promotes social equity (Stanikzai et al., 2024).

5 Principles of Sustainable Tourism

The following are the elements of sustainable tourism.

- Environmental Sustainability: Conserving natural resources and min-

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imizing pollution, waste, and energy consumption (Kumari, 2023).

- Social Responsibility: Honoring the local values, tradition, and culture, and encouraging the participation of people in tourism development (Rahman, 2021).
- Economic Viability: Ensuring that tourism is financially feasible for host communities and helps to reduce poverty would help to ensure their viability (Arismayanti, 2019).
- Cultural Integrity: Maintaining cultural legacy and encouraging resident and tourist cultural interaction would help to ensure cultural integrity (Stanikzai, 2024).
- Stakeholder Cooperation: Involving all the stakeholders—that is, governments, travel agencies, local communities, and visitors—in planning and running tourism (Dinda, 2006).

6 The Role of Eco-Tourism in Sustainable Development

Eco-tourism is a vital way in which sustainable development is attained, particularly in the creation of environmental protection, economic development, and social justice (Bala, 2025). Being concerned about the natural environment with little impact on it, it helps preserve the ecosystems, wildlife, and biodiversity (Arismayanti, 2019). Eco-tourism supports conservation by establishing protected areas and conservation activities funded from tourism levies (Wang & Ap, 2013). It promotes economic growth through the creation of employment opportunities and diversification of livelihoods, particularly for local rural communities (Martini et al., 2020). Local enterprises that deliver tour management, hospitality, and handicrafts get their fair share of the revenue derived from tourism (Rahmawati et al., 2023). Furthermore, eco-tourism helps the local population to empower themselves through increased agency concerning land and decisions that concern resource use (Rahman & Baddam, 2021). Another benefit of eco-tourism is facilitating intercultural relations between tourists and resident communities, which improves cross-cultural sense and respect (Stanikzai et al., 2024). Eco-tourism encourages the conservation of cultures and heritage while at the same time deepening the transition and communication between cultures by

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encouraging cultural resources that could be used in tourism such as culture, traditions, and heritage places (Acharya, 2023). As part of the sustainable development framework, eco-tourism also entails focussing on the education and advocacy of people regarding environmental issues and long-run consequences of irresponsible tourism. Research that has been conducted indicates that tourists' experiences at eco-tourism destinations boosts their awareness of climate change, biodiversity conservation, and sustainable living, thus creating future support for sustainability efforts (Tie-fei, 2011). Eco-tourism thus serves as a bridge connecting sustainability goals, local growth, environmental protection and the pressure of the current globalization on these resources.

7 Environmental Conservation in Eco-Tourism

Environmental conservation is the backbone of sustainable eco-tourism. It entails natural resource conservation, pollution control, and encouragement of biodiversity (Chen, 2024). Proper environmental conservation activities are the core to the ecological sustainability of the eco-tourism destinations as well as their upkeep in the long term (Chikamai, 2009).

7.1 Strategies for Environmental Conservation

Protected Areas Management: Establishment and management of protected areas such as national parks and nature reserves to preserve natural habitats and protect biodiversity (Acharya, 2023). Ecosystem Restoration: Implementing ecosystem restoration programs to restore degraded ecosystems and render them more resistant to climate change and other threats (Badr, 2022). Sustainable Resource Use: Encourage responsible consumption practices and reduce pressure on natural resources through sustainable tourism programming (Dasgupta et al., 2007). Pollution Control Measures: Implementing waste control, anti-spraying practices and clean sources of energy to diminish pollution from tourism operations (Serba et al., 2022). Environmental Education: Inform the tourists about environmental issues and how their behaviour could impact on natural areas using interpretive programmes (Tie-fei, 2011).

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7.2 Case Studies of Environmental Conservation in Eco-Tourism

Wildlife Conservation Areas: Eco-tourism projects in wildlife conservation areas, where entrance fees and tourist activities have been used to support game control, anti-poaching operations, and habitat restoration initiatives, aiming at improving ecological outcomes (Acharya, 2023). Coastal Eco-Tourism Zones: Responsibility for governing waste and conservation of coral reefs and coastal habitats at eco-tourism sites has been observed to be effective and has led to improved coastal health and biodiversity in certain regions (Chen, 2024).

8 Community Involvement in Eco-Tourism

Community participation is the backbone of sustainable eco-tourism. By involving local communities in governance and profit-sharing systems, tourism helps grow local economies and improve the quality of living (Macharia et al., 2010). Community involvement is in form of community-based tourism, where community members contribute to and largely control the tourism enterprises (Rahmawati et al., 2023). Such involvement enables the locals to access the gains from tourism, hence supporting welfare and development projects in the communities.

8.1 Strategies for Community Involvement

Community-Based Tourism Initiatives: Encourage and develop initiatives that foster community-based tourism, where the management and control of tourism businesses are carried out by local communities, thus helping in wealth generation while at the same time conserving the local culture (Rahman & Baddam, 2021). Capacity Building Programs: Running the initiative the way of training to the local communities to equip them with skills in tourism management, hospitality and sustainable practices so as to enhance their participation in tourism (Rahmawati et al., 2023). Profit-Sharing Models: Introducing profit-sharing mechanisms and measuring performance on economic results made by tourism operations and the local population (Stanikzai et al., 2024). Community Consultation: Make sure that the community will be consulted about tourism activities so that their opinions regarding such activities are heard, and the degree of support for such actions

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would be increased to the maximum. (Rahman & Baddam, 2021). Cultural Preservation Initiatives: Funding for preservation of cultural practices, through support for cultural festivals, traditional arts, languages, and heritage sites, through tourism (Martini et al., 2020).

8.2 Case Studies of Community Involvement in Eco-Tourism

Eco-Tourism Projects in Southeast Asia: Several eco-tourism projects in Southeast Asia have aligned with community-based tourism by supporting societies, promoting local enterprise and investing in education, health etc. (Rahmawati et al., 2023). Community-run Eco-Tourism Enterprises: Instances where community cooperative-run eco-tourism businesses have generated revenue for infrastructure and development at local level in an effort to ensure that the benefits of tourism reach the disadvantaged (Morales et al., 2018).

9 Economic Viability of Eco-Tourism

A central principle of sustainable eco-tourism is assessing an eco-tourism destination's economic viability. This demands that tourism operations generate adequate investment returns and support local economies without over-reliance on external funding (Bala, 2025). Economic viability includes job creation, enabling entrepreneurial opportunities, and attracting local investment (Rahman & Baddam, 2021). Tourism is also responsible for job creation in both the formal and the informal sectors within eco-tourism destinations.

9.1 Strategies for Enhancing Economic Viability

Diversifying Tourism Offerings: The innovation of new tourism products and services such as cultural tourism, adventure tourism and wildlife experiences, helps attract different markets (Kurniawan, 2024). Supporting Local Enterprises: Provide support to local enterprises that provide tourism services and products, including lodging, travel, food, and culture (Martini et al., 2020). Encouraging Local Investment: Promote the investment by the locals in tourism-related businesses and providing assistance through grants, loans, and tax breaks for enterprises (Rahmawati et al., 2023). Pricing Strategies:

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Using pricing strategies for tourism services that promote both demand and sustainability in addition to ensuring that the revenue collected is adequate to maintain environmental and social efforts (Apriani et al., 2024).

9.2 Case Studies of Economic Viability in Eco-Tourism

Successful Eco-Tourism Destinations: Examples of eco-tourism destinations where proper pricing cannot be overemphasized as the revenues are widely distributed and create sustainable economic development (Arismayanti, 2019). Community-Based Enterprises: Reports of community-based eco-tourism where money made is invested in the local projects like the development of infrastructure, schools and health services, which ensure that tourism does not only benefit the investors (Morales et al., 2018).

10 Challenges and Opportunities in Promoting Sustainable Eco-Tourism

Although eco-tourism has a wide range of positive attributes, there are various hurdles that face sustainable development. The difficulties involve local society dispossession and loss of cultural identity, as well as succumbing to high commercialization of the tourism sector (Acharia, 2023). Eco-tourism development often results in displacement of communities and restriction of access, which in turn can fuel resentment and conflict instead of support from the community (Rahman & Baddam, 2021). The ecological problems include environmental degradation as a result of increasing numbers of tourists, problems with waste disposal, and resource depletion (Serba et al., 2022). In some cases, eco-tourism that is poorly managed leads to degradation of sensitive areas in particular environmental zones hence the loss of biodiversity and damage to fragile ecosystems (Chen, 2024). Another challenge arises with respect to governance and policy management. Endangered eco-tourism destinations require political leadership and a comprehensive legal framework in order to conserve and sustainably utilize their resources (Tie-fei, 2011). Such regulatory bodies may remain ineffective and policies that are capable of supporting sustainable eco-tourism growth are lacking in many areas. A major problem is the unpredictability in tourism markets due to global shifts including economic shocks and changes in tourist behaviours, and this can affect the sustainability of eco-tourism initiatives (Acrhi et al.,

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2023).

Despite these challenges, eco-tourism presents several unique opportunities. If pursued properly, eco-tourism serves as a path toward sustainable development by rallying support for environmental investments, social incentive implementation, and economic growth at local levels (Kurniawan, 2024). Eco-tourism can support climate adaptation and resilient strategies by encouraging land use practices that maintain the resilience of ecosystems and local communities (Dasgupta et al., 2007). Technological advancements also offer opportunities for sustainable eco-tourism, including digital marketing, mobile applications, and online booking platforms to improve visitor management and promotion (Serba et al., 2022). New technologies help enhance visitors' experience and simultaneously enable destination monitoring and assessment.

11 Strategies for Maximizing the Impact of Eco-Tourism on Achieving SDGs

Eco-tourism can be a powerful engine for driving achievement of Sustainable Development Goals, including poverty reduction, environmental preservation and decentralization of quality of livelihoods (Bala, 2025). Strategies for maximizing its effect are as follows: Integrating SDGs into Tourism Policies: Ensure that eco-tourism policies are in line with national development frameworks and the Sustainable Development Goals to elaborate synergies and priority areas of action (Kumari, 2023). Strengthening Community-Based Initiatives: Promote community-driven tourism activities by means of funding and policy support aimed at empowering local communities and promoting the concept of equitable sharing of resources (Rahmawati et al., 2023). Environmental Conservation Programs: Give priority to tourism-based conservation programs and integrate sustainability initiatives as part of eco-tourism packages (Acharya, 2023). Monitoring and Evaluation Frameworks: Establish comprehensive scheme for evaluating the impact of eco-tourism on the financial, social and ecological parameters, and revisit strategies as frequently as necessary (Acrhi et al., 2023).

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12 Eco-Tourism Destinations Eco-Tourism: A Sustainable Pathway

Eco-tourism opportunities include development of sustainable eco-tourism locations that aim to harmonize environmental, social and economic sustainability (Acharya, 2023). Eco-tourism sites act as living laboratories and testing grounds in sustainable development, showing how tourism can become a promoter of environmental protection rather than an agent of its degradation (Kurniawan, 2024). Key aspects of sustainable eco-tourism sites include: Enhancing Local Livelihoods, Reforestation and biodiversity conservation, Climate change mitigation and adaptation, Cultural heritage preservation, Community empowerment and participatory governance.

12.1 Environmental Conservation and Restoration

Establish a Protected Area: Designate Eco-Tourism destinations as a protected area so that their natural habitats and biodiversity are preserved (Acharya, 2023). Promote reforestation and afforestation programs to bolster ecosystems, enhance biodiversity and build climate change resilience (Chen, 2024). Implement conservation strategies, including endangered species protection, habitat restoration, and the creation of wildlife corridors.

12.2 Community Involvement and Empowerment

Promote community-based tourism initiatives that empower locals to run the tourism enterprises and share profits (Rahmawati et al., 2023). Provide capacity-building programs and training to local communities in sustainable tourism practices, conservation activities, and business administration. Encourage active involvement in decision-making processes regarding tourism project planning, management, and evaluation to ensure that tourism serves the interest of communities (Rahman & Baddam, 2021).

12.3 Economic Viability and Sustainable Livelihoods

Diversify tourism products to include cultural tourism, eco-adventure, educational tourism and wellness tourism, ensuring multiple streams of revenue (Martini et al., 2020). Encourage entrepreneurship through grants, microloans, and other financial support for local businesses (Bala, 2025).

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Create linkages between tourism and other sectors like agriculture, handicrafts, renewable energy projects to extend economic benefits across the community (Kumari, 2023).

13 Findings

The literature review on clubbing eco-tourism, sustainable tourism, community involvement, and economic opportunities finds a great deal of fundamental insights useful for framing strategies for the development of a sustainable eco-tourism destination. The major findings include:

13.1 Eco-Tourism as a Driver of Sustainable Development

Environmental Protection: Eco-tourism can be a supportive element for the protection of biodiversity and conservation efforts through funding, designation of protected areas, and sustainable practices (Acharya, 2023). However, human impacts like such as increased visits if unregulated, pose threats to fragile ecosystems (Chen, 2024). Economic Growth: Eco-tourism provides sources of income for local communities by creating jobs and stimulating business for small and medium-sized enterprises (Rahmawati et al., 2023). Social Development: Social benefits from eco-tourism include empowerment of community people and cultural preservation. However, poorly planned projects can contribute to marginalization or community marginalization or limited decision-making (Rahman & Baddam, 2021).

13.2 The Role of Community Participation

Community participation is the cornerstone of sustainability in eco-tourism. Studies show that community involvement results in better conservation outcomes, greater acceptance of tourism and equitable distribution of benefits (Morales et al., 2018). Community-based tourism models in which locals participate in planning and governing tourism operations, tend to contribute to empowerment, increased income and stronger social cohesion (Macharia et al., 2010).

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13.3 Economic Opportunities and Challenges

Eco-tourism presents opportunities for local economic development and for job creation, especially in rural and remote regions (Bala, 2025). Local communities may become independent from unstable agricultural incomes by moving to tourism services such as farming, lodging or guiding (Martini et al., 2020). However, these opportunities are challenged by constraints such as dependence on seasonal tourism, acute swing in tourist flows and unfair distribution of benefits (Badr, 2022).

13.4 Policy and Governance Issues

Effective governance is essential in managing eco-tourism which needs planning and oversight. Policy shortfalls, weak implementation, and often-conflicting regulations diminish the prospects for sustainable eco-tourism (Acrhi et al., 2023). Effective eco-tourism governance requires integrated approaches that align environmental, economic and social objectives and involve stakeholders using participatory governance frameworks (Dinda, 2006).

13.5 Balancing Tourism Growth and Environmental Sustainability

Most of the literature is concerned with balancing the growth and sustainability of tourism. The increased tourism has the potential for economic benefits and may cause environmental problems, such as resource depletion, interruption of habitats, and pollution (Patunru & Haryoko, 2015). The promotion of sustainable transport practices, through controlled visitor access, and establishment of carrying capacity frameworks is key to managing this dynamic (Chen, 2024).

13.6 The Role of Technology in Eco-Tourism

Technology is now increasingly playing a part in aiding eco-tourism management and sustainability. This includes GIS for resource and visitor management, social media for marketing and visitor engagement, and digital platforms for booking and monitoring (Acrhi et al., 2023). However, the digital divide in terms of access to technology and digital literacy gaps must be addressed to ensure equal access to opportunities for all stakeholders (Serba et al., 2022).

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13.7 Climate Change and Eco-Tourism

Eco-tourism is faced by the risks associated with the effects of climate change which include the recurrent natural calamities, the modification of weather patterns and sea levels. These threats affect the survival of tourist destinations such as coastal regions, mountains, and forests (Dasgupta et al., 2007). Eco-tourism initiatives have also now grown to include climate change adaptation, which include landscape conservation, diversified livelihood options and development of climate-resilient infrastructure (Serba et al., 2022).

13.8 Environmental Awareness and Education

Studies have shown that eco-tourism could influence positive environmental attitudes and behaviours. Eco-tourism is associated with both educational experiences, interpretive programs and increased exposure to natural environments that increase environmental awareness and stewardship among tourists (Tie-fei, 2011). However, the effectiveness of such initiatives depends on the quality of the educational experiences and the interlink between the activities that are performed during the visits.

13.9 The Importance of Local Governance and Stakeholder Cooperation

Local governance plays a crucial role in achieving sustainability outcomes in eco-tourism. Collaborative governance models that involve local governments, community organizations, businesses, and non-profits tend to facilitate more sustainable eco-tourism projects (Macharia et al., 2010). Partnering and collaboration increases the likelihood that eco-tourism will fit in with local necessities, focused on long-term sustainability, and easy to maintain.

13.10 The Importance of Education

It has also been noted that education plays an essential role in creating a sustainable eco-tourism destination (Morales et al., 2018). Providing local communities with resources, opportunities, and information may help them participate more fully in protecting the environment and tourism management. Environmental education is also a major factor in motivating visitors to adopt responsible and sustainable tourism practices (Tie-fei, 2011).

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13.11 The Circular Economy and Eco-Tourism

The concept of the circular economy is now applied in sustainable tourism, with the aim of reducing waste, minimizing environmental impact and recycling resources (Kumari, 2023). In the context of eco-tourism, circular economy ideas are implemented through promotion of sustainable consumption, waste recycling, and incorporation of local resources into the tourism supply chains. These circular approaches are vital for reducing resource consumption and making eco-tourism areas more resilient to global economic shocks.

13.12 Balancing Tourism and Environmental Protection

Most of the studies in this area emphasize the need to balance tourism development with environmental protection. Eco-tourism pathways that take into account both the carrying capacity of ecosystems and the rules limiting certain tourist activities, appear to have higher chances to be sustainable (Chen, 2024).

13.13 The Role of Local Characteristics and Culture

Local characteristics and culture play a critical role in determining the nature of eco-tourism activities and their level of adoption. Successful eco-tourism destinations can take advantage of local customs, traditions, economic activities, landscapes, and cultural heritage in order to build authentic and sustainable tourist products (Rahmawati et al., 2023).

13.14 Sustainable Tourism Development Index

The concept of sustainable tourism is often measured using indices that take indicators like environmental impacts, economic benefits, social equity and governance into account (Kumari, 2023). These measures provide a critical benchmark for international and regional comparison and enable monitoring of progress over time. Effective eco-tourism strategies must therefore target action in areas that can improve these indicators.

13.15 Community Attachment and Support

Community attachment and support are some of the important determinants of sustainable tourism development. Studies show that when residents feel strong ties to their place and receive tangible benefits from tourism, they are more likely to support tourism development and engage in conservation efforts (Morales et al., 2018). Conversely, when communities feel displaced, marginalized or under-compensated, they may resist tourism development or engage in activities that undermine sustainability.

13.16 The Significance of Wildlife Conservation Areas

Wildlife conservation areas are often some of the most important eco-tourism destinations and are critical areas in the conservation of biodiversity (Acharya, 2023). In these areas, eco-tourism can be a powerful instrument to finance conservation, promote sustainable land use, and influence local people to participate in protecting wildlife. But there must be proper regulations in place as well as enforcement mechanisms to prevent excessive exploitation and ensure that such goals are met.

14 Specific Contributions

The review article mostly contributes through its thorough study and synthesis of sustainable approaches for the development and management of eco-tourism locations. The main contributors are:

1. The paper offers a disciplined framework emphasizing environmental preservation, community engagement, and financial sustainability. It lays forth doable plans for encouraging environmentally friendly travel habits.

2. It draws attention to the main obstacles in the way sustainable eco-tourism is promoted—regulatory restrictions, overtourism, and limited market demand—as well as the possibilities including technological developments, rising consciousness, and policy support.

3. Global best practices and case studies—which show effective models of sustainable eco-tourism projects—are included in this paper. For anyone wanting to apply sustainable tourism ideas, they provide useful guides.

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4. Policy Suggestions: To promote sustainable eco-tourism, it offers strategic suggestions to local governments, travel agencies, and legislators. This covers recommendations for infrastructure development, community empowerment, capacity building, and legal systems.

5. The paper underlines how eco-tourism may help to reach the Sustainable Development Goals (SDGs), especially those of social inclusion, economic growth, and environmental sustainability, economic development, and environmental sustainability

6. It points up gaps in present research and suggests topics for more study, including the effects of eco-tourism on nearby towns, methods of climate change adaptation, and technology integration for environmentally friendly travel.

15 Conclusion

Eco-tourism in general has been portrayed as a viable method of attaining sustainable development goals in that it promotes environmental conservation, promotes community development and improves local economic and social welfare. Reviewing the existing literature, this paper points to the various strategies that can be used to develop and promote sustainable eco-tourism destinations. These incorporate conservation programmes, support for community-based tourism initiatives, economic empowerment through job creation, inclusion of modern technologies, and conservation of the local culture. At the same time, the paper identifies significant constraints, including environmental degradation, community marginalization, policy deficiencies, and the vulnerability of tourism to global economic and climate influences.

The transition of eco-tourism into a sustainable form entails unification of a number of different but mutually supporting strategies and policies. It demands inclusive and participatory governance, effective use of tools, and full integration of ecotourism into national and local sustainable development agendas. Eco-tourism, when directed in a manner that is thoughtful, has the potential to be a key contributor to the SDGs through the provision of economic opportunities, promotion of environmental preservation and social equity in communities.

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16 Scope for Future Research

Although this study offers insightful analysis of sustainable routes for Eco-Tourism sites, certain areas need more investigation: Environmental Tourism Initiatives: Impact Assessment Analyze the environmental, social, and financial impacts of current eco-tourism projects in Eco-Tourism sites (Tie-fei, 2011). Investigate local community attitudes and views of eco-tourism and find elements influencing their support of sustainable travel development (Morales, 2018). Economic Valuation of Ecosystem Services: Investigate the economic advantages of natural resources for tourism and eco-system services and how to monetize these benefits. Climate Change Resilience: Examine the susceptibility of Eco-Tourism destinations to climate change and determine possible adaptive interventions (Dasgupta et al., 2007). Technological Innovation: Find out what role emerging digital technologies, like smart tourism platforms and data based decision making, play in sustainability at eco-tourism destinations (Acrhi et al., 2023). Policy Implementation and Governance: Conduct in-depth research on policy interventions for eco-tourism in Eco-Tourism locations and identify the limitations and strengths in those types of systems (Dinda, 2006).

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 ISBN: 978-81-993134-0-8

Revolutionizing Marketing Management: The Power of Artificial Intelligence

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Abstract

The initiation of artificial intelligence (AI) in the marketing industry transformed the overall marketing environment. The use of AI postulates marketers with astonishing efforts to improve customer satisfaction through their marketing tactics. This conceptual paper examines the effects of artificial intelligence (AI) on marketing ventures, focusing on how AI has transformed important facets of marketing like segmentation, targeting, research, advertising campaigns, performance assessment, consumer behaviour analysis, and market demand. The use of specialised and individualised marketing strategies enhances marketing efficiency, and it can be streamlined by AI-driven automation. This paper covers the areas of AI in marketing administration, going over its advantages and difficulties. It also highlights the ways for the adoption and execution of marketing using AI's potential. The focus of this paper is the use of AI in marketing management, which will open up new avenues, innovation, and customer-focused marketing.
Key Words: Marketing, Artificial Intelligence, Marketing Administration.

1 Introduction

Marketing is the learning of knowing and satisfying societal and individual wants profitably (Kotler, 2000). It entails figuring out what the market wants, creating plans to fill those requirements ensuring customer delightfulness, and meeting organisational goals. Application areas of artificial intelligence are throbbing an impact on various fields of life (Patil et al., n.d.).

Due to the advent of Artificial Intelligence (AI), the marketing industry is in a digital transformation by enhancing workflows, accelerating growth, and reshaping the organization and its structure (Labib, 2024). Marketing management is one of the major areas that utilize artificial intelligence

 ISBN: 978-81-993134-0-8

(AI) by optimising ad campaigns, developing marketing tactics, and offering consumer experiences through the inclusion of individualised campaign elements. This article explores the ways in which artificial intelligence (AI) is being used in the marketing industry.

2 AI's Function in Marketing Administration

2.1 Customisation together with Customer Knowledge

The capacity of AI to evaluate a mass of data and extract consumer insights is the most important contribution of technology to marketing. AI algorithms can generate inclusive customer profiles by examining big data from numerous sources, including social media, past purchases, and browsing habits. This makes it possible for marketers to customise their advertisements to each customer's tastes. It increases client loyalty and engagement.

Customer Relationship Management (CRM) strategies based on data augment the personalization and customization of selling, service delivery, and support services. CRM relies on big data to deliver improved customer experiences, particularly through tailored client services and personalized interactions (Anshari et al., 2019). The field of business intelligence depends on data analytics in decision-making (Fan et al., 2015).

2.2 Predictive Analytics

Artificial intelligence also excels at predictive analytics. Predictive analytics models are used to forecast future and different variables determining behaviour (Kumar & L., 2018). AI algorithms can forecast market trends and changes in consumer behaviour based on previous data. It enables marketers to predict shifts in the industry, spot possible opportunities, and use resources more wisely. To find the best project characteristics and algorithms for forecasting potential budget deviations, several prediction models have been worked (Wach & Chomiak-Orsa, 2021).

2.3 Chatbots and Customer Service

Nowadays, an essential part of customer support is through Chatbots powered by AI. These chatbots work around the clock and can manage a variety of consumer enquiries and reviews. Also, it offers prompt replies. This augments the consumer experience to deal with more complicated problems with

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less human intervention. Natural language processing, or NLP, is a technique that chatbots use to understand and respond to user questions. They can help with purchases of the prospect, answer complaints, and give product-related information. Over time, they get better at replying in a way they keep learning from encounters. The way chatbots function in the context of services validates their importance in high-quality customer care (Misischia et al., 2022). Python was the most common programming language used in chatbot applications, with Java, Javascript, and PHP following closely behind (Gamboa-Cruzado et al., 2022).

2.4 Content Creation and Curation

The contribution of AI in content curation and development is incredible. Artificial intelligence (AI) systems are utilised in user-generated content curation and moderation, as well as in personalised ad delivery (Heitz & Rozgonyi, 2021). AIs are capable of producing excellent content for email marketing campaigns, blogs, and social media platforms. With the aid of these technologies, marketers can create content more rapidly and effectively, guaranteeing a constant supply of original and timely information. Machine learning is used in advertising to provide accurate communication. The algorithm, not simply the database, is updated by the computer based on response rates (Lowman, n.d.).

2.5 Programmatic Advertising

Programmatic advertising pulls AI to automate the ads by using factual data; AI can determine the best ad placements and target audiences, ensuring maximum ROI for marketing campaigns. This process involves real-time bidding, where AI algorithms decide the value of an impression and bid accordingly. This automation not only makes advertising more efficient but also enables marketers to reach their target audience more effectively. AI can analyze user behavior to display ads that are most likely to resonate with them, thereby increasing the chances of conversion.

2.6 Sentiment Analysis

Sentiment analysis involves using AI to examine buyer feedback and social media interactions to gauge public opinion about a brand or product. By

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understanding how customers feel, marketers can make necessary adjustments to their strategies and address any issues promptly. For example, if sentiment analysis reveals a negative trend in customer feedback, a company can investigate the root cause and take corrective actions. This helps in maintaining a positive brand image and improving customer satisfaction.

3 Advantages of AI Tools in Marketing Administration

The way firms handle marketing has been completely transformed by the incorporation of Artificial Intelligence (AI) solutions into marketing management. The following succinctly labels the benefits of AI technologies in marketing administration:

1. **Improved Knowledge of Customers:** With the use of AI techniques, marketers can examine colossal volumes of consumer data and gain a greater estimation of their needs, inclinations, and behaviour. This makes it possible for marketers to extend audience-resonant, designed marketing programs.

2. **Increased Effectiveness in Marketing:** Marketing procedures are streamlined by AI-powered automation, which frees up resources for more innovative and strategic endeavours. Marketing teams' burden may be decreased by using AI solutions to automate practices like data analysis, lead creation, and campaign optimisation.

3. **Large-Scale Personalisation:** Marketers can now mass-personalize marketing messages and experiences thanks to AI technologies. Large-scale personalization in marketing is possible through AI. AI and its capabilities enabled the process of analysing vast amounts of data and cram patterns for predictions.

4. **Analytics for Prediction:** Predictive analytics potentials offered by AI systems tolerate marketers to forestall consumer preferences and behaviour. This facilitates marketers to remain ahead of the competition by awaiting and responding to shifting consumer wants.

5. **Optimisation in Real Time:** Real-time campaign optimisation is made possible by AI techniques. Campaign performance data may be

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analysed by AI-powered algorithms, which can then identify areas for improvement and help vendors make informed decisions.

6. **Financial Savings:** Through the automation of manual operations, campaign optimisation, and increased marketing efficiency, artificial intelligence (AI) systems may assist marketers in reducing expenditures. This makes it possible for marketers to more efficiently distribute resources, increasing the gain on investment of their marketing proposals.

7. **An edge over competitors:** Businesses may get a viable edge and remain ahead of the competition by implementing AI solutions in marketing administration. Businesses can react quickly to shifting consumer demands using AI-powered marketing, which keeps them flexible and agile in the dynamic marketing environment.

4 Problems or Issues in Marketing Administration and AI

It is apparent from the literature on the ethics of AI that besides its enormous advantages, many challenges also occur with the enhancement of AI in the perspective of values, human behaviour, trustworthiness, and life privacy etc. (Ahmad et al., 2023). These issues include:

1. **Technical Issues:**

   (a) *Data Feature Issues:* AI algorithms require quality data to function effectively. Insignificant data quality can lead to inclined or inaccurate results.

   (b) *Algorithmic Predisposition:* AI algorithms can perpetuate existing biases if they are trained on biased data, leading to unfair or discriminatory marketing practices.

   (c) *Technical Debt:* The rapid evolution of AI technology can lead to technical debt, making it challenging to maintain and update AI-powered marketing systems.

   (d) *Integration Encounters:* Integrating AI-powered marketing tools with existing marketing management systems and data retrieval mechanisms can be complicated.

2. **Ethical Issues:**

 ISBN: 978-81-993134-0-8

(a) *Privacy Concerns:* AI-powered marketing approaches often depend on large amounts of customer data, heaving the concerns about data privacy and security issues.

(b) *Transparency:* AI algorithms can be challenging to recognise and clarify marketing decisions and actions to customers and stakeholders.

(c) *Manipulation and Deception:* AI-powered marketing can be used to deceive customers, eroding trust and injuring brand status.

3. **Organizational Issues:**

(a) *Skills and Talent Gap:* The effective use of AI in marketing requires specialized skills and expertise, which can be difficult to find and retain.

(b) *Change Management:* The adoption of AI-powered marketing requires significant organizational change, which can be challenging to manage and implement.

(c) *Budget and Resource Allocation:* AI-powered marketing requires significant investment in technology, talent, and training, which can be challenging to prioritize and allocate.

4. **Regulatory Issues:**

(a) *Compliance with Regulations:* AI-powered marketing must comply with relevant regulations, such as GDPR and CCPA, which can be challenging to navigate and implement.

(b) *Lack of Standardization:* The lack of standardization in AI-powered marketing can make it difficult to ensure compliance with regulations and industry standards.

5 Conclusion

The way firms handle marketing has been completely transformed by the incorporation of Artificial Intelligence (AI) into marketing management. This study has examined the uses, advantages, and difficulties of artificial intelligence (AI) in marketing management, emphasising how it might revolutionise important facets of marketing such as client segmentation, market research, campaign optimisation, and performance evaluation. This study

shows that AI may boost corporate growth, improve marketing effectiveness, and personalise consumer experiences. Marketers can better understand their clients, predict their requirements, and provide individualised messages and experiences by utilising AI-powered tools and strategies.

The paper also draws attention to the difficulties in implementing AI in marketing management, such as problems with data quality, algorithmic bias, and the requirement for a large investment in both skill and technology. Businesses that fail to adopt AI-powered marketing strategies risk being left behind in an increasingly competitive market landscape. Future research should focus on exploring the ethical implications of AI in marketing management, developing more sophisticated AI-powered marketing tools, and examining the impact of AI on marketing employment and skills. The findings of this study have significant practical implications for marketers. Businesses should prioritize investment in AI-powered marketing tools, develop strategies for addressing data quality issues and algorithmic bias, and focus on building teams with the skills and expertise needed to leverage AI in marketing management. By embracing AI-powered marketing strategies, businesses can stay ahead of the competition in an increasingly multifaceted and dynamic market landscape. In summary, there is no denying the benefits of AI technologies for marketing management. Marketers may improve consumer insights, increase marketing efficiency, personalise marketing messages, and optimise campaigns in real-time by utilising AI-powered tools and methodologies. We anticipate more cutting-edge uses of AI in marketing administration as the technology develops further.

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 ISBN: 978-81-993134-0-8

Unemployment Among Educated Women in Developing Regions: The Case of Idukki District, India

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Abstract

The persistent issue of unemployment among female graduates presents a significant challenge to achieving gender equality and economic growth. This study explores the unemployment rate among female graduates, examining the underlying causes, patterns, and implications. Through a comprehensive analysis of statistical data, socio-economic trends, and labor market dynamics, the research identifies key factors contributing to female graduate unemployment, including skill mismatches, societal expectations, and workplace biases. Additionally, the study delves into regional disparities, policy effectiveness, and the role of education systems in preparing women for evolving job markets. The findings underscore the urgency for targeted interventions, including skill development programs, inclusive hiring practices, and supportive policies aimed at bridging the gap between education and employment. This research emphasizes that addressing female graduate unemployment is a matter of social justice and a critical step towards fostering sustainable development.

Keywords: Biases, Education, Employment, Equality, Graduates, Interventions, Policies, Skill mismatch, Unemployment, Women.

1 Introduction

Unemployment among female graduates has become a growing concern in various regions of India, and Idukki district in Kerala is no exception. Despite the increasing literacy rates and higher educational attainment among women, the district continues to face challenges in providing adequate employment opportunities for female graduates. This issue not only affects the economic empowerment of women but also limits their overall contribution

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to society and the local economy. The situation in Idukki, with its unique socio-economic and geographical context, offers valuable insights into the broader national challenge of graduate unemployment.

The unemployment rate among female graduates in Idukki district is influenced by a range of factors, including limited job opportunities, lack of skill development, and socio-cultural barriers that discourage women from seeking employment. The traditional agricultural economy, which has historically been the backbone of Idukki, has not expanded sufficiently to absorb the growing number of educated women into its workforce. Additionally, the lack of industrialization and fewer private sector opportunities have compounded the problem, leaving difficulty in finding suitable employment opportunity for many female graduates.

This study sets out to explore why so many educated women in Idukki struggle to find work, and what it means for them and the region. By examining how economic conditions, education levels, and the local job market interact, it aims to uncover the deeper forces at play. By understanding the barriers that prevent female graduates from entering the workforce, this research will contribute to the development of targeted policies and interventions that could promote greater inclusion and empowerment for women in the district.

2 Review of Literature

Alessandra Costagliola (2021) explains that challenging traditional and patriarchal ideas about women's roles—and dismantling outdated beliefs around "men's work" versus "women's work"—is essential for creating a society where women have real freedom. When women are empowered to move freely, make their own choices, and participate fully in the workforce, it not only benefits them individually, but also strengthens development efforts as a whole. Women's re-entry into the labor market depends on challenging deep-rooted patriarchal and traditional ideas about their role in society. To truly open doors, we must rethink societal expectations and create systems that actively support women's autonomy and freedom of movement.

Atta Muhammad Asif (2015) shows that women are generally more likely to be employed as their education level goes up. But there's a surprising twist: women who have only primary education are actually more likely to be unemployed than even those with no education at all. This pattern is echoed in findings from other studies too. Women with higher education

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levels tend to have greater independence in decision-making and enjoy better access to job opportunities. Education not only sharpens skills but also empowers them to navigate the job market with confidence. Age also plays a role—women in older age groups are more likely to be employed than their younger counterparts. Interestingly, a woman's likelihood of working can also be influenced by her partner's background. The study found that women were less likely to be employed if their partner had higher education. On the flip side, having a husband working in agriculture actually increased the chances that a woman would be employed—possibly because Pakistan's economy is deeply rooted in agriculture, and women often support family farms, especially during harvest seasons.

Demissie (2021) found that a wide range of factors—like curriculum design, institutional culture, the quality of graduates, labour market dynamics, and even global challenges—play a major role in shaping whether university graduates in Ethiopia find jobs. Interestingly, the only factor that didn't show a strong predictive power was demographics, such as age and gender. This means most of the responsibility falls not on the graduates themselves, but on the universities they attend. The findings point to the importance of improving the overall quality of higher education institutions. To truly prepare students for a fast-changing job market, universities and policymakers need to rethink how curricula are designed—making them more flexible, relevant, and responsive to real-world demand.

Gauri Dhingra (2020) reveals that the very factors preventing educated women from joining the workforce—such as family responsibilities, in-laws' expectations, and male-dominated norms—have a strong and measurable impact on their lives. While the data show a clear cause-and-effect relationship between these barriers and women's employment status, the outcomes are far from positive in human terms. These obstacles don't just keep women out of jobs—they often lead to a range of emotional and psychological struggles. Many women affected by these pressures experience loneliness, depression, and low self-worth. The inability to work can trigger deep frustration, strained relationships, humiliation, and even financial stress.

Hedayat et al. (2013) found that although women make up the majority of art students in Iran, the reality after graduation is sobering: nearly 75% of them remain unemployed. Even so, the number of young people aspiring to pursue careers in the arts continues to grow. The authors argue that this trend deserves more serious attention from both government officials and university leaders. They suggest that students themselves should be

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better informed about the job market before committing to a specific field of study—particularly in areas like fine arts, where opportunities may be limited.

Pradeep M. B. (2019) studied that even with strong educational backgrounds, many women continue to face multiple hurdles when trying to join the workforce. This study highlights that educated unemployed women often struggle not because of a lack of qualification, but due to a web of societal challenges, including social, economic, financial, religious, and family factors. When asked what could help them break through unemployment, most educated women pointed to one thing above all: the need for additional qualifications. Many women feel that their current level of education doesn't match today's job market expectations. To improve their chances, they're seeking additional qualifications, job-oriented training, and government support.

Ismail (2011) reveals a crucial reality: doing well in university doesn't automatically lead to a job. Many Malaysian graduates with strong academic records still struggle to find employment. Instead of relying solely on academic qualifications, graduates need to build strong communication skills—especially in English—along with other key strengths like analytical thinking, independence, leadership, digital literacy, and hands-on work experience. What's particularly eye-opening in this study is the ongoing gap between men and women when it comes to landing jobs after graduation in Malaysia. Even though women make up a larger portion of university students, they're still less likely to be employed compared to men.

3 Objectives of the Study

1. To analyze the key factors contributing to the unemployment rate among female graduates.

2. To understand the significant relationship between level of education and the length of job search among female graduates.

4 Research Methodology

This study combines survey data with existing reports and research to explore the factors behind unemployment among educated women in Idukki,

 ISBN: 978-81-993134-0-8

India. A structured questionnaire was administered to 100 female respondents selected through convenience sampling. The primary data collection focused on employment status, education, and socio-cultural barriers. Secondary data were gathered from credible journals, official reports, and online sources. Data were analyzed using descriptive statistics, Chi-square tests, and graphical tools such as pie charts to identify key patterns and relationships.

5 Data Analysis and Interpretation

Objective 1: To analyze the key factors contributing to the unemployment rate among female graduates.

Table 1: The employability factors of female graduates

Serial no	**Key factors**	**Rank 1**	**Rank 2**	**Rank 3**	**Rank 4**	**Rank 5**	**Total**
1	Educational level	72%	20%	7%	0	1%	100%
2	Skills	49%	40%	8%	1%	2%	100%
3	Work experience	59%	22%	14%	3%	2%	100%
4	Networking and connections	37%	38%	12%	8%	5%	100%
5	Donation	24%	44%	17%	9%	6%	100%

Source: Primary data

Interpretation: As the above Table 1 reveals, educational qualifications are regarded as the most influential factor in securing employment. Work experience is also considered highly important, followed by individual skills. Networking and personal connections are recognized as relevant, though to a lesser extent. Donations are perceived as the least significant factor influencing employability.

Objective 2: To understand the significant relationship between level of education and the length of job search among female graduates.

Hypothesis Test

H_0: There is no significant relationship between length of job search and education level.

Chi-Square Test Results:

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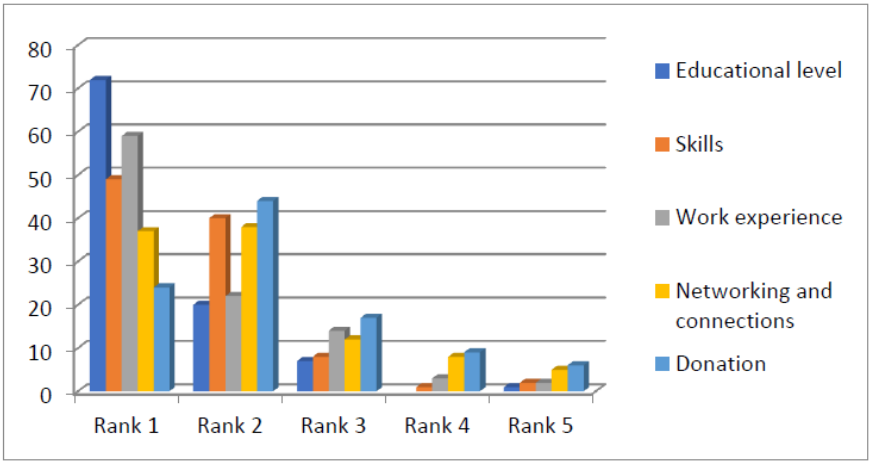

Figure 1: Employability factors of female graduates

- Calculated Chi-Square Value $(\chi^2) = 9.0895$
- Table (Critical) Value $(\chi^2) = 15.507$
- Significance Level $(\alpha) = 0.05$

Interpretation: Here the calculated value is less than the table value. Therefore, the null hypothesis, "There is no significant relationship between length of job search and education level" is accepted, and the alternate hypothesis is rejected.

6 Result and Discussion

The study set out to analyze the key factors contributing to the unemployment rate among female graduates and to examine the relationship between educational level and the duration of job search. The findings provide several critical insights.

In line with the first objective, the analysis revealed that multiple interrelated factors contribute to unemployment among female graduates. Educational qualifications were perceived as the most influential factor, indicating that higher degrees are believed to improve job prospects. However, respondents also pointed to a mismatch between academic learning and industry requirements, which limits employability despite having formal education. In addition, a lack of work experience, insufficient skill development, limited

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access to professional networks, and socio- cultural expectations emerged as significant barriers. These factors suggest that unemployment is not solely a result of inadequate education, but a combination of systemic and societal challenges that disproportionately affect women.

With respect to the second objective, the study found a meaningful relationship between the level of education and the length of the job search. Graduates with higher educational qualifications, such as postgraduates, generally experienced a shorter job search period compared to those with only undergraduate degrees. This implies that advanced education may provide greater access to job opportunities and improved competitiveness in the labor market. However, even among highly educated women, delays in employment were often influenced by factors such as family responsibilities, lack of guidance, and regional limitations in job availability.

Overall, the results underscore the importance of bridging the gap between education and employment by promoting skill-based training, offering internship opportunities, and ensuring better career support systems. Solving these challenges calls for teamwork—from colleges and universities to companies and government leaders. Together, they need to build a system that welcomes female graduates and helps them grow, thrive, and contribute meaningfully to the workforce.

7 Conclusion

This study highlights the multifaceted nature of unemployment among female graduates in the Idukki district, emphasizing that while education remains a foundational factor for employability, it alone is not sufficient to guarantee job placement. The research reveals that employability is significantly influenced by a combination of educational qualifications, relevant work experience, skill development, and socio-cultural dynamics. Furthermore, the analysis demonstrates a notable relationship between the level of education and the duration of job search, suggesting that higher qualifications tend to reduce the time taken to secure employment.

However, persistent barriers such as limited local opportunities, lack of industry exposure, and gender-based expectations continue to hinder the employment prospects of women in the region. These findings call for a more holistic and gender-sensitive approach to policy formulation. Strategic interventions—including practical training, career counseling, inclusive recruitment practices, and the promotion of female participation in emerging

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sectors—are essential to closing the education-employment gap.

Ultimately, addressing female graduate unemployment is not only vital for economic development but also for advancing gender equity and social progress in developing regions like Idukki.

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 ISBN: 978-81-993134-0-8

An Analysis of Rural Housewives' Participation in Income-Generating Activities: Evidence from Idukki Taluk

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Abstract

Gone are the days when homemaking meant being confined to household chores. Today, many women, especially in rural communities are stepping into roles that not only support their families financially but also elevate their standing in society. Income is more than just money in hand; it's a pathway to social empowerment and personal growth. Women in rural areas like Idukki are tapping into new income-generating opportunities, particularly in agriculture and related fields. This study dives into the kinds of activities they pursue, how involved they are, what drives them, and the obstacles they often face. Most women are engaged in farming and animal husbandry, and their biggest motivator is the desire to be financially independent. But there's a less visible side to their story, the strain of juggling physically demanding work with domestic responsibilities. In addition to identifying how women participate in various livelihood activities, the study delves into how the type of work they do, whether it's seasonal farming, livestock care, or small-scale business—shapes the income they're able to bring home each month.

Keywords: Economic Independence, Financial Freedom, Income-generating activities.

1 Introduction

Across villages and communities, women are quietly powering economic change. Many homemakers are no longer confined to household roles—instead, they're finding new ways to earn an income while still managing their families. These self-driven ventures, like stitching clothes, cooking local delicacies, or tutoring children, are carefully chosen to fit around daily responsibilities. And they do more than just provide financial support—they give women a voice in family decisions and a stronger sense of independence. In

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rural areas where formal job options are scarce, this kind of participation is a lifeline. It opens doors to empowerment and personal growth. Yet, in many developing regions, real economic freedom remains just out of reach. Deep-rooted traditions and financial dependence on male relatives can make it hard for women to make choices for themselves. Challenging these norms isn't easy, especially in places where male authority is the rule. That's why recognizing these obstacles—and actively working to remove them—is so vital. With the right support, women can step fully into their potential. Though their efforts are often unseen, rural women are anything but passive. They're creative, determined, and quietly becoming one of the greatest forces for change the world has yet to fully embrace.

Over the last twenty years, even as development policies have evolved, poverty hasn't declined as much as hoped—and for many women, the struggle remains unchanged. A large part of their work, especially the kind that keeps households afloat, is missing from the official economic radar. These efforts—often unpaid or poorly paid—are mostly tied to the home, yet they're central to family survival and wellbeing. This study shines a light on the growing wave of housewives stepping into income-generating roles. There's been a noticeable shift as more women begin to explore small business ideas and economic pursuits that fit around their family duties. Whether it's making pickles, stitching clothes, or offering tuition, these ventures allow women to earn while continuing to care for their families. By doing so, they aren't just working—they're wearing many hats: caregiver, provider, and decision-maker. This multitasking isn't easy, but it speaks volumes about their resilience, resourcefulness, and quiet strength in navigating both home and livelihood.

While men also navigate work and family roles, the intensity and expectations placed on women are often greater. Women's participation in income-generating activities is not just about economic contribution—it's a key lever for rural development in many developing countries. Recognizing this, institutions and stakeholders working on rural development must treat these efforts as strategic interventions that can meaningfully accelerate progress and empowerment.

2 Review of Literature

The issue of women and development has been a global priority since the United Nations hosted its first women's conference in Mexico in 1975 (Boserup

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et al., 2013).

Abera Alemu (2022) found that several factors influence whether a woman participates in earning activities. These include her age, her own and her husband's level of education, the size of the family and landholding, how far the market is, how much livestock the family owns, and whether the woman has access to credit. The findings highlight a striking pattern: in many households, cultural norms prevent women from taking part in high-income opportunities. Instead, they are traditionally viewed as housewives, while men are expected to take on the role of primary earners.

Asmat Naqati (2016) found that women entrepreneurs' satisfaction with their businesses tends to grow with age, experience, and education. In other words, the older and more qualified they are—and the longer they've been running their businesses—the more satisfied they tend to feel. Interestingly, women between the ages of 40 and 49 reported the highest levels of satisfaction. This may be because many in this age group have moved past some of life's more demanding phases, such as establishing their marriages, raising young children, or navigating the early stages of their careers. With those responsibilities less pressing, they may now have more time, clarity, and energy to devote to their businesses— and to take pride in what they've built.

Gashahun Bogale and Million Lemma (2023) summarised in their study that, even though overall participation of women in income-generating activities is relatively low, those who are involved tend to take on more than one source of income. Selling livestock products emerged as the most common and significant way women earn money. The study also found several factors that influence whether women participate in such activities. These include the woman's age, her education level, her husband's education, the size of the household, how far they live from the nearest market, the number of livestock they own, and their access to credit.

Janet Mutua and Nyaga G. Juster (2021) found that income-generating activities had a great influence on women empowerment. When women take part in income-generating activities, they gain more financial freedom—and with that comes a better quality of life. Financial stability empowers them to make decisions, have their voices heard, and be taken seriously. Earning their own income boosts their confidence to join in on important discussions, share their ideas, and speak up about the challenges they face. What's more, many women go on to employ others in their ventures, creating opportunities and uplifting fellow women. All of this adds up to something powerful: real,

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lasting empowerment.

Mafruha Binte Shameem (2020) conducted an impact analysis of women's involvement in income-generating activities (IGAs) over the past three years and revealed encouraging progress. About 43% of the women reported an increase in their personal income thanks to their participation in IGAs. Even more notably, 62% of rural women shared that their overall livelihoods have improved because of these efforts. The data also highlights a clear difference between women affiliated with NGOs and those who are not. Women connected to NGOs tend to be more involved in a variety of IGAs and earn significantly more profit from them than non-NGO women. This suggests that strengthening and expanding such participation—particularly through organized support—could play an important role in boosting the rural economy in Bangladesh.

Md. Lutfor Rahman et al. (1986) revealed that many individuals who received loans struggled to transition into stable, long-term occupations. As a result, they often continued to depend on labour-based jobs for income and frequently sought additional loans, since the financial support they initially received was insufficient. These programs, it seems, placed greater emphasis on short-term financial outcomes rather than addressing the broader, holistic needs of participating families.

Mehwish Yaqoob and Rashid Menhas (2014) examined that women's social standing can be significantly improved by enabling them to become income earners within their families. When women contribute directly to the household economy, they often gain more respect and decision-making power than those whose work is limited to domestic roles. Women, especially in rural areas, play a vital role in shaping stronger, more resilient societies. Yet, many of them face the "double burden"—juggling both household responsibilities and work outside the home.

Mpfubhusa Laurent and Benard Mushi (2024) found that there is no significant relation between land owned and women participation in income-generating activities, which implies that having land has no significant drive to engage or participate in income- generating activities, but in their findings women owning land had significant and positive influence in participating in agriculture activities and not small business activities.

Pooja Jena (2021) revealed several important characteristics of rural women in the survey. Over half (52%) were from a younger age group, and about 30% had completed education up to the high school level. Half of them were classified as marginal women, and 50% lived in small households

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with five or fewer members. A majority (55%) belonged to nuclear families. When it comes to livelihood, around 45% of these women were engaged in agricultural work, and the same percentage reported earning an annual income between ₹15,001 and ₹20,000. Training needs were also notable—70% of the respondents expressed a high need for training to support income-generating activities, while 20% had moderate training needs. Among the specific areas where training was most needed, 85% showed strong interest in nursery establishment. The remaining needs were spread fairly evenly across vegetable production, animal husbandry, and poultry farming. The analysis also found that training needs were significantly influenced by factors like age, education level, landholding size, family type, occupation, and annual income.

Onyebu C. M. (2016) found that most rural women are in their economically active years, which enables them to engage in a range of income-generating activities. Their level of education also plays a key role in shaping the kinds of ventures they pursue. Based on these findings, the study recommends organizing women entrepreneurs into groups where they can receive training on a broader variety of income-generating activities. Additionally, the government should support rural women by offering soft credit facilities—low-interest or interest-free loans—so they can access the funds needed to grow or sustain their businesses.

3 Objectives of the Study

1. To identify the type of income-generating activities engaged by housewives in rural areas for livelihood.

2. To understand the significant relationship between type of income-generating activities and monthly income contributed by housewives towards family.

4 Importance of the Study

Rural housewives contribute significantly to social and economic progress by participating in a wide range of productive activities—yet their efforts often go unnoticed or underappreciated. While managing their families and personal lives, many also take on additional ventures to supplement

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household income. Balancing these dual roles is far from easy, but the rewards—financial independence, confidence, and greater community involvement—are substantial. Despite this, there has been limited research exploring their experiences and contributions from this perspective. This study aims to bring those overlooked efforts into focus, highlighting the resilience, adaptability, and untapped potential of rural housewives in shaping local development.

5 Research Methodology

The study based on the involvement of rural housewives in income-generating activities, with special reference to Idukki Taluk, is conducted with the help of non-random sampling through a convenient sampling method. The researcher has used primary and secondary data. Primary data was collected from 100 housewives in Idukki Taluk through a questionnaire. The secondary data was gathered from books, magazines, journals, newspapers, and websites for the conceptualization of theories. Mathematical and statistical tools like percentages and chi-square tests were employed for analysis and interpretation of data.

6 Data Analysis and Interpretation

Objective 1: To identify the type of income-generating activities engaged by housewives in rural areas for livelihood.

Table 1: Types of Income-Generating Activities

Options	**Frequency**	**Percentage**
Agricultural and Animal Husbandary	22	28
Food Production	14	18
Tailoring	17	22
Handicraft	12	15
Online Jobs	4	5
Tuitions	8	10
Total	**77**	**100**

Source: Primary Data

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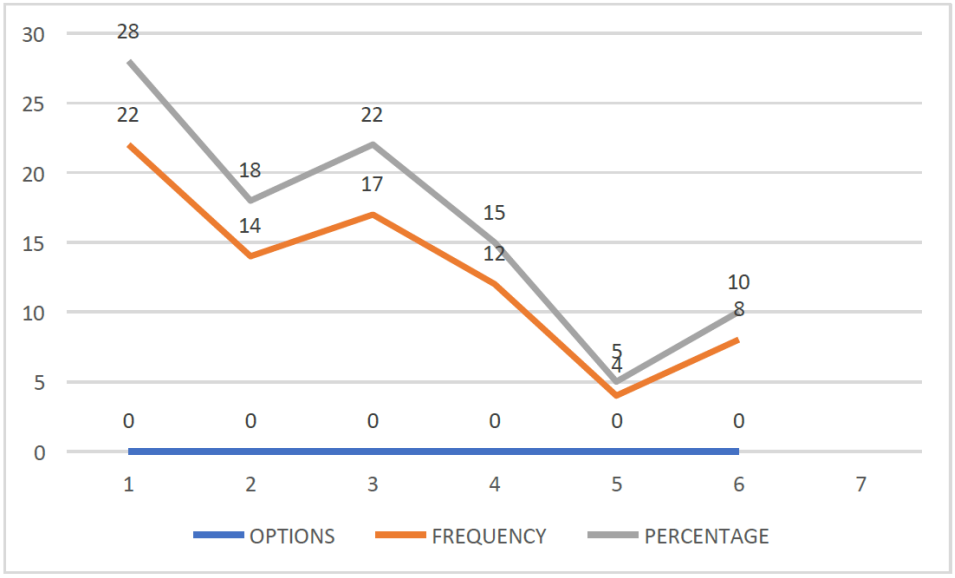

Figure 1: Types of income-generating activities (Figure 1)

Interpretation: As the above graph reveals most of the respondents choose agriculture and animal husbandry as their major income-generating activity, whereas online jobs are the least opted income-generating activity.

Objective 2: To understand the significant relationship between type of income generating activities and monthly income contributed by housewives towards family.

Hypothesis Test

H_0: There is no significant difference between the type of income-generating activities and monthly income contributed by housewives towards family.

Chi-Square Test Results:

- Calculated Chi-Square Value ($\chi^2_{\text{calculated}}$) = 50.8
- Table (Critical) Value (χ^2_{critical}) = 31.41
- Significance Level (α) = 0.05

Interpretation: Since χ^2 calculated value (50.8) is greater than χ^2 table value (31.41), reject the null hypothesis. This indicates that there is a significant difference between type of income generating activity and monthly income contributed by the housewives towards family.

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7 Results

- From the study, it is revealed that most of the housewives chosen for the study are engaged in any type of income-generating activities (77%) and the least of them are not engaged in income-generating activities (23%). Among them, most of them (29%) are engaged in agricultural and animal husbandry-related activities and the least of them are engaged in online jobs (5%). From that, we could conclude that rural housewives are not effectively tapping various online job options available now.

- From the analysis it is clear that the major benefit derived by most of the respondents (48%) by engaging in an income-generating activity is an improvement in the standard of living. Involvement in family decision-making is yet another benefit, constituting 39%, so the involvement in income-generating activities brings many positive changes in their personal life and family lives.

- From the opinion of most of the respondents (48%), financial independence is the major motive for participating in the income-generating activity. However, they are not able to generate employment opportunities for others. Through participation, they get high personal satisfaction and they can effectively use their time, thereby they can support their family. And the major consideration of housewives to choose a particular income-generating activity is their personal interest (30%) followed by high profit-making capability.

- From the study, it is observed that the major difficulty faced by housewives is emerging health problems as a result of continuous physical work and restlessness, constituting 26%.

8 Discussion

The study reveals that a significant proportion of rural housewives (77%) are engaged in various income-generating activities, with agricultural and animal husbandry-related occupations being the most common (29%). However, a relatively small percentage (5%) are involved in online jobs, indicating that rural housewives are not fully utilizing the wide array of online employment opportunities currently available. This suggests a need for awareness pro-

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grams and skill development initiatives to encourage participation in digital and remote job sectors, which can offer flexible working conditions and financial stability.

The study reveals a clear pattern: for nearly half of the women involved in income- generating activities, the most immediate benefit is a better standard of living. With 48% reporting improved household conditions, it's evident that these efforts go beyond simple earnings—they bring tangible upliftment to daily life. Equally powerful is the shift in household dynamics. About 39% of respondents shared that earning an income gave them a greater say in family decisions, highlighting how financial contribution can elevate a woman's standing and influence at home. These benefits showcase more than just economic progress—they reflect a deeper transformation. Income-generating activities are helping rural women gain not just financial security, but personal confidence and social respect.

For many housewives, the drive to earn stems primarily from a desire for financial independence—with 48% highlighting it as their top motivator. These efforts bring not only a strong sense of personal satisfaction but also a smart use of their time. However, a common limitation is their inability to create jobs for others. This is likely due to the nature of their ventures, which are often small-scale and run independently from home.

For nearly half of the housewives surveyed, the main reason for taking up income- generating work is the pursuit of financial independence. These women find deep personal satisfaction in their efforts and make smart use of their time, balancing work with household duties. However, there's one hurdle that many face—they aren't able to create jobs for others. This challenge likely stems from the nature of their ventures, which tend to be home-based, small-scale, and carried out independently. Still, there's plenty of room to grow. Future research could help uncover ways to expand these activities—whether through training, access to markets, or better financial support—so they not only empower individual women but also become engines for broader economic development in their communities.

A common challenge that many housewives face is the toll on their health from non-stop physical work and the lack of proper rest—with about 26% reporting related issues. These health concerns often go unnoticed, yet they reflect the silent strain of managing both household duties and income-generating activities day in and day out. This calls for strategies to improve working conditions, promote better work-life balance, and incorporate ergonomic and health-friendly practices in their economic activities.

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Awareness campaigns on self-care and proper work management can help mitigate these issues. Overall, the study underscores the substantial impact of income-generating activities on rural housewives' financial independence, personal empowerment, and household dynamics. However, addressing challenges such as limited access to digital job opportunities, employment generation potential, and health issues could further enhance their economic participation and well-being.

9 Conclusion

This study is based on the income-generating activities of housewives in Idukki Taluk. Majority of the respondents are engaged in any types of income-generating activities. Income generating activities tend to give women a higher status within the family. It helps to improve the standard of living and greater involvement in family decision-making. The study generally indicates that the greater the amount of income under the women's control, the greater the amount devoted to their children's education and savings for future. It is mentioned that generally incomes of women are used for increase of the wellbeing of the family. Household work pressure is the major limitation faced by them and personal health is highly affected due to the participation in income-generating activities. Gender gap is persistent across every stage of a woman's financial life; some women are forced to live in a very crucial life situation throughout their life. Majority of the problems start with the cause of not having financial freedom in women. Without proper financial planning, their life would be even harder to pursue, and they won't be able to provide to their home until they attain financial security themselves. This freedom will provide them ample chances to participate in family decision-making and she will feel more confident and more courageous in the rest of her life. Financial freedom can give wings to a woman to fly like a phoenix bird from all her life problems. Life of a woman who is not having financial security is more miserable. Financial freedom is important because it gives a voice in the world and allows her to invest in what makes sense.

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 ISBN: 978-81-993134-0-8

STUDY ON THE INFLUENCE OF CELEBRITY ENDORSMENT ON PURCHISING DECISION

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ABSTRACT

In today's marketing landscape, celebrities often hold as much sway over consumers as the products they promote. With their dazzling lifestyles, captivating personalities, and vast social media followings, celebrities can make or break a brand's reputation. In these studies, we'll delve into the compelling impact of celebrity endorsements on buying behaviour and the brand image, risk involved. When a brand enlists a celebrity as its ambassador, it can enjoy the radiance of their esteemed reputation, enhancing the brand's image to one of high quality and appeal. This study aims to examine the influence of celebrity in consumer purchase intention and in promoting the brand image with a reference of Idukki district.
Keywords: Celebrity endorsement, brand image, Purchase behaviour,

1 INTRODUCTION

In the fast-moving and competitive environment of today's marketing, businesses are always on the lookout for innovative ways to enhance their visibility in consumer behavior. One of the most widely used strategies that has garnered a lot of attention is celebrity endorsement. Celebrity endorsement refers to using famous persons to endorse products and services, leveraging the fame and influence to create an impact on consumer preferences. It relies on celebrity appeal, which most of the time influences consumers to believe and even buy more.

The effectiveness of celebrity endorsements has been widely debated across industries, particularly in sectors where brand image and consumer perception play a vital role, such as fashion, beauty, sports, and technology. The growing presence of celebrities on social media platforms and their constant interaction with fans further enhance their influence, making them an even more attractive choice for brands looking to reach a broader audience.

 ISBN: 978-81-993134-0-8

Celebrity endorsement has emerged as one of the most dominant and effective marketing strategies used by brands to increase consumer awareness and influence purchasing behavior. Celebrity endorsement has become an essential entity for companies in modern marketing. Many companies utilize famous personalities within advertisements, sponsorships, and brand associations. Brands use a well-known personality to associate with a product or service to promote consumer trust and loyalty while improving their market position. This research studies the impact of celebrity endorsement on consumer purchasing decisions based on the case study of Idukki District.

2 REVIEW OF LITERATURE

Celebrity endorsements have been part of advertising since the 19th century. From this presence of celebrities in ads has increased, with 25% of contemporary advertisements featuring them, compared to just 17% in the 1970s. it also gives the result that the growth is due to their effectiveness in making ads more noticeable and appealing to new audiences. Additionally, celebrity endorsements offer substantial earnings for the endorsers. (Astrid Keel, 2012)

According to Arman h j, his study shows that the young celebrities significantly influence brand images and sway young consumers, which makes them a favored option for endorsing products and services in today's marketing landscape. (Arman HJ Ahmad, 2019).

Study of Lawrence yaw Kusi, Purchase intention is what consumers feel they will purchase, but most of the times it does not align with their actual purchase for various reasons. Celebrity endorsements are helpful in terms of making commercials more attractive and memorable, therefore, leading to more purchases, but negative intention can still shift customers to some other brand, and bad mouth it. (Lawrence Yaw Kusi, 2018)

Companies also use a brand image and perception in penetrating new product lines or categories while transferring the intangible qualities of a brand to make it highly competitive. This study shows that the success, however, hinges on maintaining a perceived "fit" between the brand and its extensions. If this "fit" is not maintained, the brand suffers, and it needs to carry across all brand associations that include celebrity endorsements. (Doss)

The way that consumers act when making purchases is known as consumer purchasing behavior. Marketers attempt to pique public attention,

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primarily by using celebrity endorsements, which they have enhanced in value as the items gain recognition. Celebrity endorsements are a common marketing tool that help to create a favorable impression. The study also provide that they draw in customers, build a reputation for the brand, and effectively convey the quality of the products, all of which frequently result in increased consumer loyalty. (Deepana P, 2023)

The study of Manuela biz shows that Professional athletes are frequently viewed as perfect brand ambassadors because of their capacity to establish specific connections that lend reliability, recognition, and intangible value to goods and services. This idea has also been expanded to include the employment of famous athletes to promote social concerns. (Manuela Biz, 2024)

As businesses leverage celebrities' notoriety and clout to market goods and engage with customers, celebrity endorsements have grown in popularity. Celebrities in sports, in particular, are essential in bridging the gap between private experiences and public values and desires. Frome this study results that the Celebrities have a big impact on consumer behavior in today's media-driven society, influencing attitudes, perceptions, and buying intentions. (Dodi Ria Atmaja, 2024)

Swallehe implies from his stydy that to gain a competitive edge, marketers use a variety of tactics, but brand exposure is essential. Using celebrities to draw interest and attention from customers is one important strategy. (Swallehe, 2024)

Sports stars are powerful role models who are appreciated for their extraordinary traits, which makes them good marketing representatives. The study shows celebrity endorsements are an effective way to increase brand awareness and recall because of their affiliation with aspirational groups and well-established sporting credentials. (Francisco Moreira, 2023).

From the study of Rudzewicz ,celebrities are frequently used by advertisers to sell brands because of their media appeal and credibility, which can better pique consumers' attention than that of unknown people. But for a celebrity endorsement to be successful, the selected person must be trustworthy and complementary to the brand. Choosing the ideal celebrity requires taking into account a number of variables, including the length of the campaign, public opinion, the tastes of the target demographic, and the celebrity's affiliation with the business. (Rudzewicz, 2024)

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3 OBJECTIVES OF THE STUDY

- To examine the impact of celebrity endorsement on the consumer buying behaviour, to analyse which factors of celebrity endorsement attract more.
- To determine whether products and services endorsed by celebrities enhance the brand image.
- To understand the overall effectiveness of celebrity endorsement.

4 RESEARCH METHODOLOGY

The study utilizes both primary and secondary data sources. Primary data was collected through a structured questionnaire using Google Forms, while secondary data was obtained from journals, articles, websites, magazines, and other publications. The research employed a convenience sampling method to gather responses from available participants. A total of 100 respondents from Idukki district were selected using a simple random sampling technique.

5 LIMITATIONS OF THE STUDY

- The results might be incorrect if the information given is wrong.
- The study was confined to Idukki district only.
- Lack of knowledge in answering the questionnaire was also a limitation while conducting the study.

6 ANALISIS AND INERPRETATION

1. How likely are you to buy a product if it is endorsed by a celebrity you admire?

Table 1: Likelihood of purchasing a celebrity-endorsed product

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Category	Response	Percentage
Very likely	46	46%
Likely	40	40%
Unlikely	9	9%
Very unlikely	5	5%
Total	**100**	**100%**

Interpretation

From the Table 1 we can understand that celebrity endorsements have a considerable impact on purchasing behavior, with 46% of respondents being very likely to buy a product if endorsed by a celebrity they admire. However, 40% remain indicating that while endorsements can influence decisions, they are not a guaranteed driver of sales. The remaining respondents (9% likely, 5% very unlikely) highlight a mixed perception,

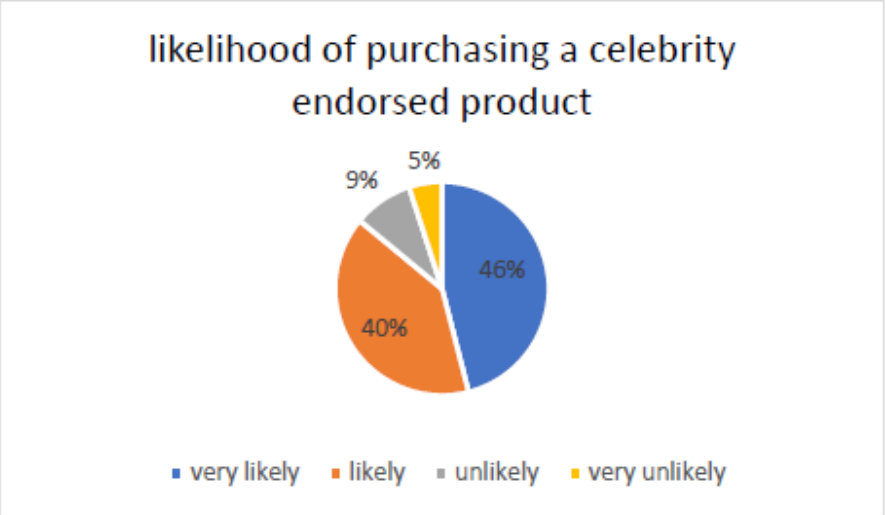

Figure 1: Likelihood of purchasing a celebrity-endorsed product

2. How often do you purchase products or services that are endorsed by celebrities?

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Table 2: Frequency of purchasing celebrity-endorsed products

Category	**Responses**	**Percentage**
Very often	41	41%
Occasionally	38	38%
Rarely	12	12%
Never	9	9%
Total	**100**	**100%**

Interpretation

The table 2, revealed that 41% of participants purchase celebrity-endorsed products very often, while 38% do so occasionally, indicating that a significant portion of consumers are influenced by endorsements. However, 9% rarely and 12% never buy such products, showcasing a level of resistance.

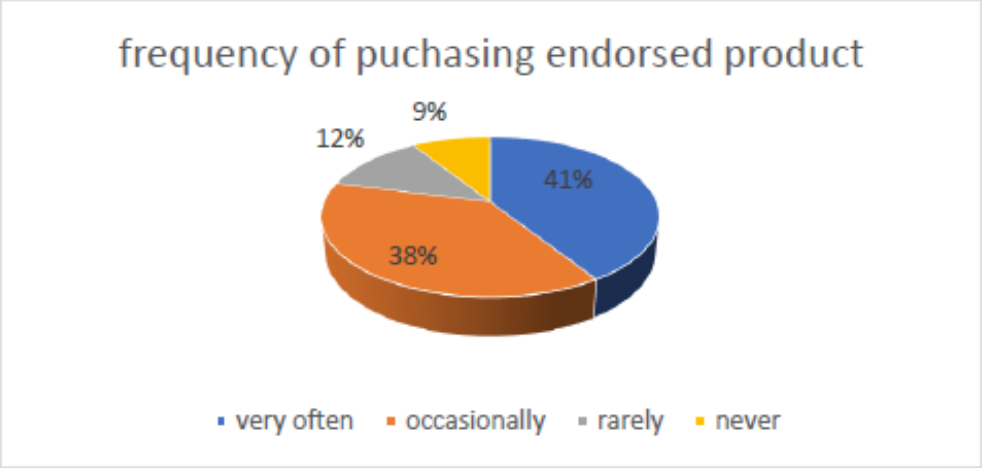

Figure 2: Frequency of purchasing endorsed products

3. Which of the following factors makes a celebrity endorsement most appealing to you?

Table 3: Factors making a celebrity endorsement most appealing

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Category	**Responses**	**Percentage**
Celebrity's popularity	33	33%
Celebrity's experience in product category	42	42%
Celebrity's likeability	15	15%
Celebrity's social media presence	10	10%
Total	**100**	**100%**

Interpretation

From the table 3, we can understand that among the reasons why endorsements are attractive, 42% of the respondents say that the celebrity's experience in the product category is a significant reason, indicating that credibility is more important than fame. In contrast, 33% look at a celebrity's fame, and likeability and social media presence are less critical factors at 15% and 10%, respectively. This indicates that consumers are more likely to trust endorsements from celebrities who have relevant expertise or a strong connection with the product rather than just being widely known.

4. Do you feel that celebrity endorsement helps to influence the status of the brand?

Table 4: Celebrity endorsement on brand status

Category	**Responses**	**Percentage**
Significantly	50	50%
Somewhat	42	42%
Not really	7	7%
Not at all	1	1%
Total	**100**	**100%**

Interpretation

The table 4 revealed that celebrity endorsements significantly influence brand perception, with 50% of respondents believing they greatly enhance a brand's status and 42% stating they have a moderate effect. Only a small percentage (7% not really, 1% not at all) feel endorsements have little to no impact. This data suggests that endorsements are an effective branding strategy, reinforcing a brand's credibility and appeal to consumers.

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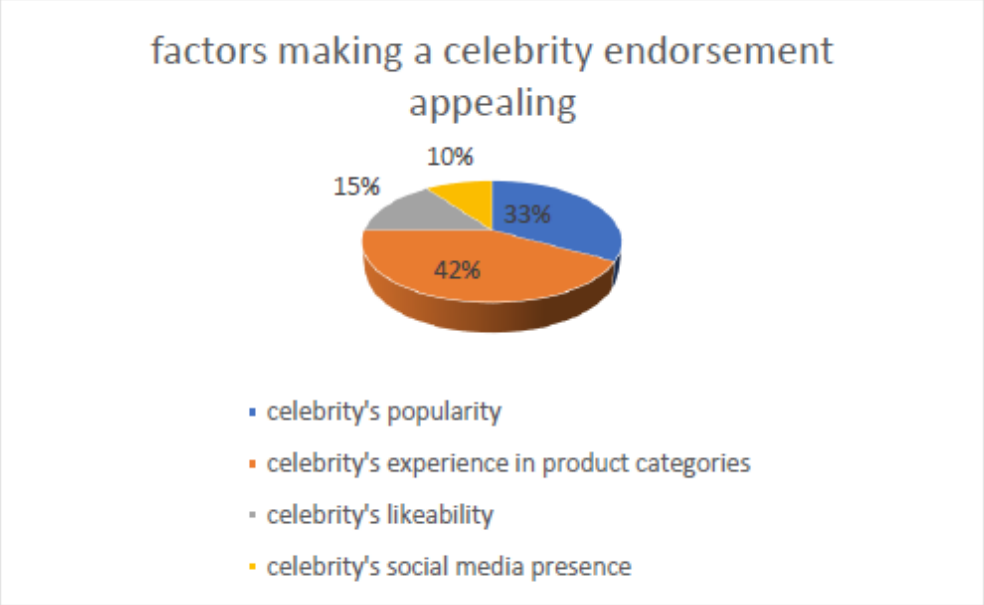

Figure 3: Factors making a celebrity endorsement appealing

5. Do you think that a brand is more trustworthy if a well-known celebrity endorsed it?

Table 5: Brand trustworthiness and celebrity endorsement

Category	**Responses**	**Percentage**
Definitely	47	47%
To some extent	38	38%
Not really	10	10%
Not at all	5	5%
Total	**100**	**100%**

Interpretation

The survey results indicated in Table 5 revealed that celebrity endorsements positively influence brand trustworthiness, with 47% of respondents believing a brand is "definitely" more trustworthy if endorsed by a well-known celebrity. Additionally, 38% think endorsements increase trust "to some extent," suggesting that while credibility is enhanced, other factors may also matter. However, 10% of participants are sceptical, stating endorsements do

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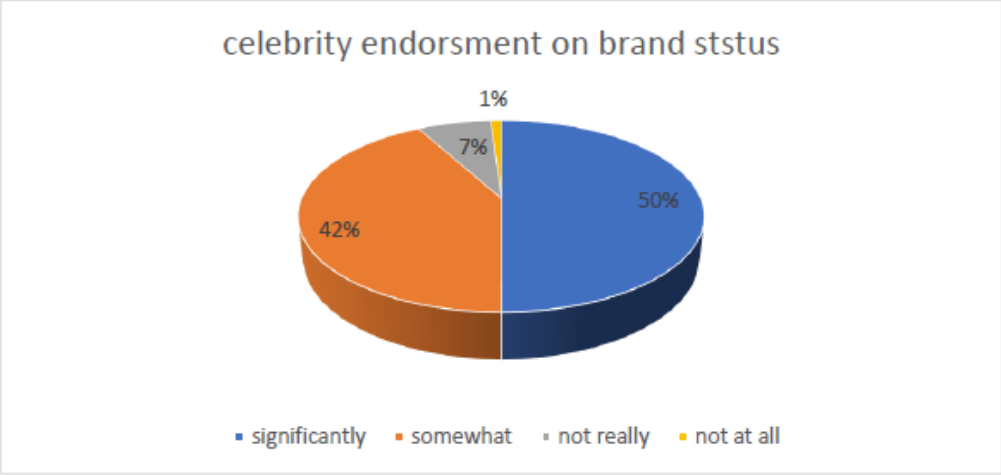

Figure 4: Celebrity endorsement on brand status

"not really" impact trust, while 5% believe they have "no effect at all." This data highlights that while celebrity endorsements can significantly enhance a brand's image, trust is not solely dependent on them.

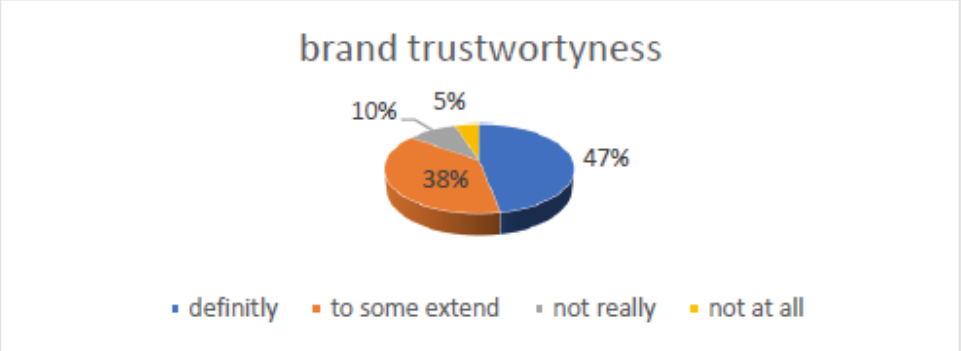

Figure 5: Brand trustworthiness

7 FINDINGS

- Celebrity-endorsed products are frequently purchased by 41% of consumers.
- Popularity (33%) and the celebrity's likeability/personality (42%), respectively, are the most important elements in an endorsement.

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- This study revels nearly half of consumers (47%) are more likely to trust a brand if it has a celebrity endorsement.
- The study shows that 46% of respondence are very likely buy a product endorsed by a celebrity admire them.
- The study shows that half of the respondence belief that the celebrity endorsement influence the brand status.

8 CONCLUSION

This study examines how celebrity endorsements affect purchasing decisions, providing valuable insights into consumer perceptions and reactions to products backed by celebrities. The results indicate that a large percentage of consumers experience increased confidence in a product when it is endorsed by a celebrity, highlighting the substantial psychological impact that such endorsements have on brand perception and buying behavior. Research shows that celebrity endorsements are often seen as more effective than other advertising methods, making them a powerful asset for brands looking to improve their image and build consumer trust. The effectiveness of endorsements largely hinges on a celebrity's appeal, charisma, and personality. Essentially, celebrity endorsements can influence consumer buying choices when they align with the brand's identity. This has enabled companies to forge more strategic partnerships with celebrities, enhancing their marketing strategies to boost consumer engagement and sales. This study highlights that celebrity endorsements can greatly impact consumer behavior, especially when the endorsement is credible and matches the brand's identity. Marketers and businesses can use these insights to form strategic partnerships with celebrities, ensuring to connect with the target audience.

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 ISBN: 978-81-993134-0-8

TRACKING THE RAILS: SHORT-RUN INTERDEPENDENCE AND PRICE DYNAMICS IN INDIA'S RAILWAY FIRMS

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Abstract

This study examines the daily stock price dynamics of two railway-linked public-sector companies in India—IRCTC and RVNL—using BSE-listed OHLC data from October 2019 to February 2025. Descriptive analysis shows that IRCTC trades at higher, more stable prices, whereas RVNL trades at lower prices with greater volatility and frequent extreme movements. Unit root tests confirm that both series are non-stationary in levels but stationary after first differencing ($I(1)$), allowing for cointegration analysis. The Engle-Granger test reveals no long-run equilibrium between the two stocks, while VAR analysis indicates that short-term price changes in IRCTC significantly influence RVNL, suggesting short-run shock transmission. Overall, although these structurally linked firms do not share a common long-term trajectory, IRCTC serves as a short-term leading indicator for RVNL, offering insights into inter-stock dynamics and market behaviour in India's railway-linked corporate sector.
Key Words: Stock Prices, Stock Price Volatility, Short-Run Dynamics, Time Series Analysis, EGC Test, VAR Analysis, Indian Equity Market, Public Sector Companies, Railway Sector Stocks, IRCTC, RVNL.

1 Introduction

Stock price behaviour has long been an important area of research in financial economics, as prices reflect the combined influence of market expectations, investor behaviour, sectoral fundamentals, and broader economic dynamics. In emerging markets like India, the capital market has undergone significant structural changes, with public sector enterprises increasingly participating in market- driven operations. Within this context, railway-

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linked companies such as the Indian Railway Catering and Tourism Corporation (IRCTC) and Rail Vikas Nigam Limited (RVNL) have gained prominence due to their strategic importance, stable government backing, and their unique role within the country's transport infrastructure ecosystem. Understanding the movement of their stock prices is therefore essential, not only for investors but also for policymakers and researchers analysing the financial performance and integration of public-sector infrastructure companies.

Although railway-sector public enterprises such as IRCTC and RVNL are operationally and infrastructurally interconnected, it remains unclear whether their stock prices are also linked in the long term or move independently in the market. Prior research has largely concentrated on macroeconomic determinants, behavioural influences, or predictive modelling of stock price movements, leaving limited evidence on firm-level co-movement within specific sectoral ecosystems. This gap is particularly significant in the railway domain, where structural developments including IRCTC's IPO and major railway infrastructure reforms may influence price dynamics but remain insufficiently studied. The lack of empirical examination of long-run price relationships between IRCTC and RVNL restricts investors' ability to assess diversification opportunities, policymakers' understanding of sectoral financial integration, and researchers' insight into market responses to structural shifts. Hence, this study is undertaken to analyse whether a long-run equilibrium relationship exists between IRCTC and RVNL using cointegration methods, and to assess the strength and stability of such a relationship over time.

2 Significance of the Study

This study is important because it provides a long-term, data-driven understanding of price behaviour and co-movement between two major railway-linked public sector companies in India— IRCTC and RVNL—using high-frequency daily market data spanning more than fifteen years. Despite the growing interest in infrastructure and transport-sector stocks, empirical evidence on how these firms move together, respond to market shocks, and share long-run price relationships is limited. By analysing trends, volatility patterns, and cointegration, the study helps investors, traders, and portfolio managers understand whether these stocks behave similarly or indepen-

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dently, which is crucial for diversification and risk-management decisions. Furthermore, the findings offer valuable insights for policymakers and regulators by revealing how structural events such as IRCTC's IPO, railway reforms, and the COVID-19 period affect the integration within the railway corporate ecosystem. The results also contribute to academic literature by addressing an understudied area and demonstrating how long-span daily data can reveal dynamic linkages that short datasets or macro-level studies may overlook.

3 Literature Review

The reviewed literature highlights that stock price movements are influenced by a complex interplay of macroeconomic factors, investor behaviour, and market dynamics, with both global and local contexts shaping volatility and trends. Recent advances in analytical techniques, including machine learning and network-based models, further emphasise the importance of integrating traditional financial indicators with behavioural and textual data to achieve more accurate predictions and interpretations of market behaviour.

3.1 Theoretical Foundations of Stock Price Behaviour

In his seminal 1984 work, Stock Prices and Social Dynamics, Shiller challenges the traditional interpretation of empirical evidence supporting the efficient markets theory. He argues that such evidence does not preclude the significant influence of investor fashions or fads on financial market prices. His findings suggest that non-fundamental factors, including changing investor sentiments and social trends, play a substantial role in determining stock price movements, thereby questioning the completeness of purely rational explanations of market behaviour (Shiller, 1984).

Lucas and McDonald (1990), in their influential study Equity Issues and Stock Price Dynamics, develop an information-theoretic, infinite-horizon model to explain the behaviour of firms around seasoned equity offerings under conditions of adverse selection. Their model successfully accounts for several well-documented empirical patterns. First, the authors show that equity issues are typically preceded by abnormal positive stock returns. Second, they find that equity offerings generally follow periods of abnormal overall market increases. Third, consistent with adverse-selection

theory, the study demonstrates that stock prices tend to decline at the announcement of an equity issue, reflecting investor concerns about information asymmetry (Lucas and McDonald, 1990).

The study conducted by Grossman explains the key difference between real securities and synthetic securities created through dynamic trading. Using portfolio insurance as an example, they show that creating a synthetic put option through dynamic hedging does not offer the same market signals as an actual traded put option. Therefore, relying only on synthetic strategies can increase future market volatility, making real traded securities essential for stability and efficient pricing (Grossman, 1987).

Bak et al. investigated why financial markets experience frequent large price swings that standard Gaussian models cannot explain. Using simple multi-agent simulations, they show that extreme price movements naturally arise when traders imitate each other, creating crowd effects. Overall, the study shows how imitation and heterogeneous trader behaviour drive market volatility and bubbles (Bak et al., 1997).

Saldanha et al. reviewed the key factors influencing stock market behaviour within the framework of the Adaptive Market Hypothesis (AMH). Their findings show that existing research has predominantly focused on return predictability, with limited attention to other adaptive dimensions. The authors argue that future work should incorporate broader behavioural factors, such as investor psychology, the cyclical profitability of trading strategies, and price-volume dynamics, to develop a more holistic understanding of market adaptability (Saldanha et al., 2023).

3.2 Macroeconomic and Market Determinants of Stock Prices

Ravazzolo and Phylaktis (2005) investigated the long-run and short-run interactions between stock markets and foreign exchange markets across selected Pacific Basin countries. The authors find that the US stock market plays a pivotal intermediary role, acting as a conduit linking domestic stock prices with movements in exchange rates. They demonstrate that exogenous shocks transmit through identifiable channels, primarily via the US market, reinforcing the interconnectedness of global financial systems.

Wongbangpo and Sharma (2002) examined the fundamental link between stock prices and key macroeconomic variables across five ASEAN countries. Their findings reveal both long-run and short-run relationships

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between stock prices and these macroeconomic indicators. The study shows that stock prices and macroeconomic variables mutually influence each other, indicating bidirectional causality in several cases.

Topcu (2025) examined the existence and persistence of stock price bubbles in Turkey's Borsa Istanbul (BIST) liquid banking sector index. The findings link these bubble formations to macroeconomic inconsistencies and disruptions in Turkey's monetary policy. The bubbles detected in the sector persisted through the third quarter of 2024, underscoring ongoing deviations from intrinsic values.

Kumar and Banu (2023) conducted an extensive investigation into how major macroeconomic variables influence stock price volatility in the Indian capital market. The study reveals how fluctuations in these economic indicators translate into volatility in the Indian stock market, emphasising that macroeconomic conditions significantly shape investor sentiment and market behaviour.

3.3 Indian Market Context and Behavioural Insights

Sahu (2022) investigated the causal relationship between open market share repurchase announcements and stock price volatility in the Indian market. The findings show a slight decline in price volatility following repurchase announcements, though the effect is statistically insignificant for Infosys and significant for IIFL, suggesting mixed evidence on volatility reduction.

Panigrahi et al. (2022) analysed how liquidity and profitability influence the share prices of Indian cement companies. The study finds that liquidity plays a more dominant role than profitability in determining market value. Specifically, a faster cash conversion cycle (CCC) is associated with higher share prices, indicating that firms with greater liquidity are more favourably valued by investors.

Goud (2023) examined the relationship between dividend policy and stock price volatility within the context of Indian listed companies. The findings indicate a significant negative relationship between dividend payouts and stock price volatility, suggesting that higher payouts are associated with greater price stability.

Shreya (2025) investigates market efficiency in India by examining the price discovery dynamics of major stock indices, including the Sensex. The study provides insights into the functioning of price discovery in an emerging market, contributing to understanding the robustness of India's market

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efficiency.

3.4 Predictive Models and Price Movement Analysis

Shirota and Chakraborty (2021) analysed the impact of COVID-19 on global automobile manufacturers' stock prices. The results showed that stock price movements clustered primarily by country rather than by individual company performance, indicating that national factors influenced market behaviour more strongly during the pandemic.

Ye et al. (2021) propose Multi-GCGRU, a deep learning framework that integrates graph convolutional networks (GCN) and gated recurrent units (GRU) to capture both cross-stock relationships and temporal patterns. Experimental results on two major Chinese stock indices demonstrate that Multi-GGCGRU outperforms conventional baselines.

Ma et al. (2022) propose MAC (Multi-source Aggregated Classification), a model that integrates numerical features, market-driven news sentiments of target stocks, and sentiment information from related companies. Using these combined features, MAC predicts next-day stock price movements and demonstrates superior performance over state-of-the-art baselines.

Li et al. (2023) introduce the Prediction-Explanation Network (PEN), a framework designed to address the growing demand for explainability in stock price movement prediction. The PEN model jointly processes text and price streams through an aligned, shared representation-learning module. Experiments on real-world data show that PEN delivers superior interpretability, effectively combining prediction and explanation within a single system.

4 Research Gap

Although existing literature extensively examines stock price behaviour, volatility, macroeconomic linkages, and co-movement across markets, the studies reviewed predominantly focus on macro-stock interactions, behavioural dynamics, prediction models, sectoral analyses, and event-specific effects rather than long-horizon, firm-level price integration. None of the reviewed works investigates daily price movement dynamics or long-run equilibrium relationships between closely related public-sector railway companies in

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India, nor do they explore trend behaviour and cointegration using high-frequency OHLC data over an extended 15-year period.

The available studies emphasise macro fundamentals, behavioural influences, market shocks, prediction frameworks, and volatility drivers, but they do not address whether structurally connected firms like IRCTC and RVNL exhibit shared long-run price trajectories or stable co-movement patterns across major structural events. This leaves a clear gap for a comprehensive trend, correlation, and cointegration analysis using long-span daily data to understand the evolving price relationship within India's railway-linked corporate ecosystem.

5 Scope of the Study

The scope of this study is limited to analysing the daily stock prices of IRCTC and RVNL as recorded on the Bombay Stock Exchange (BSE). The analysis is confined to OHLC (Open, High, and Low) price data collected from October 2009 to 19 November 2025. The study focuses solely on price-based time-series behaviour, including trend movements, short-run dynamics, and long- run equilibrium relationships through cointegration analysis. No other variables such as macroeconomic indicators, global market factors, trading volumes, financial statements, or sectoral data are included. The findings are therefore specific to BSE-listed price movements of the two companies and may not be generalised beyond this market or dataset.

6 Overview of the Dataset

The face value (FV) of IRCTC (Indian Railway Catering & Tourism Corporation Ltd.) is currently Rs. 2 per share, while the FV of RVNL (Rail Vikas Nigam Ltd.) is Rs. 10 per share. IRCTC had split its face value from 10 to 2 on 28 October 2021, resulting in a 5-for-1 stock split. Accordingly, all historical IRCTC prices prior to the split have been adjusted by dividing them by 5 to ensure consistency in the time series. The dataset consists of 1,326 trading-day observations spanning from 14 October 2019 to 7 February 2025. Although the period covers 1,944 calendar days, 618 days are non-trading days for BSE (weekends and exchange holidays), resulting in missing rows in the daily series.

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Table 1: Summary Statistics (2019-10-14 to 2025-02-07)

Variable	Mean	Median	Min	Max	SD	C.V.	Skew
WAP RVNL	34.65	124.3	11.11	632.51	157.55	1.27	1.65
WAP IRCTC	608.06	646.82	138.39	1203	259.23	0.43	-0.17
Open Price RVNL	124.3	34.8	10.35	638.4	157.67	1.27	1.65
Open Price IRCTC	645.05	608.12	128.8	1242.4	259.81	0.43	-0.16
Close Price RVNL	34.63	124.03	11	630	157.22	1.27	1.65
Close Price IRCTC	607.29	647.25	140.12	1175.5	258.83	0.43	-0.17
T. Turnover RVNL	2.35E+08	3.89E+07	1.02E+06	1.08E+10	2.78	7.78	85.89
T. Turnover IRCTC	2.48E+08	1.19E+08	3.21E+06	6.38E+09	1.88	6.43	56.25

The weighted Average Price (WAP) shows that IRCTC trades at nearly five times the average price of RVNL. The median values also indicate that RVNL remained in lower price zones for most of the period, while IRCTC consistently traded at higher valuation levels. Although both companies exhibit wide price ranges, IRCTC's range is almost double that of RVNL, reflecting its position as a higher-priced, large-cap PSU with stronger market demand.

Price volatility, measured through standard deviation and the coefficient of variation (CV), reveals that RVNL is substantially more volatile relative to its price level. A CV greater than 1 indicates that RVNL's prices fluctuate more than its own average price, categorising it as a low-priced but highly volatile stock. In contrast, IRCTC's much lower CV shows reduced risk and more stable pricing behaviour.

The distributional characteristics further differentiate the two stocks. The strong positive skewness in RVNL (long right tail) reflects occasional sharp upward price spikes, often linked to speculative surges. IRCTC, with slight negative skewness, shows occasional downward drifts but retains an overall near-symmetric price distribution. Similarly, the kurtosis values emphasise that RVNL experiences more outliers and extreme positive returns, indicating abnormal jumps and heightened speculative activity. IRCTC, with flatter kurtosis, exhibits fewer extreme events and thus more normalised pricing behaviour.

7 Time Series Diagnostics

The next step of the study involves examining whether the price movements of IRCTC and RVNL exhibit meaningful time-series properties such as stationarity, persistence, and long-run dependence. While the descrip-

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tive statistics highlight substantial differences in price levels, volatility, and turnover behaviour between the two public-sector railway companies, these summary measures alone cannot reveal whether the series follow a stable pattern over time or whether their price movements share any long-term equilibrium relationship.

Financial time series, particularly stock prices, typically exhibit strong trends and nonstationarity. Therefore, before assessing interdependence or forecasting, it is essential to determine the order of integration of each price series. The Augmented Dickey-Fuller (ADF) tests are applied to both IRCTC and RVNL to verify whether the open prices contain unit roots. Establishing the stationarity properties of the variables is critical because cointegration techniques used to investigate whether two non-stationary series move together in the long run require both variables to be integrated of the same order. The ADF tests for both series were performed by testing down from 22 lags, with lag selection based on the Akaike Information Criterion (AIC), using a sample size of 1313 observations, under the null hypothesis of a unit root ($\alpha = 1$).

Table 2: ADF Test Results

Series	**Test Statistic (τ_{ct})**	**Asymptotic p-value**
Open Price RVNL	-1.68	0.7592
Open Price IRCTC	-1.83	0.6886
d_OpenPrice RVNL	-10.77	5.355e-23
d_OpenPrice IRCTC	-6.65	2.344e-08

8 Long-Run Relationship

Following the stationarity diagnostics, cointegration analysis is conducted to examine whether IRCTC and RVNL share a stable long-run relationship. The ADF test results indicate that both IRCTC and RVNL open-price series are non-stationary in levels ($p > 0.05$) but become stationary after first differencing ($p < 0.05$). This confirms that each variable is integrated of order one, $I(1)$, thereby satisfying the prerequisite for applying the Engle-Granger Cointegration (EGC) approach.

To establish cointegration using the Engle-Granger approach, two conditions must be met: (a) each individual series must be non-stationary in

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levels (i.e., contain a unit root), and (b) the residuals from the cointegrating regression must be stationary. Condition (a) is satisfied, as the ADF test results show that both the RVNL and IRCTC open-price series are non-stationary in levels and become stationary after first differencing.

8.1 Engle-Granger Two-Step Procedure

Step 1: Cointegrating Regression. An OLS regression was estimated with the RVNL open price as the dependent variable and the IRCTC open price as the explanatory variable. The slope coefficient of IRCTC is statistically significant ($p < 0.001$), indicating a strong contemporaneous association between the two price series in levels.

Step 2: Residual Stationarity Test. The residuals from the regression (uhat) were subjected to an ADF test to assess long-run equilibrium. The ADF statistic (-0.93) is not statistically significant ($p = 0.91$) indicating that the residuals remain non-stationary and retain a unit root. Therefore, RVNL and IRCTC stock prices do not share long-term equilibrium dynamics over the study period (2019-2025).

9 Short-Run Relationship

The absence of cointegration implies that RVNL and IRCTC stock prices do not move together in the long run and do not share a common equilibrium path. Therefore, the analysis shifts to short- run dynamics using VAR in first differences. The optimal lag length was determined to be 10 based on AIC and likelihood-ratio criteria. AIC is lowest for lag 10 (7.0161 < 7.0190 for lag 9), and the likelihood ratio test also supports lag 10.

Table 3: VAR Estimates for ΔRVNL with ΔIRCTC and Controls

Regressor	**Coefficient**	**Std. Error**	**t-statistic**	**p-value**
Constant	-3.318	1.254	-2.65	0.008
ΔIRCTC	0.1548	0.0344	4.5	0.000
Lags of ΔRVNL (1-10)	Not significant	-	-	> 0.10

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Results show that IRCTC's short-run price changes have a statistically significant and positive effect on RVNL's short-run price movements ($\beta = 0.1548$, $p < 0.001$). This indicates the presence of short-run shock transmission from IRCTC to RVNL despite the absence of a long-run equilibrium relationship. However, the lagged values of RVNL do not significantly predict its own short-term movements, indicating weak autoregressive behaviour.

10 Summary of Findings

1. **Price Levels and Volatility:** IRCTC consistently traded at higher prices than RVNL, with weighted-average prices nearly five times higher. RVNL exhibits higher relative volatility ($CV > 1$) than IRCTC, indicating greater price fluctuations relative to its average price.

2. **Distributional Characteristics:** RVNL's prices are positively skewed with high kurtosis, reflecting occasional sharp upward spikes and extreme returns. IRCTC's prices are slightly negatively skewed, with low kurtosis, indicating a near- symmetric distribution and fewer extreme events. Turnover patterns mirror price behaviour: RVNL experiences episodic volume spikes, while IRCTC shows steadier trading activity.

3. **Time-Series Properties:** Both the IRCTC and RVNL open-price series are non-stationary in levels but become stationary after first differencing ($I(1)$), satisfying the prerequisite for cointegration analysis.

4. **Long-Run Relationship:** Engle-Granger cointegration analysis indicates no stable long-run equilibrium between IRCTC and RVNL prices (residuals remain non-stationary, $p = 0.91$). Despite structural and operational linkages, the two stock prices do not share a common long-term trajectory over the study period (2019-2025).

5. **Short-Run Relationship:** VAR analysis in first differences reveals that short-term price changes in IRCTC significantly influence RVNL ($\beta = 0.1548, p < 0.001$). Lagged values of RVNL are not significant predictors of its own price changes, suggesting weak autoregressive

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behaviour. This indicates short-run shock transmission from IRCTC to RVNL, despite the absence of a long-run co-movement.

6. **Implications:** RVNL is more reactive and speculative, whereas IRCTC remains stable and less prone to extreme fluctuations. Investors seeking short-term opportunities may monitor IRCTC as a leading indicator for RVNL's price movements. Long-term investment strategies cannot rely on a cointegrated relationship between the two stocks, as they do not move together over extended periods.

11 Conclusion

IRCTC consistently trades at higher, more stable prices, whereas RVNL trades at lower prices with greater volatility and frequent extreme movements. Both series are non-stationary in levels but become stationary after first differencing ($I(1)$), confirming the need for cointegration analysis. The Engle-Granger test indicates that there is no long-run equilibrium between the two stocks. However, short-term price changes in IRCTC significantly influence RVNL, demonstrating short- run shock transmission. These findings suggest that, while the two railway-linked public-sector companies do not share a common long-term trajectory, IRCTC can serve as a short-term leading indicator for RVNL, offering insights for trading strategies and risk assessment in India's railway- linked equity market.

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 ISBN: 978-81-993134-0-8

6 Panel Discussion

A panel discussion on the role of Artificial Intelligence (AI) in academic writing, along with other themes related to paper presentations, was conducted as part of the seminar. This engaging session offered valuable insights into the evolving influence of AI on academic practices, including research design, drafting of scholarly content, plagiarism detection, and academic content generation. The panelists shared their expert perspectives on how AI tools can improve the efficiency, accuracy, and quality of academic writing while also highlighting the opportunities and limitations associated with their use in research processes.

The discussion also addressed concerns such as ethical responsibility, academic integrity, and the importance of human judgment in scholarly work. The session concluded with a collective call for continued research and meaningful collaboration between academia and AI developers to ensure that technological advancements support and strengthen human intellectual effort rather than replace it. Overall, the panel discussion facilitated a thoughtful exchange of ideas and encouraged participants to adopt AI tools responsibly and effectively in their academic and research endeavors.

7 Conclusion

The National Seminar on "Leveraging NEP and AI to Revitalize Academic Writing and Research Practices" has successfully provided a platform for meaningful discussions and exchange of ideas between scholars, educators, and researchers. The integration of the National Education Policy (NEP) with emerging technologies like Artificial Intelligence (AI) holds immense promise for transforming the academic scenario. Throughout the seminar, the exploration of how these forces can shape the future of education, improve research methodologies, and refine academic writing is sought. The participation of distinguished speakers and the diverse perspectives of attendees have made this seminar a rich source of inspiration and intellectual stimulation. The discussions and papers presented will continue to inspire further research and collaboration, ultimately contributing to the advancement of academic writing and research practices across the globe. This seminar has reaffirmed the importance of interdisciplinary collaboration and the need for continuous adaptation to new educational paradigms.

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