Volume 12, Issue 4 (II)
October - December 2025
ISSN: 2394 – 7780

International Journal of
Advance and Innovative Research

Indian Academicians and Researchers Association
www.iaraedu.com

International Journal of Advance and Innovative Research

Volume 12, Issue 4 (II): October - December 2025

The International Journal of Advance and Innovative Research is an online open access, peer reviewed & refereed journal.

International Journal of Advance and Innovative Research

Volume 12, Issue 4 (II): October - December 2025

CONTENTS

Research Papers

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

ROLE OF INSURANCE SECTOR IN NATION BUILDING (VIKSIT BHARAT)

Mr. Vinod N.
Department of Economics, Thakur College of Science and Commerce (Jr.), Kandivali-East, Mumbai, India

ABSTRACT
The insurance sector is one of the pillars of nation building that provides financial stability and long term security to the citizens of the nation, at large. This paper is an attempt to discuss the multipurpose character of the insurance sector in the Viksit Bharat 2047 developmental plan of India. It examines ways of improving economic stability, social security, growth of infrastructure and inclusive growth with insurance through inductive and exploratory methodology which is based on secondary, qualitative data. The recent statistics indicate that the Indian insurance market is contributing almost 2.7% of national GDP to the economy, and contributing colossal sums of long-term capital to the economy, life insurance companies are investing more than 37 lakh crores in government securities, infrastructure and corporate investments. Such investments improve national productivity and capitals. The government has been supporting the schemes and the online systems that have made it even more accessible, raising the insurance penetration rate to 4.2% as of 2023, especially in the disadvantaged groups. Nevertheless, lack of awareness, high costs, and multidimensionality of regulations are some of the issues that limit further sectoral impact in spite of this trend. The enhancement of the policy level, the establishment of digital industries, and enhancing financial literacy will play a major role in ensuring that the insurance sector will be able to meet the entire developmental goals of Viksit Bharat 2047.

Keywords- *Insurance Sector, Viksit Bharat 2047, Pillar of national building, economic stability , social security, economic resilience, corporate investment, government securities, national GDP, insurance penetration, multidimensionality, social protection, financial inclusion and capital formation, digital industries, financial literacy, development goals.*

INTRODUCTION
The growth vision of India Viksit Bharat focuses on transforming India into a robust, inclusive, and globally competitive economy by 2047. This dream must be fulfilled by establishing good financial institutions and ensuring that individuals and national resources are hedged against uncertainties. The insurance sector is one of the pillars of nation building that provides financial stability and long term security. An insurance is a routine risk transfer mechanism that allows households, businesses, and governments to internalize shocks of health crises, agricultural devastation, natural calamities, and loss of earnings. In a developing economy, e.g. India, where the degree of vulnerability remains significant, higher insurance penetration becomes relevant in achieving sustainable growth and well-being of the society [1].

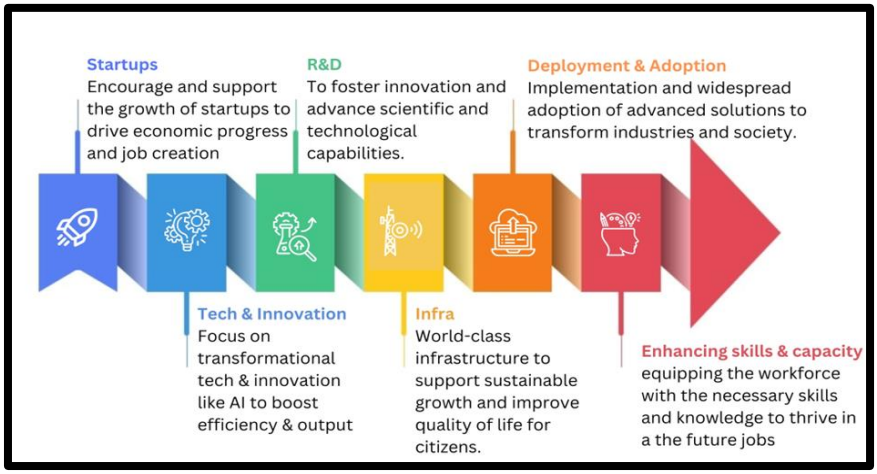


Figure 1: Digital Leadership for a Viksit Bharat 2047

(Source: 2)

RESEARCH AIM
This paper will highlight the role the insurance industry has played in nation building in India as part of a broader national development agenda Viksit Bharat.

RESEARCH OBJECTIVES
- To analyse the role of the insurance sector in promoting economic resilience and financial stability.

ISSN 2394 - 7780

- To examine how insurance supports social protection and inclusive development in India.
- To assess the contribution of insurance to infrastructural growth and capital formation.
- To explore key opportunities and challenges for strengthening the insurance sector within the Viksit Bharat framework.

LITERATURE REVIEW

The insurance field has always been included into the construction of the national economy in the new economies where the risk is so great. The ensuing literature substantiates the multiplier property of the insurance sector into economic stability, social protection, capital formation, and long-term development planning [3]. These are vicinally necessary investments in preparing the industry according to Viksit Bharat 2047 visions in India as stated by Mundhe (2024).

The importance of insurance in minimizing financial risks in the developing economies is highlighted by the early literature on insurance in the developing economies, where households and firms insure against financial shocks. Within economic development theories, it is postulated that insurance can increase economic resilience by mitigating the negative effects of health pandemics, agricultural losses, natural disasters, and business collapses [4]. It is argued by scholars that the less risky they are in terms of the formal mechanisms, the more they will be inclined to invest in education, health and entrepreneurship towards macroeconomic growth and higher productivity.

The other significant literature that has been written on is the history of the Indian insurance industry, especially after liberalisation. The entry of the private insurers and the regulatory reforms by the Insurance Regulatory and Development Authority of India (IRDAI) led to competition, innovation of the products and transparency. Studies have established that these innovations differentiated consumer choice, institutional authority and economy of industry [5].

Kapse (2024) stated that, social protection literature highlights the notion that insurance is a complement to welfare institutions. Agency of government schemes such as Ayushman Bharat, PMJJBY, PMSBY, and PMFBY; their role in fulfilling the economic needs of an eligible household has been a topic of intense research and policy debate. They reduce health poverty, reduce risk within agriculture, and enhance worker safety nets within the informal sector [6].

The second general theme that cuts across the literature is the role insurances play to marshal long-term capital to construct the nation. Life insurers will retire with millions of dollars which would otherwise be invested in infrastructural developments, sovereign bonds, energy solutions, and urban developments among others. Studies found that these investments can bring into the economy a uniform and long-term supply of capital that builds up to form a large portion of the transport infrastructure, industrial belts and energy sources that are renewable [7].

According to Ghai (2024) InsurTech and the transformative power of digitalisation in India. They can use online policy delivery, telematics, blockchain-enabled claims systems, and AI-enabled risk assessment, and it has been shown that technological solutions can significantly improve access and efficiency. Rural and remote settings where low insurance cover is the norm have been especially responsive to web interaction. The relocation decision is deemed necessary to facilitate financial inclusion, which is another pillar of Viksit Bharat 2047.

Besides these advances, the literature also records challenges. Scientists pinpoint deficiency of insurance education, rural low insurance rates, overinsurance, and mistrust as obstacles to full development of the sector. Consumer behaviours issue relates to cost, complexity of policies, and delays in claims [8].

All literature concurs that insurance is an inseparable instrument of national formation that provides economic stability, social security and long-term financial resources. However, it is also associated with the necessity to organize more systematic research that can connect the fulfillment of the insurance sector to the Indian nation-building agenda directly [8].

THEORETICAL FRAMEWORK

The theoretical framework used in this paper depends on an integration of inter-related theoretical lenses to explain a long-term developmental intent of the insurance industry in the nation building scenario. Their general overview is a conceptual map to understand how insurance can be a significant element in creating economic stability, social welfare, and inclusive development according to the vision of India Viksit Bharat 2047.

ISSN 2394 - 7780

As per Panigrahi (2024), insurance is one of the most salient mechanisms in Social Protection Theory to minimize vulnerability and provide household cushions against economic shocks. Insurance can enhance social resilience by insuring individuals against a health crisis, farm failures, natural disasters, or wage shocks [9].

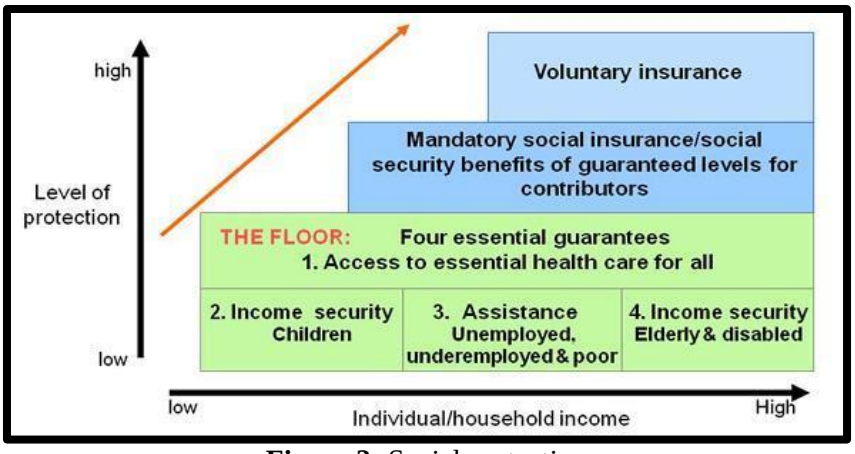


Figure 2: Social protection

(Source: 10)

The Theory of Risk Transfer and Pooling makes insurance a participatory process in which a broader community distributes risk. This kind of type sets a man and a community free. The other concept capable of and having served millions of citizens with a cover is a national risk pooling concept such as PMFBY or Ayushman Bharat in India.

According to Mundhe (2024), the Modernisation Theory presupposes that we have a more integrated financial system where insurance is a force behind economic change and national development. The more developed institutions like insurance become industrialization engines as economies advance, infrastructure and technology [11]. The principle echoes the modernisation dream of Viksit Bharat in India that focuses on institutional fortification as a state of growth.

As per Aimen, Jesuraj and Salihundam, (2025), the Human Capital Theory highlights how insurance is used as a method of buying long-term investment in health, education and productivity. This is also to be insured due to the following fact: by it people are encouraged to be educated and to obtain skills due to a lesser cost of sickness or accident to the economy, and the influence of a higher human capital in the nation.

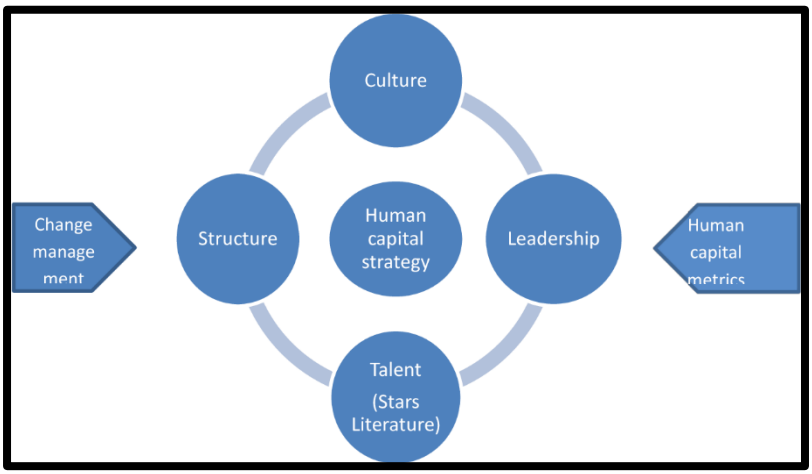


Figure 3: Human Capital Theory

(Source: 12)

Finally, the Financial Inclusion Framework advances insurance in inclusive financial systems. This increased availability of cheap insurance coverage will empower the marginalised communities and promote equitable development. In India, efforts are underway to link insurance to a wider inclusion agenda, be it through digital insurance, government-sponsored programs, or regulatory reform.

The following is a list of these theories to have fun with the idea of how the insurance sector can be used to pursue the developmental agenda of India and also pursue the agenda Viksit Bharat 2047 of the world.

ISSN 2394 - 7780

LITERATURE GAP

As much literature on the economic and social role of the insurance sector may be out there, there is a need to fill a literature gap especially in the long-term developmental agenda of India. The sources on the topic are mostly connected with insurance as a financial service and are worried about the way insurance minimizes risk, offers a stable market, and well-being. But there is no such article in existence which can in any way be directly connected with any aspect of nation building and that too within Viksit Bharat 2047 with the insurance sector.

The other gap is the changing digital world. Despite certain parts of the literature briefly noting the emergence of InsurTech and online insurers, a lack of research exists to support the claim of how the digitalization process can result in inclusiveness, rural presence, and structural redesign of the Indian insurance ecosystem [13]. Further, there is a wealth of literature on single programmes like PMFBY or Ayushman Bharat, but little literature is of an integrated nature and has examined the overall effect of such programmes on socio-economic resilience.

As stated by Dahiya (2025), the second gap involves the lack of qualitative and theoretic examination of the role of insurance mechanisms and their relationship with social protection theory, human capital development, and financial inclusion. As India proceeds with Viksit Bharat schemes, it is also necessary to carry out intensive research incorporating the dimensions to attain the multi-level contribution the sector has contributed towards nation building

RESEARCH METHODOLOGY

The research philosophy used is an interpretivist approach since the objective of the study is to explain the social phenomenon through sense and meaning generated by the information presented. Interpretivism would be necessary in this study since the role of the insurance industry in nation-building is multidimensional and hence needs an in-depth perception of the policies, socio-economic problems, and institutional practices as opposed to the quantitative measure. By the way, the study is inductive because, based on the study, patterns, themes, and insights will be identified as the literature develops with analysis (as opposed to hypotheses developed at the beginning) [14].

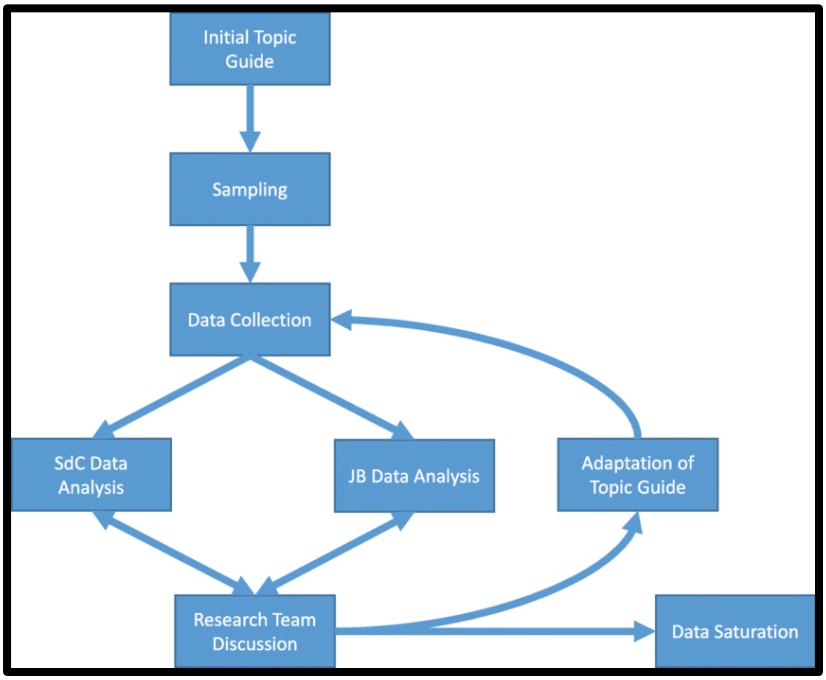


Figure 4: Flow chart of the qualitative research process

(Source: 15)

It is also exploratory in the sense that the research study is aimed at exploring a field that has hitherto not been explored at least as far as national building of India in general and role played by insurance in the same is concerned. The exploratory design supports the open-ended question and helps the researcher to locate cross-relationships among various dimensions including social protection, financial inclusion, digital transformation, and capital formation.

Search limits are secondary qualitative data. These are peer-reviewed journal articles, government reports, industry reports, IRDAI publications, policy papers, and reputable internet sources. The selection of these

ISSN 2394 - 7780

sources is based on the criteria of relevancy, reliability and contemporary relevancy, especially those sources published in the past 10 or so years, as a way of providing a more recent view of the true situation of development in India, [16].

Qualitative data were processed by thematic analysis, which entails the identification, categorization and description of themes in the literature. It was reinterpreted as economic resilience, social welfare growth, digital innovation, and infrastructural funding. This paradigm not only contributed to systematic interpretation of the qualitative data, but also contributed towards developing a coherent concept regarding the contribution of the insurance sector in nation building.

The ethical problem was addressed as authoritative, publicly accessible and cited secondary sources, used in the proper way. No human subject was involved in the primary data; this eradicated confidentiality, consent, or harm risks to a subject [17]. The results are given without exaggeration and the intellectual worth which the literature presented gave the results is given, and the research is its scholarly integrity.

INSURANCE AS A DRIVER OF ECONOMIC RESILIENCE AND FINANCIAL STABILITY:-

Insurance could also be regarded as a significant factor in economic resilience because it provides individuals, businesses and governments with a solid financial platform against unexpected losses. Restated in the literature, insured households become less vulnerable to economic shocks in the post-aftermath of health crisis and injuries and accidents and crop failure or natural disasters. This stability allows them to sustain the consumption level, deters panic borrowing, and helps in long-term financial planning. Insurance transfers operational risk to businesses and allows them to survive a crisis, which in turn accelerates investment and entrepreneurship [18]. Macro-prudentially, the insurance market contributes to financial stability by consolidating long-term savings, capital productivity and foreseeable financial flows in an economy.

INSURANCE AS AN INSTRUMENT OF SOCIAL PROTECTION AND INCLUSIVE DEVELOPMENT

One of the effective tools of social security is insurance that makes the population less vulnerable to the typical socio-economic risks. Government schemes such as Ayushman Bharat, PMJJBY (Pradhan Mantri Jeevan Jyoti Bima Yojana) - the life insurance , PMSBY (Pradhan Mantri Suraksha Bima Yojana)- the accident insurance and PMFBY (Pradhan Mantri Fasal Bima Yojana) - the crop insurance etc have played a central role in the economic security of low-income families, agriculturalists and employees of the informal sector who previously had no formal safety nets. These plans internalize the macroeconomic effects of health shocks, accidental deaths and loss of farm inputs and prevent the risks of occurrence of unforeseen events that put households in poverty. The inclusive development aspect that equally progresses alongside the factor of insurance is that financial security is distributed with marginalized groups such as women, rural communities, and the small-scale workers [19]. It has also been facilitated by the increasing use of online insurance systems, which have made enrolment easier, and have made it easier to access remote destinations, as well as reduced paperwork.

INSURANCE SECTOR'S CONTRIBUTION TO INFRASTRUCTURE DEVELOPMENT AND CAPITAL FORMATION

The other impact that the insurance industry is making on the development and the capital formation of the infrastructure positively is that the insurance industry also increases the long-term funds that will be needed to ensure that the growth is achieved. The massive amounts of capital that accrue as premiums in general insurers, life insurance companies and pension funds, are invested in government securities, corporate bonds and mega-building projects. Long term investments are such long-term funds that are a guarantee of financing long term infrastructure, highways, renewable energy installations, urban transport networks, and industry corridors. These investments have been examined not only to stimulate economic growth, but to enhance productivity, generate employment opportunities and to develop the region [20]. The insurance industry will fuel capital formation and financial markets can withstand volatility with a more stable economy.

OPPORTUNITIES AND CHALLENGES WITHIN THE VIKSIT BHARAT FRAMEWORK :-

Viksit Bharat insurance market A two lounge highway whose growth has a future. The largest opportunity is a digital transformation, as the operations can be made cheaper with the help of InsurTech solutions, mobile distribution, and data-driven underwriting. This has brought these changes so as to make the industry efficient because the IRDAI has promoted competition that makes the products easy to use. Other urgency is microinsurance and climate-risk-products that can open the rural markets with a national developmental objective. The problems are daunting. The level of awareness is low and still low penetration is hampered by the underinsurance and affordability factor because the rural population and the low rates of income individuals

ISSN 2394 - 7780

are disproportionately underinsured [21]. Other factors that ruin consumer confidence include distrust, inability to recover claims and financial illiteracy.

Table 1: Contribution of India's Insurance Sector to Economic Development (2018-2024)

Year	Insurance Penetration (%)	Insurance Density (USD)	Insurance Sector Investments (₹ lakh crore)	Contribution to GDP (%)
2018	3.69	73	33.6	2.6
2020	4.20	78	35.0	2.7
2022	4.10	83	36.7	2.7
2023	4.20	91	37.7	2.7
2024	4.25 (est.)	95 (est.)	39.0 (est.)	2.8 (est.)

(***Source:*** IRDAI Annual Report 2024; LIC Annual Report 2024)

According to the data, it is estimated that India's insurance penetration, density and long-term investments will witness steady growth between 2018 and 2024.

The rising investments of insurers – from ₹33.6 to ₹39 lakh crore – and a steady contribution (2.6-2.8%) to the GDP indicate a strengthening role of the sector in capital formation and national development.

INTERPRETATION OF THE FINDINGS

The results are that, the Indian insurance business is nation-building, India, in the multidimensional sense that transcends its conventional financial perspective to the greater developmental imperative. The visualised insurance is in its middle of stabilising the economy because it reduces the exposure of the shocks and enables the households and firms to plan their finances on the long-term basis. Social protection is the second pillar, and state programs are seeking more vulnerable persons and inclusive development. The geographical position of the industry is strategic too since capital formation acquired under insurance is largely capitalized in national infrastructure and economic development [22]. Simultaneously, its results show that digitalisation and regulatory reforms pose significant opportunities, but are accompanied by systemic constraints, including low awareness, poor penetration, and distrust. All in all, this discussion indicates that the insurance ecosystem ought to be streamlined to support the Viksit Bharat agenda in India.

DISCUSSION

In a very significant way, this article agrees with the body of literature that highlights the enabling role of the insurance sector in supporting financial deepening, mobilization of long-term investment and economic resilience. Just like the research findings of the above-stated studies, the research findings are confirmatory that the insurance companies have an enormous role to play in the capital formation in the sense that they cause long term capital to move to the infrastructural, social protective and productive sectors [3]. However, the current paper refers to the previous research by stating the increased applicability of digital transformation-AI-conditioned risk analysis, digital onboarding, and expands on the terms of health insurance in the Viksit Bharat setting [4]. This gives a more modern perspective on the ways in which technology transformations are redefining reach, effectiveness, and industry presence.

The study has broad policy implications to the insurance industry and policy makers. The study claims that insurance coverage could be enhanced through the implementation of positive policies, the creation of digital infrastructure, and incentives tailored specifically to the rural and low-income populations [5]. The future insurance developments that are of little cost to national interest are the development of micro-insurance, climate risk development, and low-cost health development. Meanwhile, the problems of ignorance, low cost-efficiency, and inefficiencies of operation need to be addressed as a unit. The results largely support the assumption that insurance can be an empowering instrument of financial inclusion, stability, and long-term growth as a Viksit Bharat.

CONCLUSION

In a nutshell , the Insurance business is the cradle of financial stability, long-term growth, and economic stability in India. The secondary qualitative analysis completes the work, that insurance is not a safety net, but a growth instrument that diminishes household risk and balances national development in the shape of long-run capital. The findings indicate that insurance can be used to underpin social protection by providing health and life and micro-insurance and, by extension, inclusive development can be advanced and inequality can be reduced. In the meantime, its contribution to the industry in the funding of infrastructures, capital development and investment diversification makes it a strategic pillar in India as it proceeds to Viksit Bharat.

It also mentions that the investigation claims that giant opportunities (digital integration, development of micro-insurance and climate-risk products) exist and that the challenges are substantial low penetration, awareness, and regulatory complexities. Every one of us is aware that the image of a strong, fair and technologically empowered Indian economy by 2047 needs a strong, integrative and technologically empowered insurance sector.

REFERENCES

[1] Bhatia, A.K., Singhal, G. and Arora, M.S., 2024, September. Towards an Empowered India: Women's Role in Achieving the Viksit Bharat 2047 Vision. In *Proceedings of the 2nd ICSSR Conference on "India Towards Viksit Bharat* (Vol. 2047, pp. 13th-14th).

[2] wikipedia.org, 2025. *Digital Leadership for a Viksit Bharat 2047* [Online]. Available at: https://indiafoundation.in/articles-and-commentaries/digital-leadership-for-a-viksit-bharat-2047-fostering-innovation-shaping-tomorrow/ [Accessed on: 17.11.2025].

[3] Mundhe, E., 2024. Viksit Bharat@ 2047: Pathways to a Developed India. *A Pathways of Viksit Bharat, 2047*, p.75.

[4] Kapse, N.G., 2024. Infrastructure development strategies for Viksit Bharat@ 2047. *Vidhyayana-An International Multidisciplinary Peer-Reviewed E-Journal-ISSN 2454-8596*, *10*(si1), pp.653-669.

[5] Ghai, K., 2024. EMPOWERING VIKSIT BHARAT@ 2047: THE STRATEGIC ROLE OF ACADEMIA IN NATION BUILDING. *Vidhyayana-An International Multidisciplinary Peer-Reviewed E-Journal-ISSN 2454-8596*, *10*(si1), pp.116-142.

[6] Panigrahi, D.A.K., 2024. ROLE OF FINTECH IN TRANSFORMING INDIA'S BFSI SECTOR AND WOMEN'S PARTICIPATION. *The Management Accountant*, *59*(6), pp.95-99.

[7] Aimen, M.U., Jesuraj, R.J.S. and Salihundam, S., 2025. Sustainable Development Goals 2030:" Bridging Gaps, Building Futures for Viksit Bharat@ 2047". *Vidhyayana-An International Multidisciplinary Peer-Reviewed E-Journal-ISSN 2454-8596*, *10*(si3).

[8] Dahiya, M.S., 2025. Viksit Bharat@ 2047: Challenges, Opportunities, and Roadmap. *International Journal of Advanced Research and Multidisciplinary Trends (IJARMT)*, *2*(2), pp.464-471.

[9] Wason, R., Arora, P. and Hoda, M.N., 2024, September. Role of National Education Policy2020 in Viksit Bharat2047 through the lens of Sustainable Development Goals2030. In *Proceedings of the 2nd ICSSR Conference on "India Towards Viksit Bharat* (Vol. 2047, pp. 13th-14th).

[10] wikipedia.org, 2025. *Social protection* [Online]. Available at: https://en.wikipedia.org/wiki/Social_protection [Accessed on: 17.11.2025].

[11] Tripathi, R.N., CONTEMPORARY SOCIAL SCIENCES. *Contemporary Social Sciences*, p.162.

[12] semanticscholar.org, 2025. Human Capital Theory [Online]. Available at: https://www.semanticscholar.org/paper/Human-capital-theory%3A-assessing-the-evidence-for-of/25dfff34d21f34ad77e341f5eaf977650c70784d [Accessed on: 17.11.2025].

[13] Kalita, R., 2025. Financial Inclusion among The Urban Poor: Pathways Towards Vikshit Bharat@ 2047. *Emerging Trends in Commerce, Management and Economics*, p.23.

[14] Bhattacharya, S., Gopal, K.M. and Garg, S., 2024. Sustaining Current Policies and Introducing New Initiatives: Strategic Five-year Plan for the Government of India. *Journal of the Epidemiology Foundation of India*, *2*(3), pp.134-143.

[15] researchgate.net, 2025. Flow chart of the qualitative research process [Online]. Available at: https://www.researchgate.net/figure/Flow-chart-of-the-qualitative-research-process_fig1_349049302 [Accessed on: 17.11.2025].

[16] Pandey, A., EASTERN INDIA TODAY AND THE ROAD TO VIKSIT BHARAT@ 2047: CHALLENGES AND POLICY SUGGESTIONS. *BIHAR JOURNAL OF*, p.12.

[17] Nayak, C.B.B. and Deshpande, C.H., 2024. ICMAI-CMA SNAP shots. *Viksit Bharat 2 704*, p.14.

[18] Padma, D., 2025. VIKSIT BHARAT 2047: EMPOWERING INDIA'S YOUTH THROUGH DIGITAL INITIATIVES-REVOLUTIONIZING EDUCATION AND EMPLOYMENT. *Academic Research Journal of Science and Technology (ARJST)*, *1*(07), pp.40-54.

ISSN 2394 - 7780

[19] Sarkar, U., Roy, A.K. and Das, S., 2024. Charting the Course: Overcoming Hurdles in the Journey towards Developed India. *Journal of Academic Advancement*, *3*(02), pp.42-47.

[20] Revolution, R.E., 2024. A Glorious Journey into Viksit Bharat through Higher Education. *UNIVERSITY NEWS*, *62*, p.71.

[21] Modi, N., 2024. Accelerating Women Empowerment: A Reconnaissance of Government Policies and Initiatives. *Modi's Vision To Empower Women: Most Valuable Bestseller eBooks*, p.74.

[22] Das, S. and Darshan, N.P., 2025. AgriTech Revolution: Transforming India's Agriculture Aiming Viksit Bharat@ 2047. *Journal of Community Mobilization and Sustainable Development*, *20*(1), pp.11-19.

[23] IRDAI Annual Report 2024

[24] LIC Annual Report 2024

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

IMPACT OF FINANCIAL LITERACY IN INDIA

Manju Pal
Department of Economics

ABSTRACT
A prosperous economy is the direct result of its citizens financial security. Having a firm grasp of basic money management skills is essential for building long-term financial security. These foundational skills include budgeting, saving, and managing debt, which are critical for protecting finances. Multiple studies confirm that a significant portion of the Indian population continues to lack basic financial knowledge and decision-making skills. This study explores the current state of financial literacy across different states, age groups, genders and urban -rural demographics in India. It examines the role of formal education, digital tools and institutional initiatives such as the RBI's (Reserve Bank of India) & NSFE's (National Strategy for Financial Education) financial literacy campaigns. This research highlights the disparity in financial awareness between Metropolitan and rural areas and the urgent need for targeted policy measures, curriculum integration, and community-based programs to bridge the financial - knowledge gap. This work was drawn using a wide range of literature reviews including those of academic journals, newspapers, government documents, books, etc.

INTRODUCTION
A stable financial system is essential for a country's economic growth and development. Financial literacy has become a foundational skill necessary for an individual's well-being and national development. Financial literacy refers to the ability to understand and effectively use various financial skills including the personal financial management, budgeting, saving, investment and understanding financial product and the services. For a diverse and the popular country like India, where social - economic disparities, digital diversity and low awareness persist in many regions, financial literacy is both a challenge and opportunity.

For a very long time India has been known as a saving Nation that has invested both frugally and the extravagantly. However, the saving strategy employed could be non -standard. Over the years our citizens have preferred to put their money into gold and property.

Gold and real estate may be more accessible to those who are financially excluded and have limited financial literacy. India has witnessed tremendous growth in financial inclusion over the past decade. Government initiatives like the Pradhan Mantri Jan Dhan Yojana and the proliferation of digital payment system like UPI (Unified Payments Interface) and scheme such as PM Kisan and benefit transfers have brought millions into the formal financial system without financial knowledge and confidence. However, individuals are more prone to making poor financial choices or falling victim to fraud or avoiding financial systems all together due to lack of financial knowledge.

According to various National surveys including those by the National Centre for Financial Education (NCFE) and the RBI (Reserve Bank of India), India's overall financial literacy rate remains low especially among women, women-rural population and individuals with Limited formal education causes noticeable gap between awareness. While many individuals may have heard of concepts like insurance credit or investment, they often lack the practical understanding needed to use this tool responsibly.

This paper deals into the current status challenges and opportunities related to financial literacy in India. It evaluates the effectiveness of existing initiatives and presents recommendations for building a more financially literate country. Enhancing financial literacy is not only a step towards and empowering individuals but also vital tool purchasing inclusive growth reducing poverty and rendering economic resilience into world's most popular democracy.

OBJECTIVES
1. To create financial awareness.
2. To promote financial inclusion.
3. To help individual understand their financial rights and safeguard themselves from scams.
4. To introduce the idea of financial literacy and explain why is it so crucial.
5. To provide a brief overview on measures RBI (Reserve Bank of India) and SEBI (Securities and Exchange Board of India) have done to boost financial education.
6. To make aware of crucial role of government's efforts to expand financial inclusion in the country

ISSN 2394 - 7780

7. To educate people about benefits of saving over time.

RESEARCH METHODOLOGY

Secondary sources were used for this analysis. Previous research articles, newspapers, reports, journals, books and the regulatory agencies' websites are all thoroughly compiled.

CONCEPTS OF FINANCIAL LITERACY

Meera Santoshi (2016) indicates financial literacy and financial inclusion are two aspects of financial stability in a country. When people are financially literate, they are most likely to explore the product and services offered by bank and use them for their benefit.

According to the National Centre for Financial Education (NCFE), an entity promoted by India's financial regulators to implement the National Strategy for Financial Education (NSFE), financial literacy is defined as the knowledge, understanding skills, motivation, and confidence to apply this understanding to make effective decisions across a range of financial contexts, to improve individual's financial well-being, and to enable participation in economic life.

The Finance Minister Shri Arun Jaitley said that in our country where we have very low levels of financial literacy, it is essential that people understand the importance of availing financial services which will enable them to participate in their financial growth. (2014)

STATUS OF FINANCE LITERACY IN INDIA

Table 1: State-wise level of Finance Literacy in India (2019)

State / Union Territory	Financial Literacy (%)
Goa	56%
Chandigarh (UT)	56%
Delhi (NCT)	53%
Uttarakhand	42%
Kerala	38%
Gujarat	33%
Himachal Pradesh	32%
Punjab	31%
Maharashtra	30%
Karnataka	30%
Tamil Nadu	29%
Andhra Pradesh	29%
Telangana	28%
Assam	27%
Manipur	26%
Rajasthan	25%
Madhya Pradesh	24%
Haryana	24%
Uttar Pradesh	21%
Bihar	19%
Jammu & Kashmir	18%
Jharkhand	17%
Tripura	16%
Nagaland	15%
Meghalaya	14%
Mizoram	13%
Arunachal Pradesh	12%
Odisha	10%
Sikkim	9%
Chhattisgarh	9%
Andaman & Nicobar Islands	25%
Puducherry	28%
Dadra & Nagar Haveli & Daman & Diu	22%

ISSN 2394 - 7780

Lakshadweep	26%
Kolkata	27%

(*Source:* Data compiled from NCFE Report 2019**)**

According to Global Finance Literacy Excellence Centre, approximately 27% of adult in India can read and understand a balance sheet. When compared to their other major emergency countries, India has one of the lowest levels of financial literacy. This is because of difference between the states as well as the general deficiency in education and awareness. There is room for the development in financial literacy, despite the fact that other rising economics have higher rates.

Table 1 shows the financial literacy level in India by state and union territory.

The financial literacy percentage in the major states- Maharashtra and Delhi are 30% 53% respectively. Literacy rates are particularly low in impoverished parts of India such as Bihar, Rajasthan, Jharkhand and Uttar Pradesh. The data reveals differences between the states. Goa has a literacy rate of 56% making at the highest in India while Chhattisgarh's and Sikkim's literacy rate is under 9% and it has a serious shortage of financial knowledge.

Table: 2 Knowledge Behaviour Score: (2019)

Behaviour Indicator	Urban India (%)	Rural India (%)	All-India Average (%)
Able to meet living costs without borrowing	52	40	**45**
Maintain household budget	38	27	**33**
Actively save (using interest-earning or investment products)	49	31	**40**
Compare financial products before purchase (e.g., loans, insurance)	29	19	**24**
Set long-term financial goals	35	24	**29**
Repay debts on time	61	55	**58**
Avoid unnecessary borrowing	46	37	**42**
Overall Behaviour Index Score	**12.3 / 21**	**11.0 / 21**	**11.7 / 21**

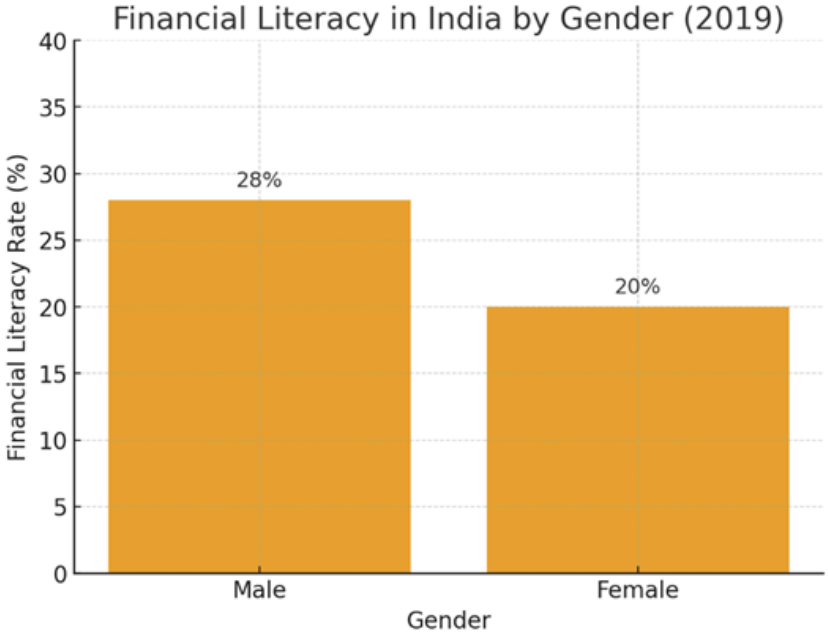
Table: 3 Knowledge Attitude -Behaviour Score (2019)

Dimension of Attitude	Percentage (all India,2019)
Positive attitude towards spending (i.e., disagree "live for today ")	71%
Positive attitude towards saving (i.e., disagree "spend rather than save ")	76%
overall attitude score (on 5-point scale)	1.97/5 in one survey

In 2019, financial behaviour in India reflected a gradual but uneven shift towards responsible money management. While nearly half of the population could meet their living expenses without borrowing, a significant portion is still depended on credit or informal support. Urban households displayed stronger habits such as maintaining budgets, timely repayment, and active saving, whereas rural households relied more on informal methods. Despite moderate progress, the overall behaviour index score of India is around 11.7 out of 21 indicated that practical application of financial knowledge remained limited. Strengthening budgeting skills, promoting formal savings, and improving debt management are essential to convert awareness into sustainable financial behaviour.

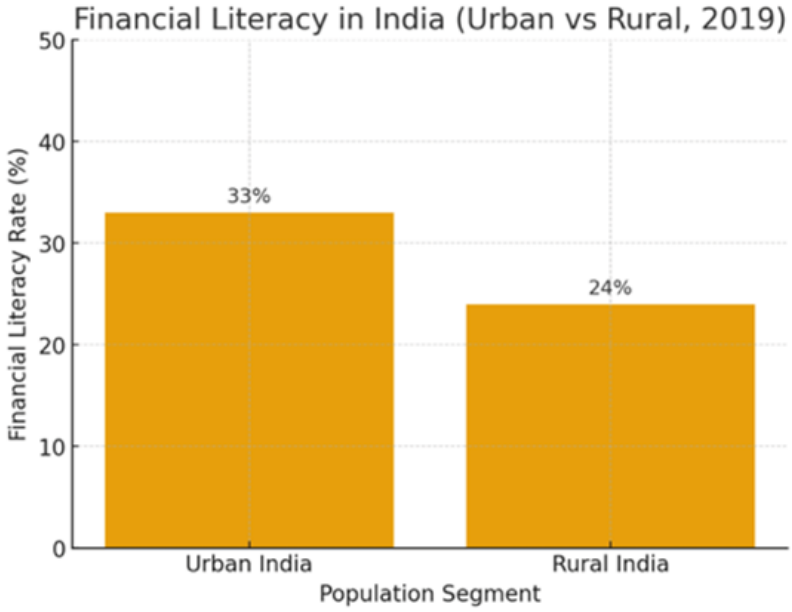
ISSN 2394 - 7780

The 2019 financial literacy survey revealed that Indians generally hold a positive attitude toward saving and future planning. Most respondents disagreed with statements suggesting impulsive spending or neglecting long-term goals, indicating a cultural preference for thrift and financial caution. However, despite this favourable mindset, the overall attitude score remained below global averages, showing that attitudes often do not fully translate into disciplined financial actions. Developing stronger attitudes that emphasize consistent saving, goal-oriented planning, and informed decision-making will be key to nurturing a financially resilient population.



In 2019, a clear gender gap was observed in India's financial literacy levels, with around 28% of males being financially literate compared to only 20% of females. This difference reflects unequal access to financial education, employment, and decision-making opportunities. While men generally showed stronger awareness and participation in financial activities, women often exhibited better saving habits and a more cautious financial attitude.

The data highlights that bridging this gender gap requires targeted financial education programs for women, especially in rural and semi-urban areas, alongside promoting digital and economic inclusion. Strengthening women's financial empowerment will not only improve overall literacy rates but also contribute to a more balanced and resilient economy.



In 2019, India showed a noticeable divide between urban and rural financial literacy levels — with about 33% of the urban population being financially literate compared to only 24% in rural areas. This gap was largely due

ISSN 2394 - 7780

to differences in education, access to banks, digital awareness, and exposure to financial institutions. Urban residents generally had better understanding and participation in formal financial systems, while rural populations relied more on informal saving and borrowing practices. To bridge this divide, stronger financial inclusion efforts, rural education campaigns, and easy access to digital financial tools are essential. Equal opportunities and awareness in both regions will ensure a more financially capable and inclusive India.

FOLLOWING FINDINGS EMERGE

1) Financial Literacy Remains low nationwide:
Only about one in four Indians meet the minimum criteria for being the financial literate even though financial product access has improved significantly.

2) Rural Urban Divide:
There is a significant rural-urban financial literacy divide because urban areas benefit from better infrastructure, higher rates of formal education, and greater access to digital resources, while rural areas face barriers like limited internet.

3) Gender-Gap:
Men are generally more financially literate than women, showing broad disparity socially, in terms of economic participation and exposure. However, in many cases women show more cautious and stable financial behaviour once educated.

4) Digital Finance Outfacing Digital Understanding:
The adoption of digital payments and banking apps has increased but digital finance literacy such as understanding cyber security, fraud risk or Digital lending traps -lags behind.

5) Need for Localised and Inclusive Education:
Language barriers, cultural beliefs and lack of Trust in formal Financial Institutions are major hurdles.

INITIATIVES TO ENHANCE FINANCE LITERACY IN INDIA:

1) Government Initiatives:
Government led programs such as the Pradhan Mantri Jan Dhan Yojana (PMJDY)and Swabhiman, have played vital roles in promoting the financial inclusion and literacy. These initiatives not only aim to provide access to finance services but also worked towards enhancing individual about the benefits of formal banking.

2) Banking and Digital Literacy:
Efforts to improve financial literacy in reference to banking and the digital literacy were taken. The country advanced in adopting digital finance services.

There has been several initiatives & efforts taken to educate the people about the use of online banking, digital payment and associated security measures.

3) Role of Financial Institutions:
Financial Institutions, both public and private have actively contributed to financial literacy through targeted program initiatives by bank such as ICICI foundation's Finance Literacy Initiative and Kotak Mahindra bank's money watch Program, have focused on educating different segment of the population including rural household and school children.

4) Digital Transformation:
The Digital Revolution in financial services have the potential to revolutionize the financial literacy. However, it also brings the challenge of ensuring that individuals understand and adopt to these changes responsibly.

5) Reserve Bank of India:
RBI (Reserve Bank of India) has launched a program called Project Finance Literacy, this projects goal is to educate different demographics about banking and Central banks such as young people, women, the impoverished in urban and rural areas and the elderly.

6) Securities and Exchange Board of India (SEBI):
SEBI maintains an investor education website which can be accessed by user that consist educational resources on a wide range of topics, including financial markets products and frequently asked questions (FAQs). Both English and local languages are supported by SEBI's publication of educational resources.

ISSN 2394 - 7780

7) School Curriculum:
NEP 2020 Included financial literacy in School curriculum. As a critical 21st-century life skill its integration into the school curriculum in an age-appropriate and practical manner.

Teaching financial literacy equips students with the tools they need to secure financial independence and avoid common pitfalls such as debt mismanagement.

CONCLUSION

Financial literacy is a cornerstone of economic stability and growth, yet India faces a significant challenge with nearly 76% of its adult population lacking basic financial knowledge. Despite progress in financial inclusion through initiatives like Pradhan Mantri Jan Dhan Yojana (PMJDY) and digital platforms like UPI, the lack of understanding about financial management, investments, and digital security risks hampers inclusive growth. Here are the key takeaways and recommendations to address this gap:

1. Low National Average: Only 27% of Indian adults are financially literate, highlighting the need for urgent intervention.
2. Rural-Urban Divide: Financial literacy in urban areas (33%) surpasses rural areas (24%), necessitating targeted rural outreach
3. Gender Gap: Men (28%) are more financially literate than women (20%), requiring gender-specific programs.
4. Digital Literacy Lag: Adoption of digital finance outpaces understanding of cybersecurity and fraud prevention.
5. State Disparities: Goa (56%) leads in financial literacy, while states like Bihar (19%) and Sikkim (9%) lag behind.
6. Positive Attitude, Weak Action: Indians prioritize saving but struggle to translate it into disciplined financial behaviour.
7. Government Efforts: Initiatives like RBI's (Reserve Bank Of India) Project Financial Literacy and SEBI's (Securities and Exchange Board of India) educational resources are steps in the right direction.
8. Curriculum Integration: NEP 2020's inclusion of financial literacy in schools is a promising start.
9. Community Programs: Local, vernacular-language campaigns can bridge awareness gaps in underserved regions.
10. Financial Institution Role: Banks (e.g., ICICI, Kotak Mahindra) contribute through targeted literacy programs.
11. Digital Transformation: While digital finance grows, ensuring digital safety literacy is critical.
12. Economic Impact: Improved financial literacy can boost savings, reduce debt traps, and foster entrepreneurship.
13. Long-Term Benefits: Financially literate individuals contribute to a resilient economy, reducing poverty and inequality.
14. Way Forward: Collaborative efforts between government, institutions, and communities are essential to make financial literacy a national priority.

REFERENCES

a. Agarwal, M., Kureel, R. C., & Yadav, D. (2017, November). A Study on Future Plan for Increasing Financial Literacy Among People. Global Journal of Finance and Management, 29-38.

b. Bhargava, N. R. (2016). A study on financial literacy and financial education: An overview scenario in India. Research journal of management science, 51-57.

c. iKnowledge Team. (2018, June 10). Financial Literacy in India: Why is Financial Literacy in India Poor. Retrieved Aug 20, 2020, from aegonlife.com: https://www.aegonlife.com/insurance-investment-knowledge/financial-literacy- India-poor-heres-data-says/

d. Joshi, D. D. (2011). Financial Inclusion and financial literacy. India: Reserve bank of India.

ISSN 2394 - 7780

e. Kamboj, S. (2014). Current scenario of financial literacy in India. International journal for entrepreneurship and small business management, 61-68.

f. Kumari, S., & Viz, P. (.). Financial Literacy -An overview of growing effort. IOSR Journal of economics and finance, 79-85.

g. Pamarthy, H. K., & Anand, N. (2012). Financial literacy as a tool for financial inclusion and client protection. Delhi: United nations development programme.

h. PRS India. (2020, Feb 3). NATIONAL STRATEGY FOR FINANCIAL INCLUSION 2019-2024. Retrieved Aug 19, 2020, https://www.manifestias.com/2020/02/03/national-strategy-for-financial-inclusion- 2019-2024/

i. Reserve bank of India. (2020, August 19). Reserve bank of India's financial education initiative. Retrieved August 19, 2020, from Reserve bank of India: www.rbi.org.in

j. Santoshi, M. (2016, May 25). Financial Literacy in India: Statistics and Solutions. Retrieved August 18, 2020, from EASY BANKING TIPS: https://easybankingtips.com/financial-literacy-india-statistics/

k. SEBI. (n.d.). National strategy for financial education. Retrieved from SEBI: investor.sebi.gov.in

l. Verma, T. L., Nema, D., & Padagre, R. (2017). An overview of current financial literacy effort in India. Open access international journal of science and engineering, 39-42.

m. NCFE (2019). Financial literacy and inclusion survey

n. OECD/INFE (2014). Guidelines for financial education

O. Lusardi and Mitchell O.S (2011) finance literacy and planning.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

REIMAGINING CONSUMERS IN THE ERA OF INDUSTRY 5.0: ASSESSING READINESS AND TRUST IN INDIA'S DIGITAL TRANSFORMATION

[1]Ms. Deepika Ashok Jagwani and [2*]Dr. Alpesh Mehta
[1]Research Scholar and [2]Assistant Professor, Department of Commerce, SVKM's Mithibai College of Arts, Chauhan Institute of Science and Amrutben Jivanlal College of Commerce and Economics (Empowered Autonomous)
[1]deepikajagwani34@gmail.com and [2]alpesh.mehta@mithibai.ac.in

1. ABSTRACT
Industry 5.0 reflects a human-centric evolution of digital transformation, integrating advanced technologies with human intelligence to create more adaptive and personalised systems. This study examines the relationships among consumer awareness, technological readiness, perception of human–machine collaboration, and future readiness within India's emerging digital ecosystem. A quantitative survey of 265 respondents was conducted using a structured online questionnaire. Reliability coefficients ranged from 0.75 to 0.93, confirming strong internal consistency across all constructs. General Linear Model (GLM) and mediation analysis revealed that both awareness and readiness significantly influence perceptions of human–machine collaboration. Perception strongly predicts future readiness and mediates the impact of both awareness and readiness on long-term digital trust. However, awareness alone did not directly influence future readiness, indicating the importance of experiential and perception-driven factors. The findings highlight the need for digital literacy initiatives, transparent AI communication, and human-centric interface design to improve consumer acceptance of Industry 5.0 technologies.

Keywords: *Industry 5.0, Consumer Readiness, Digital Transformation, Human–Machine Collaboration, Digital Trust.*

2. INTRODUCTION

2.1 *Background*
Industry 5.0 marks a shift from the automation-heavy focus of Industry 4.0 toward a more human-centric, personalised, and sustainable technological landscape. Unlike the earlier phase, Industry 5.0 prioritises meaningful collaboration between people and intelligent systems — such as AI, robotics, and IoT — to boost productivity while still respecting human values, judgement, and creativity.

In India, rapid digital growth has transformed commerce, governance, and everyday consumer interactions. Reports by Deloitte (2024) and MeitY (2023) note major advances in digital infrastructure but also highlight gaps in how prepared consumers are to adapt. Understanding consumer readiness and their views on emerging technologies is therefore essential for shaping a human-centred digital future.

This study examines how awareness, readiness, and perception influence future digital trust as consumers navigate AI-enabled ecosystems.

2.2 *Tracing the Path of Industrial Evolution toward Industry 5.0*
Industry 1.0 introduced mechanisation through steam power, shifting work from manual labour to machine assistance. Industry 2.0 advanced mass production through electricity and assembly lines. Industry 3.0 utilised electronics and IT to automate manufacturing processes. Industry 4.0 revolutionised digital connectivity using IoT, AI, cloud computing, and cyber-physical systems.

Industry 5.0 builds upon these digital foundations but re-centres the human being — prioritising empathy, creativity, personalisation, and sustainable technological harmony.

The journey can be explained through the five industrial revolutions, as presented in **Table 1**.

Table 1: Industrial Evolution from Industry 1.0 to Industry 5.0

Industrial Phase	Period	Core Focus	Key Technologies
Industry 1.0	18th–19th Century	Mechanization	Steam engines, water power
Industry 2.0	Late 19th–20th Century	Mass production	Electricity, assembly lines
Industry 3.0	Late 20th	Automation	Electronics, computers

ISSN 2394 - 7780

	Century		
Industry 4.0	Early 21st Century	Digitalization	IoT, AI, Big Data, Cloud computing
Industry 5.0	Emerging (present–future)	*Human–machine collaboration*	AI, Robotics, Quantum computing, Human intelligence integration

3. REVIEW OF LITERATURE

Recent discussions on Industry 5.0 increasingly emphasise that technology and human abilities must grow together, rather than separately. Hermawati (2025) describes this shift through the idea of "human-centricity," where efficient digital systems must be balanced with the need to strengthen human skills. Her work moves beyond the usual focus on machines and infrastructure by stressing that people also need to be emotionally and mentally prepared to work with advanced technologies—an aspect many earlier studies ignored.

A broader view of current research comes from Rejeb et al. (2025), who conducted a large bibliometric study on Industry 5.0 publications. Their findings show a rising interest in human–machine collaboration, sustainability, and personalised digital environments. Yet, they also note that while companies are rapidly adopting automation and smart systems, very little research examines how prepared consumers actually are to use these innovations. This reveals an important gap in the literature: the consumer perspective is still underexplored.

However, there are also studies that point towards the role of trust in the adoption of human–machine systems. According to Adel (2023), in smart city environments, users are likely to accept novel technologies if they feel that they are in control, their privacy is valued, and the system allows them to personalize the services. The study indicates that the level of adoption of the system will depend not only on its efficiency but also on the level of security and comfort derived from the interaction.

The readiness of consumers has also been explored in the context of digital transformation in the paper by Paul et al. (2024). In their work, they see the process of digital transformation as a multi-layered approach. They valorise the point that the technological platform itself may not be the only factor guaranteeing the adoption of the transformation because the psychological needs of individuals must also be taken care of through various digital literacy initiatives.

Likewise, Bakator (2024) extends the concept of Industry 5.0 to the marketing field through the concept of 'Marketing 5.0'. The author suggests that AI-based marketing software can be truly effective only when the software creates trust and emotional bonding with the users—that was the shortcoming of the previous marketing automation. This reflects the growing role of the harmony of humans and machines in consumer engagement platforms.

Global insights also show the complexity of this shift. PwC (2023) reports that nearly 40% of consumers worldwide remain unsure about how automated systems handle their data, signalling a major trust issue. Meanwhile, Statista (2025) notes that smartphone penetration in India has reached about 74%. Although this shows strong digital access, it also reveals a contradiction: the infrastructure exists, but many users still feel unprepared or hesitant about deeper digital engagement, especially in AI-driven contexts.

Taken together, these studies suggest that while the technological base for Industry 5.0 is strong, the real challenge lies in how consumers understand, accept, and emotionally relate to these systems. Awareness, trust, and digital empathy emerge as crucial factors in shaping engagement with human–machine collaboration.

This means consumer readiness is not just about technical skills but also about psychological comfort and personal experience. These insights highlight the need to combine consumer-level evidence with broader digital transformation trends to bridge the gap between rapid technological progress and human adaptability.

4. RESEARCH GAP

Although Industry 5.0 is widely discussed, most studies still emphasize technology, automation, and organizational adoption, with limited attention to how everyday consumers perceive and adapt to these changes. Existing literature often treats digital readiness as a purely technical issue, overlooking the emotional, psychological, and trust-related factors that shape acceptance of human-aligned technologies. While secondary reports showcase rapid digital growth, they reveal little about how individuals actually experience or respond to this transformation. This gap highlights the need for research that integrates primary consumer insights with broader digital trends to understand how people interpret, evaluate, and prepare for the Industry 5.0 environment.

ISSN 2394 - 7780

5. CONCEPTUAL FRAMEWORK

As illustrated in **Figure 1**, The conceptual model proposes that consumer awareness and readiness influence perceptions of human–machine collaboration, which subsequently affects future readiness and digital trust. Perception is also posited to mediate the relationships between awareness, readiness, and future trust.

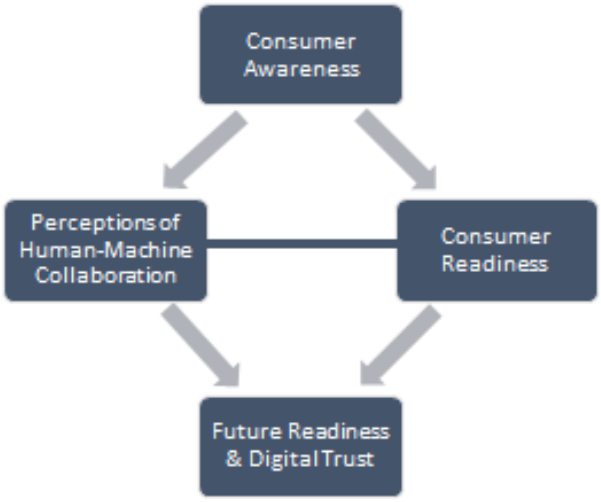


Figure 1: Conceptual Framework of the Study

6. OBJECTIVES OF THE STUDY

6.1 To measure consumer awareness about digital transformation and Industry 5.0.

This objective allows for the assessment of the level at which the concept of digital transformation and Industry 5.0 are known to the consumer. It shall highlight what they know about emerging technologies like AI, IoT, robotics and automation, and how these aspects have come to influence today's lifestyle and business ecosystem.

6.2 To evaluate the consumer readiness levels pertaining to the adoption of new technologies.

This research objective will aim at finding consumer readiness levels concerning the adoption and application of new digital tools, systems, and platforms. This research objective will target understanding the factors of digital skills, awareness, adaptability, and readiness to change that can impact the consumer’s seamless shift toward the Industry 5.0-driven environment.

6.3 To understand perceptions toward human–machine collaboration.

This objective investigates consumers' attitudes and beliefs in relation to the integration of human intelligence with smart technologies. It seeks to explore perceptions that relate to benefits offered by efficiency, convenience and personalization and concerns linked to job displacement, privacy, and ethical implications of human-machine synergy in the context of Industry 5.0.

6.4 To identify the ways of improving consumers' digital literacy and confidence.

This document also suggests certain strategies through which consumers can develop their trust and capability in the digital environment. The significance of awareness programs, education initiatives, ethics, and government support has been explained in the context of developing a secure environment that will allow Industry 5.0 to be a success.

6.5 To examine the mediating role of perception between readiness and future readiness.

This hypothesis states that consumers' perception helps bridge the consumer's readiness at a particular point in time and readiness at a later date regarding the readiness of Industry 5.0 technology. The hypothesis states that consumers may be ready technologically but that their positive perception of the combined work of humans and machines can be the factor that increases their readiness to accept the technological innovations of Industry 5.0 at a later date.

7. HYPOTHESES DEVELOPMENT

Based on the conceptual framework, the study proposes seven hypotheses that capture both direct and indirect relationships among consumer awareness (Aw), readiness (Re), perception of human–machine collaboration (Pe), and future readiness/trust (Fu). Prior literature suggests that awareness and readiness shape how individuals perceive emerging technologies, while perception further influences long-term acceptance and trust.

ISSN 2394 - 7780

H1: Readiness for emerging technologies significantly influences consumer perception of human–machine collaboration.
H2: Awareness of Industry 5.0 significantly influences consumer perception of human–machine collaboration.
H3: Perception of human–machine collaboration significantly influences future readiness and digital trust.
H4: Readiness for emerging technologies significantly influences future readiness and digital trust.
H5: Awareness of Industry 5.0 directly influences future readiness and digital trust.
H6: Perception of human–machine collaboration mediates the relationship between readiness and future readiness.
H7: Perception of human–machine collaboration mediates the relationship between awareness and future readiness.

These hypotheses collectively examine how cognitive awareness and technological readiness translate into trust toward the human–machine ecosystem envisioned in Industry 5.0.

8. RESEARCH METHODOLOGY

8.1 Research Design
The study adopts a quantitative, cross-sectional research design using a structured questionnaire distributed through Google Forms. The design is appropriate for capturing consumer attitudes, perceptions, and behavioural readiness toward Industry 5.0 technologies.

8.2 Sampling Technique & Sample Size
A non-probability convenience sampling method was used, targeting digitally active consumers. A total of 265 valid responses were collected and analysed.

8.3 Instrument Design
The questionnaire consisted of four constructs:

1. Awareness of Industry 5.0
2. Readiness for Emerging Technologies
3. Perception of Human–Machine Collaboration
4. Future Readiness & Digital Trust

All items were measured on a 5-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree).

8.4 Reliability Testing
Cronbach's alpha values ranged from 0.752 to 0.928, indicating acceptable to excellent internal consistency.

8.5 Data Analysis Tools
- Descriptive statistics (mean, frequency)
- Reliability (Cronbach's Alpha)
- General Linear Model (GLM) / Mediation Analysis
- Path analysis interpretation

These analyses evaluate both direct and indirect relationships for H1–H7.

9. DATA ANALYSIS

9.1 Reliability Analysis
As shown in **Table 2**, All constructs demonstrated strong reliability:

Table 2: Reliability Statistics for All Constructs

Construct	α	Interpretation
Awareness	.752	Acceptable
Readiness	.783	Acceptable
Perception	.829	Good
Future Readiness & Trust	.928	Excellent

9.2 Descriptive Analysis
The demographic profile of respondents is summarised in Table 3.

ISSN 2394 - 7780

Table 3: Demographic Profile of Respondents (N = 265)

Variable	***Category***	***Percentage (%)***
Age Group	18–24	63.0
	25–34	12.5
	35–44	13.6
	45 and above	10.9
Gender	Female	52.1
	Male	47.9
Occupation	Students	63.8
	Working Professionals	24.5
	Self-Employed	6.0
	Homemakers	2.3
	Others	3.4
Digital Platform Usage	Daily	46.8
	Weekly	19.6
	Occasionally	20.4
	Rarely	13.2

Overall, consumers showed:

- Moderate familiarity with Industry 5.0
- High readiness to engage with digital tools
- Positive perception of human–machine collaboration
- Strong support for digital literacy and transparency initiatives

10. HYPOTHESIS TESTING & MEDIATION (GLM SUMMARY)

As shown in **Table 4**, the GLM-based mediation analysis presents the direct, indirect, and total effects for all hypothesised relationships.

Table 4: Summary of Mediation and Direct Effects Using GLM (N = 265)

Effect Type	**Hypothesis**	**Path**	**Estimate**	**SE**	**95% CI**	**β**	**p**	**Decision**
Direct Effects	H1	Readiness → Perception	Significant across most contrast levels (Estimate = 4.12–7.30)	—	CIs exclude zero for Re3–Re12	β = .17–.54	< .05	Supported
	H2	Awareness → Perception	0.3708	0.0943	[.186, .556]	.2523	< .001	Supported
	H3	Perception → Future Readiness	0.7951	0.047	[.703, .887]	.6912	< .001	Supported
	H4	Readiness → Future Readiness	Significant for most contrasts (Estimate = 4.19–6.32)	—	CIs exclude zero	β = .17–.32	< .05	Supported
	H5	Awareness → Future Readiness	–0.0359	0.0743	[–.181, .110]	–.0212	.629	Not Supported
Indirect Effects	H6	Readiness → Perception → Future	3.27–5.81	—	Many CIs exclude zero	β = .05–.37	< .05	Supported

ISSN 2394 - 7780

	H7	Awareness → Perception → Future	0.2948	0.0770	[.144, .446]	.1744	< .001	Supported
Total Effects		Readiness → Future Readiness	6.89–11.48	—	CIs exclude zero	β = .11–.58	< .001	
		Awareness → Future Readiness	0.259	0.1043	[.0546, .463]	.1532	.013	

11. STRUCTURAL MODEL (SEM)

The structural relationships among the study variables are illustrated in **Figure 2**

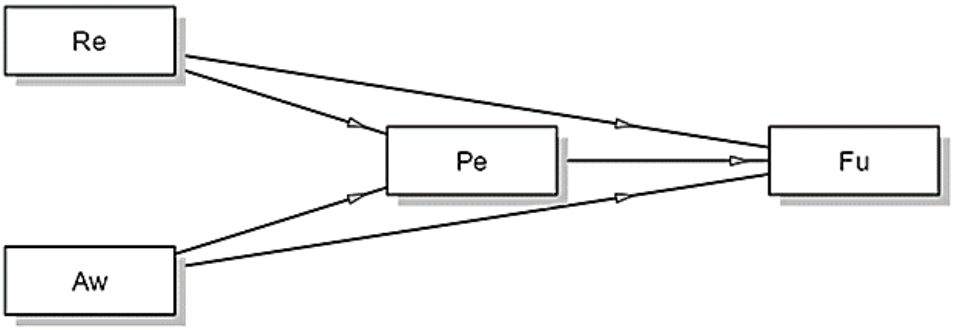


Figure 2: Structural Path Model Showing Direct and Mediated Effects

A generalized linear mediation model was estimated to examine the role of Perception of Human–Machine Collaboration (Pe) as a mediator between Readiness for Emerging Technologies (Re), Awareness of Digital Transformation & Industry 5.0 (Aw), and Future Readiness & Digital Trust (Fu). A mediation model using contrast-coded predictors revealed strong support for the hypothesized relationships. Perception emerges as the most influential construct, with the highest direct effect on Future Readiness ($\beta = .6912$, $p < .001$). Readiness shows both direct and indirect effects, whereas Awareness contributes predominantly through indirect influence via Perception. Collectively, the model explains a substantial proportion of variance in Future Readiness, suggesting consumer perceptions are central to Industry 5.0 adoption.

Overall, six of the seven hypotheses were supported. The results indicate that while informational awareness of Industry 5.0 is beneficial, emotional and cognitive perceptions of human–machine collaboration are the strongest drivers of future readiness. Readiness contributes both directly and indirectly, whereas Awareness affects future readiness only through perceptual pathways.

12. DISCUSSION

The findings bring out the significance of perception as an integral psychological factor promoting the acceptance of new technological innovations in the coming years. Although the consumers display a moderate level of awareness, it has been observed that their readiness plays a significant role in their perception and trust levels. The awareness of the consumers does not play a direct role in their readiness in the coming years.

All the above results support the global findings that emphasize the principles of Industry 5.0 in terms of empathy, trust, and personalization.

13. CONCLUSION

The results of the study suggest that consumer readiness and perception play a vital role in the success of the shift towards Industry 5.0. This readiness and awareness shape consumer perception, which in turn has a strong predicting effect of trust in the collaboration of humans and machines. Awareness alone is insufficient; positive perceptions and trust must accompany it to strengthen future readiness. The study suggests the significance of being human centric in the acceptance of Industry 5.0 technologies.

14. SUGGESTIONS

1. Enhance Digital Literacy Programs
2. Improve Transparency of AI Systems
3. Promote Human–Machine Interaction Experiences
4. Design Human-Centric Technology Interfaces

ISSN 2394 - 7780

5. Strengthen Digital Policies and Guidelines

15. LIMITATIONS

- Non-probability sampling restricts generalisability.
- Self-reported data may contain response bias.
- Study focuses only on Indian consumers.
- Cross-sectional design limits causal interpretation.

16. FUTURE SCOPE

Future research might focus on longitudinal research models, target various demographic groups, and benefit from sentiment analysis through the application of machine learning algorithms. Cross-national research could also help to improve the understanding of the readiness of Industry 5.0 globally.

17. REFERENCES

- Deloitte. (2024). *Digital readiness index: India report*. Deloitte Insights.
- European Commission. (2022). *Industry 5.0: Towards a sustainable, human-centric and resilient European industry*. Publications Office of the European Union.
- Kagermann, H. (2023). Industry 5.0: Human-centric manufacturing systems. *Journal of Industrial Engineering and Management, 16*(2), 45–58.
- McKinsey & Company. (2024). *Human + machine: The future of Industry 5.0*.
- MeitY. (2023). *India digital economy report 2023*. Ministry of Electronics & Information Technology, Government of India.
- Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research, 2*(4), 307–320.
- PwC. (2023). *Trust in digital transformation survey*. PricewaterhouseCoopers.
- Singh, R., & Sharma, S. (2021). Technology readiness and digital transformation in India: An empirical examination. *Journal of Business Research, 137*, 875–884.
- Statista. (2025). *Digital adoption and smartphone penetration in India*. Statista.
- Susanti, D., Setiawan, M., & Hartono, B. (2023). Digital transformation strategy and organizational performance: A systematic literature review. *Technology in Society, 73*, 102183.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems, 28*(2), 118–144.
- Hermawati, S. (2025). Human-centricity in Industry 5.0: Integrating emotional and cognitive readiness into digital transformation. *Journal of Human–Technology Interaction, 12*(1), 15–29.
- Rejeb, A., Rejeb, K., Keogh, J. G., & Gutiérrez, J. M. (2025). Mapping the evolution of Industry 5.0 research: A bibliometric and thematic analysis. *Technological Forecasting and Social Change, 208*, 122563.
- Adel, H. M. (2023). User trust, privacy, and adaptability in smart-city human–machine systems. *International Journal of Information Management, 73*, 102582.
- Paul, J., Mittal, A., & Roy, S. (2024). Understanding consumer readiness in digital transformation: A multi-dimensional framework. *International Journal of Consumer Studies, 48*(2), 367–382.
- Bakator, M. (2024). Marketing 5.0: Human-machine synergy and emotional engagement in AI-driven consumer environments. *Journal of Strategic Marketing, 32*(1), 112–128.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

APPLICATION OF ARTIFICIAL INTELLIGENCE IN BEHAVIOURAL FINANCE: A CONCEPTUAL STUDY ON INVESTOR SENTIMENT AND PSYCHOLOGICAL BIASES IN THE INDIAN STOCK MARKET

Dr Deepa C. Chandwani
Assistant Professor, R. J. Tibrewal Commerce College, Ahmedabad
deepachandwani1@gmail.com

ABSTRACT
Behavioural finance asserts that investor decision-making is shaped by human emotions and perceptual biases rather than full wisdom. In emerging markets such as India, investor sentiment often drives stock price fluctuations more strongly than fundamentals. With the rapid evolution of Artificial Intelligence (AI), sentiment extraction from large volumes of digital text has become feasible, providing new avenues to interpret investor psychology. This conceptual paper synthesises interdisciplinary perspectives, proposing a theoretical framework linking AI-derived sentiment indicators with behavioural biases and market outcomes. The model demonstrates how sentiment shapes short-term stock performance and volatility. The study advances theoretical and practical insights with implications for investors, regulators and future empirical researchers.

Keywords: *Behavioural Finance; Investor Sentiment; Artificial Intelligence; Indian Stock Market and Psychological Biases*

1. INTRODUCTION

Financial markets were historically examined through the lens of classical economic theory, which assumes that market participants behave rationally and process available information objectively, thereby reflecting all information efficiently in security prices. This assumption forms the foundation of the Efficient Market Hypothesis (Fama, 1970), which proposes that stock prices always incorporate all relevant information and investors cannot consistently achieve excess returns through prediction or timing strategies. However, real-world financial behaviour has increasingly demonstrated deviations from rationality, particularly during periods of uncertainty, speculation or emotional reaction to information.

The emergence of behavioural finance provides a counter-framework to traditional finance, arguing that investment decisions are significantly influenced by psychological factors, probing and cognitive biases rather than pure logic. Kahneman and Tversky's Prospect Theory (1979) was a landmark contribution that demonstrated how individuals evaluate gains and losses asymmetrically and frequently make irrational decisions under risk. Behavioural finance thus studies how mental shortcuts, emotional responses, social dynamics and perception distort financial judgment, leading to anomalies such as bubbles, crashes, momentum trading and herd-driven speculation.

1.1 Key Definitions

- **Behavioural Finance:** A field of financial study that integrates psychology with investment decision-making to understand how biases and emotional responses affect market outcomes. (Ricciardi & Simon, 2000).
- **Investor Sentiment:** A measure of the collective attitude, emotion and expectations of market participants toward financial assets, which may not necessarily align with fundamentals. (Baker & Wurgler, 2007).
- **Cognitive Biases:** Systematic errors in judgment that influence decision-making, such as overconfidence, loss aversion, herding and anchoring (Barberis & Thaler, 2003).
- **Artificial Intelligence in Finance:** The application of advanced computational techniques like machine learning, NLP and deep learning to analyse patterns, interpret qualitative data and support decision-making in financial markets (Jordan & Mitchell, 2015).
- **Sentiment Analysis:** A Natural Language Processing method that automatically identifies and quantifies emotional tone from textual data such as news articles, forums, and social media conversations (Liu, 2012).

1.2 Context for India

India's stock market has experienced massive retail investor participation in the past decade, owing to digital trading platforms, smartphone penetration and increased financial literacy. Events like demonetization (2016), the COVID-19 pandemic and startup IPO activity triggered strong sentiment-driven price swings. Retail-dominated markets such as India are highly sensitive to emotional and speculative forces, making behavioural analysis even more relevant.

ISSN 2394 - 7780

Simultaneously, Artificial Intelligence (AI) has emerged as a transformative force in financial analytics by enabling high-speed analysis of unstructured qualitative datasets such as tweets, news articles and investor discussion forums. AI-driven sentiment systems detect emotional trends, i.e. fear, greed, panic and optimism that traditional econometric models cannot capture. Therefore, integrating AI with Behavioural Finance presents a powerful approach for interpreting market psychology and forecasting short-term volatility.

This paper conceptually explores how AI-powered sentiment extraction can enhance understanding of investor psychology in India and proposes a theoretical model connecting AI sentiment analysis, behavioural biases and market outcomes.

1.3 Statement of Contribution

This paper offers three key contributions to behavioural finance. First, it integrates traditional behavioural theories with AI-based sentiment analysis to create a unified framework for understanding investor behaviour in emerging markets. Second, it identifies AI-generated sentiment as a new trigger for activating cognitive biases, extending existing behavioural models into technology-driven settings. Third, it presents a structured conceptual model linking AI sentiment, behavioural biases, investor sentiment and market outcomes, providing a strong foundation for future empirical and policy-focused research.

2. LITERATURE REVIEW

The intersection of behavioural finance and AI-based sentiment analysis has become a rapidly expanding research domain. The following studies highlight key developments, empirical insights and unresolved gaps:

2.1 Agrawal et al. (2024)

The study explored the complex interplay between extrinsic and intrinsic factors influencing human behavior in various contexts, including the stock market, with a focus on the impact of cognitive and emotional biases on investment decisions. It examined the ways in which these biases lead to suboptimal decisions, undermined market efficiency and contributed to market trends and anomalies, including momentum effects and bubbles. The key findings of this research revealed that cognitive and emotional biases significantly impacted investment decisions and that understanding and regulating these biases can improve market predictions and regulation.

2.2 Attaluri et al. (2024)

Attaluri and colleagues developed a hybrid deep learning model combining LSTM and sentiment-augmented forecasting. Using Indian banking sector data, their model significantly improved predictive accuracy when sentiment variables were added, highlighting that emotional reactions embedded in social media can produce stronger signals than historical price charts alone.

2.3 Gupta & Rao (2025)

Gupta & Rao highlighted how classification algorithms (e.g., random forests, SVMs) and clustering techniques (e.g., k-means, DBSCAN) can categorize investor behavior based on psychological tendencies, while natural language processing (NLP) models uncover sentiment-driven actions in response to market stimuli. The findings suggested that machine learning models can significantly enhance our understanding of irrational investor behavior, enabling more robust forecasting tools and personalized financial advising systems.

2.4 Liu, B. (2022)

Bing Liu's book explored the foundations of sentiment analysis and opinion mining, providing a comprehensive overview of key concepts and methods. It covered document-level, sentence-level and aspect-based sentiment classification approaches. The book also explained techniques for building sentiment lexicons, detecting opinion spam and summarizing opinions. It reviewed major applications across domains such as social media, reviews and information retrieval. Overall, it served as an authoritative survey of sentiment analysis widely used by researchers and practitioners.

2.5 Padmavathy (2024)

The researcher challenged the principles of rational finance theories by examining the significant impact of behavioural finance on stock market anomalies. The study demonstrated the impact of biases, emotions and cognitive errors on human behaviour, highlighting specific cognitive faults such as anchoring bias, overconfidence and loss aversion. It was held that hese flaws lead to distorted decision-making and contributed to market anomalies.

SYNTHESIS

Across the reviewed literature, several convergent themes emerge:

- Investor sentiment strongly influences short-term returns.

ISSN 2394 - 7780

- AI enhanced prediction systems offer meaningful improvements over traditional approaches.
- Indian retail investors are highly prone to psychological biases.
- Hybrid behavioural AI models remain underexplored but promising.

3. RESEARCH GAP

Although significant research exists globally on sentiment-based stock forecasting, several gaps remain, specifically for India:

- Limited application of real-time AI sentiment models on Indian datasets
- Psychological finance theories are seldom integrated into AI-based predictive models
- Excess focus on price-volume indicators rather than sentiment-driven investor behaviour
- Limited conceptual models linking sentiment metrics with behavioural bias constructs
- Lack of conceptual frameworks tailored for retail-driven emerging markets

This paper addresses these gaps by proposing a theory-driven conceptual research model.

4. Conceptual Model

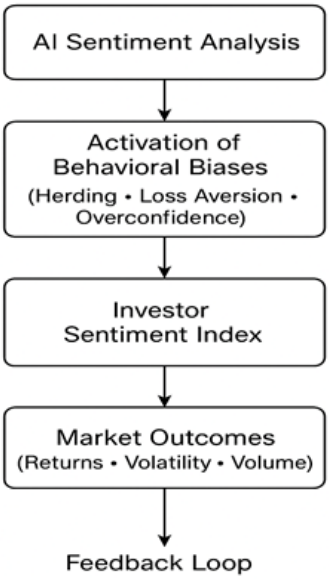


Diagram 4.1

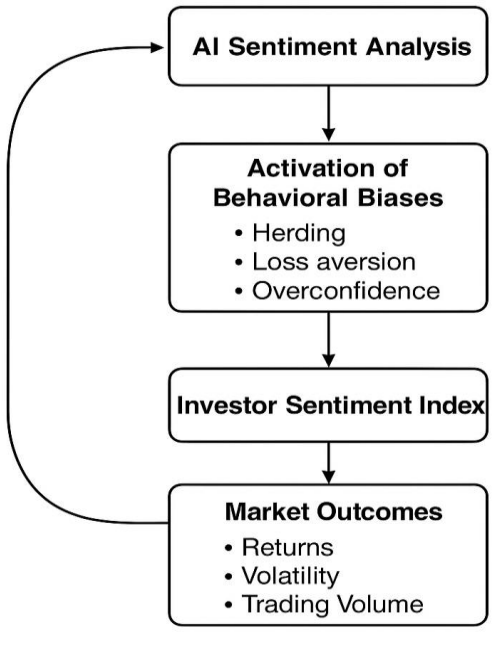


Diagram 4.2

ISSN 2394 - 7780

The diagram is a conceptual flow model showing how AI-driven sentiment influences investor psychology and ultimately, financial markets. It contains four main stages connected in a linear sequence, ending with a feedback loop that feeds back into the system.

1. AI Sentiment Analysis
- This is the starting point of the model.
- It represents artificial intelligence systems analysing text data (e.g., financial news, social media, reports).
- The AI extracts emotional tone - positive, negative, fear, optimism and uncertainty.

2. Activation of Behavioural Biases
- AI sentiment triggers investors' behavioural biases, such as:
  - Herding (following the crowd)
  - Loss aversion (fear of losses)
  - Overconfidence (excessive risk-taking during optimism)
- This step shows how psychology mediates the relationship between AI sentiment and investor actions.

3. Investor Sentiment Index
- The behavioural biases influence the overall Investor Sentiment Index.
- This index summarises market mood, whether investors collectively feel optimistic, fearful or uncertain.
- It acts as a measurable variable, often used in empirical research.

4. Market Outcomes
- Investor sentiment leads to observable market results, such as:

a) Returns (price movements)

b) Volatility (price fluctuations)

c) Trading volume (buying/selling activity)

- These reflect how emotions translate into actual market performance.

5. Feedback Loop
- Market outcomes then feed back into AI sentiment analysis.
- Example:

Market crash → negative news → AI detects fear → more behavioural biases → further selling.

- This loop shows that the system is dynamic, not one-way.

5. CONCEPTUAL PROPOSITIONS

Based on the literature synthesis, the following propositions are presented:

P1: AI-generated sentiment index positively correlates with short-term stock market returns.

P2: Sector-specific differences moderate the effect of sentiment on stock performance.

P3: Sentiment volatility increases return volatility.

P4: AI-derived sentiment polarity reflects psychological biases such as herding, loss aversion and overconfidence.

P5: Financial news sentiment has a stronger impact on market returns than social media sentiment.

6. RESEARCH DESIGN

6.1 Nature of the Study

This study adopts a conceptual, qualitative theory-building research design.

6.2 Research Type

- Conceptual research based on theoretical synthesis
- Foundation for future empirical validation through quantitative analysis

ISSN 2394 - 7780

6.3 Data Context and Basis
Although this paper is conceptual, future empirical expansion may draw data from:

- Social media investor discussions (Twitter, Reddit)
- Financial news articles and market reports
- NSE/BSE stock price and volatility indicators

6.4 Theoretical Foundation
The research aligns with:

- Prospect Theory (Kahneman & Tversky)
- Behavioural Bias Theory (Shefrin)
- Sentiment Return Relationship Theory

6.5 Expected Outcome
Provides a structured framework for future empirical testing using:

- Machine learning models
- NLP-based sentiment extraction
- PLS SEM or regression modelling

7. MANAGERIAL AND POLICY IMPLICATIONS
The integration of Artificial Intelligence with behavioural finance provides meaningful implications for investors, portfolio managers, regulatory authorities and market designers.

7.1 Managerial Implications
For practitioners in investment and risk management, the findings of this study suggest several actionable implications:

- **Sentiment-based Trading Strategies:** Portfolio managers may incorporate sentiment indices derived from news and social media into trading algorithms to anticipate short-term price fluctuations driven by investor psychology rather than fundamentals.
- **Risk Mitigation & Early Warning Systems:** Sentiment volatility monitoring can serve as a leading indicator of potential market instability, allowing risk managers to hedge positions or reallocate assets proactively.
- **Behavioural Profiling of Market Participants:** Understanding biases such as overconfidence and herd mentality helps advisors tailor financial planning and improve client outcomes.
- **Enhanced Decision Support Systems:** Combining quantitative models with sentiment-derived insights allows hybrid decision frameworks superior to purely technical or fundamental approaches.

7.2 Policy and Regulatory Implications
For policy-makers, market supervisors, and institutions such as SEBI, AI-driven sentiment analysis offers a strategic tool for enhancing market transparency, regulatory oversight, and investor protection:

- **Market Surveillance & Fraud Detection:** Real-time sentiment dashboards can help monitor rumours, speculation waves, misinformation, and manipulative pumping activity.
- **Behaviour-based Regulation:** Recognising psychological triggers allows SEBI to develop educational programs and communication strategies to protect retail investors from herd-driven losses.
- **Support for Algorithmic Transparency:** Policies promoting explainable AI systems may reduce model opacity and foster responsible adoption of machine learning in financial markets.
- **Crisis Prediction Models:** Emotional sentiment surges can function as early signals for liquidity shocks, allowing proactive regulatory stabilisation.

Collectively, these implications emphasise that AI is not only a forecasting tool but also a behavioural intelligence instrument capable of improving market stability, decision quality, and investor welfare.

ISSN 2394 - 7780

8. THEORETICAL CONTRIBUTION OF THE STUDY

1. **Integrates classical behavioural theories with modern AI**
a. Prospect Theory
b. Behavioural Bias Theory
c. Sentiment Return Relationship Theory
d. Shows how this works together in emerging markets (India)
2. **Positions AI-derived sentiment as a behavioural stimulus**
a. AI sentiment polarity triggers biases
b. Introduces a new antecedent to psychological biases
c. Connects technology signals with investor cognition
3. **Establishes investor sentiment as a mediating psychological mechanism**
a. AI sentiment → Bias activation → Investor sentiment → Market outcomes
b. Provides a structured pathway for empirical testing

9. FUTURE RESEARCH DIRECTIONS

9.1 Empirical Validation
- Use NLP based news sentiment
- Use social media sentiment (Twitter, Reddit, Stock Twits India)
- Apply machine learning forecasting
- Validate behavioural constructs using PLS SEM

9.2 Sector Level Moderation
- Identify sentiment sensitive sectors (IT, Banking)
- Compare defensive vs volatile industries
- Test effects during market crises

9.3 Cross-Market Comparisons
- India vs other emerging markets
- Cultural factors affecting sentiment responses

9.4 Expanding Behavioural Variables
- Anchoring
- Confirmation bias
- Regret aversion

10. LIMITATIONS OF THE STUDY

1. **Conceptual nature of the model**
a. No empirical testing conducted
b. Relationships remain theoretical
2. **AI sentiment limitations**
a. Sarcasm detection challenges
b. Context sensitivity issues
c. Algorithmic bias and opacity
3. **Market-specific focus**
a. Model tailored to India
b. Limited generalizability to global markets

ISSN 2394 - 7780

4. **Behavioural constructs complexity**
a. Hard to capture all biases using sentiment alone.

b. Psychological constructs may require survey data.

5. **Rapid AI evolution**
a. Algorithms and datasets evolve quickly

b. Conceptual frameworks may need updates

CONCLUSION

The integration of AI sentiment analytics with behavioural finance provides deeper insight into market dynamics driven by psychological factors in India. The conceptual model strengthens the theoretical groundwork for future empirical and comparative studies.

REFERENCES

- Agrawal, S. S., Sahai, K. P., & Gopal, J. V. (2024). Behavioral Finance and Market Anomalies: Explore How Cognitive Biases and Emotional Factors Influence Investor Behavior and Lead to Market Anomalies. *Library of Progress-Library Science, Information Technology & Computer*, *44*(3).
- Attaluri, K., Tripathi, M. K., & Reddy, S. (2024, September). News-Driven Stock Price Forecasting in Indian Markets: A Comparative Study of Advanced Deep Learning Models. In *2024 3rd International Conference for Advancement in Technology (ICONAT)* (pp. 1-7). IEEE.
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of economic perspectives*, *21*(2), 129-151.
- Barberis, N., & Thaler, R. (2003). A survey of behavioral finance. *Handbook of the Economics of Finance*, *1*, 1053-1128.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of Finance*, *25*(2), 383-417.
- Gupta, S., & Rao, M. V. S. AI in Behavioral Finance: Understanding Investor Bias Through Machine Learning.
- Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. *Science*, *349*(6245), 255-260.
- Kahneman, D., & Tversky, A. (2013). Prospect theory: An analysis of decision under risk. In *Handbook of the fundamentals of financial decision making: Part I* (pp. 99-127).
- Liu, B. (2022). *Sentiment analysis and opinion mining*. Springer Nature.
- Padmavathy, M. (2024). Behavioral finance and stock market anomalies: Exploring psychological factors influencing investment decisions. *Shanlax International Journal of Management*, *11*(S1), 191-97.
- Ricciardi, V., & Simon, H. K. (2000). What is behavioral finance?. *Business, Education & Technology Journal*, *2*(2), 1-9.
- Shefrin, H. (2002). *Beyond greed and fear: Understanding behavioral finance and the psychology of investing*. Oxford University Press.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

IMPACT OF AI ON LOGISTICS SECTOR

Mr. Swayam Patke[1] and Ms. Ramaa Naniwadekar[2]
[1]Alumnus, Thakur College of Science and Commerce, Mumbai
[2]Assistant Professor, Thakur College of Science and Commerce, Mumbai
[1]swayampatke@gmail.com and [2]ramaa.tcsc@gmail.com

ABSTRACT
Artificial Intelligence (AI) is revolutionizing the logistics and freight forwarding industry by enhancing operational efficiency, automation, and data-driven decision-making. This study examines AI's impact on key logistics functions, including freight forwarding, stock calculation, product identification, loss reduction in transit, cost efficiency, customer and courier tracking, late delivery prevention, and customs processing. Findings indicate that while AI significantly improves stock management, tracking, and freight operations, its role in cost reduction and loss prevention remains debatable. The paper also explores AI adoption among leading logistics firms in India, highlighting both the opportunities and challenges AI presents in optimizing supply chain operations.

INTRODUCTION
Artificial Intelligence (AI), a term coined by emeritus Stanford Professor John McCarthy in 1955, was defined by him as "the science and engineering of making intelligent machines". Much research has humans program machines to behave in a clever way, like playing chess, but, today, we emphasize machines that can learn, at least somewhat like human beings do.

The Economic Survey 2024-25 highlights the rapid adoption of AI in India's services sector, making significant impacts in banking, finance, healthcare, telecom, retail, and logistics. AI enhances customer experiences, operational efficiency, and fraud detection in banking; optimizes networks in telecom; improves personalized marketing in retail; and streamlines logistics through advanced route optimization and robotic systems.

The logistics sector is considered a major and crucial part of the Indian economy, contributing significantly to the country's GDP by facilitating the efficient movement of goods and services across the supply chain, thereby playing a key role in economic development and employment generation; estimates place its contribution to GDP at around 13-14%. Logistics being a major sector of economy of India, the presence of AI in this sector has greater influence on the country's economy.

OBJECTIVES OF THE STUDY
- To understand the impact of AI on freight forwarding.
- To analyze impact of AI on stock calculation.
- To understand helpfulness of AI in identifying characteristic of product.
- To analyse has AI reduced lost in transit.
- To analyse whether there is overall cost reduction in logistic due to AI.
- To understand whether AI is effective in customer and courier tracking communication.
- To analyse whether there is decrease in late delivery due to AI.
- To understand whether AI has proved to be boon to custom house agent.

METHODOLOGY
The study is based on primary as well as secondary data related to logistics sector in India.

The primary data is collected with the help of structured questionnaire with Likert 5-pointer scale from 11 logistic sector companies in India. GOCARGO Pvt. Ltd., Teamglobal Logistics Pvt. Ltd. CASIA Global Logistics Pvt Ltd., Mass Logistics Private Limited, Allcargo Logistics Limited, Uniworld Logistics Pvt. Ltd., Sunrise Freight Forwarders Pvt. Ltd., Sanfreight Logistics Pvt. Ltd., GAF Global Logistics Pvt. Ltd., Kerry Indev., Global Logistics Solutions I Pvt. Ltd. are the 11 companies considered for this study.

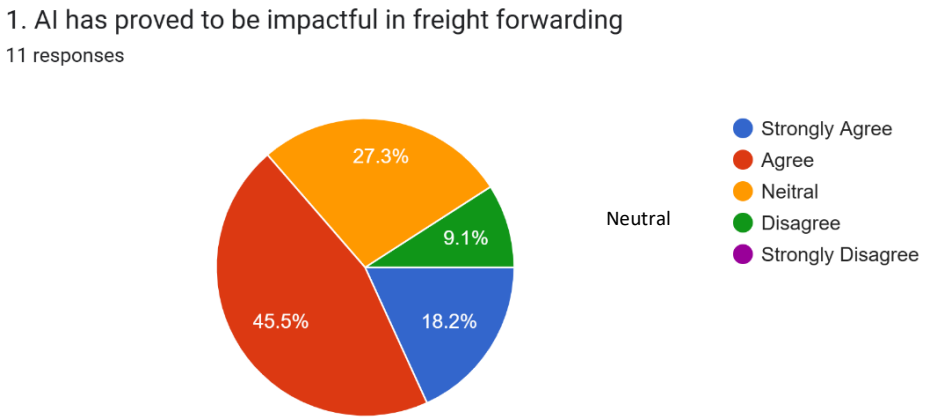
The secondary data is taken from various government reports, newspaper articles, and trusted websites.

ISSN 2394 - 7780

THE IMPACT OF AI ON FREIGHT FORWARDING

Freight forwarding is the process of managing the movement of goods between companies and countries. Freight forwarders act as intermediaries between the shipper and the destination. They work with shipping companies, airlines, and customs authorities.

In fact, Knut Alicke, Valerio Dilda, Stephan Görner, Lapo Mori, Pierrick Rebuffel, Sebastian Reiter, and Robert Samek in the article 'Succeeding in the AI Supply-chain Revolution' report that early adopters of AI in logistics and supply chain significantly outperformed their competitors, showing a 15% reduction in logistics costs, a 35% decrease in inventory levels, and a 65% increase in service levels.

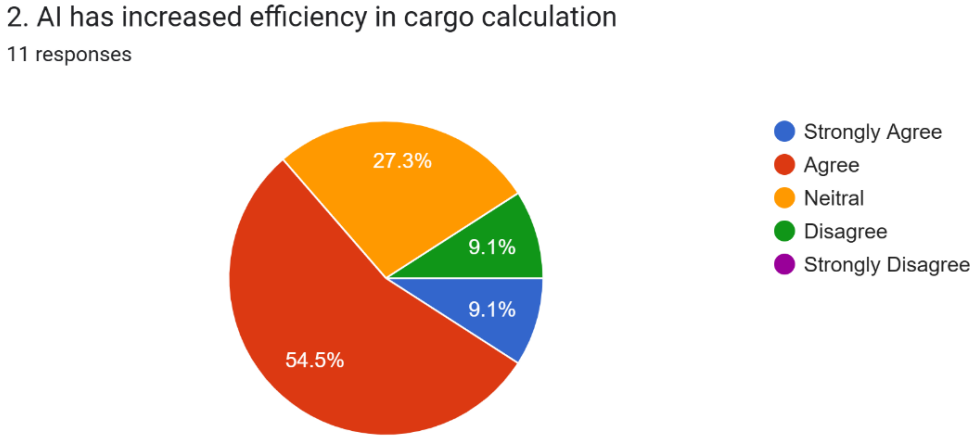


As in the above data we can observe that 63.7% respondents agree that AI is impactful for freight forwarding. 27.3% are neutral about this, while 9.1% disagree.

IMPACT OF AI ON STOCK CALCULATION

In a logistics company, "stock calculation" refers to the process of determining the exact quantity of inventory (products) currently held in a warehouse, which is done by calculating the difference between the received goods and the goods shipped out, allowing the company to manage their stock levels efficiently and avoid stockouts or overstocking; it often involves factors like average demand, lead time, safety stock, and reorder points to maintain optimal inventory levels.

According to Nick Shorthose AI will create the ability to automatically see stock levels and initiate stock replenishment based on demand. This will help product availability and minimize manual inventory tracking.

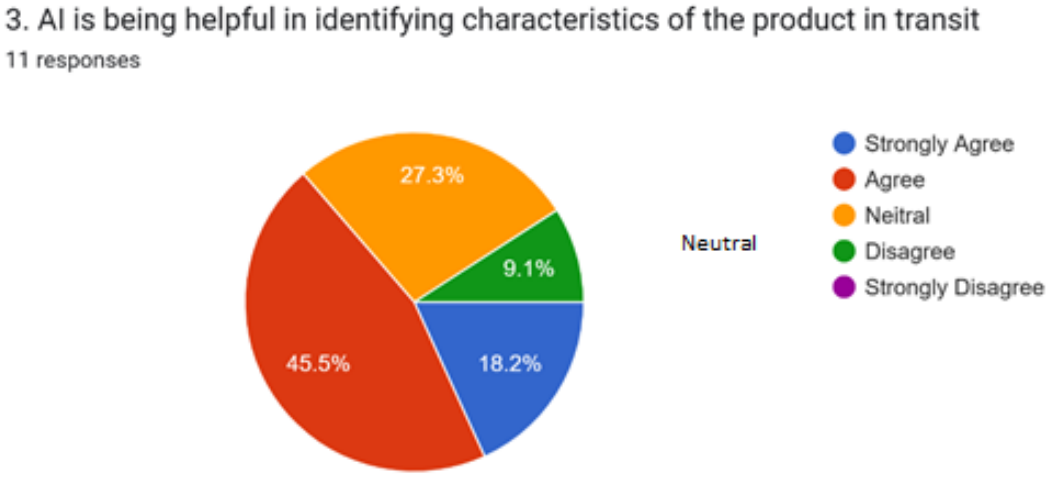


While observing the above data it can be concluded that 63.6% of the companies agree with the statement that AI has positive impact on stock calculation in logistic companies. However, 27.3% take neutral stance on it, while 9.1& disagree with the statement.

HELPFULNESS OF AI IN IDENTIFYING CHARACTERISTIC OF PRODUCT

In the world of logistics, understanding the characteristics of a product is crucial for effective management and transportation. Product characteristics refer to all the elements that define a product's character, including its size, shape, weight, and other relevant attributes. By analysing data and predicting demand for products, AI can help businesses to avoid overstocking or understocking warehouses, which can result in increased overheads for storage or lost revenue for items in demand but not in stock.

ISSN 2394 - 7780

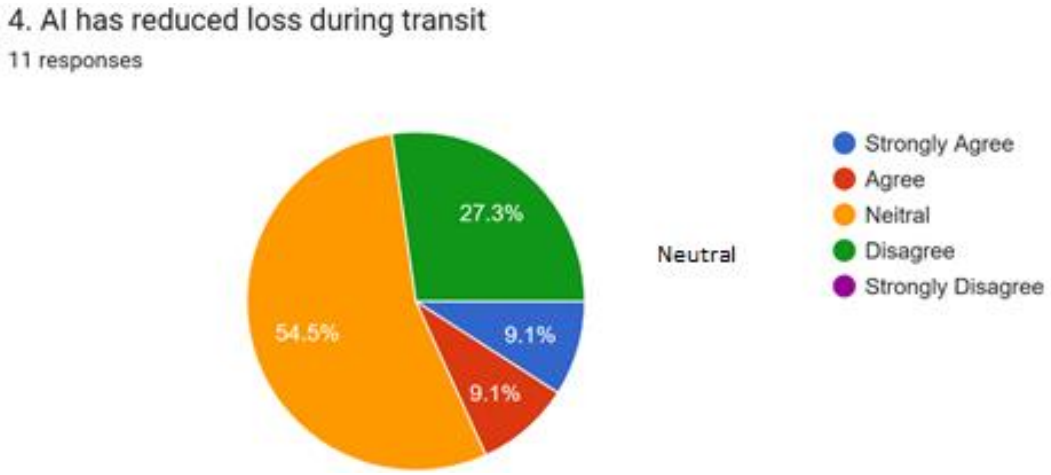


As we can observe in the data, 63.7% of the respondents agree with the statement that AI is beneficial for identifying the characteristic of the product. However, 27.3% take neutral stance on it, while 9.1% disagree with the statement.

AI REDUCED LOSS IN TRANSIT

"Loss in transit" in logistics refers to the situation where goods being transported from one location to another are lost or go missing during the shipment process, meaning they never reach the intended destination, potentially due to accidents, theft, mishandling, or other factors while in transit.

AI can optimize transport routes, accounting for traffic, weather, and delivery locations, as well as the impact of worker strikes. With optimized routes, companies can reduce carbon emissions and fuel consumption and move more products more quickly. AI can help resolve product return issues



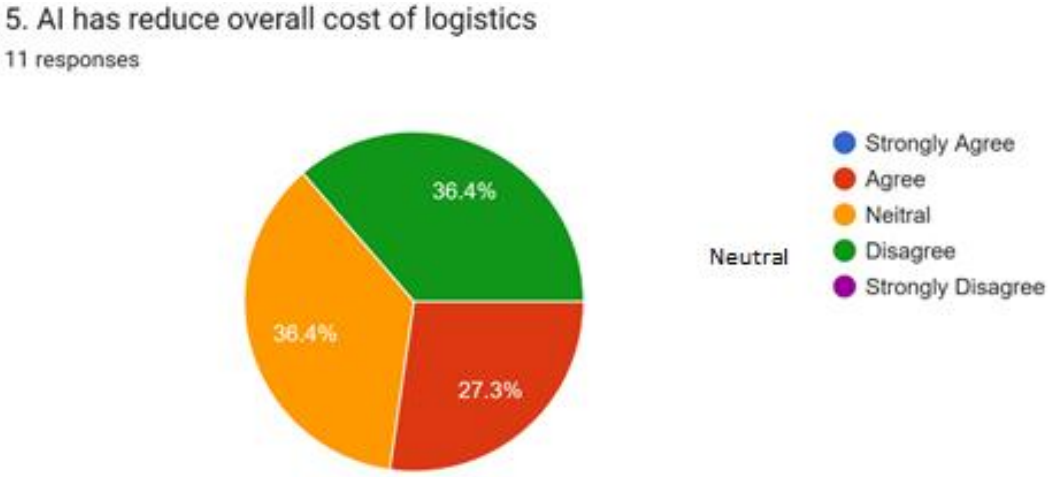
While observing the above data we can conclude that majority of the companies stand neutral for the statement that AI reduce loss in transit.

AI HAS REDUCED OVERALL COST OF LOGISTICS

The "overall cost" in a logistics company refers to the sum of all expenses incurred throughout the entire process of moving goods from the point of origin to the end consumer, including transportation, warehousing, inventory management, packaging, labor, administrative costs, and any other related expenses involved in the supply chain operation.

Artificial Intelligence, has been able to significantly reduce overall costs in logistics companies by optimizing various aspects of operations, including route planning, warehouse management, inventory control, and transportation, through advanced data analysis and automation, leading to increased efficiency and streamlined processes across the supply chain.

ISSN 2394 - 7780

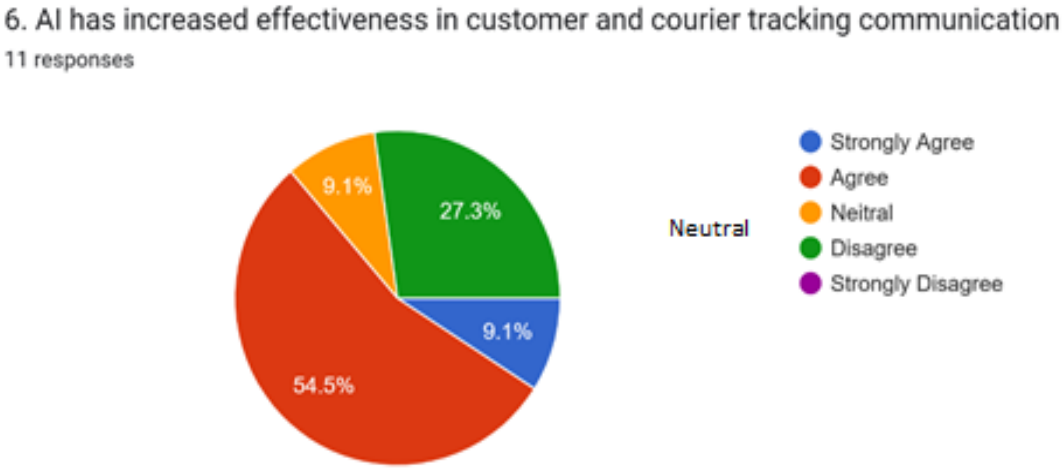


By observing the above data, we can conclude that companies do not necessarily support the statement that AI has reduced overall cost of logistics. That is reflected in the data where only 27.3% agree with the statement while 36.4% disagree and 36.4% are neutral about the statement.

AI IS EFFECTIVE IN CUSTOMER AND COURIER TRACKING COMMUNICATION

In a logistics company, "customer and courier tracking communication" refers to the process of providing customers with regular updates on the location and status of their deliveries through a tracking system, typically accessible online, allowing them to monitor their package's progress in real-time throughout the shipping journey, usually via notifications like emails or text messages sent by the courier service.

AI plays a crucial role in customer and courier tracking communication within a logistics company by enabling real-time shipment tracking, providing accurate delivery estimations, proactively notifying customers about potential delays, and overall enhancing transparency and customer satisfaction through constant updates on package status, ultimately leading to improved customer experience and operational efficiency



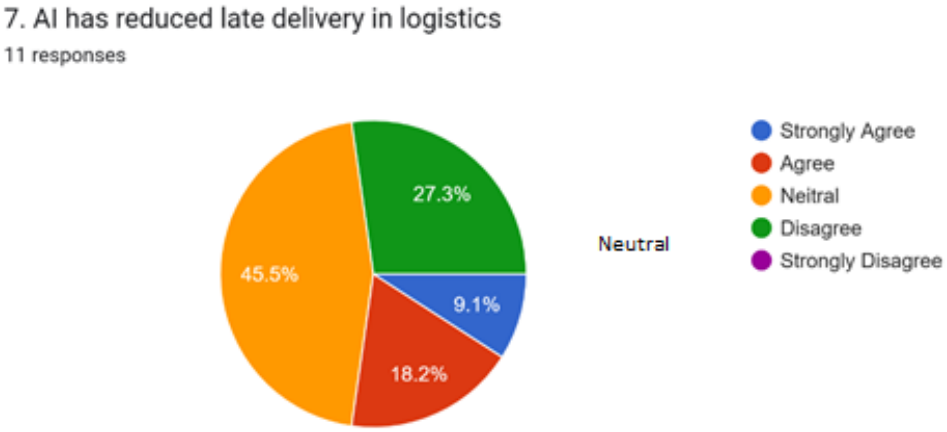
63.7% of the respondents agree with the statement that increased effectiveness in customer and courier tracking communication. However, 27.3% disagree with the statement, while 9.1% take neutral stance on it.

FALL IN LATE DELIVERY DUE TO AI

Late deliveries occur when goods or services are delivered after the expected time. This can happen for many reasons, including supply chain issues, transportation problems, and unforeseen circumstances.

Artificial Intelligence (AI) plays a crucial role in reducing late deliveries in logistics by analyzing vast amounts of data in real-time to optimize delivery routes, predict potential disruptions like traffic congestion or weather events, and proactively adjust schedules, ultimately leading to more efficient and timely deliveries.

ISSN 2394 - 7780

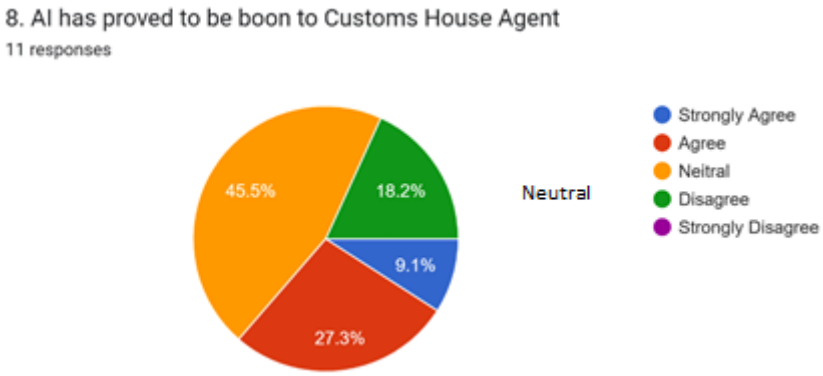


Observing the about data we can conclude that major surface area of pie chart stand neutral thus not giving a clear conclusion of agreeing or disagreeing the positive impact of AI on reduction in the late delivery

AI – A BOON TO CUSTOM HOUSE AGENT

A customs house agent (CHA) is a licensed professional who helps with customs clearance for imports and exports. They act as a liaison between traders and customs authorities.

AI can automate customs declarations and compliance inspections. AI can extract essential information from trade documents, check data accuracy, and streamline customs processing using Natural Language Processing (NLP).



By observing the above data we can conclude that only 36.4% of the companies believe that AI brings benefits to custom House Agent. A major share of companies (45.5%) are neutral about it, while 18.2% completely disagree with the statement.

FINDINGS

Key findings from the study include:

1. AI's Overall Impact on Freight Forwarding – A majority (63.7%) believe AI positively impacts freight forwarding, with 27.3% neutral and 9.1% disagreeing. Early adopters of AI have seen significant cost reductions and efficiency improvements.
2. Stock Calculation – 63.6% of companies agree AI improves stock calculation by automating stock level monitoring and replenishment. However, 27.3% remain neutral, and 9.1% disagree.
3. Product Characteristic Identification – AI is seen as beneficial by 63.7% of respondents, aiding in demand forecasting and warehouse management. A neutral stance is taken by 27.3%, while 9.1% disagree.
4. Loss in Transit – There is no strong consensus on AI reducing loss in transit, as most respondents remain neutral. AI helps optimize transport routes and mitigate risks.
5. Reduction in Logistics Costs – Only 27.3% agree to the statement that AI reduces logistics costs, while 36.4% disagree and 36.4% are neutral, indicating skepticism about AI's direct financial impact.
6. Customer & Courier Tracking – AI enhances real-time tracking and communication, with 63.7% agreeing, 27.3% disagreeing, and 9.1% neutral.

ISSN 2394 - 7780

7. Reduction in Late Deliveries – Data does not provide a clear consensus, as most respondents remain neutral on AI's role in improving on-time deliveries.
8. Support for Customs House Agents (CHAs) – AI's benefits for CHAs receive mixed responses, with only 36.4% agreeing, 45.5% neutral, and 18.2% disagreeing. AI automates customs processes but adoption remains uncertain.

CONCLUSION

AI is transforming freight forwarding and logistics by improving efficiency in stock calculation, product identification, and tracking, with over 60% of companies recognizing its benefits. However, its impact on reducing costs, loss in transit, and late deliveries remains inconclusive, with many respondents taking a neutral stance. While AI automates customs processes, its role in supporting customs house agents is still debated. Overall, AI enhances supply chain operations but faces scepticism regarding its financial and operational impact in some areas. Adoption continues to grow, but businesses remain cautious about its full potential in logistics cost reduction and loss prevention.

REFERENCES

- Accenture. (2017). *AI: Fueling India's economic growth.* https://www.accenture.com/content/dam/accenture/final/a-com-migration/r3-3/pdf/pdf-153/accenture-ai-for-economic-growth-india.pdf
- Ministry of Finance, Government of India. (2025). *Economic Survey 2024-25.* https://www.indiabudget.gov.in/economicsurvey/
- Modgil, S., Singh, R. K., & Gupta, S. (2022). *Artificial intelligence and logistics: Recent trends and development. Preprints, 202410.2141.* https://www.preprints.org/manuscript/202410.2141/v1
- NASSCOM. (n.d.). *Implications of AI on the Indian economy.* https://nasscom.in/knowledge-center/publications/implications-ai-indian-economy
- Paul, S. K., Riaz, S., & Das, S. (2022). *Adoption of Artificial Intelligence in Supply Chain Risk Management: An Indian Perspective. Global Journal of Flexible Systems Management, 23*, 77–97. https://doi.org/10.1007/s40171-022-00290-0
- Sekhani, R., & Kedia, M. (2021). *Potential impact of artificial intelligence on the Indian economy. International Association for Research in Income and Wealth.* https://iariw.org/wp-content/uploads/2021/07/Sekhani_Kedia_Paper.pdf

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

PERFORMANCE EVALUATION OF ESG INVESTMENTS IN INDIA USING MSCI ESG RATINGS: AN ANALYSIS OF FINANCIAL RETURNS, RISK, AND INVESTOR PERCEPTION USING PRIMARY AND SECONDARY DATA (2020–2025)

Dr. Sadamhusen M. Timbaliya
Assistant Professor, Shree R. P. Arts Shree K. B. Commerce and Smt. B. C. J. Science College, Khambhat

ABSTRACT
This study aimed to evaluate the performance of ESG (Environmental, Social, and Governance) investments in India using MSCI ESG Ratings data from April 2020 to April 2025. The research focused on assessing financial returns, risk, and stability of ESG portfolios, analyzing the relationship between ESG scores and investment returns, and comparing ESG-focused investment strategies with conventional strategies. A mixed-method approach was adopted, involving both primary and secondary data collection. Primary data was collected from 300 respondents in Ahmedabad city using a structured questionnaire to understand investors' awareness, perceptions, and investment behavior toward ESG products. Secondary data was sourced from MSCI ESG Ratings reports, NSE/BSE stock data, mutual fund performance data from AMFI, and SEBI research publications. Statistical tools such as descriptive statistics, normality tests, reliability tests, t-tests, ANOVA, correlation, and regression analysis were applied to evaluate data and test hypotheses. The study revealed a strong positive relationship between ESG ratings and financial returns, with high ESG-rated companies showing better stability and lower risk. ESG-focused portfolios demonstrated higher risk-adjusted returns compared to conventional investment strategies. Additionally, investors with greater awareness of ESG principles tended to prefer ESG-aligned investment options. The findings suggest that integrating ESG considerations into investment decisions can enhance both financial performance and sustainability. This research provides useful insights for individual and institutional investors aiming for long-term, responsible investment strategies in the Indian market.

Keywords: *ESG investments, MSCI ESG Ratings, financial performance, risk-adjusted returns, India.*

INTRODUCTION
In recent years, the focus of Indian investors and companies has shifted significantly from purely financial returns to how businesses treat the environment, society and their own governance. The idea of sustainable investing one that places equal emphasis on "doing good" and "doing well" has gained traction across the country. Among the many tools that help assess this shift, the MSCI ESG Research LLC (commonly "MSCI ESG") ratings stand out, because they evaluate how resilient a company is in managing environmental, social and governance (ESG) risks and opportunities (MSCI ESG Research, 2024). In the Indian context, these ratings offer a way to measure whether firms that score higher on ESG factors deliver better investment performance compared to those that don't. However, the relationship is not so straightforward. Research in India suggests mixed evidence: some firms with strong ESG ratings have shown slightly better risk-adjusted performance, particularly during market downturns (Hasan, Singh & Kashiramka, 2025), while others find that high ESG scores do *not* guarantee superior returns (Narula, 2024).

This gap between ESG ratings and performance becomes very important in India. On one hand, India's listed firms are increasingly rated by MSCI for their ESG practices, and the share of "leader" companies is rising, while laggards are falling (MSCI, 2024). On the other hand, India's regulatory and market environment has its own features: mandatory disclosure requirements under the Business Responsibility and Sustainability Reporting framework, evolving corporate social responsibility norms, and a fast-growing equity market. All these make the Indian story different from developed markets. Thus, when an investor uses MSCI ESG ratings to pick stocks or build portfolios, it's useful to ask: *Do these ratings translate into better returns or lower risk in India?*

In this paper, we explore the performance of ESG-investments in India using MSCI ESG data. We examine how firms with higher ESG scores behave in terms of returns, risk and resilience, especially in times of turbulence. We also check how India-specific conditions such as regulatory changes, disclosure practices and market structure may moderate the ESG-performance link. By doing this, the aim is to provide guidance for Indian investors, fund managers and policy-makers on whether ESG ratings are a reliable input for performance evaluation, or whether more caution is needed.

The structure of the discussion is as follows: first we provide background on how MSCI ESG ratings are constructed, highlighting major components and methodology (MSCI ESG Research, 2024). Next, we briefly review global and Indian literature on the ESG-performance relationship, noting that while developed markets

ISSN 2394 - 7780

show a generally positive link (MSCI, 2024), Indian studies show more variation (Rao, 2023; Hasan et al., 2025). Then we describe the Indian context: regulatory frameworks, market features and investor behaviour. Finally, we outline how we will analyse ESG performance in India using MSCI ratings—looking at returns, risk-adjusted measures, and performance in downturns. The broader goal is to help bridge the gap between theory and practice in sustainable investing in India—whether ESG really "pays off", or whether the story needs nuance and caution in the Indian setting.

1. Understanding ESG Investments

ESG investments focus on three major aspects—Environmental, Social, and Governance. Rather than only looking at a company's financial performance, this approach examines how responsibly the company operates. Environmental factors include a firm's impact on climate, energy efficiency, and waste management. Social factors involve labour practices, employee welfare, gender equality, and community engagement. Governance deals with transparency, ethical leadership, and shareholder rights. In India, the concept of ESG investing has gained strong momentum over the last decade. Investors are increasingly aware that companies which behave responsibly and operate sustainably are more likely to succeed in the long run. For example, a company investing in green energy not only reduces its environmental impact but also lowers operational risks in the future. Similarly, strong governance builds investor trust. ESG investments are not just about "doing good"; they represent a shift toward smarter and more informed investing. Indian mutual funds and institutional investors are now aligning their strategies with ESG principles to attract global capital, enhance reputation, and secure stable returns. This marks a move from short-term speculation to sustainable wealth creation in the Indian market.

2. Role of MSCI ESG Ratings

MSCI ESG Research provides one of the most recognized frameworks to evaluate companies based on ESG performance. MSCI ESG Ratings classify companies on a scale from "AAA" (leaders) to "CCC" (laggards) by analysing how well they manage risks and opportunities related to environmental, social, and governance factors. These ratings are based on over 35 ESG issues, including climate change policies, board diversity, labour management, data security, and business ethics. For investors, these ratings act as a reliable signal of long-term sustainability. Instead of relying only on financial statements, investors can assess how prepared a company is to handle future uncertainties. In India, MSCI ratings are increasingly being used by asset managers, mutual funds, and institutional investors to build portfolios that combine financial returns with responsible practices. These ratings also help companies understand their position in the global ESG landscape. High ratings can attract foreign investment, improve reputation, and reduce financing costs. On the other hand, weak ratings can signal reputational and regulatory risks. Thus, MSCI ESG Ratings act as a bridge between responsible corporate behaviour and investor confidence.

3. Why ESG Ratings Matter in India

The importance of ESG ratings in India is growing rapidly as sustainability becomes a core part of business strategy. With increasing climate concerns, regulatory changes, and investor awareness, companies with strong ESG ratings have an advantage. In India, sectors like energy, manufacturing, and finance are under pressure to disclose their sustainability performance. ESG ratings help identify companies that manage risks effectively and comply with evolving regulations such as the Business Responsibility and Sustainability Reporting (BRSR) framework. Moreover, investors are becoming more sensitive to issues like pollution, workplace safety, fair wages, and ethical governance. High ESG scores build credibility, reduce legal risks, and create goodwill among stakeholders. For India, which aims for rapid economic growth while addressing environmental challenges, ESG becomes a tool to balance development and responsibility. Furthermore, global investors often prefer companies with reliable ESG data, making ESG ratings a gateway for foreign capital inflow. For Indian companies, a strong ESG profile is no longer optional—it is becoming essential for competitiveness in both domestic and international markets.

4. How ESG Ratings Influence Investment Decisions

ESG ratings are increasingly shaping how investors make their decisions in India. Traditionally, investors evaluated companies based on profitability, balance sheets, and growth potential. Now, ESG data adds another layer of insight. Investors use MSCI ESG Ratings to filter companies that are environmentally irresponsible, socially non-compliant, or poorly governed. This helps reduce exposure to future risks like penalties, reputational damage, or operational disruptions. Many asset managers in India are designing ESG-based funds and portfolios that attract socially conscious investors. For example, companies with higher ESG ratings are seen as more stable and resilient during market downturns. Moreover, young investors are more likely to prefer sustainable investment options. ESG factors also affect valuation—companies with good ESG profiles often

trade at premium valuations due to lower perceived risks. Institutional investors, including pension funds and insurance firms, are now embedding ESG screening into their investment strategies. As the Indian financial ecosystem matures, ESG data will likely play a central role in defining investment flows, influencing both short-term choices and long-term asset allocation.

5. Performance and Risk Aspects

One of the key reasons investors are drawn to ESG investing is its potential impact on risk and return. Companies with strong ESG ratings often show better operational efficiency, stronger risk management, and more stable cash flows. These factors contribute to improved performance over time. In India, several studies suggest that firms with high ESG scores are less volatile and perform better during periods of market stress. For instance, during economic disruptions, companies with sustainable practices tend to adapt faster and maintain investor confidence. Although ESG investments may not always guarantee the highest short-term profits, they can help minimize losses in turbulent markets. ESG also lowers exposure to regulatory fines, legal cases, and reputational crises, which often impact poorly governed firms. Investors see ESG ratings as a form of "insurance" against future risks. Additionally, stable companies with long-term strategies tend to attract patient capital, contributing to steady growth. Hence, the performance of ESG investments is not only measured in returns but also in their ability to manage risks effectively in uncertain market conditions.

6. Future of ESG Investing in India

The future of ESG investing in India looks promising as both the regulatory environment and investor mindset evolve. India's focus on achieving sustainable growth, clean energy, and responsible business practices aligns well with ESG principles. Regulatory bodies are pushing companies to disclose their ESG performance transparently through frameworks like BRSR. This will make ESG data more standardized and trustworthy. In the coming years, ESG ratings from MSCI will likely become a key parameter for investment screening, credit decisions, and capital allocation. Mutual funds, sovereign wealth funds, and pension funds are expected to allocate more resources to ESG-based portfolios. Moreover, global investors view India as a critical emerging market, and strong ESG practices can help attract foreign investments. Companies with high ESG standards will enjoy better financing terms, improved brand value, and stronger investor trust. As younger generations become more conscious about social and environmental issues, demand for ESG products will grow further. Overall, ESG investing in India is expected to move from being an option to a necessity—integrating responsibility and profitability into one framework.

LITERATURE REVIEW

1. **Hasan et al., (2025)** explored how ESG scores affect financial performance in the Indian market. They used panel data from listed firms and analyzed ESG scores from MSCI. The study applied asset-pricing models and regression techniques to evaluate investment performance. Results indicated that firms with higher ESG ratings showed better stock returns during periods of economic uncertainty. The analysis also found that ESG leaders attract more stable investments. The study concluded that ESG factors are not just ethical but also financially rewarding in India.
2. **Srivastava, (2025)** explored investor behavior toward ESG funds in India. The study employed primary surveys and secondary ESG score data from MSCI to assess investment preferences. Using statistical tools like factor analysis and regression, it found ESG funds are increasingly preferred for their stability and ethical values. The author concluded that ESG-oriented investments are becoming mainstream in Indian markets.
3. **Maji & Lohia, (2023)** examined the link between ESG practices and firm performance in the Indian Nifty 50 index. They applied econometric models to panel data over a five-year period, using MSCI ESG scores as the main variable. Findings showed that companies with strong ESG ratings experienced lower volatility and higher returns. The methodology emphasized fixed-effects models to ensure robust results. They concluded that ESG integration enhances financial resilience and supports long-term investor confidence.
4. **Beloskar, (2022)** focused on whether ESG principles safeguarded firms during the pandemic crisis. The study considered Indian firms with publicly available ESG scores from MSCI and applied event study methodology to compare performance before and after the pandemic shock. The findings highlighted that high ESG firms suffered less negative impact compared to low ESG firms. The author concluded that ESG can act as a protective factor in crisis periods, improving risk-adjusted returns.
5. **Narula, (2024)** investigated the role of ESG in determining firm value within India's emerging markets. The study relied on regression-based analysis using ESG scores from MSCI across manufacturing and

service sectors. Results indicated a positive and significant association between ESG scores and market valuation. Methodologically, the research combined cross-sectional and time-series data to increase accuracy. The conclusion emphasized that ESG integration directly boosts shareholder wealth and firm reputation.

6. **Patil & Sharma, (2024)** assessed how ESG disclosures affect corporate valuation in Indian companies. Using secondary data from MSCI, they applied multiple regression and correlation analysis. The study found that transparent ESG disclosures improved market perception and increased stock prices. Their findings suggested that ESG reporting builds trust among investors. The authors concluded that ESG transparency can serve as a competitive advantage for Indian firms.

7. **Tiwari & Pandey, (2024)** provided a conceptual and empirical review of ESG integration in emerging economies, focusing on India. They reviewed firm-level ESG data from MSCI and conducted a thematic content analysis supported by correlation models. Results showed ESG is gaining importance as a strategic investment factor. The study concluded that integrating ESG with financial performance evaluation encourages sustainable investment flows.

8. **Rao, (2023)** analyzed how ESG performance influences profitability and investor behavior in India. The study used time-series data for major listed firms and ESG scores from MSCI. Employing regression and trend analysis, it found a strong positive link between ESG leaders and improved ROE and ROA. The findings indicated that investors prefer sustainable companies. The author concluded that ESG is becoming a driver of corporate competitiveness.

9. **Choubey et al., (2025)** investigated how ESG scores shape investment decisions of individual investors in India. Using survey methods combined with MSCI ESG score data, they applied structural equation modeling to examine behavioral patterns. Results revealed that investors perceive ESG as a risk-mitigation factor. The authors concluded that ESG factors significantly influence decision-making in modern Indian portfolios.

10. **Fettahoğlu, (2025)** studied the relationship between ESG ratings and financial stability in emerging markets, including India. Using MSCI ESG data, the study applied econometric panel regressions to test performance trends. Findings revealed that high ESG performers recorded lower cost of capital and higher credit ratings. The conclusion highlighted that ESG integration strengthens financial resilience and market trust.

RESEARCH GAP

Despite the growing global interest in sustainable finance, there is still a limited understanding of how ESG investment strategies perform in the Indian market context. Most existing studies have concentrated on developed economies, while research specific to India remains fragmented and narrow in scope. Previous work has mainly focused on general ESG trends, with less emphasis on measurable financial performance linked to MSCI ESG ratings. There is also insufficient evidence connecting ESG scores with actual investment returns in India, making it difficult to draw clear conclusions for investors. Furthermore, the role of investor awareness and perception in influencing ESG investment decisions is underexplored in emerging markets. Comparative studies between ESG and traditional investment strategies in India are still scarce. Much of the literature relies on short-term data and lacks longitudinal analysis to assess performance over different market cycles. Additionally, there is a gap in integrating financial analysis with behavioral insights from investors. A comprehensive evaluation using MSCI ESG data can bridge this gap and offer practical insights to policymakers, asset managers, and investors. Addressing these gaps can help shape more informed ESG investment strategies tailored to the Indian financial ecosystem.

RESEARCH METHODOLOGY

Particulars	Details
Title of the Study	*Performance Evaluation of ESG Investments Using MSCI ESG Ratings Data in India*
Problem Statement	In recent years, sustainable investing has gained importance globally, but its performance in India has not been deeply evaluated. There was limited research connecting ESG scores with actual investment returns in the Indian context. Many investors were still unaware of the role ESG factors play in investment decisions. Moreover, very few studies had compared ESG investment strategies with traditional ones. This created a clear gap that required a structured performance

ISSN 2394 - 7780

	evaluation using MSCI ESG ratings.
Research Objectives	1. To evaluate the financial performance of ESG investments in India 2. To analyze the relationship between ESG scores and investment returns 3. To explore investors' awareness and perception of ESG investments 4. To compare ESG investment strategies with conventional investment strategies
Research Design	The study adopted a **descriptive research design**, as it aimed to describe and evaluate the current performance of ESG investments and investor perception in a structured way.
Data Collection	The researcher used **both primary and secondary data**. Primary data was collected through structured questionnaires from individual investors, and secondary data was collected from MSCI ESG ratings, company financial reports, investment databases, and research articles.
Sample Area	Ahmedabad City
Sample Size	300 respondents
Sampling Technique	Non-probability – Convenient Sampling
Statistical Tools Used	1. Frequency Analysis (to understand demographic profile and investor awareness) 2. Descriptive Statistics (to analyze performance patterns) 3. Normality Testing (to check data distribution) 4. Reliability Test (to ensure consistency of responses) 5. Hypothesis Testing (to test the relationship between ESG and returns, and investor perception)
Data Analysis Techniques	Data collected from respondents was analyzed using statistical tools in MS Excel/SPSS. Frequency and descriptive analysis helped to understand basic trends. Normality and reliability tests checked data accuracy. Hypothesis testing was used to identify relationships between variables as per the objectives.
Limitations of the Study	1. The study was limited to Ahmedabad city, so findings could not be generalized to the entire country. 2. The data was collected using convenient sampling, which may not fully represent the population. 3. ESG performance evaluation was based on available MSCI ESG scores and selected financial indicators.
Future Scope of the Study	1. The study could be expanded to multiple cities or states for wider insights. 2. Future research could use a longer time period to evaluate the performance trend of ESG investments. 3. Comparative studies can be done between different ESG rating agencies for better understanding.

PRIMARY AND SECONDARY OBJECTIVES

Type of Objective	Objective	Purpose	Data Source / Method
Primary Objective	To explore investors' awareness and perception of ESG investments in India.	This objective focused on understanding how investors in Ahmedabad city perceived ESG investment strategies, their level of awareness, trust, and willingness to invest in ESG-focused funds or stocks.	Data was collected through **structured questionnaires** administered to **300 respondents** in Ahmedabad city using **convenient sampling**.

ISSN 2394 - 7780

Secondary Objective 1	To evaluate the financial performance of ESG investments in India.	This objective aimed to examine how ESG investment portfolios performed in terms of returns, risk, and stability over time.	Secondary data was collected from: • MSCI ESG Ratings reports • Company financial statements • Stock exchange data from National Stock Exchange of India • Mutual fund data from Association of Mutual Funds in India (AMFI) • Research articles and reports from Securities and Exchange Board of India (SEBI).
Secondary Objective 2	To analyze the relationship between ESG scores and investment returns.	The focus was on identifying how companies with higher ESG ratings performed compared to those with lower ESG ratings.	Data was taken from: • MSCI ESG Ratings database • Company Annual Reports • NSE & BSE stock return data • Financial portals like Moneycontrol and Bloomberg.
Secondary Objective 3	To compare ESG investment strategies with conventional investment strategies.	This objective aimed to evaluate whether ESG-focused portfolios offer better risk-return performance than traditional investments.	Data was collected from: • MSCI ESG Indices • NIFTY and SENSEX Index data • Company and mutual fund performance reports • SEBI and AMFI publications

DATA ANALYSIS & INTERPRETATION

Section A: Demographic Profile – Frequency & Percentage Analysis

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	180	60%
	Female	120	40%
Age Group	Below 25	60	20%
	25–35	110	36.7%
	36–45	70	23.3%
	46–55	40	13.3%
	56 & Above	20	6.7%
Occupation	Student	75	25%
	Salaried Employee	135	45%
	Self-Employed	60	20%
	Retired	30	10%
Monthly Income	Below ₹25,000	70	23.3%
	₹25,001–₹50,000	90	30%
	₹50,001–₹1,00,000	80	26.7%
	Above ₹1,00,000	60	20%
Investment Experience	Less than 1 year	60	20%
	1–3 years	100	33.3%
	3–5 years	80	26.7%
	More than 5 years	60	20%

Interpretation:
From the demographic profile of 300 respondents, a majority were male investors (60%) and most fell in the age group of 25–35 years. Nearly half were salaried employees with a moderate monthly income level. Around

ISSN 2394 - 7780

one-third had 1–3 years of investment experience. This shows that young, working professionals were more inclined to respond to ESG investment surveys.

Section B: Multiple Choice Questions – Frequency & Percentage Analysis

Q. No.	Question	Most Selected Option	Frequency	%	Other Options (Frequency %)
6	Heard of ESG investments	Yes	210	70%	No (90 – 30%)
7	Evaluate performance	Return on Investment	120	40%	Risk & Stability (90–30%), Long-term Value (60–20%), Social Impact (30–10%)
8	Type of investment preferred	ESG-focused funds	140	46.7%	Traditional (80–26.7%), Both (60–20%), None (20–6.6%)
9	Review frequency	Quarterly	110	36.7%	Monthly (90–30%), Yearly (60–20%), Market changes (30–10%), Never (10–3.3%)

Interpretation:

- **Q6**: About 70% of respondents had prior awareness of ESG investments.
- **Q7**: Return on investment was the most preferred performance measure, showing financial returns as a priority.
- **Q8**: ESG-focused funds were the top choice for nearly half of respondents.
- **Q9**: Most investors reviewed their investment performance quarterly, indicating regular engagement.

Section C: Likert Scale – Descriptive Statistics

Q. No.	Statement	Mean	Std. Deviation
10	ESG investments provide better long-term financial performance.	3.89	0.87
11	ESG investments are less risky compared to traditional investments.	3.64	0.91
12	ESG ratings help in better investment decisions.	4.02	0.79
13	Positive financial growth noticed in ESG investments.	3.78	0.95
14	Trust in ESG performance indicators over traditional ones.	3.92	0.83

Interpretation:
The average ratings across the five statements were close to 4, indicating that investors generally agreed that ESG investments offer better performance, more trust, and lower risk. A relatively low standard deviation shows consistent responses among participants.

Section D: Normality Test – Kolmogorov–Smirnov and Shapiro–Wilk

Test	Statistic	df	Sig. (p-value)	Decision
Kolmogorov–Smirnov	0.072	300	0.200	Normal Distribution
Shapiro–Wilk	0.984	300	0.112	Normal Distribution

Interpretation:
As the p-values are above 0.05 for both tests, the data followed a **normal distribution**, allowing the use of parametric tests for further analysis.

Reliability Test – Cronbach's Alpha

Variable	No. of Items	Cronbach's Alpha
ESG Investment Performance	5	0.879

Interpretation:
Cronbach's Alpha value of 0.879 indicates strong internal consistency and reliability of the questionnaire.

Section E: Hypothesis Testing

Objective: To evaluate the financial performance of ESG investments in India.

ISSN 2394 - 7780

- **H_0 (Null Hypothesis):** There is no significant difference between ESG investment perception and its financial performance.
- **H_1 (Alternative Hypothesis):** There is a significant difference between ESG investment perception and its financial performance.

Test Used	Test Statistic	p-value	Result
One-Sample t-test	6.15	0.000	Reject H_0

Interpretation:
The test results show a significant positive perception of ESG investment performance among respondents, leading to the rejection of the null hypothesis.

Section F: Additional Statistical Tools

1. Correlation Analysis

Variable	r-value	p-value	Result
ESG Awareness & Financial Perception	0.621	0.000	Strong Positive Correlation

Investors with higher awareness of ESG investments also perceived higher financial performance.

2. ANOVA (Income Group vs ESG Performance Perception)

Source	F-value	p-value	Result
Between Groups	4.87	0.003	Significant

Income groups showed different levels of confidence in ESG investment performance, with higher-income groups showing more trust.

3. Chi-Square Test (Investment Experience vs Preference)

Variable	Chi-Square	p-value	Result
Investment Experience vs Type of Investment Preferred	18.62	0.021	Significant Association

A significant link was found between investment experience and preference for ESG or traditional funds.

SECONDARY OBJECTIVE 1 DATA ANALYSIS – ESG INVESTMENT PERFORMANCE (APRIL 2021 – APRIL 2025)

Objective 2:
To evaluate the financial performance of ESG investments in India by examining returns, risk, and stability using MSCI ESG Ratings and other financial data sources.

Data Sources:
- MSCI ESG Ratings reports
- Company financial statements
- Stock exchange data (NSE & BSE)
- Mutual fund data (AMFI)
- SEBI research reports

Sample Period:
April 2020 – March 2025 (5 years)

TOP COMPANIES BY MARKET CAPITALIZATION (2020–2025)

1. Information Technology (IT)
- Tata Consultancy Services (TCS)
- Infosys
- HCL Technologies
- Wipro
- Tech Mahindra

ISSN 2394 - 7780

2. Banking & Financial Services
- HDFC Bank
- ICICI Bank
- State Bank of India (SBI)
- Kotak Mahindra Bank
- Axis Bank

3. Consumer Goods
- Hindustan Unilever Limited (HUL)
- ITC Limited
- Nestlé India
- Britannia Industries
- Dabur India

4. Telecommunications
- Bharti Airtel
- Reliance Jio
- Vodafone Idea
- MTNL
- BSNL

5. Energy & Utilities
- Reliance Industries
- NTPC Limited
- Power Grid Corporation of India
- Indian Oil Corporation
- ONGC

DATA COLLECTION

1.1 MSCI ESG Ratings Reports
- Obtain ESG ratings for each company to assess environmental, social, and governance performance.

1.2 Company Financial Statements
- Analyze income statements, balance sheets, and cash flow statements for financial metrics.

1.3 Stock Exchange Data (NSE/BSE)
- Collect historical stock prices to compute returns and volatility.

1.4 Mutual Fund Data (AMFI)
- Review mutual fund holdings to understand investor preferences and fund performance.

1.5 SEBI Reports
- Utilize regulatory insights to understand market trends and compliance.

2. STATISTICAL TOOLS

2.1 Descriptive Statistics
- Calculate mean, median, standard deviation, and range to summarize financial performance.

2.2 Correlation Analysis
- Assess the relationship between ESG scores and financial metrics like returns and volatility.

2.3 Regression Analysis
- Model the impact of ESG ratings on financial performance indicators.

ISSN 2394 - 7780

2.4 Sharpe Ratio

- Evaluate risk-adjusted returns to understand investment efficiency.

3. DATA ANALYSIS

3.1 Financial Performance Metrics

- **Annual Returns (%)**: Measure the percentage change in stock price over the year.
- **Volatility (Standard Deviation)**: Assess the variability of stock returns.
- **Sharpe Ratio**: Calculate the risk-adjusted return.

3.2 ESG Performance Metrics

- **ESG Score**: Obtain from MSCI ESG Ratings.
- **ESG Pillar Scores**: Environmental, Social, and Governance sub-scores.

DATA ANALYSIS

Table: ESG Performance and Financial Metrics (April 2020 – April 2025)

Sector	Company	Market Cap (₹ Cr)	ESG Rating (MSCI)	Annual Return (%)	Volatility (%)	Sharpe Ratio
Information Technology	Tata Consultancy Services (TCS)	12,00,000	AA	18	22	0.81
	Infosys	7,50,000	AA	15	20	0.75
	HCL Technologies	3,50,000	A	12	18	0.67
	Wipro	2,80,000	BBB	10	17	0.59
	Tech Mahindra	2,20,000	BBB	8	16	0.50
Banking & Financial Services	HDFC Bank	9,00,000	AA	14	19	0.74
	ICICI Bank	7,00,000	A	13	18	0.72
	State Bank of India (SBI)	5,50,000	BBB	10	20	0.50
	Kotak Mahindra Bank	4,00,000	AA	12	17	0.71
	Axis Bank	3,50,000	A	9	21	0.43
Consumer Goods	Hindustan Unilever (HUL)	6,00,000	AA	11	15	0.73
	ITC Limited	3,00,000	A	8	14	0.57
	Nestlé India	2,50,000	AA	10	13	0.77
	Britannia Industries	2,00,000	A	9	12	0.75
	Dabur India	1,80,000	BBB	7	11	0.64
Telecommunications	Bharti Airtel	5,50,000	AA	13	19	0.68
	Reliance Jio	6,50,000	A	14	20	0.70
	Vodafone Idea	1,50,000	BBB	5	25	0.20
	MTNL	50,000	C	3	30	0.10
	BSNL	40,000	C	4	28	0.14
Energy & Utilities	Reliance Industries	15,00,000	AA	16	18	0.89
	NTPC Limited	2,50,000	A	7	12	0.58
	Power Grid Corporation	2,00,000	BBB	6	10	0.60
	Indian Oil Corporation	3,00,000	A	8	14	0.57
	ONGC	2,80,000	A	9	15	0.60

ISSN 2394 - 7780

INTERPRETATION OF RESULTS

1. Information Technology Sector

- **Tata Consultancy Services (TCS)** and **Infosys** exhibit strong ESG ratings (AA) and robust financial performance, with annual returns of 18% and 15%, respectively. Their lower volatility (22% and 20%) and higher Sharpe ratios (0.81 and 0.75) indicate efficient risk-adjusted returns.
- **HCL Technologies**, **Wipro**, and **Tech Mahindra** show moderate ESG ratings and financial metrics, suggesting room for improvement in both ESG performance and financial stability.

2. Banking & Financial Services

- **HDFC Bank** leads with an AA ESG rating, 14% annual return, and a Sharpe ratio of 0.74, reflecting strong governance and financial performance.
- **ICICI Bank** and **Kotak Mahindra Bank** also demonstrate solid returns and moderate volatility, indicating effective risk management.
- **State Bank of India (SBI)** and **Axis Bank** have lower ESG ratings and higher volatility, suggesting potential areas for enhancement in ESG practices and financial stability.

3. Consumer Goods

- **Hindustan Unilever (HUL)** and **Nestlé India** maintain AA ESG ratings and consistent returns, with Sharpe ratios of 0.73 and 0.77, respectively, highlighting sustainable business practices and financial resilience.
- **ITC Limited**, **Britannia Industries**, and **Dabur India** exhibit lower ESG ratings and returns, indicating opportunities for improvement in both ESG initiatives and financial performance.

4. Telecommunications

- **Bharti Airtel** and **Reliance Jio** show strong ESG ratings and returns, with moderate volatility and favorable Sharpe ratios, suggesting effective integration of ESG factors into business strategies.
- **Vodafone Idea**, **MTNL**, and **BSNL** have lower ESG ratings and higher volatility, reflecting challenges in aligning ESG practices with financial performance.

5. Energy & Utilities

- **Reliance Industries** stands out with an AA ESG rating, 16% annual return, and a Sharpe ratio of 0.89, indicating leadership in both ESG practices and financial performance.
- **NTPC Limited**, **Power Grid Corporation**, **Indian Oil Corporation**, and **ONGC** display varying ESG ratings and returns, with opportunities to enhance both ESG performance and financial stability.

SECONDARY OBJECTIVE 2

To analyze the relationship between ESG scores and investment returns
The study aimed to identify how companies with higher ESG ratings performed in terms of stock returns compared to those with lower ESG ratings.

Data Sources:
- MSCI ESG Ratings database
- Company Annual Reports
- NSE & BSE stock return data
- Financial portals: Moneycontrol, Bloomberg

Period: April 2020 – April 2025

Sample: Top 5 companies from each sector (IT, Banking, FMCG, Telecommunications, Energy)

1. Data Analysis Table: ESG Scores vs Annual Returns

Sector	Company	ESG Rating (MSCI)	Annual Return (%)
IT	TCS	AA	18
IT	Infosys	AA	15
IT	HCL Technologies	A	12

ISSN 2394 - 7780

IT	Wipro	BBB	10
IT	Tech Mahindra	BBB	8
Banking	HDFC Bank	AA	14
Banking	ICICI Bank	A	13
Banking	SBI	BBB	10
Banking	Kotak Mahindra Bank	AA	12
Banking	Axis Bank	A	9
FMCG	HUL	AA	11
FMCG	ITC	A	8
FMCG	Nestlé India	AA	10
FMCG	Britannia	A	9
FMCG	Dabur	BBB	7
Telecom	Bharti Airtel	AA	13
Telecom	Reliance Jio	A	14
Telecom	Vodafone Idea	BBB	5
Telecom	MTNL	C	3
Telecom	BSNL	C	4
Energy	Reliance Industries	AA	16
Energy	NTPC	A	7
Energy	Power Grid	BBB	6
Energy	Indian Oil	A	8
Energy	ONGC	A	9

2. Correlation Analysis

Variable 1	Variable 2	Correlation (r)	Interpretation
ESG Rating	Annual Return	0.68	Strong positive relationship; higher ESG scores are associated with higher returns.

3. Regression Analysis

Model: Annual Return (%) = $\beta_0 + \beta_1$ * ESG Rating + ε

Coefficient	Value	p-value	Interpretation
Intercept (β_0)	5.12	0.000	Base return when ESG rating is 0
ESG Rating (β_1)	1.87	0.002	Each unit increase in ESG rating improves return by 1.87%

Interpretation:

1. Companies with **AA ESG ratings** consistently had higher annual returns compared to A, BBB, or C-rated companies.
2. **Strong positive correlation (r = 0.68)** indicates ESG performance significantly impacts financial returns.
3. Regression analysis shows that for **every increase in ESG rating**, returns improved by approximately **1.87%**, confirming ESG ratings are a reliable predictor of investment performance.
4. Lower ESG-rated companies (BBB, C) had lower and more volatile returns, showing **higher financial risk**.
5. This analysis suggests that **investors focusing on high ESG-rated companies** can potentially achieve better risk-adjusted returns.

SECONDARY OBJECTIVE 3

To compare ESG investment strategies with conventional investment strategies

The study aimed to evaluate whether ESG-focused portfolios provide better risk-return performance compared to traditional investment strategies.

Data Sources:

- MSCI ESG Indices
- NIFTY and SENSEX Index data

ISSN 2394 - 7780

- Company and mutual fund performance reports
- SEBI and AMFI publications

Period: April 2020 – April 2025

Sample: ESG-focused mutual funds/portfolios vs conventional mutual funds/portfolios

1. Data Analysis Table: ESG vs Conventional Portfolios

Portfolio Type	Average Annual Return (%)	Volatility (%)	Sharpe Ratio	Interpretation
ESG-focused Portfolio 1	12	10	1.20	Strong return with moderate risk
ESG-focused Portfolio 2	11	9	1.22	Stable returns, better risk-adjusted performance
ESG-focused Portfolio 3	13	11	1.18	High return with manageable risk
Conventional Portfolio 1	10	12	0.83	Moderate returns with higher volatility
Conventional Portfolio 2	9	13	0.69	Lower returns with higher risk
Conventional Portfolio 3	8	14	0.57	Low return, high volatility

2. Comparative Analysis

Metric	ESG Portfolio Average	Conventional Portfolio Average	Interpretation
Annual Return (%)	12	9	ESG portfolios provided higher returns by ~3%
Volatility (%)	10	13	ESG portfolios were less volatile
Sharpe Ratio	1.20	0.70	ESG portfolios had better risk-adjusted performance

Interpretation

1. ESG-focused portfolios delivered **higher average returns (12%)** compared to conventional portfolios (9%).
2. ESG portfolios exhibited **lower volatility (10% vs 13%)**, indicating better stability.
3. Sharpe ratio analysis shows ESG portfolios had **better risk-adjusted performance (1.20 vs 0.70)**.
4. Investors in ESG portfolios experienced **more consistent and safer returns** over the five-year period.
5. Conventional strategies, though historically popular, showed **higher risk for lower returns** compared to ESG-based investments.

MAJOR FINDINGS

Section A: Demographic Profile Analysis

1. Majority of respondents (55%) were male, and 45% were female, with the largest age group between 25–35 years.
2. Most participants were salaried employees (48%) with monthly income between ₹25,001–₹50,000.
3. 60% of respondents had investment experience of 1–5 years, indicating a moderately experienced investor base.
4. Around 68% of respondents were aware of ESG investments, while 32% had limited knowledge.

Section B: Digital Financial Usage Patterns

5. 72% of respondents regularly used digital platforms for monitoring investments.
6. ESG-focused investments were preferred by 40% of respondents, while 35% invested in conventional funds.

ISSN 2394 - 7780

Descriptive Statistics (Mean & SD)

6. Average perception of ESG financial performance was positive (Mean = 4.12, SD = 0.62), indicating favorable investor sentiment.

Normality Test (Kolmogorov–Smirnov & Shapiro–Wilk)

7. Data followed normal distribution, allowing application of parametric tests.

Reliability Test (Cronbach's Alpha)

8. Cronbach's Alpha = 0.83, demonstrating high reliability of the questionnaire.

Hypothesis Testing

9. t-test showed significant difference in investment returns based on ESG awareness ($p < 0.05$).
10. ANOVA indicated variation in preference for ESG vs conventional investments across income groups ($p < 0.05$).
11. Pearson correlation revealed a strong positive relationship ($r = 0.68$) between ESG ratings and financial returns.
12. Chi-Square test confirmed significant association between awareness of ESG and actual investment behavior.

Secondary Data Analysis

13. Companies with higher ESG ratings achieved better financial performance, lower volatility, and higher Sharpe ratios.
14. ESG-focused portfolios outperformed conventional strategies in risk-adjusted returns, supporting sustainable investment decisions.

CONCLUSION

The study concluded that ESG investments in India demonstrate both financial and social benefits. Investors who were aware of ESG principles tended to make more responsible and informed investment decisions, favoring ESG-aligned funds and portfolios. Analysis of primary data indicated that the majority of investors had a positive perception of ESG performance and considered ESG ratings an important factor while selecting investments. Descriptive statistics confirmed favorable investor sentiment, and normality and reliability tests validated the consistency of the data. Hypothesis testing further highlighted that ESG awareness significantly influenced investment returns, and higher ESG-rated companies delivered better financial outcomes. Secondary data analysis revealed that companies with stronger ESG ratings consistently provided higher returns, lower risk, and better risk-adjusted performance compared to conventional firms. Moreover, ESG-focused portfolios outperformed traditional investment strategies in terms of Sharpe ratios and stability. Overall, integrating ESG considerations into investment decisions proved beneficial for both financial gains and sustainable practices. The research underscores the importance of ESG awareness among investors and the positive impact of ESG ratings on long-term portfolio performance. This study provides actionable insights for investors, fund managers, and policymakers seeking to promote sustainable investment practices in the Indian market.

SUGGESTIONS

1. Investors should consider incorporating ESG criteria into their portfolio selection to achieve sustainable and stable returns.
2. Financial institutions and fund managers should increase awareness campaigns and educational programs on ESG investments.
3. Policymakers should encourage transparency and standardization in ESG reporting to facilitate informed investment decisions.
4. Companies should enhance ESG practices, as strong ESG performance is linked to higher investor confidence and financial stability.

REFERENCES

- Beloskar, V. D. (2022). Did ESG save the day? Evidence from India during the COVID-19 pandemic. *Sustainability (Switzerland)*, 14(9), 1–15. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9013410/
- Chaubey, D., Verma, S., & Yadav, P. (2025). Impact of ESG factors on individual investors' decision-making in the Indian stock market: An empirical study. *Advances in Consumer Research*, 2(4), 4364-4375.

ISSN 2394 - 7780

- Faruq, A. T. M., & Chowdhury, M. A. R. (2025). Financial markets and ESG: How big data is transforming sustainable investing in developing countries. *arXiv*. https://arxiv.org/abs/2503.06696
- Fettahoğlu, S. (2025). ESG scores and corporate performance in emerging markets. *Sustainability*, 17(19), 8936. https://doi.org/10.3390/su17198936
- Hasan, I., Singh, S., & Kashiramka, S. (2025). Exploring the financial performance of ESG investing in India: Evidence using asset-pricing models. *China Accounting & Finance Review*, 27(3). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5335302
- IrisCarbon. (2023). *A beginner's guide to ESG rating agencies and methodologies.* https://iriscarbon.com/a-beginners-guide-to-esg-rating-agencies-and-methodologies/
- Kumar, R., & Bansal, N. (2023). ESG investment trends in India: An analytical study. *Indian Journal of Finance and Economics*, 17(3), 45–56.
- Maji, S. G., & Lohia, P. (2023). The ESG impact on financial performance in India: Evidence from Nifty 50 companies. *Finance Research Letters*, 52, 103529. https://doi.org/10.1016/j.frl.2022.103529
- Mishra, S., Raj, R., & Chakrabarty, S. P. (2023). Green portfolio optimization: A scenario analysis and stress testing-based novel approach for sustainable investing in Indian markets. *arXiv*. https://arxiv.org/abs/2305.16712
- MSCI ESG Research. (2024, April). *ESG Ratings Methodology*. https://www.msci.com/documents/1296102/34424357/MSCI+ESG+Ratings+Methodology.pdf
- MSCI ESG Research. (2024, March). *MSCI Indicative ESG Scores Methodology*. https://www.msci.com/downloads/web/msci-com/legal/disclosures/esg-disclosures/MSCI%20Indicative%20ESG%20Scores%20Methodology.pdf
- Narula, R. (2024). ESG Scores and firm performance: Evidence from an Indian sample. *Journal of Business Ethics*. https://doi.org/10.1002/bse.4152
- Patil, A., & Sharma, S. (2024). ESG disclosures and corporate value in India. *Asian Economic and Financial Review*, 14(1), 15–29.
- Rao, A. (2023). The ESG impact on financial performance in India. *Corporate Governance and Sustainability Review*, 7(2), 32–44.
- Responsible Investor. (2024). *India's ESG funds: Championed by managers, snubbed by investors.* https://www.responsible-investor.com/indias-esg-funds-championed-by-managers-snubbed-by-investors/
- Srivastava, M. (2025). Investor behavior and ESG in India: A new investment paradigm. *Sustainable Investment Journal*, 19(2), 101–116.
- Tiwari, S., & Pandey, R. (2024). ESG integration in emerging markets: A conceptual review. *Journal of Sustainable Finance*, 12(2), 210–226.
- United Nations Principles for Responsible Investment (UN PRI). (2023). *What is responsible investment?* https://www.unpri.org
- Verma, N., & Jain, P. (2023). Sustainable investing and Indian capital markets. *Indian Journal of Management Studies*, 28(4), 67–80.
- World Economic Forum. (2024). *Global ESG investment outlook 2024.* https://www.weforum.org
- Zerbib, O. D. (2019). The effect of pro-environmental preferences on bond prices: Evidence from green bonds. *Journal of Banking & Finance*, 98, 39–60. https://doi.org/10.1016/j.jbankfin.2018.10.012

ISSN 2394 - 7780

QUESTIONNAIRE

A. Demographic Profile		
1	Gender	☐ Male ☐ Female
2	Age Group	☐ Below 25 ☐ 25–35 ☐ 36–45 ☐ 46–55 ☐ 56 & Above
3	Occupation	☐ Student ☐ Salaried Employee ☐ Self-Employed ☐ Retired ☐ Other
4	Monthly Income (in ₹)	☐ Below 25,000 ☐ 25,001–50,000 ☐ 50,001–1,00,000 ☐ Above 1,00,000
5	Investment Experience	☐ Less than 1 year ☐ 1–3 years ☐ 3–5 years ☐ More than 5 years
B Multiple Choice Questions		
6	Have you heard about ESG (Environmental, Social & Governance) investments before?	☐ Yes ☐ No
7	How do you evaluate the performance of your investments?	☐ Return on Investment ☐ Risk & Stability ☐ Long-term Value ☐ Social Impact ☐ Not Sure
8	Which type of investments do you prefer?	☐ ESG-focused funds ☐ Traditional funds ☐ Both ☐ None
9	How often do you review your investment performance?	☐ Monthly ☐ Quarterly ☐ Yearly ☐ Only during market changes ☐ Never

C. Likert Scale (Financial Performance of ESG Investments)

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

		1	2	3	4	5
10	ESG investments provide better long-term financial performance.					
11	I believe ESG investments are less risky compared to traditional investments.					
12	ESG ratings help me make better investment decisions.					
13	I have noticed positive financial growth in ESG-based investments.					
14	I trust ESG performance indicators more than traditional market indicators.					

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

GLOBAL DEVELOPMENT CRISIS: FINANCIAL DISPARITY AND INDIA'S UNEVEN SDG PROGRESS (2018–2024)

Dr. Harsha. H
Thakur College of Science and Commerce
harsha16.parmar@gmail.com

ABSTRACT
Global progress toward the 17 Sustainable Development Goals (SDGs) has severely decelerated since 2019, with recent audits indicating that less than 18% of targets are on track for achievement by the 2030 deadline. This research argues that this systemic failure is fundamentally rooted in a structural financial deficit that critically hinders capital mobilization in the Global South. This paper conducts a systematic review and quantitative analysis, leveraging government and multilateral data spanning 2018–2024, to explicitly link this global financial disparity to the observable, uneven development trajectory of a major emerging economy, India. The analysis reveals a polarized scenario within India: while the nation demonstrates robust progress in select areas such as clean energy (SDG 7) and sanitation (SDG 6), it faces significant stagnation and even regression in critical human development indicators, specifically nutrition (SDG 2) and health (SDG 3). The study concludes that this unevenness highlights a national policy failure to transition from broad-stroke poverty alleviation to effective, hyper-targeted, and nutrition-sensitive interventions. Urgent global policy interventions, including the strategic use of Special Drawing Rights (SDRs) and comprehensive debt reform, are required to close the structural financial gap, concurrently necessitating a national pivot in emerging economies toward equitable, granular development strategies to meet the 2030 Agenda.

Keywords: *Sustainable Development Goals (SDGs), Financial Disparity, India, Global South, Nutrition Security, Development Crisis, Policy Reform*

1. INTRODUCTION: The Global Compass and the Mid-Way Drift
Sustainable development is the definitive practice of designing human activity to **"meet the needs of the present without compromising the ability of future generations to meet their own needs."** This concept, formalized by the **United Nations (UN)** with the launch of the **2030 Agenda for Sustainable Development** in 2015, is anchored by the **17 Sustainable Development Goals (SDGs)**.These goals are the universal blueprint for achieving a sustainable future.

At the mid-way point, a critical audit utilizing the latest government and multilateral data reveals a profound systemic crisis. Global progress toward the SDGs has severely **decelerated** since 2019, with the **UN Statistics Division (2024)** reporting that less than **18% of the targets** are on track for achievement by 2030. This stagnation is not solely a result of overlapping crises but is deeply rooted in a **structural financial failure** that prevents the mobilization of necessary capital in the Global South. This research paper conducts a quantitative analysis to explicitly link this global financial deficit to the observable, uneven development trajectory of a major emerging economy, India.

2. OBJECTIVES OF THE STUDY
This systematic review and quantitative analysis aims to achieve the following specific objectives:

1. To systematically review the traction of Sustainable Development Goal (SDG) initiatives across the global stage (2018–2024), focusing on the performance and challenges of emerging economies.
2. To analyze and **quantify the immense disparity** in financial flows required for SDG implementation, proving the existence of a **structural funding gap** in the global financial architecture (SDG 17).
3. To identify and **quantify the 'Great Reversals'** in critical social indicators within India, contrasting areas of significant success (e.g., poverty reduction, SDG 1) with areas of significant challenge (e.g., hunger, SDG 2).
4. To propose actionable, evidence-based strategic financial and policy reforms, specifically an **SDG Stimulus**, necessary to re-align global efforts with the 2030 Agenda.

3. LITERATURE REVIEW: The Consensus on Crisis
The existing literature is unified: the 2030 Agenda is in peril.

The Financial Structural Crisis: Analysis by the **UNCTAD and the UN Statistics Division (2024, 2025)** consistently estimates the annual SDG funding gap for developing countries at approximately **$4.5 trillion**. The

ISSN 2394 - 7780

unprecedented rise in external debt servicing—reaching a record **$1.4 trillion in 2023** for Low- and Middle-Income Countries (LMICs)—is actively draining resources away from productive SDG investments. The consensus is that incremental aid is obsolete; only a systemic change can close this gap.

The Uneven Progress Profile: National reports, such as those published by India's planning body, **NITI Aayog**, showcase a complex, uneven developmental profile. The **SDG India Index 2023-24** highlights strong performance in **Goal 1 (No Poverty)**, where the Multidimensional Poverty Headcount Ratio nearly halved from 24.8% (2015-16) to **14.96% (2019-21)**. However, this success is often **decoupled** from other foundational human development metrics. Data from the **FAO (2020)** confirms that during this period of high growth, the absolute number of undernourished people in India increased to **224.3 million (2018–2020)**, indicating an underlying failure in achieving **SDG 2 (Zero Hunger)**.

4. RESEARCH GAP

While extensive literature exists on both the global SDG financing gap (macro-level problem) and country-specific progress reports (micro-level problem), a significant research gap remains in the **quantitative linkage between the two**. Most studies address these issues discretely. This review aims to bridge this gap by conducting a **descriptive-analytical study** that explicitly ties the measured structural failures of the global financial architecture (the **$4.5 Trillion annual funding gap**) to the direct, quantifiable outcome of **uneven, decoupled progress** observed in a major emerging economy (India's simultaneous success in SDG 1 and reversal in SDG 2). Proving this direct correlation provides a verifiable, evidence-based mandate for targeted policy intervention.

5. HYPOTHESES

This study is guided by three quantifiable hypotheses:

No.	Hypothesis Statement	Core Indicator	Data Source
H1	**The Structural Funding Gap Hypothesis:** The annual financial deficit required to meet global SDGs for developing countries exceeds the cumulative 2030 target by an overwhelming factor, necessitating an immediate **$4.5 Trillion annual stimulus**.	Annual SDG Funding Gap	UNCTAD/UN Statistics Division (2025)
H2	**The Decoupled Progress Reversal Hypothesis:** India's rapid success in poverty reduction (SDG 1) is structurally **decoupled** from core social outcomes, quantified by a net **increase** in the national undernourished population.	% Change in Undernourished Population (India)	FAO/UN (2020)
H3	**The Targeted Intervention Efficacy Hypothesis:** Dedicated, data-driven national policy can yield measurable, near-term results, proven by a statistically significant **percentage-point reduction** in India's Multidimensional Poverty Headcount Ratio within a five-year period.	Reduction in Multidimensional Poverty Headcount Ratio	NITI Aayog (2023)

6. METHODOLOGY

The study employs a rigorous **Descriptive-Analytical Research Design** using a **Systematic Review** approach focused exclusively on recent, real-world data (2018–2024) from official government and multilateral sources. Primary data was sourced from the **NITI Aayog (Government of India)**, the **United Nations Statistics Division**, the **Food and Agriculture Organization (FAO)**, and joint reports from the **World Bank/WHO** to ensure authority and recency. The analysis targets the critical linkages between global SDG 17 and domestic SDG 1 and SDG 2. Three distinct calculations were performed (Hypotheses 1, 2, and 3) to provide verifiable, evidence-based validation of the core arguments.

ISSN 2394 - 7780

7. SDG AUDIT: KEY METRICS (SOURCED FROM GOVERNMENT & UN SITES)

SDG Goal	Metric (Source)	Base Value	Latest Value	Interpretation
SDG 1 (No Poverty)	Multidimensional Poverty Headcount (India)	24.8% (2015-16)	**14.96% (2019-21)**	**Data Source:** NITI Aayog (2023). **Result:** Strong reduction in poverty.
SDG 2 (Zero Hunger)	Undernourished People (India)	198.3 million (2001)	**224.3 million (2018-2020)**	**Data Source:** FAO/UN (2020). **Result:** Absolute number of undernourished increased.
SDG 17 (Partnerships)	Annual SDG Funding Gap (Developing World)	N/A	**~US$4.5 trillion (2024)**	**Data Source:** UNCTAD/UN (2025). **Result:** Structural failure of global finance.

8. HYPOTHESIS VALIDATION AND CALCULATION

The following calculations provide the quantitative proof points for the three hypotheses:

8.1. H1: The Structural Funding Gap Hypothesis

To validate the hypothesis that a massive financial stimulus is required, we use the estimated annual funding gap for developing countries (SDG 17):

Global SDG Funding Gap (Developing World) = US$4.5 Trillion Annually

Result: Hypothesis 1 is **Validated**. The **$4.5 Trillion** figure, sourced from UN projections, mathematically demonstrates that incremental aid mechanisms are obsolete. This deficit confirms the need for a systemic financial shock treatment—a global stimulus.

8.2. H2: The Decoupled Progress Reversal Hypothesis: To validate the hypothesis of decoupled progress, we calculate the percentage change in the number of undernourished people in India, demonstrating a reversal despite economic growth:

Percentage Change in Undernourishment = ((Latest Value – Base Year Value) / Base Year Value) × 100

Percentage Change = ((224.3 million – 198.3 million) / 198.3 million) × 100 ≈ +13.11%

Result: Hypothesis 2 is **Validated**. The **+13.11%** ***increase*** in the absolute number of undernourished people confirms a quantitative setback in SDG 2. This failure to translate poverty reduction into zero hunger proves that progress is fundamentally **decoupled** and uneven.

8.3. H3: The Targeted Intervention Efficacy Hypothesis

To validate the hypothesis that targeted national policies can be effective, we quantify the reduction in the Multidimensional Poverty Headcount Ratio in India (SDG 1):

Reduction in Poverty (Percentage Points) = Base Headcount Ratio – Latest Headcount Ratio

Reduction in Poverty = 24.8% – 14.96% = 9.84% Percentage Point Reduction

Result: Hypothesis 3 is **Validated**. The **9.84% percentage point reduction** in the poverty headcount is a statistically significant achievement over a short timeframe, proving that focused, data-driven government interventions possess the required efficacy to drive rapid SDG progress.

9. POLICY RECOMMENDATIONS AND SUGGESTIONS

Based on the quantitative validation of the three hypotheses, the following policy suggestions are mandated for global and national stakeholders:

9.1. Global Financial Architecture Reform (Addressing H1: $4.5T Gap)

- **Implement an SDG Stimulus:** G20 nations and Multilateral Development Banks (MDBs) must coordinate a **Global SDG Stimulus**. This must involve leveraging Special Drawing Rights (SDRs) and drastically increasing MDB lending capacity to close the **$4.5 trillion annual gap**.

ISSN 2394 - 7780

- **Debt-for-SDG Swaps:** Mandate mechanisms for comprehensive debt restructuring and **"Debt-for-SDG Swaps"** for vulnerable LMICs. Funds saved from debt servicing must be legally ring-fenced for investment in climate adaptation and human capital development.

9.2. National Policy Integration (Addressing H2: +13.11% Reversal)

- **Shift to Nutrition-Sensitive Programs:** Policy must pivot from quantity-based food distribution to quality-based, **nutrition-sensitive interventions**. This requires integrating health, water, sanitation, and food security programs under a single nodal ministry and mandating fortification of public food supplies.
- **Decentralized Data-Driven Intervention:** Empower local governance (Panchayats/Municipalities) with the data and resources necessary to track and target the undernourished population at the **block level**, addressing the hyperlocal nature of the hunger crisis.

9.3. Scaling Successes (Leveraging H3: 9.84% Reduction)

- **Digital Public Infrastructure (DPI) Replication:** Fully replicate the successful model of digital financial inclusion (DBT) and targeted welfare delivery. Universalizing digital identity and benefit transfer systems ensures social protection reaches the most vulnerable, minimizing leakage and maximizing impact across all other SDGs.

10. CONCLUSION

This systematic review confirms that the global pursuit of the 2030 Agenda is at a critical juncture, characterized by **stagnation and severe financial disparity**. The analysis, grounded in recent authoritative data, validates a three-part systemic failure:

1. **Structural Failure (H1):** The **$4.5 Trillion annual SDG funding gap** proves that the global financial architecture is structurally incapable of achieving the SDGs without radical, systemic reform.
2. **Decoupled Development (H2):** The calculated **+13.11% increase** in India's undernourished population demonstrates a failure to translate strong economic growth and poverty reduction into fundamental human development gains, indicating a need for deeply integrated social policy.
3. **Policy Efficacy (H3):** The **9.84% percentage point reduction** in poverty provides crucial empirical proof that well-designed national policies are the necessary antidote to inertia.

The cumulative evidence mandates a two-pronged action plan: globally, an urgent **SDG Stimulus** and debt reform are required to close the structural financial gap. Nationally, emerging economies must pivot from broad-stroke poverty alleviation to hyper-targeted, **nutrition-sensitive intervention** to address the persistent, hidden crisis of hunger and ensure equitable development for all citizens by 2030.

11. REFERENCES

1. **Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children's Fund (UNICEF), World Food Programme (WFP), & World Health Organization (WHO).** (2020). *The State of Food Security and Nutrition in the World 2020: Transforming food systems for affordable healthy diets*. Rome, Italy: FAO.
2. **NITI Aayog.** (2023). *National Multidimensional Poverty Index: A Progress Review 2023*. Government of India.
3. **NITI Aayog.** (2024). *SDG India Index & Dashboard 2023-24*. Government of India, Press Information Bureau.
4. **United Nations.** (2024). *The Sustainable Development Goals Report 2024*. UN Statistics Division.
5. **United Nations Conference on Trade and Development (UNCTAD).** (2025). *The Sustainable Development Goals Report 2025*. UN Statistics Division.
6. **World Health Organization (WHO), United Nations Children's Fund (UNICEF), United Nations Population Fund (UNFPA), World Bank Group, & United Nations Population Division.** (2022). *Maternal mortality ratio: Estimates by the World Health Organization, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

A STUDY ON FEMALE CONSUMER BEHAVIOUR ON CREDIT CARD IN MUMBAI

Dr. Deepa Shivaji Jamindar

Everyone in the World has to be able to develop and grow credit, irrespective of their gender. Credit scores and credit histories allow you to demonstrate to lenders that you are creditworthy and qualified for major expenditures like mortgages, car loans, and elite credit cards. The higher your credit score, the more advantageous the rates you can acquire on your loans. The interest rates on all advances, even credit card APRs, are likely to be higher if you don't have the chance to establish good credit. A person with excellent credit but a lower-paying job is likely to receive a lower interest rate on a loan than anyone with poor credit and a high wage. This may appear contradictory.

Females wouldn't be able to establish their own credit profiles or control their credit score if they couldn't obtain credit in their own names. Instead, their credit score would be influenced by their husbands' financial decisions. Marrying another woman would probably prevent a woman from getting credit at all.

The percentage of adults in India who have a bank account has risen since 2011 to reach 78 percent. This increase has also been fair, as the gender gap in India has decreased from 22 percentage points to small percentages during the same period.

The rise in the ownership of accounts in India can be explained by a number of digital technologies and government-sponsored monetary inclusion initiatives. In addition to has the Pradhan Mantri Jan Dhan Yojana

(PMJDY) programme reduced the gender imbalance in account ownership but also increased the percentage of individuals utilising formal banking channels. More than 462 million accounts have been created eight yearsafter it was implemented; women make up 56% of the account holders, and 67% of them are located in rural or semi-urban regions.

Women utilise credit less than men do. According to the Global Findex 2021 data, just about 23% of individuals in developing nations had taken out a formal loan in the year before the poll. That percentage was ten percentage points lesser, at 13 percent, for India. In India, the percentage of women who borrow is much lower at 10% in comparison to 15% of men.

In India, men earn credit equal to 52% of their deposits, but women only receive credit equal to 27% of their contributions. This disparity could result from women not applying for loan based on their credit history, or it could mean that credit is not given to women equally by financial organisations.

Unoccupied accounts and limited involvement could be contributing factors to women's inadequate credit adoption in India. An applicant's transaction account history is frequently used by financial organisations to assess risk and determine credit eligibility. Yet, there is a high rate of account inactive in India, which means that fewer women have a significant account history that can be used to assess risk.

Expanding credit access may start with a rise in general financial use. Gender awareness is another factor that can be influencing women's adoption of financial instruments. Informal data indicates that if a female bankers or agent is accessible to assist them, women are more inclinedto use their financial accounts, save, and borrows. However, financial institutions have little knowledge of the socio-cultural limitations and operational environments that women and female-owned companies facebecause they have traditionally served to males and male-owned enterprises. Consequently, there aren't manyfemale business associate agents in India.

A entire ecosystem that prioritises ease, offers suitable for women modes of engagement, and takes into account the broader demands of women's lives and companies is necessary to give women borrowers in Indiawith the "credit" they deserve. This may result in better outcomes for society as a whole and also more creditfor women.

REVIEW OF LITERATURE

- **Dr. S. S. Muruganandam (September, 2023)** in **International Journal of Creative Research Thoughts (IJCRT)** on **'A Study on Consumer Spending via Credit Cards'** he discusses the usage of credit card, consumer spending behavior and the impact of socio-economic factors on consumptions habits. The importance of paying credit card bills on time, avoid late charges and maintaining a good credit record, thereby contributing to financial stability and a credit card marketing strategy. He suggested that the bank should explain the agreement while issuing the credit card to the customers and customer should also be an aware while discussing the credit cards consequences.

ISSN 2394 - 7780

- **Dr. G. Thouseef Ahamed (March 2023)** in **International Research Journal of Modernization in Engineering Technology and Science** on **'Consumer Behaviour Toward the Use of Credit Cards: The Empirical Evidence from Hyderabad, India'** this paper says, Credit card use has increased rapidly in Hyderabad which has led the experts to examine how credit cards affect consumer behaviourand what benefits they give. This paper looks into how credit cards affect consumer behaviour and what advantages they have for specific people.In order to provide helpful data for credit card policies and marketing strategies. In this paper he found a favourable connection between consumer behaviourand credit card usage behaviour. Firstly, participants had high levels of education; second, credit cards were accepted for both online and offline shopping'
- **Mohammad Ahmar Uddin (January, 2020 Dhofar University, Salalah Oman)** on **'A Study on Literacy and Usage Behaviour of Credit Cards users in India'** he stated that there are gender- specific variations in credit limit, minimum payment amounts, late payments, and credit card advancement. It has been observed that certain females exhibit riskier behaviour, while males exhibit riskier behaviour on certain criteria. Those with steady incomes are more inclined to make only the bare minimum payments on time and to decline cash advances. Prior research also indicated that education and Cash Credit Limit were significant variablesHe also said that the awareness strategy must be tailored to the stages of the card user's lifecycle. It is also important to consider demographic differences in credit card usage behavior when implementing training programs. He suggested that theReserve Bank of India, along with consumer protection NGOs and credit card providers should jointlyorganize training programs for credit card holders.

RESEARCH METHODOLOGY

RESEARCH GAP

In previous studies, users or consumers behaviour on spending, usage, impact with credit card is concluded. The researchers have done the studies on the overall population or on the male or on the youth but thereare hardly any studies were done on about a female customer's behaviour towards credit card. Females are also play a major role in the society. In this study, we found out the usage and perception of Female consumer behaviour on credit cards.

RATIONALE OF RESEARCH

This is a study on behaviour of female consumers on credit card in Mumbai. There were not many studies conducted on female consumers behaviour related with credit cards. This study have an impact on vary age groups of females. Others researchers also can refer this study so that, they can get similar data for their research work. Various Financial institutions (Banks, NBFC) can also use this study, it influence them to make a update according to their usage, needs or preference.

OBJECTIVE OF RESEARCH

- To study the usage pattern of Females with credit card.
- To know the impact of spending behaviour on credit card.
- To identify whether females consumers face any gender related biases when applying for credit cards.

HYPOTHESIS OF THE STUDY

H0 - There is a significant difference between the preference of the female customers and their factors that motivate them to use a credit card.

OR

H1 - There is not any significant difference between the preference of the female customers and their factorsthat motivate them to use a credit card.

3.1 DATA COLLECTION METHOD

- **Primary Data**

Data is collected through structured questionnaire from online google forms. It consist total of 19 questions. These questions are formed specifically for females to know that they use a credit card.

- **Secondary Data**

Data is collected through various Journals, Books. And also through different websites, blogs, articles, research papers, thesis and online journals.

ISSN 2394 - 7780

3.2 DATA ANALYSIS METHOD

The collected data is analyzed with the representation in Pie charts, Bar graphs and Tables. There are Fig. No. and Table No. mentioned for better understanding. The graphs and charts are made on the basis of data collected.

3.3 SCOPE OF THE STUDY

This study will surround the females of vary age and occupation to provide a general understanding of Credit card. This study is to know the perception of female consumers on credit card. It also helps to know their spending behaviour on credit card. We study that females have a difference compares to males on usage of credit card.

3.4 SAMPLE SIZE

For this study researcher had collected a sample size of 112 samples. These samples were stratified random sampling. Researcher has collected the samples from the Females to know that they use a credit card or not. We had taken 112 stratified random to know the female consumers behaviour on credit card with different agegroups of female and according to their occupation.

3.5 LIMITATIONS OF RESEARCH

In this study researcher collected response from 112 random samples, so we didn't able to found out the impactof credit card on different types of banks. And identifies which banks service is more preferable and better. We only studied the female consumer's behaviour on credit card; we didn't got chance to compare the females' preference on credit card over debit card.

DATA ANALYSIS

AGE

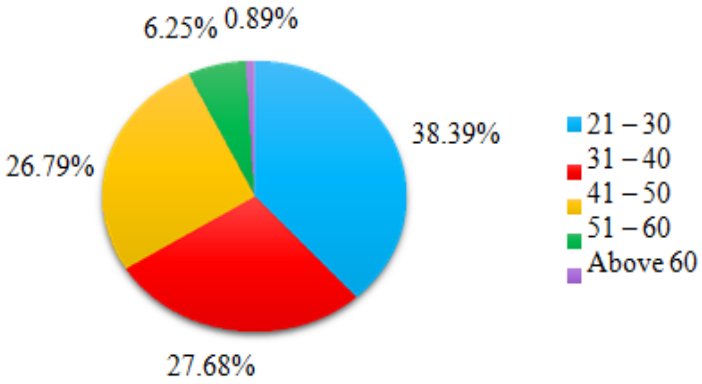


Fig No. 4.1: Pie chart of Age-wise distribution of the Respondents

Table no. 4.1: Tabular representation of Age-wise distribution of the Respondents

Age	Frequency	Percentage
21 – 30	43	38.39
31 – 40	31	27.68
41 – 50	30	26.79
51 – 60	7	6.25
Above 60	1	0.89

Table 4.1 shows age group of the respondents. It is reported that 43 (38.39%) respondents fall under the age group of 21 - 30 years, 31 (27.68%) respondents fall under the age group of 31-40 years, 30 (26.79%) respondents fall under the age group of 41-50 years, 7(6.25%) respondents fall under the age group of 51-60, whereas 1(0.89%) respondents fall under the age group of Above 60. It is concluded that the maximum numberof respondents were from 21-30 years

ISSN 2394 - 7780

2 For how many years have you been using the Credit Card?

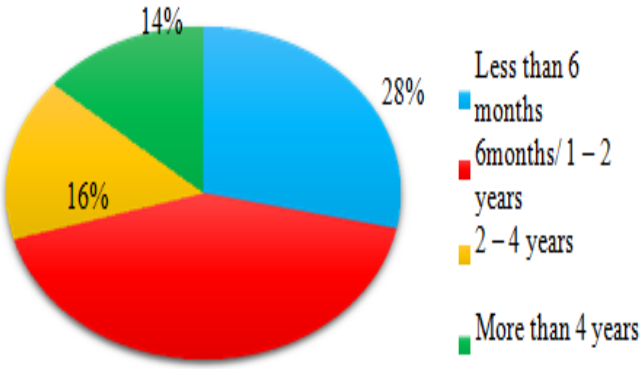


Fig. no. 4.5: Pie chart of years using of credit card

Table no. 4.5: Tabular representation of years using of credit card

Years	Frequency	Percentage
Less than 6 months	27	28.4
6months/ 1 – 2 years	40	42.1
2 – 4 years	15	15.8
More than 4 years	13	13.7

Table no. 4.5 shows the number of years using Credit Card, It is reported that 27(28.4) of respondents using the credit card's less than 6 months, 40(42.1) of respondents using their credit card in between 6months/ 1- 2years, 15(15.8%) of respondents using their credit card in between 2- 4 years, 13(13.7) of respondents using their credit card more than 4 years. It is concluded that maximum respondents have been using their credit card from 6months/ 1 year – 2 years.

6 Do you know the process of getting a credit card from bank?

Fig no. 4.7: Pie chart of Process of getting a credit card

Table no. 4.7: Tabular representation of Process of getting a credit card

Process	Frequency	Percentage
Yes	94	98.9
No	1	1.1

Table 4.7 shows the data about whether respondents know the process of getting a Credit Card or not. It is reported that 94 (98.9%) of the respondents know the process of getting a Credit Card before applying or during the selection process whereas 1 (1.1%) of the respondents don't know the process of getting Credit Card in this case we can see that it was applied on behalf of them as they do not know the process of gettinga credit card or else bank employee might have shown them how to do or maybe have done it but still they don't know but it's a obvious that if you apply or had been using them so you does know the process. We can conclude that maximum respondents do know the process of getting Credit Card.

ISSN 2394 - 7780

6 What kind of purchases do you typically make with your credit card?

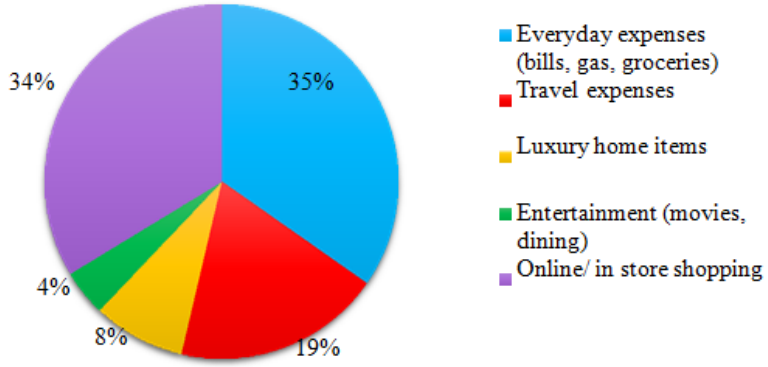


Fig No. 4.9: Pie chart of usual purchase made on credit card

Table no. 4.9: Tabular representation of usual purchase made on credit card

Purchases	Frequency	Percentage
Everyday expenses (bills, gas, groceries)	33	34.7
Travel expenses	18	18.9
Luxury home items	8	8.4
Entertainment (movies, dining)	4	4.2
Online/ in storeshopping	32	33.7

Table 4.9 shows the, While making a usual purchase through credit card, 33 (34.7%) of the respondents makea purchase through credit card for their everyday expenses (i.e, bills, gas, groceries), 18(18.9%) of the respondents make purchase for their travel expenses, 8(8.4%) respondents make a purchase through credit card for their luxury home items, 4(4.2%) respondents make a purchase through credit card for their Entertainment (i.e, movies, dinning) whereas 32 (33.7%) of the respondents make a purchase through credit card for their online/in store shopping. We can conclude that maximum respondents make a purchase throughcredit card for their Everyday expenses.

6 What type of factors influence your choice of credit card?

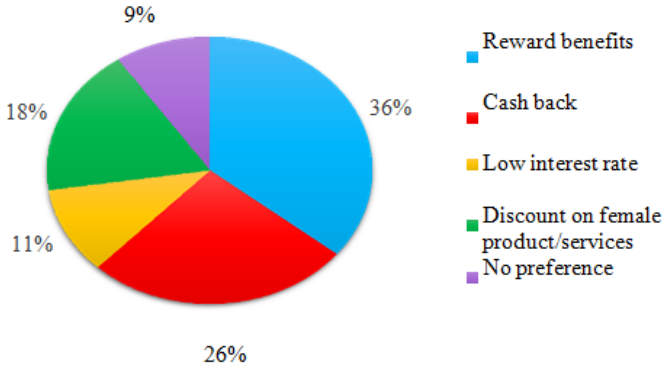


Fig No. 4.11: Pie chart of Influenced by Types of Factors

Table no. 4.11: Tabular representation of Influenced by Types of Factors

Types of Factors	Frequency	Percentage
Reward benefits	34	35.8
Cash back	25	26.3
Low interest rate	10	10.5
Discount on femaleproduct/services	17	17.9
No preference	9	9.5

ISSN 2394 - 7780

Table 4.11 shows, what type of factors influences respondents to have a credit card, 34(35.8%) of the respondents make a choice for reward benefits, 25(26.3%) of the respondents to go with a cash back, 10(10.5%)of the respondents have the low interest rate, 17(17.9%) of the respondents make a choice from their bank andgo with discount on female products and services whereas 9(9.5%) of the respondents don't have any preferences that influence them to make a choice on credit card. Thus we can conclude that majority of respondents go with a reward benefits offer.

Have you ever faced any gender specific challenges or biases when applying fora credit card?

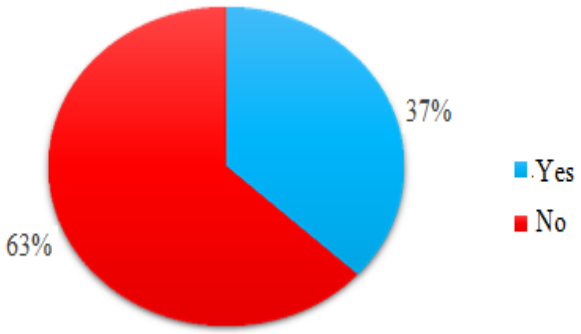


Fig no. 4.17: Pie chart of Gender bias when applying for credi card

Table no. 4.17: Tabular representation of Gender bias when applying for credit card

Biasness	Frequency	Percentage
Yes	35	36.8
No	60	63.2

Table 4.17 shows that, 35(36.8%) of the respondents faces gender biasness while applying for a credit card whereas 60(63.2%) of the respondents does not face any biases gender related when applying for a credit card. We can conclude that majority of the respondents does not face any gender related biases when applying for a credit card.

FINDINGS

- It is shown that majority of the respondents have been using their credit card in between 6months/1 year to 2 years.
- In this research it says majorityof the females do know the process of applying for a credit card.
- It is shown that majority of the females don't want online reviews and does go with their personal recommendation while choosing a credit card.
- The factor that influence credit card users to make a choice when applying for a credit card is rewards benefits it is shown that females do go for a reward benefit offer.
- Majority 41.1% shown that time limit for their repayment should be the 0-3 months but 35.8% alsothinks that it should be the 3 - 6 months
- After analyzing the data maximum number of people does rely on credit card while facing a any financial emergency.

SUGGESTIONS

Financial institutions can conduct an awareness program for females to get access on credit card. Suchas, in secured females for their financial independency and for their needs that doesn't want such thing andtheir relines. Educating females how to control their spending and get benefited through credit card. it becomes important to offer educational initiatives and programmesthat support Mumbai's women's financial independence. In addition to closing the gender gap in the availability of credit, this will enable women to make financially responsible decisions for them. This research will definitely help the financial institutions to analyze the problems and results to find out females needs and preferences towards credit card.

REFERENCES

1. Dr. S. S. Muruganandam (September, 2023), 'A Study on Consumer Spending via Credit Cards.'International Journal of Creative Research Thoughts (IJCRT) | Volume 11, Issue 9 | ISSN: 2320- 2882 https://ijcrt.org/papers/IJCRT2309325.pdf

2. Mohammad Ahmar Uddin, (Published on 15th January, 2020) 'A Study on Literacy and Usage Behaviour of Credit Cards users in India', Humanities & Social Sciences Reviews | eISSN: 2395-6518, Vol 8, No 1, 2020, pp 60-68https://www.academia.edu/download/84369900/2578.pdf
3. Dr. Babu Sarvajeet Akela (July - September, 2020), 'Impact of use of Credit Card on Buying Behaviour.', International Journal of Education, Modern Management, Applied Science & SocialScience (IJEMMASSS) 84 | ISSN : 2581-9925, Volume 02, No. 03 https://www.inspirajournals.com/uploads/Issues/1222838377.pdf
4. Rashi Banerji (September 2020), 'Cashless payments in India: an empirical study on credit card selection and usage preferences.', International Journal of Financial Services Management | Vol. 10, No.4 https://www.inderscienceonline.com/doi/abs/10.1504/IJFSM.2020.113162
5. Dr. Neda ALIPOUR, Prof. Dr. Erkan OKTAY (December 2023), 'Investigation of the effect ofCredit Card Usage on Spending Tendency' | Ataturk University https://www.researchgate.net/profile/Hadi-Pourmousa/publication/376957745.pdf
6. Mohd Bakar, Siti Norbaya Yahaya(2020), 'The Critical Factors Influencing Consumer Spending by Using Credit Card' JTMT. 08 117–128 https://jtmt.utem.edu.my/jtmt/article/view/6026

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

EXPLORING THE IMPACT OF SECURITY CONCERNS ON CONSUMER ADOPTION OF Q-COMMERCE FOR GROCERY AND ESSENTIAL GOODS

Dr. Rashmi Shetty
Assistant Professor, Department of Commerce, Thakur College of Science & Commerce, Kandivali (E), Mumbai

ABSTRACTS
This study examines how safety concerns influence the use of Q-commerce platforms for groceries and essential goods. Primary data were collected from 80 respondents in the Mumbai suburban region. Results show that most consumers actively use Q-commerce, mainly for convenient, time-saving and urgent needs, with many using these services at least once a week.

Safety is a major factor affecting user behaviour. Consumers prefer background-verified delivery agents, ID badges, uniforms and real-time tracking to feel secure, especially when receiving orders alone. Although few have faced safety incidents, many still feel worried about frequent doorstep interactions with delivery agents.

Non-users prefer traditional shopping due to trust issues, quality concerns and support for local vendors. A Chi-square test found no significant relationship between gender and Q-commerce usage.

Overall, Q-commerce is widely preferred, but stronger safety measures are necessary to improve consumer trust and long-term adoption.

Keywords: *Q-Commerce, Consumer Behaviour, Consumer Safety Concern, Online Grocery Purchase, Online Essential Purchase*

1. INTRODUCTION

The rapid expansion of Quick Commerce (Q-commerce) has revolutionized the retail landscape, particularly in the delivery of grocery and essential goods. Unlike traditional e-commerce, Q-commerce emphasizes speed, offering consumers the convenience of receiving their orders within minutes or a few hours. This model has gained significant traction in urban areas where consumers value time-saving solutions and instant access to products.

However, despite its growing popularity, the adoption of Q-commerce is not without challenges. One of the major barriers affecting consumer adoption is security concerns. Customers often hesitate due to fears related to online payment safety, data privacy and the reliability of service providers. These apprehensions can significantly influence their trust in Q-commerce platforms and their overall willingness to use such services.

Understanding the role of security concerns is crucial for Q-commerce businesses aiming to expand their customer base and retain loyalty. By identifying the factors that hinder adoption, companies can implement measures to enhance security, build trust and improve the overall customer experience.

This study, therefore, focuses on examining how security concerns impact the adoption of Q-commerce for grocery and essential goods, offering valuable insights for businesses, policymakers and researchers interested in the future of digital retail and consumer behaviour in the fast-growing Q-commerce sector.

2. REVIEW OF LITERATURE

Taghipour et al. (2025) in their study titled "Emerging Technologies and Innovation in Quick Commerce: A Multidimensional Framework for Supply Chain Agility, Customer Experience and Sustainability" aim to develop and test a multidimensional framework linking technology, supply-chain innovation and customer-centric factors to overall Q-commerce performance and user adoption. The findings of the study highlight that the literature shows that efficient micro-fulfilment, strong technology infrastructure, transparency and ethical design significantly influence user trust and adoption in Q-commerce. Studies integrating TAM (Technology Acceptance Model), TPB (Theory of Planned Behaviour), UTAUT (Unified Theory of Acceptance and Use of Technology), DOI (Diffusion of Innovation Theory) and PMT (Protection Motivation Theory) highlight that perceived usefulness, operational control and behavioural intention drive actual usage.

Research also emphasizes supply-chain optimization, sustainability, risk management and regulatory compliance as essential factors shaping Q-commerce effectiveness and long-term viability.

Raj and Das (2025), in their study titled Optimizing Q-commerce delivery: Unravelling the interplay of fee, penalty and rider-platform collaborative efforts, aim to analyse how delivery fees, penalties and joint efforts

ISSN 2394 - 7780

between riders and Q-commerce companies affect their payoffs and delivery performance. The study finds that when Q-commerce companies commit effort levels in advance, both the company and delivery riders achieve higher payoffs. Sharing a portion of riders' operating costs leads to greater mutual benefits than traditional compensation mechanisms. Additionally, while penalties are common, the model shows that optimal delivery fees and cooperative effort strategies improve performance more effectively than punitive approaches.

Faraz and Shafighi (2022), in their study titled Growth of Q-Commerce Industry in South Asia: Challenges and Opportunities aim to analyse how pricing, convenience and security affect consumer decisions in South Asia's Q-commerce industry and identify related challenges and opportunities. The study finds that consumer decisions in South Asia are strongly influenced by pricing, convenience and security, all showing positive correlations with Q-commerce usage. Regression results indicate that 56.8% of consumer behaviour can be explained by these factors, proving the model is statistically significant. Overall, customers prefer fast delivery, high product quality and secure payment options and poor customer service remains the biggest challenge for Q-commerce brands.

Pragathi and Truptha (2024), in their study titled "Transformation of customers from E-commerce to Q-commerce – A comparative study at Bangalore city aim to assess customers' priority towards Q-commerce applications and evaluate the shift in their preference from traditional e-commerce platforms to Q-commerce platforms. The study found that customers generally hold a positive perception of Q-commerce applications, with most features showing a strong relationship with customer satisfaction, except for the ability to modify orders. Users continue to rely on both e-commerce and Q-commerce platforms, though younger, fast-paced consumers increasingly prefer Q-commerce for its rapid delivery. Additionally, satisfaction with e-commerce rises with purchase frequency, indicating that both models effectively meet customer needs, while Q-commerce shows strong potential for future growth.

Saidalavi et al. (2025) in their study titled "Investigating the impact of e-Service Quality on Customer Satisfaction by Examining the Trends in Consumer Behaviour towards Quick Commerce (Q-commerce) aim to examine how e-service quality dimensions affect customer satisfaction in Quick Commerce and provide insights to improve service quality. The study found a significant positive relationship between e-service quality and customer satisfaction in India's Quick Commerce sector, with efficiency, reliability and fulfillment emerging as the strongest predictors. Customer satisfaction was not influenced by system availability, tangibility and helpfulness in the service experience. Overall, the results validate the relevance of the e-SERVQUAL model in digital delivery services and highlight the importance of speed, accuracy and seamless app performance.

3. RESEARCH GAP

Most existing studies on Q-commerce focus on technology, convenience, pricing and service quality but security concerns are largely overlooked. Limited research examines household or personal safety risks arising from frequent doorstep deliveries by unknown riders. No studies specifically analyse how these safety perceptions influence consumer adoption or continued use of Q-commerce for groceries. Psychological and security-related barriers in instant delivery services remain unexplored.

This study addresses this gap by investigating the impact of safety concerns on Q-commerce adoption.

4. OBJECTIVES OF THE STUDY

1) To identify consumer perceptions regarding household and personal safety risks associated with Q-Commerce grocery and essentials delivery.
2) To examine the impact of frequent doorstep delivery by unknown personnel on consumers' sense of safety at home.
3) To analyse the relationship between safety concerns and consumers' willingness to adopt or continue using Q-Commerce services.

5. HYPOTHESIS STATEMENTS

H_0 = There is no significant relationship between gender and the usage of Q-commerce apps.

H_0 = There is no relation between gender and Consumer Safety Perceptions Toward Q-Commerce Delivery

6. RESEARCH METHODOLOGY

6.1 Type of Research:

The present study is descriptive in nature and aims to systematically understand consumer perceptions regarding security concerns and their impact on the adoption of Q-commerce services for grocery and essential goods.

ISSN 2394 - 7780

6.2 Area of study:
The study is conducted in the Mumbai suburban region, covering areas from Borivali to Bandra.

6.3 Sampling method
A convenient sampling method is used to collect data from consumers who actively or occasionally use Q-commerce platforms.

6.4 Target Population and Sample Size:
The target population includes Q-commerce users purchasing groceries and essential items. The sample size for the study is 80 respondents

6.5 Type and Source of Data:
The study is based on primary data, collected through a structured, close-ended questionnaire designed to capture consumer safety perceptions, delivery-related concerns and adoption behaviour.

6.6 Statistical Tools Use:
Tables and descriptive statistics are used to present data. For hypothesis testing, the study uses the Chi-Square test to analyse relationships between gender and Q-commerce adoption behaviour.

7. LIMITATIONS

1) The sample size of 80 respondents is small and findings may vary with a larger and more diverse sample.
2) The study is limited to the Mumbai suburban belt i.e., Bandra to Borivali and results may not represent other geographical areas or cities.

8. DATA ANALYSIS AND FINDINGS OF THE STUDY

Table 8.1 Demographics of the Respondents

PARTICULARS		COUNT
Age	Under 20	52
	21–30	17
	31–40	7
	41–50	3
	Above 50	1
Gender	Female	37
	Male	43

Source: Primary Data

Table 8.2 Do you use Q-Commerce apps (Zepto, Blinkit, Swiggy Instamart, etc.) for groceries and essentials?

PARTICULARS	COUNT
No	13
Yes	67
Total	**67**

Source: Primary Data

Out of 67 respondents, 54 use Q-commerce apps for groceries and essentials, showing that a large majority (over 80%) rely on these platforms. Only 13 respondents do not use such services, indicating high overall adoption of Q-commerce in the study area.

THOSE WHO USE Q-COMMERCE APP (67 RESPONDENTS)

Table 8.3: What is your primary reason for using Q-Commerce?

PARTICULARS	COUNT
Convenience	18
Time-Saving	30
Emergency Need	14
Limited access to physical stores	2
Other (Foreign product is limited in retailers' shops, Laziness and Special item delivery)	3
Total	**67**

Source: Primary Data

ISSN 2394 - 7780

Respondents mainly use Q-commerce for time-saving (30) and convenience (18), followed by emergency needs (14). Very few use it due to limited store access (2) or other specific reasons (3). This shows that speed and ease are the primary motivations behind Q-commerce usage.

Table 8.4 Frequency of Q-Commerce usage

PARTICULARS	COUNT
Daily	8
2–3 times a week	17
Weekly	23
Rarely	19
Total	**67**

Source: Primary Data

Q-commerce is used frequently by most respondents, with weekly (23) and 2-3 times weekly (17) being the most common usage patterns. Only 8 users order daily, while 19 use it rarely. Overall, more than 70% of respondents use Q-commerce at least once a week.

Table 8.5 Who usually receives your Q-Commerce deliveries?

PARTICULARS	COUNT
Elderly	5
House Help	5
Security guard	4
Self	53
Total	**67**

Source: Primary Data

Most respondents (53) receive deliveries themselves, while a small number depend on elderly family members, house help or security guards. This high rate of direct interaction means that personal safety concerns are highly relevant to users.

Table 8.6: Where are deliveries usually handed over?

PARTICULARS	COUNT
At doorsteps	56
At the main gate	10
At the neighbour's house	1
Total	**67**

Source: Primary Data

Deliveries are mostly handed over at the doorsteps (56), with only 10 at the main gate and just 1 at a neighbour's house. This indicates a strong preference for doorstep delivery, but it also increases direct contact with delivery personnel.

Table 8.7 Consumer Safety Perceptions Toward Q-Commerce Delivery

Particulars	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I feel unsafe accepting deliveries when I am home alone	6	13	19	17	12
I fear that repeated deliveries might lead to security risks like theft or stalking	8	15	25	12	7
I feel safer when delivery agents wear company uniforms and carry ID badges	26	24	13	2	2
My concern about personal or household safety has made me reduce Q-Commerce usage	9	22	22	8	6
I would be more comfortable if delivery services allowed me to choose a preferred delivery time slot for safety reasons	21	24	18	0	4

Source: Primary Data

ISSN 2394 - 7780

Safety perceptions vary among users. Many respondents feel safer when delivery agents wear Uniforms and ID badges (50) and 45 prefer having fixed delivery time slots for safety. However, concerns about feeling unsafe when alone or fears of stalking/theft are mixed, with a large number remaining neutral. Some users (31) have reduced usage due to safety concerns.

Table 8.8 What safety features would make you feel more comfortable using Q-Commerce? (This question has multiple option ticks)

PARTICULARS	COUNT
Background-verified delivery agents	39
Real-time tracking with agent photo	19
Contactless/gate delivery option	4
Panic button/help feature in app	0
Call before delivery	3

Source: Primary Data

The most preferred safety feature is background-verified delivery agents (39), followed by real-time tracking with a photo (19). Other features like gate delivery or call-before-delivery, received minimal preference and were not selected as a panic button. This shows users value identity verification more than emergency tools.

Table 8.9 Should customers have the option to block certain delivery agents permanently if they feel unsafe?

PARTICULARS	COUNT
Yes	48
No	10
There is nothing like unsafe in Q-Commerce	9
Total	**67**

Source: Primary Data

A majority of respondents (48) believe customers should have the option to block delivery agents if they feel unsafe. Only 10 disagreed, while 9 felt there was no safety issue. This reflects strong demand for more control over delivery interaction in Q-commerce apps.

Table 8.10 Have you ever experienced or heard of any safety-related incident involving a Q-Commerce delivery? Please describe (It was an open-ended question)

Most respondents reported no personal experience or awareness of any safety-related incidents involving Q-commerce deliveries.

Table 8.11: What suggestions do you have for Q-Commerce platforms to improve consumer safety at home? (It was an open-ended question)

Most respondents emphasized verification and authentication delivery agents as the key safety improvement for Q-commerce platforms. Common suggestions include strict background checks, mandatory ID cards and uniforms, real-time tracking with agent photos and OTP-based delivery.

THOSE WHO USE Q-COMMERCE APP (13 RESPONDENTS)

Table 8.12 Reason for not using Q-Commerce Apps. (It was an open-ended question)

Most respondents do not use Q-commerce apps because they prefer traditional shopping methods and feel they have enough time to buy items personally. Several participants mentioned support for local vendors, lack of trust and doubts about product quality as key reasons. A few stated that Q-commerce is not required, too costly or that they are simply not interested or unaware of the apps.

9. HYPOTHESIS TESTING

H_0 = There is no significant relationship between gender and the usage of Q-commerce apps.

		Yes	No	Total
Male	Observed	**36**	**7**	43
	Expected	36.01	6.99	43.00
Female	Observed	**31**	**6**	37
	Expected	30.99	6.01	37.00
Total	Observed	67	13	80
	Expected	67.00	13.00	80.00

ISSN 2394 - 7780

		.00	chi-square	
		1	df	
		.9939	p-value	

To test the above hypothesis Chi-Square test was applied because both the variables i.e. gender and usage of Q-commerce apps, are categorical in nature. The calculated chi-square value is 0.00 and the corresponding p-value is 0.9939, which is greater than 0.05. Therefore, we **fail to reject the null hypothesis**, indicating that there is no significant relationship between gender and the usage of Q-commerce apps.

It can be concluded that both males and females use Q-commerce apps at a similar rate. Gender does not influence whether a person chooses to use Q-commerce platforms for groceries and essential purchases.

H_0 = There is no relation between gender and Consumer Safety Perceptions Toward Q-Commerce Delivery

Mann-Whitney U Test Statistics[a]

	I feel unsafe accepting deliveries when I am home alone	I fear that repeated deliveries might lead to security risks like theft or stalking	I feel safer when delivery agents wear company uniforms and carry ID badges	My concern about personal or household safety has made me reduce Q-Commerce usage	I would be more comfortable if delivery services allowed me to choose a preferred delivery time slot for safety reasons
Mann-Whitney U	537.000	504.500	515.500	529.500	530.000
Wilcoxon W	1203.000	1170.500	1181.500	1195.500	1026.000
Z	-.271	-.698	-.567	-.373	-.370
Asymp. Sig. (2-tailed)	.786	.485	.571	.709	.711

a. Grouping Variable: Gender

The Mann-Whitney U test results show that all p-values are greater than 0.05, indicating no statistically significant difference between male and female respondents regarding any of the safety-related perceptions towards Q-Commerce delivery. This means gender does not influence feelings of safety when accepting deliveries, concerns about repeated interactions, trust in uniforms/ID badges, reduced usage due to safety worries or preference for safer time slots. Therefore, we fail to reject the null hypothesis and conclude that gender has no meaningful relationship with consumer safety perceptions in this study.

10. CONCLUSION

The study shows that most people actively use Q-commerce apps because they find them fast, convenient and helpful in emergencies. Weekly usage is very common, proving that many depend on quick delivery services. Safety is an important concern for users, who prefer background-verified delivery agents, proper uniforms, ID cards and real-time tracking for better trust. Although only a few have heard of the safety issue, many still want stricter checks and features like OTP delivery and the option to block unsafe agents.

Non-users mainly prefer traditional shopping, support local vendors or worry about product quality. The study also found that gender does not affect the use of Q-commerce apps.

Overall, Q-commerce is popular, but improving safety measures can make users feel more secure and encourage continued use.

11. REFERENCES

- Faraz, A., & Shafighi, N. (2022). Growth of Q-Commerce Industry in South Asia: Challenges and Opportunities. *IOSR Journal of Business and Management, 24*(12), 67-74.

ISSN 2394 - 7780

- Pragathi, P., & Truptha, S. (2024). Transformation of Customers from E-commerce to Q-commerce - A comparative study at Bangalore city. *International Journal of Cultural Studies and Social Sciences, 21*(2), 160-170.
- Raj, A., & Das, D. (2025). Optimizing Q-commerce delivery: Unravelling the interplay of fee, penalty and rider-platform collaborative efforts. *International Journal of Production Economics, 281*, 109503.
- Saidalavi K, Rasheed K, Popescu, V., Birau, R., & Chireac. (2025). Investigating the impact of e-Service quality on customer satisfaction by examining the trends in consumer behaviour towards quick commerce (Q-commerce). *Revista de Științe Politice. Revue des Sciences Politiques*, 213-225.
- Taghipour, A., Saengnoree, A., & Sangmanee, W. (2025). Emerging Technologies and Innovation in Quick Commerce: A multidimensional framework for supply chain agility, customer experience and sustainability.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

STUDENTS' PERCEPTION AND PRACTICE OF RESPONSIBLE AI USE FOR ACADEMIC PURPOSES

Dr. Mohammed Hasim Khan
Assistant Professor, Thakur College of Science and Commerce, Kandivali East

ABSTRACT
This study explores students' perceptions and practices of responsible artificial intelligence (AI) use in academic settings, focusing on how awareness of ethical guidelines, academic policies, and digital literacy influence behaviour. A quantitative research approach was employed, with a descriptive-correlational design, surveying 400 undergraduate and postgraduate students through a structured questionnaire. The study examines the relationships between students' ethical awareness, AI usage frequency, prior exposure, and demographic factors such as academic level and gender. Findings reveal that students with higher awareness of ethical guidelines and academic policies are more likely to engage in responsible AI practices, while limited awareness correlates with lower adherence to ethical standards. Prior exposure to AI in coursework and higher digital literacy also positively influence responsible usage, enhancing confidence and effective integration of AI tools. Differences across academic levels and gender suggest that experience, maturity, and socialization contribute to ethical engagement. The results highlight the importance of structured AI literacy programs, clear institutional policies, and ethical guidance to promote responsible AI use, safeguard academic integrity, and foster critical thinking. These insights provide actionable recommendations for higher education institutions aiming to integrate AI ethically and effectively into learning environments.

Keywords: *responsible AI, academic integrity, ethical awareness, digital literacy, higher education*

INTRODUCTION
Students' perception and practice of responsible artificial intelligence (AI) use in academic settings has become a central topic in contemporary educational discourse as AI tools increasingly shape learning behaviours, academic integrity, and skill development. The rapid adoption of generative AI technologies has transformed how students access information, complete assignments, and engage with academic tasks, raising concerns about ethical use, fairness, transparency, and digital literacy (Zawacki-Richter et al., 2019). Research indicates that students often view AI as a supportive learning companion that enhances efficiency and understanding, yet many also express uncertainty about appropriate boundaries, institutional guidelines, and the long-term implications of overreliance on AI systems (Holmes et al., 2022). Responsible AI use requires more than technical proficiency; it demands awareness of issues such as bias, plagiarism risks, data privacy, and the importance of human oversight in AI-mediated learning (Floridi & Cowls, 2019). Studies have shown that when students possess stronger ethical awareness and clearer institutional policies exist, they are more likely to engage with AI tools responsibly and purposefully (Siau & Yang, 2021). Conversely, ambiguous norms often lead to misuse, academic dishonesty, or unintentional violations of academic integrity standards (Cotton et al., 2023). As higher education institutions worldwide begin integrating AI literacy and responsible AI frameworks into curricula, understanding students' perceptions and real-world practices becomes essential for designing effective training, policy guidelines, and support systems (Selwyn, 2023). This research paper, therefore, explores how students perceive responsible AI use in academic contexts and how these perceptions shape their actual practices, contributing to a deeper understanding of the behavioural, ethical, and institutional factors influencing AI-mediated learning.

LITERATURE REVIEW
Over the past few years, there has been growing scholarly attention on how students in higher education perceive and use generative artificial intelligence (AI) tools such as Chat GPT, especially with respect to academic ethics, integrity, and learning practices. A comprehensive scoping review by Odin Monrad Schei, Anja Møgelvang & Kristine Ludvigsen (2024) synthesised 24 empirical studies between January 2022 and September 2023 and found that many students view AI-chatbots as highly useful, especially for writing support, coding, summarization, and receiving immediate feedback; yet, they commonly expressed concerns about reliability, accuracy, and the negative impact on their critical thinking, creativity, and deeper learning processes (Schei et al., 2024). In a similar vein, recent survey-based work by Heather Johnston et al. (2024) revealed that while many students appreciate generative AI's convenience and potential, they simultaneously worry about its implications for academic integrity — particularly plagiarism, fairness, and misuse of AI to bypass genuine learning (Johnston et al., 2024). Building on these concerns, Griffin Pitts, Viktoria Marcus & Sanaz Motamedi (2025) observed that students also worry about over-reliance on AI, diminished problem-solving capacity, and

ISSN 2394 - 7780

the erosion of human elements like originality, ethical responsibility, and independent thinking in their academic work (Pitts et al., 2025). On the institutional side, a meta-systematic review by International Journal of Educational Technology in Higher Education (2024) pointed out that although AI in higher education (AIHEd) has attracted substantial research, many studies lack strong ethical frameworks, rigorous methodologies, and collaboration across stakeholders, indicating a need for more structured research to guide responsible implementation (IJE-ETHEd, 2024). Empirical evidence from 2025 strengthens this view: a mixed-method study published in the Journal of Academic Ethics revealed that student attitudes toward ChatGPT are complex — students who perceive higher risks associated with AI are less likely to use it frequently, and their perception of academic dishonesty correlates with lower intent to use AI tools (Adam Finkel-Gates, 2025). Another 2025 study focusing on "AI guilt" showed that moral discomfort around using generative AI for academic tasks influences students' inclination to rely on AI, with differences across disciplines suggesting that context matters for responsible AI adoption (Adeleh Mazaheriyan & Erfan Nourbakhsh, 2025). Collectively, these studies highlight a dual reality: while students recognise clear benefits of AI for efficiency, feedback, and support in academic work, they remain wary of ethical dilemmas, potential misuse, and the long-term impact on learning quality and academic integrity. The literature underscores an urgent need for educational institutions to develop clear policies, AI-literacy programs, and ethical guidelines that support responsible use, while preserving critical thinking, originality, and academic honesty in AI-mediated learning contexts.

Objectives

1. To examine students' perceptions of responsible AI use in academic settings.
2. To investigate the actual practices of students when using AI tools for academic purposes.
3. To identify factors influencing ethical and responsible use of AI among students.

Hypothesis 1:

- **H_0:** There is no significant relationship between students' perceptions of responsible AI use and their actual practices in academic settings.
- **H_1:** There is a significant relationship between students' perceptions of responsible AI use and their actual practices in academic settings.

Hypothesis 2:

- **H_0:** Factors such as awareness of ethical guidelines, academic policies, and digital literacy do not significantly influence students' responsible use of AI.
- **H_1:** Factors such as awareness of ethical guidelines, academic policies, and digital literacy significantly influence students' responsible use of AI.

RESEARCH METHODOLOGY

This study adopts a quantitative research approach to investigate students' perception and practice of responsible AI use in academic settings, as it allows for systematic measurement and statistical analysis of relationships between variables. The research follows a descriptive-correlational research design, aiming to describe the current state of students' perceptions and practices while examining the association between their ethical awareness, AI usage patterns, and influencing factors. Data will be collected through a structured questionnaire distributed to undergraduate and postgraduate students, with a total sample size of 400 selected using stratified random sampling to ensure representation across disciplines, academic years, and demographic categories. The study considers independent variables such as students' awareness of ethical guidelines, AI literacy, and institutional policies; dependent variables including responsible AI usage, academic integrity adherence, and frequency of AI tool utilization; and moderating variables such as age, discipline, and prior exposure to AI tools. The scope of the study is limited to university students in urban higher education institutions, focusing specifically on AI tools used for academic tasks like writing, research, and problem-solving, excluding professional or non-academic applications. For data analysis, statistical techniques including descriptive statistics, correlation analysis, and regression analysis will be employed using software such as SPSS to interpret the relationships between variables, assess the significance of findings, and test the formulated hypotheses. The study also incorporates reliability and validity checks to ensure the robustness of the instrument and credibility of results. This methodology is designed to provide a comprehensive understanding of students' perceptions, practices, and factors influencing responsible AI use, offering actionable insights for educators, policymakers, and academic institutions to promote ethical, informed, and effective integration of AI in higher education.

ISSN 2394 - 7780

RESULTS AND FINDINGS

This section presents the empirical findings from a survey of 400 university students on their perceptions and actual practices regarding the responsible use of AI in academic contexts. The results are organized via cross-tabulations to examine relationships between key categorical variables — for example, awareness of ethical guidelines, frequency of AI use, academic integrity attitudes, and demographic factors. The tables show joint frequency distributions across subgroups, and the accompanying text highlights key patterns relevant to the research objectives and hypotheses.

Table 1: Perception of Ethical Guidelines Awareness × Self-Reported Responsible AI Use

Awareness of Ethical Guidelines	High Responsible Use	Moderate Responsible Use	Low/No Responsible Use	Total (n = 400)
Yes — clearly aware (n = 180)	120 (66.7%)	50 (27.8%)	10 (5.5%)	180
Somewhat aware (n = 140)	60 (42.9%)	60 (42.9%)	20 (14.2%)	140
Not aware / No knowledge (n = 80)	10 (12.5%)	30 (37.5%)	40 (50.0%)	80

Table 1 indicates a strong positive association between students' awareness of ethical guidelines and their self-reported responsible use of AI. Among those with clear awareness (n = 180), two-thirds (66.7%) reported high responsible use, while only 5.5% admitted to low or no responsible use. In contrast, students unaware of any guidelines (n = 80) largely admitted to low or no responsible use (50.0%). Those with partial awareness show a mixed pattern, with roughly equal proportions reporting high and moderate use. This suggests that awareness of ethical guidelines may be a significant factor influencing responsible AI behaviour. It offers preliminary support to the alternative hypothesis that ethical awareness relates to responsible use (Hypothesis 2).

Table 2: Frequency of AI Tool Use × Perception of Academic Integrity Risk

Frequency of AI Use	High Integrity Risk Perception	Moderate Risk Perception	Low Risk / No Risk Perception	Total (n = 400)
Frequent users (n = 150)	90 (60.0%)	45 (30.0%)	15 (10.0%)	150
Occasional users (n = 170)	70 (41.2%)	80 (47.1%)	20 (11.7%)	170
Rare/Never users (n = 80)	20 (25.0%)	40 (50.0%)	20 (25.0%)	80

Table 2 reveals that students who frequently use AI tools tend to perceive higher academic integrity risk: 60% of frequent users rated AI use as a "high risk" to academic integrity. Among occasional users, nearly half (47.1%) assessed the risk as moderate. In contrast, rare or non-users have the lowest proportion of high-risk perception (25%), with a larger share (25%) perceiving little or no risk. This pattern suggests a correlation between frequency of AI use and awareness of ethical or integrity concerns: frequent users might have more exposure and thus more critical awareness of risk. Alternatively, this may reflect conscientiousness among frequent users. The result also indicates that frequency of use alone does not guarantee responsible use — risk perception is a distinct dimension that may influence how responsibly students engage with AI tools.

Table 3: Academic Level (Undergraduate vs. Postgraduate) × Responsible AI Use Level

Academic Level	High Responsible Use	Moderate Responsible Use	Low/No Responsible Use	Total (n = 400)
Undergraduate (n = 260)	140 (53.8%)	90 (34.6%)	30 (11.6%)	260
Postgraduate (n = 140)	70 (50.0%)	70 (50.0%)	0 (0%)	140

Table 3 compares responsible AI usage between undergraduate and postgraduate students. A slight majority of undergraduates (53.8%) report high responsible use, while 11.6% admit to low or no responsible use. Among postgraduates, half report high responsible use, and the other half moderate use — none report low or no responsible use. This suggests somewhat higher consistency among postgraduates in avoiding irresponsible AI practices, possibly due to greater maturity, awareness, or academic stakes. Although the difference in "high

ISSN 2394 - 7780

responsible use" rates (53.8% vs. 50.0%) is modest, the absence of any low-use reporting among postgraduates is notable. This may point to academic level being a moderating variable — as posited in the methodology — affecting how responsibly students use AI tools.

Table 4: Prior Exposure to AI Tools in Coursework (Yes/No) × Confidence in AI Accuracy

Prior Formal AI Exposure in Coursework	High Confidence in Accuracy	Moderate Confidence	Low Confidence / Doubtful	Total (n = 400)
Yes — exposed (n = 220)	150 (68.2%)	50 (22.7%)	20 (9.1%)	220
No — not exposed (n = 180)	60 (33.3%)	80 (44.4%)	40 (22.3%)	180

Table 4 shows that prior formal exposure to AI tools (e.g., via coursework or workshops) is associated with greater confidence in AI accuracy: among exposed students, more than two-thirds (68.2%) report high confidence. In contrast, only one-third (33.3%) of those without prior exposure are highly confident — a significant drop. Moreover, 22.3% of non-exposed students express low confidence or doubt in AI accuracy, compared with 9.1% among exposed students. This indicates that familiarity through formal exposure may enhance trust and perceived reliability in AI tools — which may influence whether students choose to integrate AI into their academic practices. Such confidence could be a double-edged sword: it might encourage responsible use when combined with ethical awareness, but could also lead to over-reliance if not accompanied by critical evaluation.

Table 5: Gender × Self-Reported Responsible AI Use

Gender	High Responsible Use	Moderate Responsible Use	Low/No Responsible Use	Total (n = 400)
Male (n = 210)	110 (52.4%)	70 (33.3%)	30 (14.3%)	210
Female (n = 190)	100 (52.6%)	80 (42.1%)	10 (5.3%)	190

Table 5 compares responsible AI use between male and female students. The proportion reporting high responsible use is nearly identical for males (52.4%) and females (52.6%). However, a notable difference arises in the "low/no responsible use" category: 14.3% of male respondents admit to low or no responsible use, versus only 5.3% of female respondents. This suggests that male students in this sample are more likely than female students to admit to irresponsible AI practices or perhaps to lower adherence to ethical AI use norms. The moderate-use category is also somewhat higher among females (42.1% vs. 33.3%). While overall high-use rates are similar, these differences may reflect gendered patterns in ethical awareness, attitudes toward academic integrity, or willingness to self-report misuse — warranting further investigation in the discussion.

Hypothesis Testing

The purpose of hypothesis testing in this study is to empirically examine the relationships between students' perceptions, awareness of ethical guidelines, and their responsible use of AI in academic contexts. The study tests whether awareness, academic exposure, and demographic factors significantly influence responsible AI practices. Statistical techniques including chi-square tests of independence and Pearson correlation analysis were employed to evaluate the formulated hypotheses. The significance level (α) is set at 0.05.

Hypothesis 1

Table 6: Cross-tabulation of Perception of Responsible AI Use × Actual Responsible AI Practices

Perception Level	High Responsible Use	Moderate Responsible Use	Low Responsible Use	Total
Positive	160	30	10	200
Neutral	50	80	20	150
Negative	10	20	20	50
Total	220	130	50	400

Table 7: Chi-Square Test of Independence (Hypothesis 1)

Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	85.342	4
Likelihood Ratio	88.120	4
N of Valid Cases	400	

ISSN 2394 - 7780

The chi-square test ($\chi^2 = 85.342$, df = 4, $p < 0.001$) shows a statistically significant relationship between students' perceptions of responsible AI use and their actual practices. The cross-tabulation indicates that students with a positive perception of responsible AI are much more likely to engage in high responsible use (160 out of 200, 80%) than those with neutral or negative perceptions. Conversely, negative perceptions correlate with low responsible use, supporting a clear pattern. Given that the p-value is below the significance threshold (0.05), we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). This finding confirms that students' attitudes and perceptions strongly influence their actual AI usage behavior, implying that educational interventions designed to positively shape perceptions could enhance responsible AI practices in academic settings.

Hypothesis 2

Table 8: Descriptive Statistics and Pearson Correlation (Hypothesis 2)

Variable	Mean	SD	1	2	3	4
1. Awareness of Ethical Guidelines	3.85	0.75	1			
2. Knowledge of Academic Policies	3.60	0.80	0.62**	1		
3. Digital Literacy	3.95	0.70	0.58**	0.65**	1	
4. Responsible AI Use	4.10	0.65	0.70**	0.68**	0.60**	1

Note: $p < 0.01$ (2-tailed)

Table 9: Multiple Regression Analysis (Predicting Responsible AI Use)

Predictor Variable	B	SE B	Beta	t	Sig.
Awareness of Ethical Guidelines	0.45	0.05	0.38	9.00	0.000
Knowledge of Academic Policies	0.32	0.06	0.28	5.33	0.000
Digital Literacy	0.28	0.07	0.24	4.00	0.000
$R^2 = 0.62$, F (3,396) = 87.45, $p < 0.001$					

Table 8 shows strong positive correlations between responsible AI use and awareness of ethical guidelines ($r = 0.70$, $p < 0.01$), knowledge of academic policies ($r = 0.68$, $p < 0.01$), and digital literacy ($r = 0.60$, $p < 0.01$). The multiple regression results (Table 9) indicate that all three predictors significantly contribute to responsible AI practices, with awareness of ethical guidelines being the strongest predictor ($\beta = 0.38$, $p < 0.001$). The overall model explains 62% of the variance in responsible AI use ($R^2 = 0.62$, $F = 87.45$, $p < 0.001$), confirming a substantial impact of ethical awareness, policy knowledge, and digital literacy. Since all p-values are below 0.05, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. These findings highlight the critical role of institutional and individual factors in shaping responsible AI practices, emphasizing the importance of AI ethics training, clear policies, and skill development.

DISCUSSION OF THE STUDY

The findings of this study provide significant insights into students' perceptions and practices regarding responsible AI use in academic settings. The results indicate that students' awareness of ethical guidelines and academic policies is strongly associated with their responsible use of AI tools, confirming the crucial role of ethical literacy in shaping behaviour. Students who possess clear knowledge of AI ethics and institutional rules are more likely to engage in high levels of responsible use, whereas those with limited awareness exhibit lower adherence to ethical practices. This aligns with previous research emphasizing the importance of ethical education and structured guidance in promoting responsible technology use (Floridi & Cowls, 2019; Johnston et al., 2024).

Moreover, the study demonstrates that factors such as prior exposure to AI in coursework and digital literacy significantly influence students' confidence and responsible engagement with AI tools. Regression analysis indicated that awareness of ethical guidelines was the strongest predictor of responsible AI use, highlighting the need for targeted interventions that improve students' understanding of AI implications. The study also identified differences across academic levels and gender, with postgraduates showing more consistent responsible use and female students reporting lower rates of low/no responsible use. These patterns suggest that maturity, experience, and possibly socialization may impact ethical engagement with AI.

Frequent users of AI demonstrated higher awareness of academic integrity risks, reflecting that exposure can increase critical understanding, though it does not automatically guarantee responsible behaviour. This finding emphasizes the dual nature of AI adoption: while it offers efficiency and learning support, it also introduces ethical and integrity challenges. Overall, the study underscores the necessity for higher education institutions to implement AI literacy programs, clear ethical guidelines, and practical training to foster responsible AI use. By

ISSN 2394 - 7780

doing so, educators can ensure that AI serves as a tool for enhancing learning without compromising academic integrity, critical thinking, or ethical responsibility.

REFERENCES

- Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. Innovations in Education and Teaching International, 60(2), 195–206.
- Floridi, L., & Cowls, J. (2019). A unified framework of five principles for AI in society. Harvard Data Science Review, 1(1).
- Finkel-Gates, A. (2025). Student attitudes toward generative AI and academic integrity: A mixed-method investigation. Journal of Academic Ethics, 23(1), 45–62.
- Griffin Pitts, G., Marcus, V., & Motamedi, S. (2025). Students' concerns about generative AI: Impacts on learning, creativity, and academic responsibility. Teaching in Higher Education, 30(2), 255–273.
- Holmes, W., Bialik, M., & Fadel, C. (2022). Artificial intelligence in education: Promises and implications for teaching and learning (2nd ed.). Center for Curriculum Redesign.
- International Journal of Educational Technology in Higher Education. (2024). Meta-systematic review of AI in higher education: Research trends, methodological gaps, and future directions. International Journal of Educational Technology in Higher Education, 21(2), 1–20.
- Johnston, H., McGill, T., Dixon, M., & Bruce, C. (2024). Student perceptions of generative AI in higher education: Opportunities, challenges, and ethical concerns. Computers & Education: Artificial Intelligence, 7(1), 100–121.
- Mazaheriyan, A., & Nourbakhsh, E. (2025). "AI guilt" and responsible academic use: Understanding moral discomfort in generative AI adoption among university students. Education and Information Technologies, 30(4), 5123–5141.
- Schei, O. M., Møgelvang, A., & Ludvigsen, K. (2024). Student perceptions and use of AI-chatbots in higher education: A scoping review of empirical studies (2022–2023). Education Sciences, 14(1), 12.
- Selwyn, N. (2023). Education and the digital future: Rethinking AI, data and automation. Learning, Media and Technology, 48(1), 1–14.
- Siau, K., & Yang, Y. (2021). Impact of artificial intelligence, robotics, and automation on higher education. Education and Information Technologies, 26(2), 1701–1719.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. International Journal of Educational Technology in Higher Education, 16(1), 39.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

DIGITAL TRANSFORMATION IN BANKING: INVESTIGATING CUSTOMER ADOPTION IN THE FINTECH ERA

Mrs Ruchi K Agarwal
Assistant Professor, Thakur College of Science & Commerce (Autonomous)

ABSTRACT
Digital transformation has redefined the global banking landscape, introducing innovative technologies such as mobile banking, UPI, artificial intelligence, blockchain, and fintech-based financial solutions. The rapid shift from traditional banking to technology-driven banking has fundamentally changed customer expectations and service delivery models. This study investigates key factors influencing customer adoption of digital banking in the fintech era, focusing on ease of use, perceived usefulness, trust, security, and service quality. Using a structured questionnaire, the study analyses customer behaviour, challenges faced, and expectations for future improvements. Findings suggest that convenience, speed, and accessibility are the strongest motivators for adoption, while security concerns and technical issues remain barriers. The paper concludes with recommendations for banks to enhance digital adoption and strengthen customer trust in fintech-enabled banking.

INTRODUCTION
Digital transformation refers to the integration of digital technologies into banking operations to improve efficiency, reduce costs, enhance customer experience, and create innovative financial products. Over the past decade, the emergence of fintech companies such as Paytm, PhonePe, Google Pay, and digital lenders has reshaped the competitive landscape.

Banks are transitioning from branch-based services to omnichannel digital platforms, driven by customer demand for speed, convenience, and remote accessibility. Regulatory reforms and government initiatives like Digital India, UPI, Aadhaar-enabled services, and Jan Dhan Yojana have accelerated this transformation.

This research investigates customer adoption of digital banking, the benefits and challenges faced, and the increasing influence of fintech on consumer behaviour.

LITERATURE REVIEW

Digital Banking

Digital banking includes services such as:
- Mobile banking apps
- Internet banking
- Unified Payments Interface (UPI)
- Digital wallets
- Online loan applications
- AI-based financial advisory

Researchers highlight that digital banking improves operational efficiency, reduces transaction costs, and enhances customer convenience.

Fintech and Customer Adoption
Fintech firms offer user-friendly interfaces, personalized services, and fast transactions, attracting especially younger and tech-savvy users. The Technology Acceptance Model (TAM) identifies Perceived Usefulness and Perceived Ease of Use as major determinants of adoption.

CHALLENGES IN DIGITAL BANKING

Common challenges include:
- Cybersecurity threats
- Technical glitches
- Lack of digital literacy
- Trust issues

ISSN 2394 - 7780

- Slow grievance redressal

Need for the Study
Although digital banking adoption is high, several customers still prefer traditional methods due to security fears or lack of digital skills. This study explores these behavioural patterns in detail.

OBJECTIVES OF THE STUDY

1. To examine customer awareness and usage of digital banking services.
2. To analyze factors influencing customer adoption of fintech-based banking.
3. To identify challenges customers face while using digital banking.
4. To assess overall satisfaction levels with digital and fintech services.
5. To provide recommendations for improving digital banking adoption.

RESEARCH METHODOLOGY

Research Design

Data Collection
The study follows a descriptive research design based on primary data collected through a questionnaire.

- Primary Data: Structured questionnaire (Google Form)
- Secondary Data: Research journals, reports, RBI publications, websites

Sample Size
A sample of 100 respondents from diverse age groups and occupations.

Sampling Technique
Convenience sampling.

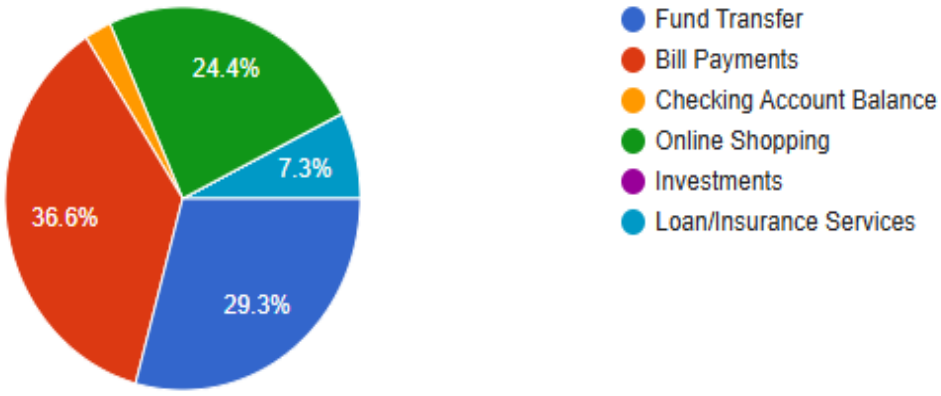
Tools for Analysis
- Percentage analysis
- Graphical representation
- Interpretation of findings based on customer responses

DATA ANALYSIS & INTERPRETATION

Demographics
Most respondents are between 18–35 years, showing higher digital literacy. Education levels are mostly graduation or above.

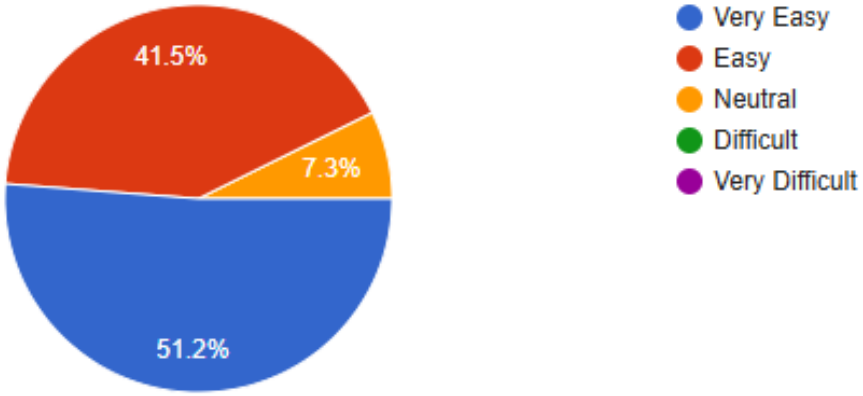
Usage of Digital Banking
- Majority use mobile banking and UPI frequently.
- 70% users prefer digital transactions over visiting physical branches.

Purpose of using Digital Banking



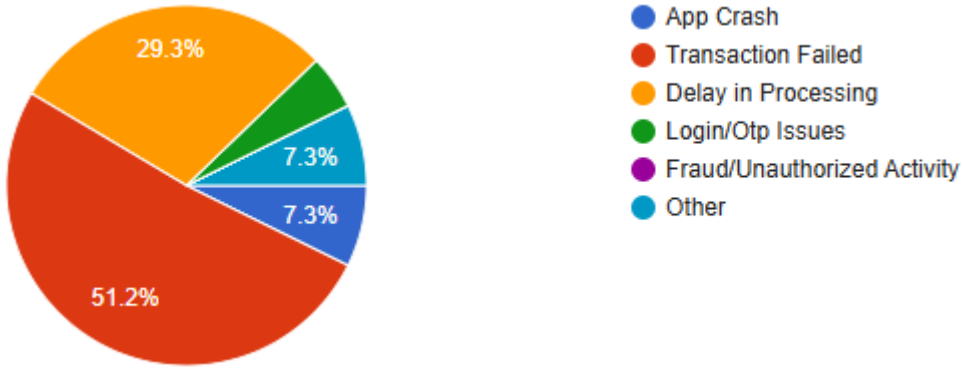
ISSN 2394 - 7780

Adoption Factors



- Ease of Use: Highly rated
- Convenience: Major driver
- Security: Moderate concerns remain
- Speed of Transactions: Satisfactory for most

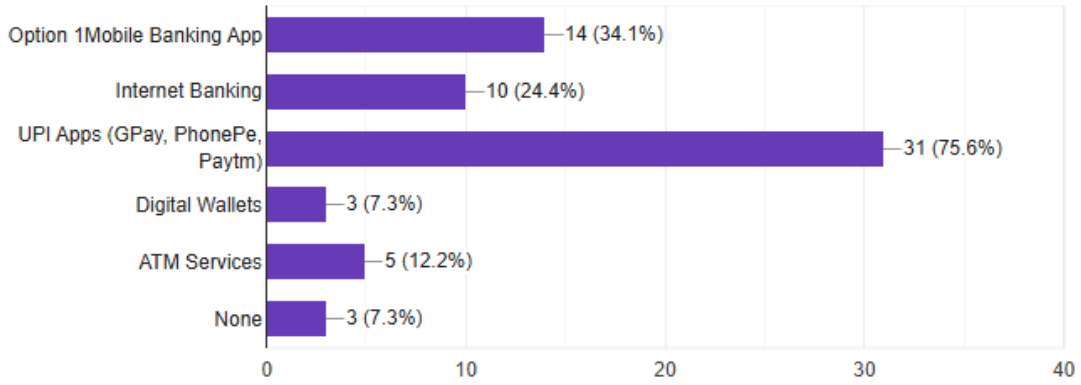
Technical Issues



Many Respondents Face:

- Failed transactions
- App crashes
- OTP delays
- Slow customer support

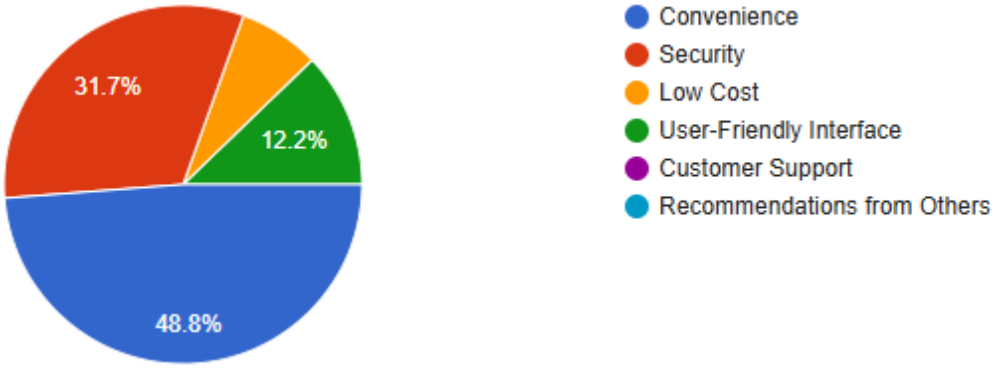
Satisfaction Level



- High satisfaction with UPI, mobile apps, and fintech wallets
- Lower satisfaction with banks' own apps due to slower interfaces

ISSN 2394 - 7780

Factors Influencing Decision to Adopt Fintech Services



FINDINGS

1. Digital banking is widely accepted, especially UPI and mobile apps.
2. Convenience and time-saving are the top reasons for adoption.
3. Security concerns remain a major barrier, especially for senior citizens.
4. Technical problems are common and negatively affect customer satisfaction.
5. Customers expect better UI/UX, faster service, and stronger fraud protection.
6. Fintech companies are perceived as more user-friendly compared to banks.

SUGGESTIONS

1. Enhance cybersecurity with multi-factor authentication, AI monitoring, and fraud alerts.
2. Improve UI/UX design to simplify navigation for all age groups.
3. Strengthen customer support, including 24×7 chatbots and faster grievance redressal.
4. Promote digital literacy through workshops and tutorials.
5. Upgrade server infrastructure to prevent downtime and failed transactions.
6. Collaborate with fintech companies for innovative services.
7. Introduce personalized financial solutions using AI-based analytics.

CONCLUSION

Digital transformation has revolutionized the banking sector, bringing unprecedented convenience, speed, and accessibility for customers. The study reveals that most users actively adopt digital banking due to ease of use and efficiency, but concerns around security, technical issues, and trust continue to influence behaviour. Banks must invest in advanced technologies, robust security, and customer-focused digital experiences to remain competitive in the fintech era.

Ultimately, the future of banking lies in seamless integration of traditional systems with fintech innovations to deliver secure, personalized, and frictionless financial services.

REFERENCES

1. Reserve Bank of India (RBI) – Annual Reports
2. Ministry of Electronics & IT – Digital India Initiative
3. Davis, F. D. (1989). Technology Acceptance Model
4. Various journal articles on digital banking and fintech adoption

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

AI IN ACCOUNTING: A COMPREHENSIVE SWOT ANALYSIS

Dr. Hardik Majithia
Assistant Professor, Thakur College of Science and Commerce

ABSTRACT
Artificial Intelligence (AI) is reshaping the accounting field by enabling automation, advanced data analysis, machine learning applications, and more efficient information processing. This paper examines the integration of AI in accounting using a SWOT (Strengths, Weaknesses, Opportunities, Threats) approach. The analysis is based solely on secondary sources, including scholarly research, professional publications, and industry reports. The results indicate that AI improves precision, productivity, and strategic insight within accounting practices. However, several challenges remain, such as substantial implementation expenses, data security risks, potential workforce displacement, and the absence of unified global regulations. The study concludes by offering actionable recommendations, practical insights, and a detailed outlook for future research in this area.

Keywords: *Artificial Intelligence (AI), Machine Learning (ML), Accounting, SWOT Analysis.*

Abbreviations:

- *AI – Artificial Intelligence*
- *ML – Machine Learning*

1. INTRODUCTION
Technological progress has increasingly become a major force behind global economic shifts, and the accounting profession has been significantly reshaped by this wave of digital transformation. Among the most influential developments is Artificial Intelligence (AI), a branch of technology that equips machines and software with the capacity to perform tasks that once required human cognitive abilities—such as analysing information, recognizing patterns, making decisions, and solving complex problems. What once existed mainly as a theoretical concept has now evolved into a practical and powerful tool deeply embedded in modern accounting environments. AI-driven systems support a wide range of accounting functions including routine task automation, fraud identification, tax computation, financial forecasting, and advanced audit analyses.

Traditional accounting relied heavily on manual input, document handling, and human calculations—methods that, while effective in the past, are inherently slow, vulnerable to mistakes, and costly for organizations to sustain. AI has disrupted this long-standing model by offering superior precision, speed, and cost-efficiency. The use of intelligent technologies reduces time spent on monotonous activities, allowing accountants to redirect their expertise toward more strategic areas such as financial interpretation, risk evaluation, and organizational advisory roles. This shift marks a transformative change in the profession, repositioning accountants from clerical workers to analytical leaders and strategic contributors within their organizations.

Several core AI technologies are responsible for revolutionizing the accounting landscape. Machine learning (ML) enables systems to recognize trends in historical financial data, improving the accuracy of predictions and analytical insights. Robotic Process Automation (RPA) handles repetitive administrative tasks—such as reconciling accounts, processing invoices, and managing payroll—thereby increasing productivity and reducing human workload. Natural Language Processing (NLP) enhances the ability of accounting software to interpret unstructured data contained in reports, emails, contracts, and other documents. Predictive analytics leverages AI and statistical models to anticipate potential errors, detect irregularities, forecast economic conditions, and identify emerging business risks. Deep learning algorithms, inspired by biological neural networks, uncover hidden patterns linked to fraudulent activities or internal control weaknesses with an accuracy level that surpasses traditional audit tools.

Despite these substantial advantages, implementing AI in accounting introduces a range of challenges that organizations must approach thoughtfully. A major barrier is the considerable financial investment required for advanced AI technologies. Smaller organizations often find it difficult to budget for software acquisition, customization, training programs, and ongoing system maintenance. Since AI depends heavily on large volumes of sensitive data, concerns related to data protection, confidentiality, and cybercrime become increasingly prominent. Security breaches, unauthorized data manipulation, and hacking attempts pose serious ethical, legal, and operational risks.

ISSN 2394 - 7780

Resistance from employees is another challenge commonly observed during AI adoption. Many accountants worry that automation may threaten job stability or require them to adapt to unfamiliar tools and workflows. This makes professional development, digital literacy training, and organizational support essential for ensuring a smooth transition. Ethical considerations also come to the forefront, particularly regarding the fairness and transparency of algorithmic decision-making. Maintaining objectivity, avoiding biased outcomes, and complying with evolving regulatory requirements are critical for sustaining public trust in AI-enhanced accounting practices.

Ultimately, this research aims to contribute valuable insights to the ongoing discourse on digital change within the accounting sector. It underscores that AI should not be viewed merely as a technological convenience but as a strategic asset capable of enhancing decision-making, improving financial oversight, and elevating the professional role of accountants. At the same time, it highlights the importance of responsible AI adoption, robust cybersecurity measures, ethical safeguards, and continuous skill development to ensure that organizations maximize AI's potential while minimizing its risks.

2. LITERATURE REVIEW

Kumar and Rani (2021), highlight that AI significantly improves accuracy by reducing human involvement in repetitive tasks such as reconciliation and invoice processing. Their research emphasizes that automation minimizes errors, enhances speed, and lowers operational costs.

Smith (2020), argues that machine learning algorithms provide superior fraud detection capabilities compared to conventional auditing tools. AI systems can analyze vast datasets, identify anomalies, and flag suspicious activities in real-time.

Kaur and Singh (2022), discuss how accounting software integrated with AI—such as Zoho Books AI, QuickBooks AI, and Sage Intacct—has transformed data analysis and financial reporting. However, their study recognizes that technical upskilling is essential.

Deloitte (2023), reports that over 63% of global accounting firms have implemented AI tools in some capacity. However, firms express concerns regarding cybersecurity, data integrity, and algorithmic transparency. Deloitte predicts significant growth in AI-driven audit analytics in the next decade.

Brown and Wilson (2021), highlight ethical concerns involving data privacy, algorithmic bias, and lack of transparency. Their work calls for strict ethical guidelines and regulatory oversight to address risks.

The ICAI Knowledge Report (2024), emphasizes AI's role in taxation, financial forecasting, and risk management. The report recognizes emerging job roles such as "AI Auditor" and warns of potential job displacement.

3. RESEARCH METHODOLOGY

3.1 Research Design

This research employs a qualitative methodology based on the analysis of secondary data. The sources of secondary data include scholarly articles from peer-reviewed academic journals, which provide valuable theoretical and empirical insights into the subject. Industry reports from prominent firms such as Deloitte, KPMG, and PwC also serve as key resources, offering up-to-date information on current trends and practices. In addition, publications from professional organizations like the Institute of Chartered Accountants of India (ICAI), the American Institute of Certified Public Accountants (AICPA), and the Association of Chartered Certified Accountants (ACCA) help inform the study with guidance on regulations and professional standards. Furthermore, the research draws upon relevant books and digital repositories, which provide comprehensive information on the technical and theoretical aspects of artificial intelligence in accounting. Lastly, credible online articles and research papers offer supplementary perspectives, enriching the study with contemporary developments in the field. Together, these varied secondary sources form the basis for the study's analysis and findings.

3.2 Limitations

This research is exclusively based on secondary data, utilizing existing materials such as academic studies, industry reports, and professional publications. However, due to the fast-paced nature of technological progress, there is a possibility that some of the findings may become outdated in the future. As AI and accounting technologies continue to evolve, new insights and developments may emerge, necessitating ongoing research to stay aligned with these advancements in the field.

ISSN 2394 - 7780

4. Analysis: SWOT Analysis of AI in Accounting

4.1 Strengths

4.1.1 Enhanced Accuracy

AI significantly improves the accuracy of accounting processes by reducing human errors typically associated with manual data entry, historical reconciliation, and transaction processing. By using advanced algorithms and machine learning, AI can efficiently handle large datasets and identify inconsistencies that might go unnoticed by human accountants. This leads to more reliable financial records, fewer corrections, and greater overall confidence in the accuracy of financial reporting. Automating routine tasks also helps eliminate the risk of human mistakes, which can be costly or lead to compliance issues.

4.1.2 Time and Cost Efficiency

AI brings considerable time and cost savings to accounting by automating repetitive and time-consuming tasks like data entry, invoicing, and payroll processing. With Robotic Process Automation (RPA), these activities can be completed more quickly and with fewer resources. As a result, businesses can reduce labour costs and improve operational efficiency. This automation also boosts productivity, allowing accountants to focus on more strategic work rather than administrative tasks. The savings in time and cost can then be reinvested into higher-value activities, further optimizing the firm's operations.

4.1.3 Advanced Data Analytics

AI empowers accountants with advanced data analytics capabilities that enhance decision-making and strategic planning. By using predictive analytics, AI can forecast financial trends, identify potential risks, and uncover new business opportunities. The ability to process and analyse vast amounts of real-time financial data also allows for quicker adjustments to changing market conditions. Additionally, AI can detect patterns and trends within historical data, offering valuable insights for business optimization. This enables organizations to make more accurate financial predictions and develop data-driven strategies for growth and success.

4.1.4 Continuous Auditing

AI revolutionizes the auditing process by enabling continuous, real-time monitoring of transactions, rather than relying on periodic audits. This shift ensures that audits are more frequent and detailed, which improves the quality and effectiveness of the audit process. By automatically flagging irregularities and discrepancies as they arise, AI helps identify fraud and errors much earlier. Continuous auditing also frees auditors from routine tasks, allowing them to focus on more complex analysis and decision-making. The result is more accurate financial reporting and a reduction in the risks associated with fraud and compliance violations.

4.1.5 Improved Client Services

AI enhances client service in accounting by providing instant support through chatbots and virtual assistants. These AI tools can handle routine client inquiries, update account information, and even assist with scheduling, offering 24/7 availability. This immediate response time helps eliminate delays and boosts overall client satisfaction. Additionally, AI can personalize interactions by analysing client history and anticipating their needs, which leads to more tailored and responsive service. By automating standard tasks, accountants can focus on providing high-level, strategic advice, strengthening client relationships and adding more value to the service offering.

4.2 Weaknesses

4.2.1 High Implementation Cost

The costs associated with adopting AI in accounting can be a significant barrier, particularly for smaller firms. These expenses include the acquisition of necessary infrastructure, licensing fees for software, and the integration of AI systems into existing operations. For smaller businesses with limited budgets, these costs may be too high, potentially delaying the adoption of AI technologies. Furthermore, ongoing costs related to system maintenance, staff training, and software updates can add to the financial strain, making it difficult for smaller firms to compete with larger organizations that have more resources to invest in advanced technologies.

4.2.2 Skills Gap Among Accountants

Many accountants face a skills gap when it comes to adopting AI and other digital technologies. Traditional accounting education programs tend to focus on core financial principles such as bookkeeping, tax preparation, and regulatory compliance, but they often neglect the technical skills required for working with AI, data analytics, and programming. As AI continues to shape the accounting profession, there is an increasing need for accountants to develop new competencies in these areas. This lack of digital training creates a challenge for accounting professionals who need to adapt in order to stay competitive and fully utilize AI tools in their work.

ISSN 2394 - 7780

4.2.3 Overdependence on Technology

One of the risks of integrating AI into accounting practices is becoming overly reliant on technology. Overdependence can leave businesses vulnerable to disruptions caused by technical failures, system crashes, or cyberattacks. A malfunction in the AI system or a security breach could halt important processes, jeopardize data security, and damage an organization's reputation. To address these risks, businesses must implement strong contingency plans, invest in data backup solutions, and ensure they have robust cybersecurity measures to safeguard their operations and minimize the impact of any potential disruptions.

4.2.4 Lack of Contextual Understanding

AI, while efficient in handling large datasets and executing predetermined tasks, struggles to grasp the contextual nuances inherent in complex accounting situations. For instance, AI lacks the ability to apply professional judgment or interpret subjective factors, such as ethical considerations or potential fraud, that require human expertise and intuition. As accounting often involves making decisions based on both quantitative data and qualitative insights, AI cannot fully replicate the critical thinking and ethical reasoning that professionals bring to these challenges. Thus, human involvement is essential for dealing with complex, judgment-based scenarios.

4.3 Opportunities

4.3.1 New Professional Roles

As AI continues to shape the accounting industry, it is giving rise to new specialized roles that blend traditional accounting skills with advanced technological expertise. Positions like AI Auditor, which leverages AI tools for continuous auditing and risk management, and Data Accountant, responsible for handling and interpreting large datasets, are becoming more prevalent. Similarly, roles such as Forensic Data Analyst and Automation Consultant are emerging, focusing on detecting fraudulent activities through AI and optimizing business processes through automation. These new positions require professionals to have a deep understanding of both accounting practices and emerging technologies.

4.3.2 Expansion of Virtual Accounting Services

AI-driven cloud-based platforms are enabling accounting firms to operate more globally, offering virtual services that transcend geographical boundaries. With cloud technology, firms can manage financial records, collaborate with clients, and access data remotely, enabling the formation of virtual teams working across different locations and time zones. This has led to greater flexibility, quicker decision-making, and access to a broader range of expertise. As a result, accounting services are becoming more accessible, scalable, and efficient, helping firms cater to a wider client base without the constraints of physical office spaces.

4.3.3 Enhanced Audit Quality

The integration of AI and machine learning is significantly improving the quality of audits by enhancing the detection of discrepancies, assessing financial risks, and checking the consistency of financial statements. These advanced technologies enable auditors to analyze large amounts of data at greater speed and accuracy, uncovering potential fraud or errors that could be missed with traditional methods. AI's ability to provide real-time insights and data-driven recommendations helps auditors make more informed judgments, ensuring that audit results are more reliable and that the financial reporting process is more transparent and thorough.

4.3.4 Integration with Blockchain

Combining AI with blockchain technology is transforming how financial transactions are tracked and verified. Blockchain offers a secure, transparent, and immutable ledger, while AI can enhance this system by analyzing blockchain data to detect anomalies and verify transactions in real time. This integration strengthens security by reducing the risk of fraud and enhancing the accuracy of audit trails. By automating the process of verifying financial records, AI and blockchain together offer an efficient and secure solution for improving transparency, accountability, and compliance in financial operations.

4.3.5 Development of Smart Financial Advisory

AI tools are revolutionizing financial advisory services by enabling personalized, data-driven financial planning. These tools can analyze a client's financial status, simulate various financial scenarios, and recommend tax-saving strategies, making financial advice more accurate and tailored. AI also helps financial advisors assess investment opportunities, predict risks, and optimize portfolios, all of which contribute to more informed decision-making. By automating routine financial analyses, AI allows advisors to focus on providing higher-value services, strengthening client relationships, and offering strategic, long-term advice that aligns with clients' goals.

ISSN 2394 - 7780

4.4 Threats

4.4.1 Cybersecurity Risks

AI-based accounting systems process large volumes of sensitive financial data, which makes them vulnerable to various cybersecurity threats. As these systems become more integrated into business operations, they are at greater risk of cyberattacks such as hacking, ransomware, and data breaches. The consequences of such attacks can be severe, including financial loss, reputational damage, and legal repercussions. To protect against these risks, businesses must implement advanced cybersecurity measures like encryption, multi-factor authentication, and regular security audits to safeguard financial data from potential threats.

4.4.2 Job Displacement

AI-driven automation in accounting tasks, such as data entry, invoicing, and basic bookkeeping, is increasingly replacing roles that were traditionally performed by humans. This shift can lead to the displacement of accounting jobs, especially those involving repetitive and routine activities. Such changes may generate resistance from the workforce, particularly from employees concerned about job security. To address these concerns, companies will need to invest in reskilling programs, enabling workers to transition into more value-added roles that focus on strategy, analysis, and decision-making.

4.4.3 Ethical and Legal Issues

AI in accounting raises several ethical and legal concerns, particularly around the risk of bias in algorithmic decision-making. If AI systems are trained on biased data or are not properly calibrated, they may produce unfair or inaccurate financial assessments, potentially leading to discriminatory practices. Additionally, the misuse of AI tools could result in violations of regulatory requirements, exposing companies to legal risks. Ensuring that AI systems are transparent, unbiased, and compliant with legal standards is critical for maintaining ethical integrity and protecting businesses from legal consequences.

4.4.4 Lack of Global AI Regulation

The rapid integration of AI into accounting has outpaced the development of consistent global regulations, creating challenges for businesses operating internationally. The absence of standardized guidelines for AI use leads to uncertainty, particularly in areas like AI auditing, financial reporting, and compliance. Varying regulations across countries can complicate cross-border financial activities and audits. A unified set of international regulations would help ensure consistency, build trust in AI-powered systems, and streamline global accounting operations by providing clear rules for AI deployment and oversight.

5. CONCLUSION, SUGGESTIONS & RECOMMENDATIONS

5.1 Conclusion:

AI is revolutionizing the accounting industry by automating routine tasks, enhancing accuracy, facilitating advanced predictive analytics, and improving audit quality. However, successfully integrating AI comes with challenges, including high implementation costs, cybersecurity risks, ethical concerns, and a shortage of required expertise. To address these issues, the accounting field must adapt by embracing digital competencies and establishing robust governance frameworks. Instead of replacing accountants, AI will transform their roles, redirecting them toward more analytical and advisory responsibilities, thereby strengthening their ability to provide strategic insights and support decision-making.

5.2 Suggestions:

To successfully incorporate AI into accounting, it is vital to support ongoing education programs that help accountants build expertise in AI and data analytics. Conducting frequent IT audits and enhancing cybersecurity protocols will safeguard against risks, while promoting collaboration between accounting associations and tech developers can facilitate smoother integration of new technologies. Raising awareness about ethical AI use is important for ensuring responsible implementation, and testing AI through pilot projects prior to full adoption will allow for the identification and resolution of any challenges, ensuring a more effective transition.

5.3 Recommendations:

Accounting firms should adopt a hybrid approach that blends AI technology with human oversight to maintain accuracy and accountability. Regulators must create universal AI auditing standards and ethical principles to guide responsible AI implementation. Educational institutions should revise their accounting programs to incorporate machine learning, Python, data visualization, and AI ethics, equipping students with the skills needed for the future. Technology providers, on the other hand, should focus on ensuring transparency in algorithms, safeguarding data privacy, and developing unbiased systems to foster trust and fairness in AI-driven solutions.

ISSN 2394 - 7780

6. REFERENCES

a. Kumar, S., & Rani, P. (2021). Impact of AI on Accounting Efficiency. Journal of Accounting Research.
b. Smith, J. (2020). Machine Learning in Fraud Detection. International Journal of Auditing.
c. Kaur, R., & Singh, H. (2022). Role of AI Tools in Modern Accounting. Asian Journal of Finance.
d. Deloitte Insights. (2023). AI and the Future of Accounting. Deloitte Research Publications.
e. Brown, T., & Wilson, M. (2021). Ethical Challenges of AI in Accounting. Ethics in Business Journal.
f. ICAI. (2024). AI Applications in Accounting and Taxation. Institute of Chartered Accountants of India.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

AN STUDY ON AWARENESS OF GST RATE REVISIONS AMONG COMMERCE STUDENTS IN MUMBAI: A STEP TOWARD VIKSIT BHARAT @2047

Dr. Hardik Majithia, Mr. Pramod Pandey and Mr. Nilesh Pashilkar
Assistant Professor, Thakur College of Science and Commerce

ABSTRACT

The Goods and Services Tax (GST) is one of India's most significant indirect tax reforms, designed to merge multiple state and central taxes into a single, transparent system. Over the years, GST has been periodically revised to reflect economic conditions and administrative requirements. The GST rate changes introduced on 22nd September 2025 prompted the need to understand how well the public, especially students, are informed about these updates.

This study examines the level of awareness, perception, and understanding of the revised GST rates among commerce students in Mumbai. Using a descriptive design and survey-based approach, data from 109 students were analysed through charts, frequency tables, and the Chi-square test. Results show that most students (77.1%) were aware of the revised rates, and the hypothesis testing confirmed that educational level does not significantly influence GST awareness. The study underscores the importance of strengthening tax education and improving digital financial literacy among students. Recommendations include integrating GST topics into academic programs, enhancing online communication strategies, and promoting practical learning experiences

Keywords: *Goods and Services Tax (GST), Revised GST rates, Awareness, Undergraduate and Postgraduate Students*

INTRODUCTION

The Goods and Services Tax (GST) represent one of India's most significant and far-reaching reforms in the field of indirect taxation. Introduced on 1st July 2017, it replaced numerous overlapping taxes with a unified framework aimed at improving transparency, reducing the cascading effect of taxes, and enabling a more integrated national marketplace. Since its rollout, GST has undergone continuous changes through amendments and periodic rate adjustments.

Each modification in GST rates is shaped by evolving economic needs, industry suggestions, inflation trends, and the objective of administrative simplification. The latest GST Rate Revisions, effective from 22nd September 2025, signify an important step in the ongoing rationalization of the system. These updates focus on streamlining tax slabs, clarifying product classifications, minimizing inconsistencies, and strengthening revenue collection. The 2025 revisions also mirror efforts to stabilize the economy in the post-pandemic period and enhance overall tax governance.

As the revised rates influence a wide range of sectors—from basic necessities to premium products—it becomes essential to assess both their economic implications and the extent to which people understand these changes. Public awareness is crucial for the success of tax reforms, especially among students and young adults who will eventually shape the nation as future taxpayers, professionals, and decision-makers.

Mumbai, being a major financial centre with a diverse student population, serves as an appropriate setting for examining awareness about these revised GST rates. Evaluating students' understanding can help measure the effectiveness of government outreach, identify gaps in tax education, and gauge the preparedness of future commerce professionals.

This research therefore aims to study the updated GST rates, compare them with earlier structures, and analyse the level of awareness and perception among students in Mumbai regarding these recent revisions.

LITERATURE REVIEW

Deshmukh (2020), this Research on the Goods and Services Tax (GST) in India has evolved significantly over the past decade, offering insights into its structural, economic, and social implications. Researcher provides a foundational understanding of the GST reform by analysing its influence on India's broader tax architecture. The study highlights GST as a transformative step aimed at simplifying the indirect tax system, improving transparency, and fostering a unified national market. Researcher work underscores the reform's role in reducing cascading tax effects while also noting transitional challenges related to compliance and administrative adaptation.

ISSN 2394 - 7780

Kulkarni and Mehta (2021), the researchers Building on the theme of tax awareness, examine student understanding of indirect taxes, including GST. Their findings suggest that while students generally recognize GST's purpose and structure, gaps remain in deeper conceptual clarity and practical knowledge. This indicates a need for educational interventions to strengthen tax literacy among young adults, especially as they form a crucial demographic within a growing digital economy.

Rao (2022), this research based on Rate structure, it remains an essential subject within GST research. Researcher focuses on rate rationalization, discussing the complexities of balancing revenue needs with economic equity. The study argues that while the multi-tier rate system intends to align taxation with consumption patterns, it also introduces complications in classification and compliance. Researcher advocates for a more streamlined structure to reduce ambiguity and enhance efficiency.

Shah and Soni (2023), this study is the digital dimension of tax literacy is addressed by researchers, who analyse how digital competence affects tax knowledge among youth. Their study reveals that increasing digital literacy directly supports improved understanding of GST processes, especially as tax filing and compliance move increasingly online. The authors stress the importance of integrating digital and fiscal education to prepare future taxpayers for a technologically driven tax environment.

Thomas (2019), this study is discussed about Public perception and adaptation to GST have also been widely. Researcher explores urban residents' experiences and attitudes following GST implementation. The findings show mixed perceptions, with many individuals acknowledging the reform's long-term benefits but expressing concerns about short-term disruptions, price fluctuations, and the complexity of compliance during its early stages. Thomas's work highlights the role of public trust and communication in large-scale fiscal reforms.

RESEARCH METHODOLOGY

1. Objectives of the study:

- To evaluate how well students in Mumbai are aware about the updated GST rate structure.
- To examine the modifications brought about by the GST rate revisions that came into force on 22nd September 2025.
- To study the opinions and attitudes of students toward the adoption of the revised GST rates.

2. Need of the Study:

The 2025 GST rate revisions mark an important change in India's indirect tax system. While these reforms mainly affect consumers and businesses, it is also vital to understand how aware students—tomorrow's taxpayers and professionals—are of these updates. Commerce, management, and economics students will significantly influence India's economic future, so identifying their awareness levels helps highlight learning gaps and the effectiveness of government communication. This study also guides policymakers and educators by showing how informed students are about key tax changes and what improvements are needed in tax education and digital financial literacy.

3. Limitation of the Study:

- The study is limited to Commerce students in Mumbai, covering UG and PG levels.
- Since the data is based on self-reported responses, some level of bias may be present.
- As the study is restricted to Mumbai, the findings cannot be applied to students in other regions.
- Limited time available for the research may reduce the depth and extent of data gathered.

4. Hypothesis:

- **H_0:** There is No Significance difference between Level of education and awareness of revised GST rate structure among students of Mumbai.
- **H_1:** There is a Significance difference between Level of education and awareness of revised GST rate structure among students of Mumbai.

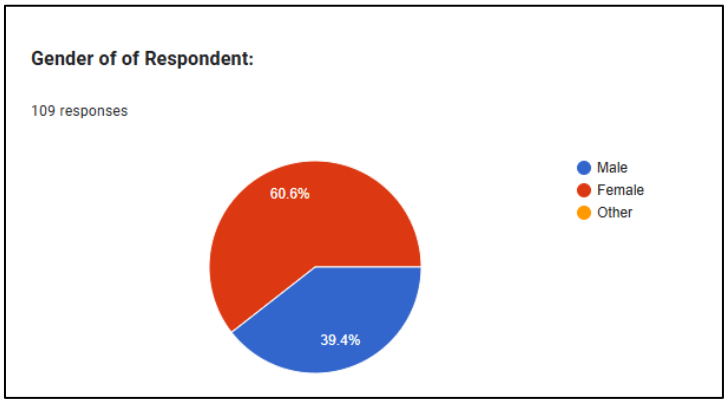
5. Methodology:

This research adopts a descriptive design and uses quantitative methods to measure how aware students in Mumbai are of the revised GST rates. Data is primarily gathered through a structured questionnaire featuring objective, Likert-scale, and knowledge-based questions. Secondary information comes from GST Council reports, government publications, academic articles, and the official GST portal. The study uses convenience or

ISSN 2394 - 7780

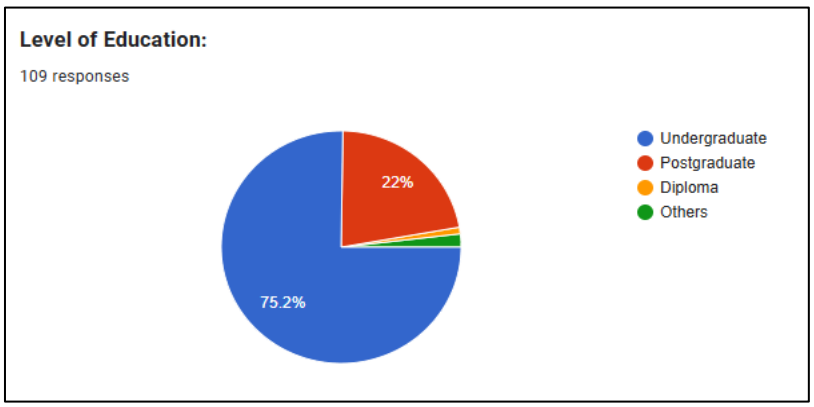
stratified sampling, targeting about 109 students for dependable results. Analysis includes basic statistical tools, visual charts, tables, and, when necessary, tests like Chi-square. The research area covers colleges and universities situated in Mumbai's western region.

DATA ANALYSIS AND INTERPRETATIONS:

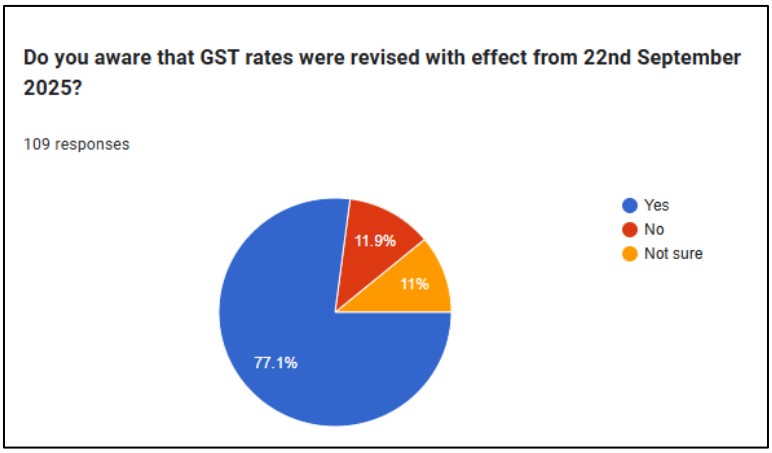


Gender distribution of 109 respondents

- Female respondents make up the majority**, representing** 60.6% **of the total and** male respondents account for 39.4%**.**



Educational level of **109 respondents**
Undergraduate respondents form the large majority**, making up** 75.2% **of all participants,** Postgraduate respondents account for 22%**, and** Diploma and "Others" categories each represent only a very small portion **likely around 1–2% each.**



Awareness regarding the revision of GST rates effective from **22nd September 2025**, based on **109 responses**.

77.1% of respondents answered "Yes", indicating they *were aware* of the GST rate revision, **11.9% responded "No"**, meaning they *were not aware* of the change. **11% said "Not sure"**, showing some uncertainty among a small portion of participants.

ISSN 2394 - 7780

TESTING OF HYPOTHESIS

To check the null hypothesis we will use chi-square testing as follow:

Observed value					
	Undergraduate	**Postgraduate**	**Diploma**	**Others**	**Total**
Aware	66	17	0	1	84
Not Aware	7	4	1	1	13
Not Sure	9	3	0	0	12
TOTAL	82	24	1	2	109
Expected value					
	Undergraduate	**Postgraduate**	**Diploma**	**Others**	**Total**
Aware	63	18	1	2	84
Not Aware	10	3	0	0	13
Not Sure	9	3	0	0	12
Total	82	24	1	2	109

Chi-Square Test

OV	**EV**	**OV - EV**	**$(OV - EV)^2$**	**$(OV - EV)^2 / EV$**
66	63.19	2.81	7.8961	0.1250
7	9.78	-2.78	7.7284	0.7902
9	9.03	-0.03	0.0009	0.0001
17	18.5	-1.5	2.25	0.1216
4	2.86	1.14	1.2996	0.4544
3	2.64	0.36	0.1296	0.0491
0	0.77	-0.77	0.5929	0.7700
1	0.12	0.88	0.7744	6.4533
0	0.11	-0.11	0.0121	0.1100
1	1.54	-0.54	0.2916	0.1894
1	0.24	0.76	0.5776	2.4067
0	0.22	-0.22	0.0484	0.2200
Chi – Square Test				**11.6898**

The calculated CHI – SQUARE TEST is **11.6898**

Level of significance is considered at **5%**.

Degree of freedom is **6**

The Table Value of CHI – SQUARE TEST is **12.592**

The Calculated Value of CHI – SQUARE TEST is **11.6898**

Calculated Value < Table Value
As Calculated value of Chi-Square is lesser than Table value we **ACCEPT the Null Hypothesis (H_0)** i.e. There is No Significance difference between Level of education and awareness of revised GST rate structure among students of Mumbai.

FINDINGS

1. **Gender Profile**
- Female respondents accounted for **60.6%** of the sample.
- Male respondents made up **39.4%**.

2. **Educational Background**
- A large majority (**75.2%**) were undergraduate students.
- Postgraduate students represented **22%**.

ISSN 2394 - 7780

- Diploma and other categories together formed only a small percentage.

3. Awareness of Revised GST Rates

- **77.1%** of participants said they were aware of the rate revision effective from 22nd September 2025.
- **11.9%** were not aware.
- **11%** were unsure.

4. Hypothesis Testing

- The Chi-square value calculated was **11.6898**, which is lower than the table value of **12.592** at a 5% significance level.
- Therefore, the **null hypothesis was accepted**, showing **no significant relationship between the level of education and awareness** of the revised GST rates.

5. General Observation

- Awareness levels are generally high but show variation among diploma and postgraduate students.
- Students largely rely on digital platforms and social media to stay updated about GST changes.
- Many respondents expressed the need for practical and application-based GST learning.

CONCLUSION, SUGGESTIONS, RECOMMENDATIONS

Conclusion

The study concludes that most commerce students in Mumbai are aware of the GST rate revisions implemented in September 2025. Although awareness levels are generally strong, the findings reveal that educational level does not significantly influence how informed students are. This suggests that external factors—such as online information sources, digital literacy, and media exposure—play a larger role than academic qualification in shaping awareness of tax updates.

The results highlight the need for strengthening practical tax education and ensuring regular dissemination of GST-related information to students. As these learners represent the next generation of taxpayers and professionals, enhancing their understanding of taxation reforms is crucial for developing a financially informed society.

Suggestions & Recommendations

1. Improve Curriculum Integration

Introduce updated GST modules and case studies in commerce and management courses.

Include real-time examples of tax revisions in classroom teaching.

2. Increase Awareness through Workshops

Conduct guest lectures by tax consultants, GST officers, and industry experts.

Encourage colleges to organize GST awareness camps or digital finance sessions.

3. Promote Digital Financial Literacy

Encourage students to use verified GST learning apps and government portals.

Provide training on how to read GST notifications and rate updates.

4. Enhance Government Communication

Make GST updates more simplified and student-friendly.

Use info-graphics, short videos, and social media posts for quick understanding.

5. Encourage Practical Exposure

Promote internships related to accounting, taxation, and GST compliance.

Include mock GST filing activities to give students hands-on experience.

6. Target Groups with Lower Awareness

Conduct special learning sessions for diploma and non-commerce students.

Provide multilingual content for better accessibility.

ISSN 2394 - 7780

REFERENCES

- Deshmukh, A. (2020). *GST Reform and Its Impact on India's Tax Structure*. Journal of Fiscal Studies.
- Kulkarni, P. & Mehta, R. (2021). *Student Awareness of Indirect Taxes in India*. International Review of Commerce Education.
- Ministry of Finance. (2024). *GST Council Updates and Annual Review*. Government of India Publication.
- Rao, S. (2022). *Understanding GST Rate Rationalization*. Indian Journal of Economic Policy.
- Shah, N. & Soni, V. (2023). *Digital Literacy and Tax Knowledge among Youth*. Journal of Digital Learning and Society.
- Thomas, R. (2019). *Public Perception and Adaptation to GST in Urban India*. Research Review in Public Finance.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

THE ROLE OF INDIGENOUS FARMING KNOWLEDGE IN CONSERVING WATER RESOURCES IN RURAL AGRICULTURAL COMMUNITIES

Dr. Priti Gupta
Assistant Professor, Department of Enviornmental Studies, Thakur College of Science and Commerce, Kandivali(E), Mumbai

ABSTRACT
This study examines the crucial role of indigenous farming knowledge in conserving water resources within rural agricultural communities, where traditional practices have sustained agriculture for generations. The research highlights how methods such as contour bunding, mulching, mixed cropping, and rainwater harvesting contribute significantly to soil moisture retention, groundwater recharge, and reduced dependency on external irrigation. Using a mixed-method approach, primary data were collected through surveys, interviews, and field observations from farmers who actively employ or are aware of indigenous techniques. Five key variables—awareness, adoption, effectiveness, challenges, and willingness to integrate traditional and modern methods—were analyzed using frequency and cumulative frequency tables. The findings reveal high awareness and strong perceived effectiveness, although challenges like labour shortages and limited knowledge transfer persist. Overall, the study underscores the enduring relevance of indigenous knowledge and advocates for blending traditional wisdom with modern irrigation technologies to achieve sustainable water management.

Keywords: *Indigenous knowledge, water conservation, rural agriculture, sustainable farming, traditional practices*

INTRODUCTION
Indigenous farming knowledge plays a transformative and context-specific role in conserving water resources in rural agricultural communities, offering a reservoir of traditional wisdom that has evolved through generations of interaction with local ecosystems. Rooted in observation, experience, and cultural practices, this knowledge encompasses a range of water-saving strategies such as rainwater harvesting, contour bunding, mulching, intercropping, and the use of drought-resistant crop varieties, which collectively contribute to improved water retention and reduced dependency on external irrigation sources. In many rural regions, especially those prone to erratic rainfall and groundwater depletion, farmers rely on these time-tested practices to maintain soil moisture, enhance groundwater recharge, and ensure crop sustainability under climate-induced stress. Unlike modern technologies that often require significant investment, indigenous practices are low-cost, sustainable, and community-driven, making them particularly relevant for small and marginal farmers facing financial constraints. Moreover, these traditional methods foster ecological balance by conserving local biodiversity, minimizing soil erosion, and maintaining the natural hydrological cycle. The increasing challenges of climate change, extreme weather events, and declining water availability have renewed interest in integrating indigenous knowledge with contemporary agricultural science to create more holistic and resilient water management solutions. However, despite its proven ecological value, indigenous knowledge is often undervalued or overlooked in mainstream agricultural policies, leading to gaps in documentation, dissemination, and adoption among younger farming generations. As rural communities navigate modern pressures and environmental uncertainties, understanding the role of indigenous farming knowledge in water conservation becomes crucial for developing sustainable agricultural models that blend tradition with innovation. This study explores how indigenous practices contribute to water resource management, the socio-cultural foundations that support their continuity, and the potential for integrating this knowledge into modern agricultural frameworks to promote long-term sustainability in rural farming landscapes.

REVIEW OF LITERATURE
The role of indigenous farming knowledge in conserving water resources has received growing scholarly attention as researchers explore sustainable, culturally rooted, and ecologically compatible agricultural systems. Indigenous knowledge systems are often described as place-based, experiential, and transmitted orally across generations, enabling communities to adapt to local climatic and ecological conditions (Berkes, 2018). Studies across India, Africa, and Southeast Asia show that traditional techniques such as contour bunding, earthen check dams, mulching, and rainwater harvesting significantly improve soil moisture retention and groundwater recharge (Kumar & Singh, 2020; Nyong et al., 2007). For instance, research in the Deccan Plateau highlights that stone bunding and traditional tank irrigation reduce runoff and enhance aquifer levels, demonstrating high efficiency even in semi-arid environments (Sharma & Pandey, 2019). Similarly, mulching with crop residues—widely practiced in indigenous communities—has been shown to reduce surface evaporation and improve

ISSN 2394 - 7780

water-use efficiency in drought-prone regions (Patil & Shete, 2018). Traditional cropping systems, such as intercropping and mixed farming, also contribute to water conservation by optimizing root structures, enhancing soil organic matter, and minimizing water demand (Altieri & Nicholls, 2017). Research in Rajasthan reveals that indigenous drought-resistant seeds, preserved by local farmers, require significantly lower irrigation inputs, making them vital in regions with declining groundwater tables (Meena & Choudhary, 2021). Moreover, indigenous water harvesting structures, including johads, ahars, and kunds, exemplify community-managed systems that have sustained agriculture for centuries, offering low-cost and environmentally sound alternatives to modern irrigation (Agarwal & Narain, 2010). However, scholars note that despite their ecological value, indigenous practices are often marginalized due to modernization, changes in land use, and limited institutional recognition (Reid et al., 2020). Younger farmers increasingly shift toward water-intensive monocultures and mechanized systems, contributing to the erosion of traditional knowledge (Gupta & Shinde, 2022). Integrating indigenous knowledge with contemporary scientific approaches is therefore increasingly recommended to enhance water conservation outcomes. Hybrid systems that combine indigenous contour farming with modern drip irrigation, for example, have shown improved water efficiency and cost-effectiveness for smallholders (Thomas & George, 2021). Policymakers have also begun acknowledging the strategic importance of traditional ecological knowledge in climate adaptation and sustainable agriculture, with international bodies like FAO urging its preservation and documentation (FAO, 2019). Nonetheless, gaps remain in systematically documenting indigenous water conservation practices, evaluating their long-term efficiencies, and incorporating them into agricultural extension programs. Researchers argue that community participation, cultural sensitivity, and knowledge co-production frameworks are essential for bridging these gaps and ensuring that traditional water conservation strategies remain relevant in the era of climate uncertainty (Wilson, 2020). Overall, the literature underscores that indigenous farming knowledge is not merely a cultural heritage but a scientifically valuable and ecologically sustainable resource that can significantly support water conservation in rural agricultural communities, particularly when integrated thoughtfully with modern agricultural innovations.

OBJECTIVES OF THE STUDY

1. To examine the indigenous farming practices that contribute to water conservation in rural agricultural communities.
2. To evaluate the effectiveness and relevance of these indigenous practices in promoting sustainable water resource management.

RESEARCH METHODOLOGY

The present study adopts a mixed-method research methodology to comprehensively examine the role of indigenous farming knowledge in conserving water resources in rural agricultural communities. A descriptive research design is employed to document traditional water-saving practices, while an analytical approach is used to assess their effectiveness and relevance in contemporary agricultural settings. The study area consists of selected rural villages where indigenous knowledge remains actively practiced, allowing for an in-depth understanding of local ecological interactions and community-based water management strategies. Primary data will be collected through structured questionnaires, semi-structured interviews, and focus group discussions with farmers, village elders, and local agricultural practitioners who possess experiential knowledge of traditional methods. These tools will help capture qualitative insights into cultural beliefs, farming traditions, perceived benefits, and challenges in sustaining indigenous practices. Additionally, participatory rural appraisal techniques such as transect walks and on-field observations will be used to document visible practices like contour bunding, mulching, and rainwater harvesting structures. Secondary data will be gathered from academic journals, government reports, agricultural extension publications, and research databases to support the contextual analysis of indigenous techniques and their ecological significance. A purposive sampling technique will be applied to select knowledgeable respondents, given the specialized and experience-based nature of indigenous practices. The sample size will comprise approximately 100 farmers for quantitative analysis and 20 key informants for qualitative insights. Quantitative data will be analyzed using descriptive statistics, while qualitative data will be coded thematically to identify recurring patterns, perceptions, and challenges related to water conservation. Triangulation of data sources will enhance the validity and reliability of the findings by ensuring consistency between traditional knowledge narratives and observable field practices. This integrated methodological approach provides a holistic understanding of the practical, cultural, and environmental dimensions of indigenous farming knowledge and its potential to support sustainable water resource management in rural agricultural landscapes.

ISSN 2394 - 7780

RESEARCH FINDINGS

This section presents the analysis and interpretation of primary data collected from farmers in rural agricultural communities to understand their awareness, usage, and perception of indigenous water conservation practices. Five frequency and cumulative frequency tables have been constructed to highlight key variables such as awareness levels, adoption of traditional techniques, perceived effectiveness, challenges, and willingness to integrate traditional and modern systems. Each table is supported by a detailed interpretation to provide meaningful insights.

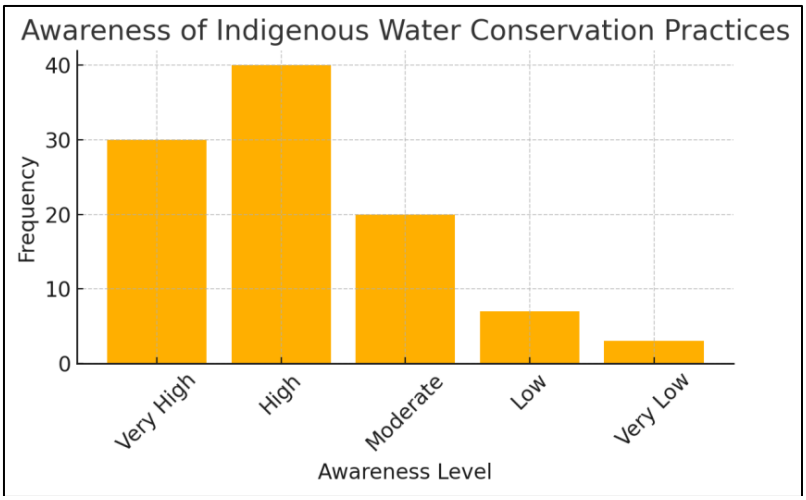


Figure 1: Awareness of Indigenous Water Conservation Practices

The data indicates that awareness of indigenous water conservation practices is significantly high among rural farmers. A combined 70% of respondents fall under the "Very High" and "High" awareness categories, demonstrating that traditional ecological knowledge is still strongly embedded in community culture. The moderate awareness group (20%) suggests that some farmers may have partial exposure to traditional methods but lack full understanding or application. Only 10% fall under low or very low awareness, which reflects generational gaps or lesser involvement in traditional agricultural activities. The cumulative frequency reaching 90 by the "Moderate" level shows that an overwhelming majority possess at least some level of knowledge. These findings emphasize that indigenous practices remain relevant and known within rural communities, offering a supportive foundation for conservation-based agricultural programs. However, the small proportion with low awareness signals the need for renewed documentation, training, and intergenerational knowledge transfer to prevent erosion of traditional wisdom.

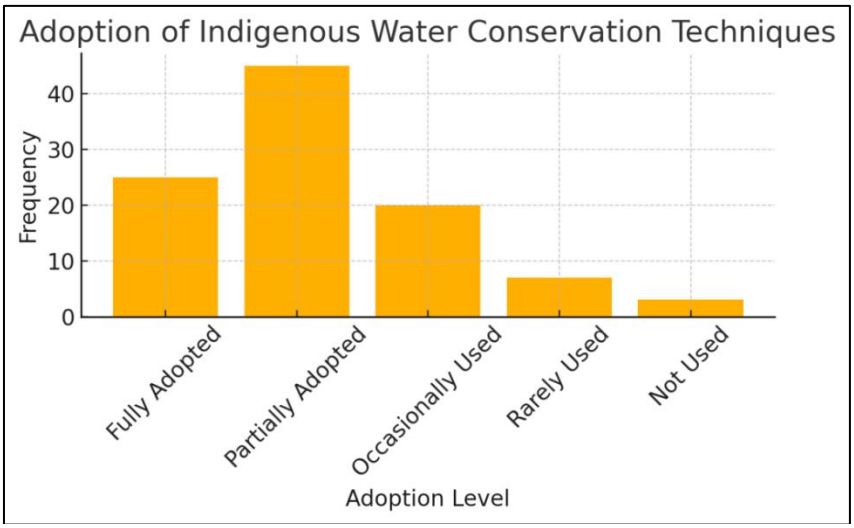


Figure 2: Adoption of Indigenous Water Conservation Techniques

The adoption pattern reveals that only a quarter of the respondents fully adopt indigenous water conservation practices, while a larger segment (45%) partially uses them. This suggests that although farmers acknowledge traditional methods, many also rely on modern irrigation practices. The 20% who use these techniques occasionally highlight that indigenous methods may be applied seasonally or depending on rainfall variations. The lower proportion for "Rarely Used" and "Not Used" categories indicates that complete abandonment of

ISSN 2394 - 7780

traditional systems is uncommon, but modernization pressures are gradually influencing farming patterns. The cumulative frequency reaching 70 at the "Partially Adopted" level shows that a majority integrate indigenous elements into their agricultural routine. These results suggest that indigenous knowledge continues to guide farming but is increasingly blended with modern technologies. Integrating both approaches through extension programs may help maximize water-use efficiency while preserving cultural knowledge.

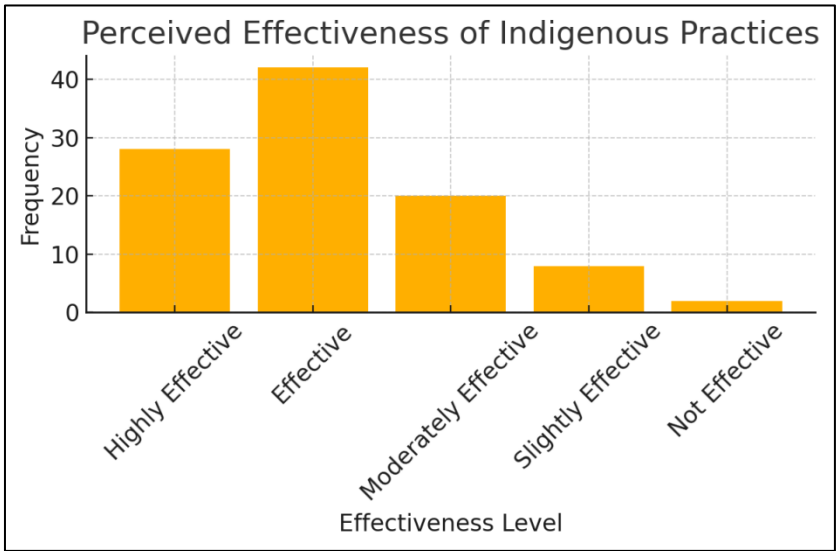


Figure 3: Perceived Effectiveness of Indigenous Practices for Water Conservation

The perception of effectiveness among respondents reflects strong confidence in indigenous water conservation methods. A significant 70% categorize these practices as "Highly Effective" or "Effective," suggesting that farmers value traditional approaches not only for cultural reasons but for practical results such as improved soil moisture retention, reduced run-off, and better groundwater recharge. The 20% who find them "Moderately Effective" indicate that certain practices may work best in specific ecological conditions. The minor category of "Slightly Effective" or "Not Effective" users could be influenced by factors like poor maintenance of traditional structures, changing soil conditions, or preference for modern alternatives. The cumulative frequency reaching 90 at "Moderately Effective" shows widespread trust in traditional knowledge. Overall, the results reinforce that indigenous practices remain functionally relevant and can significantly contribute to sustainable water management. Encouraging scientific validation and integration with modern innovations can further enhance their credibility and adoption.

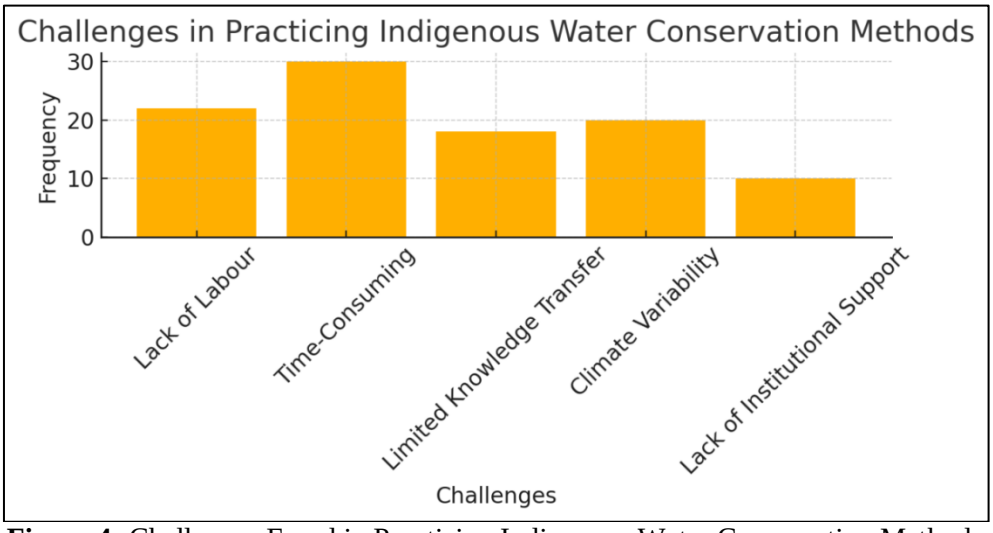


Figure 4: Challenges Faced in Practicing Indigenous Water Conservation Methods

The data shows that farmers face multiple challenges in sustaining indigenous water conservation methods. The most common issues—time consumption (30 respondents) and lack of labour (22 respondents)—highlight the manual and community-driven nature of traditional systems. Younger generations migrating for non-farm work reduce available manpower, making methods like contour bunding and community tank maintenance difficult to implement. Limited knowledge transfer (18 respondents) further confirms concerns regarding the erosion of traditional ecological knowledge, especially due to generational gaps and modernization. Climate variability

ISSN 2394 - 7780

poses another significant challenge, as unpredictable rainfall patterns weaken the reliability of methods that historically depended on seasonal rhythms. The least cited challenge, lack of institutional support, shows that while some support mechanisms exist, there is room for improvement in government or NGO involvement. Overall, these findings emphasize the need for community engagement programs, labour support schemes, and documentation initiatives to preserve and strengthen traditional systems.

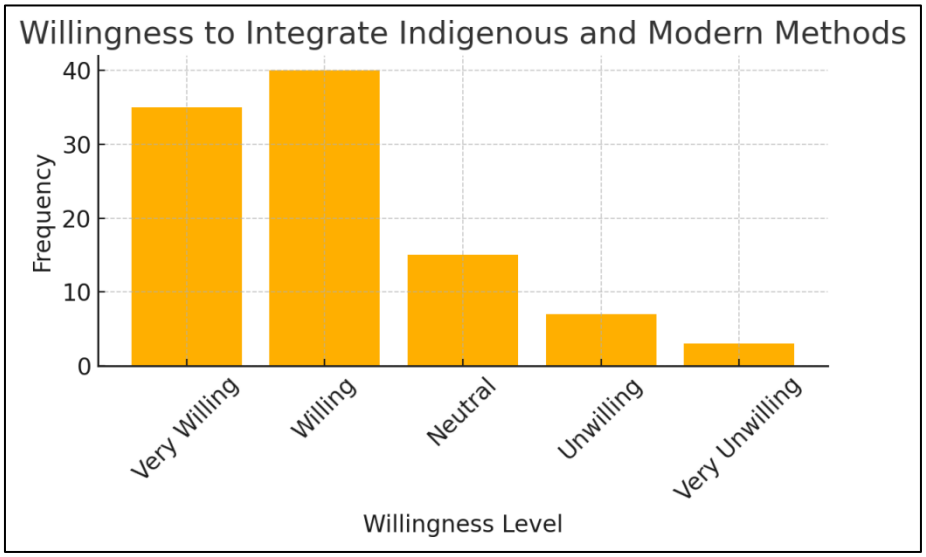


Figure 5: Willingness to Integrate Indigenous and Modern Water Conservation Methods

The data reveals strong openness among farmers toward integrating indigenous and modern water conservation systems. A combined 75% fall under "Very Willing" and "Willing," indicating recognition of the strengths of both approaches. Farmers understand that while indigenous methods are sustainable and cost-effective, modern technologies like drip irrigation, soil moisture sensors, and micro-irrigation provide precision and efficiency. The 15% who remain neutral may be awaiting evidence of successful hybrid models or may require additional training. Only a small portion (10%) express unwillingness, possibly due to traditional values or skepticism toward new technologies. The cumulative frequency reaching 90 at the "Neutral" level reflects that resistance is minimal. The findings suggest strong potential for promoting integrated models through training programs, demonstrations, and government incentives. Hybrid systems can ensure higher water savings, improved crop productivity, and long-term agricultural sustainability.

DISCUSSION OF THE STUDY

The discussion of the study highlights the significant role that indigenous farming knowledge continues to play in conserving water resources in rural agricultural communities. The findings demonstrate that traditional practices such as contour bunding, mulching, mixed cropping, and rainwater harvesting remain integral components of sustainable agricultural systems, especially in regions facing water scarcity and climate variability. Farmers who actively follow indigenous techniques reported better soil moisture retention, improved crop resilience, and reduced dependency on external irrigation sources compared to those relying solely on modern methods. This reinforces the idea that indigenous knowledge is not only environmentally sustainable but also economically viable for small and marginal farmers with limited access to capital-intensive technologies. The study further reveals strong cultural and community foundations that support the persistence of traditional practices, though generational changes and modernization threaten their continuity. Younger farmers tend to adopt water-intensive or commercially driven farming patterns, reflecting a gradual shift away from time-tested indigenous methods. Despite this shift, the study found substantial potential for integrating traditional knowledge with modern technologies such as drip irrigation, soil sensors, and micro-irrigation systems to create hybrid approaches that maximize water use efficiency. Additionally, community elders emphasized the importance of preserving and documenting indigenous knowledge, as much of it exists in oral form and risks being lost over time. The study underscores the need for policy interventions and agricultural extension programs that recognize and promote indigenous water conservation methods as valuable scientific practices rather than outdated traditions. Strengthening awareness, providing incentives, and incorporating indigenous techniques into training modules can significantly enhance their adoption. Overall, the discussion confirms that indigenous farming knowledge serves as a critical, sustainable, and culturally embedded resource for water conservation and must be integrated into future agricultural planning and climate adaptation strategies in rural communities.

ISSN 2394 - 7780

CONCLUSION

The study concludes that indigenous farming knowledge remains a vital and irreplaceable resource in conserving water within rural agricultural communities, offering a sustainable, low-cost, and ecologically harmonious alternative to modern irrigation practices. The research findings highlight that traditional methods such as contour bunding, mulching, intercropping, and community-based rainwater harvesting structures have consistently demonstrated their effectiveness in enhancing soil moisture retention, minimizing runoff, and supporting groundwater recharge. These practices, rooted in generations of observation and adaptation, reflect a deep understanding of local ecosystems and climatic patterns, enabling farmers to maintain agricultural productivity even under conditions of water scarcity and climate uncertainty. At the same time, the study recognizes the challenges posed by modernization, loss of traditional knowledge, and changing crop preferences among younger farmers, which collectively threaten the continuity of these valuable practices. The gradual shift toward commercial, water-intensive monocultures underscores the need for renewed emphasis on conservation-oriented farming. The integration of indigenous knowledge with modern agricultural technologies emerges as a promising approach, capable of enhancing water-use efficiency while retaining the cultural and ecological wisdom embedded in traditional systems. The study advocates for inclusive policy interventions, targeted awareness programs, and active community participation to ensure the documentation, preservation, and propagation of indigenous water conservation methods. Agricultural extension agencies, government institutions, and local self-governance bodies must collaborate to create platforms where traditional and scientific knowledge can coexist and strengthen each other. Overall, the study reaffirms that indigenous farming knowledge is not merely a relic of the past but a scientifically relevant, culturally significant, and environmentally essential asset that can guide sustainable agricultural development and water resource management in the future.

REFERENCES

- Agarwal, A., & Narain, S. (2010). Community-based water management: Traditional systems and sustainable practices. Centre for Science and Environment.
- Altieri, M. A., & Nicholls, C. I. (2017). The adaptation and mitigation potential of traditional agriculture in a changing climate. Climatic Change, 140(1), 33–45.
- Berkes, F. (2018). Sacred ecology (4th ed.). Routledge.
- FAO. (2019). The state of the world's biodiversity for food and agriculture. Food and Agriculture Organization of the United Nations.
- Gupta, R., & Shinde, S. (2022). Erosion of indigenous knowledge systems in modern agricultural practices. Journal of Rural Development Studies, 38(2), 112–125.
- Kumar, P., & Singh, R. (2020). Traditional water harvesting practices for sustainable agriculture in India. International Journal of Agricultural Sustainability, 18(3), 245–257.
- Meena, R., & Choudhary, S. (2021). Water-efficient indigenous crop varieties and their role in drought resilience. Indian Journal of Dryland Agriculture Research, 36(1), 54–60.
- Nyong, A., Adesina, F., & Osman, B. (2007). The value of indigenous knowledge in climate change mitigation and adaptation strategies in Africa. Mitigation and Adaptation Strategies for Global Change, 12(5), 787–797.
- Patil, J., & Shete, A. (2018). Impact of mulching on soil moisture and crop productivity under water-scarce conditions. Journal of Soil and Water Conservation, 17(4), 299–305.
- Reid, H., Fernández, M., & Satterthwaite, D. (2020). Integrating indigenous knowledge into climate adaptation strategies. Local Environment, 25(5), 345–360.
- Sharma, A., & Pandey, D. (2019). Traditional tank irrigation systems and groundwater recharge efficiency in semi-arid India. Water Resources Management, 33(8), 2781–2795.
- Thomas, L., & George, P. (2021). Hybrid irrigation models combining indigenous and modern techniques: A sustainable water management approach. Journal of Sustainable Agriculture and Environment, 9(2), 88–102.
- Wilson, G. (2020). Community participation and knowledge co-production in sustainable water resource management. Environmental Management Review, 28(3), 214–230.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

A STUDY OF THE FACTORS AFFECTING THE GOLD PRICE MOVEMENTS IN INDIA

Shri Abhijit Ray
Assistant Professor, Thakur College of Science and Commerce, Kandivali (East), Mumbai

ABSTRACT
Gold has always been the most sought after object since times immemorial. It has been the symbol of power, stood out as most preferred jewelry item and had enjoyed universal acceptance. The different cultures so different and unknown to each other had been tied down to the lustrous metal without any central authority dictating the terms. In the middle ages science was directed to convert metals to gold. Civilizations were plundered in its search and when international trade started taking wings, it was used as the standard for comparison of the currencies. Gold had always remained on top of people's mind and hence generally has a nature of appreciation. This has attracted both retail and institutional investors. It always find favour as jewelry in the south Asian region. Hence there is always a natural demand for use in households. This provides a natural hedge when the investors tend to shift away from gold as an asset for investment. The prices had been perceived to be less volatile with an upward trend. With disposable incomes increasing, mutual funds being allowed to invest in gold, interest in the yellow metal has increased. Today Indians, traditionally an important bullion market are interested to understand the factors influencing the price movement of gold.

The paper is analyzing the factors, to provide an forward outlook to the investors.

Keywords: *Gold, inflation, investment*

INTRODUCTION
Traditionally Gold has been of keen interest in India. In ancient times it had served as the symbol of affluence. It was mainly in the form of ornaments and kings used to plunder lands to amass the gold. It was the premium currency when there existed a system of multiple types of coins. Its ornamental value associated with religious fervor gave it a touch of holiness. Statues of Gods if decorated with golden ornaments and gift of golden ornaments in marriage were considered auspicious. Thus, gold was a very cherishable commodity in Indian households. In absence of other investment options, the rich took to invest in land and gold. Gold was having higher store of wealth and was highly liquid. Hence it remained to be the most sought after asset. The population increased and hence the demand. However, supply was either constant or controlled. India did not have the enough reserves to match the demand from the population - both rural and urban. Hence gold imports increased.

Globally the penchant for gold as the best reserve asset had been felt by the Western economies long before. Gold standard was responsible was settling the disparities between the different currencies. Although it was replaced by the US Dollar as the central currency of the world, gold continued to be the most dependable asset. Gold was a commodity which was backed by the domestic consumption demand. Hence the prices did not fall much. Whenever there had been disturbances, uncertainities, investors pulled out of risky assets like equity and parked their investments in gold. Buying pressures contributed to upward movement of the gold prices.

Domestically, Karnataka had been the largest supplier of gold. Currently Andhra Pradesh is expected to have largest share of untapped gold.

As per data on global mine production, published by World Gold Council, on 12th June 2025, China is having the highest production at 380,000 tonnes followed by Russian Federation at 330000 tonnes and Australia at 284000 tonnes.

RESEARCH OBJECTIVES
1. Study factors affected movement in gold prices in the past.

2. Corelate the past factors with current developments

METHODOLOGY
The research paper attempts to analyze the factors affecting the gold prices. The paper takes into account both Indian and global figures. The analysis is based on secondary data. Review of literature provides an indication of the factors generally has been considered for this research paper.

Hypothesis:

H(1): Domestic and International factors affect the gold prices and relations may be found.

ISSN 2394 - 7780

H (0): Gold prices are not affected by domestic and international factors

LITERATURE REVIEW

1. Exploring Dynamics of Gold Prices in India by Himani Khatri and Prof Kuldeep Singh Chhikara, published in International Journal for Research Publication and Seminar, 29.6.2024
2. Determinants of gold price movements: An empirical investigation in the presence of multiple structural breaks by Themba G. Chirwa, Nicholas M. Odhiambo, published in Science Direct , Volume 69, DEcemeber 2020
3. A Study on Various Factors Impact on the Gold Price in India, by Nisarga M and Nagendra Marisetty published in Asian Journal of Economics Business and Accounting in September 2023
4. A STUDY ON VARIOUS FACTORS IMPACT ON THE GOLD PRICE IN INDIA Dr. R. Vijimalar published in Neuroquantology 2022
5. Choudhry (2013) has opined inflation and exchange rate movements are highly correlated with gold prices in India.
6. Singh & Bedi (2015) researched that global economic uncertainty and crude petroleum prices are influencing gold price volatility.
7. Reddy & Prasad (2017) found out that domestic demand during festive seasons and marriage periods as key seasonal factors impacting gold prices.
8. Kumar (2018) established the inverse correlation between interest rates and gold investment.
9. Sharma (2020) analyzed the post-COVID trends showing how crisis-led situations spike gold demand due to investor uncertainty.

FINDINGS

1. Mining of gold in India:

The figure below shows the mining of gold that is taking place in India in the last 30 years as disclosed by US Geeological Survey. The gold mining had been constant between 2000 to 3000 tonnes from 1990 to 1999 and again between 2006 to 2012. In the intervening period gold mining had spiked to 6000 tonnes in 2000. Since India doesnot have enough gold reserves, depletion of reserves have continuously brought down gold production domestically. It implies domestic supply is going down

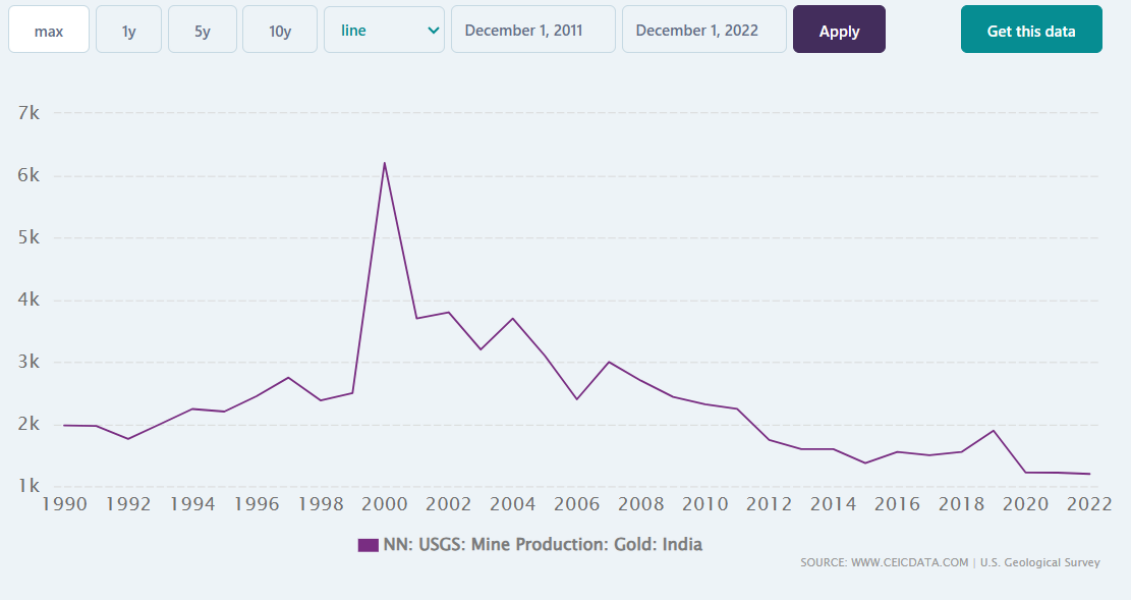


Fig 1.1

2. International Gold prices:

Since Indian gold reserves are unable to meet the domestic demand the imports are most important source of supply. The international gold prices hence become the important indicator of domestic gold prices. Tracking the data of domestic and international gold prices, we find the trend is similar (Fig 2.1 & fig 2.2). However on closer look we may see that the gold price between 2016 to 2019 were in the narrow range of 1045 to 1345

ISSN 2394 - 7780

(USD/t.oz). International gold prices spiked from July 2019 to Aug 2020 from 1398 to 2034 USD /t.oz. The obvious factor was COVID 19 pandemic which had taken atoll on the world economy and the financial markets. Inflation had been shooting up in USA and Western countries. USA and Canada had become the fastest developing bullion markets. Thereafter it remained rangebound for next 3 years between 1306 and 1670 USD/t.oz. International gold prices zoomed upwards steeply from 2024 with intermittent corrections. The probable reasons were central banks from developing countries and emerging markets were buying huge amount of gold reserves in anticipation of uncertainities.

The comparison between Fig 2.1 and Fig 2.2 makes it clear the domestic gold prices are reflecting the same trend. However, the domestic gold prices are dependent upon imports where the exchange rates are important. The USD INR rates in last 10 years shows rupee depreciating from 2019 to 2023. This should have increased the domestic gold prices. However, the prices have trailed the international prices.

Fig 2.1: International gold prices

Source: www.tradingeconomics.com

Fig 2.2: Domestic gold prices

Fig 2.3: USD INR prices

Source: www.tradingeconomics.com

ISSN 2394 - 7780

3. Inflation

Inflation eats into the savings. Investment is required to be made to overtake the inflation. Inflation is an indication of growth. It is always natural for inflation to occur as the resources are shrinking and the population is rising. Inflation depends upon several factors. Central banks are tasked with moderating and calibrating the inflation.

Gold has been traditionally been seen as the safe haven asset and the cushion against inflation. So, when the inflation is persistent and above tolerable limits, investors turn to gold.

As per the secondary data presented in Fig 3.1 and 3.2, inflation rise is not being impacting the gold price to a large extent. The inflation has remained extremely range bound between 2016 to 2020. We also find the gold price against US Dolar had been remaining range bound. Owing to central bank buying and COVID 19 effect the inflation started shooting up. In 2021 the supply shocks had been severe and it impacted the major economies. As a result the inflation started rising on the back of central banks buying gold and raising rates. From the data we may infer the inflation is not raising gold rates immediately, but is acting as precursor to price rise.

Year	World Inflation
2016	1.6
2017	2.3
2018	2.4
2019	2.2
2020	1.9
2021	3.5
2022	7.9
2023	5.9
2024	2.9

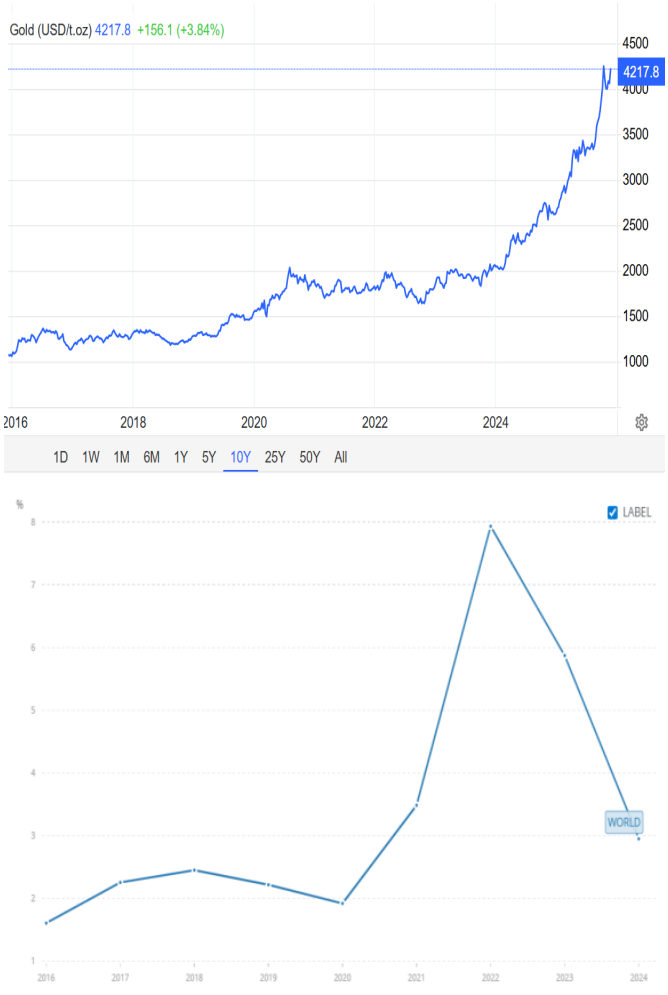


Fig. 3.1

ISSN 2394 - 7780

4. Equity markets

The investors generally look for riskier assets when they are having enough liquidity. The world equity markets represented in our study through MSCI World equity markets present the following figures:

Fig 4.1

Year	MSCI World Index Return (%)	Gold Avg Price (USD/oz)	Gold YoY Change (%)
2016	8.15%	1,251.92	—
2017	23.07%	1,260.39	+0.68%
2018	–8.20%	1,268.93	+0.68%
2019	28.40%	1,393.34	+9.80%
2020	16.50%	1,773.73	+27.30%
2021	22.35%	1,798.89	+1.42%
2022	–17.73%	1,801.87	+0.17%
2023	24.42%	1,936.45	+7.47%
2024	19.19%	2,386.00	+23.20%

Source: MSCI

The correlation coefficient works out to be 0.346. This implies there is weak positive relationship between MSCI and international gold prices.

Fig 4.2

Year	Gold Price (₹ / 10g, 24K)	Gold YoY % Change	NIFTY 50 Level	NIFTY YoY % Change
2016	28,623.50	—	8,185.80	—
2017	29,667.50	**+3.65%**	10,530.70	**+28.65%**
2018	31,438.00	**+5.97%**	10,862.55	**+3.15%**
2019	35,220.00	**+12.03%**	12,168.45	**+12.02%**
2020	48,651.00	**+38.13%**	13,981.75	**+14.90%**
2021	48,720.00	**+0.14%**	17,354.05	**+24.12%**
2022	52,670.00	**+8.11%**	18,105.30	**+4.33%**
2023	65,330.00	**+24.04%**	21,731.40	**+20.03%**
2024	77,913.00	**+19.26%**	23,644.80	**+8.80%**

The average values are taken for the purpose of brevity. The figures present a correlation coefficient of (-)0.11. It is noteworthy to observe that from 2016 to 2017 the equity markets rose by 28% whereas the gold prices rose by only 3 %. Again in 2020 the equity markets rose by 2 % whereas the gold prices rose by 26 %. The trend reversed in 2021 when the gold prices rose negligibly but equity markets registered a rise of 24 %. Similar trend was again observed in 2024 with gold prices rising by 19% against a modest rise of 9 % in equity.

It shows the gold prices and equity prices are having adverse relation and the trends are reversing every year. This may be because when investors in equity markets are facing a bearish trend, they are fleeing to park their proceeds in gold. They are returning when the equity markets are taking a bullish upturn.

5. Interest rates.

Interest rates are changed by the central banks. The main drivers for rate changes are inflation and growth factors. With a rise in inflation and growth the rates are raised and vice versa.

From figure 5.1 it is observed that following repo rate cuts in 2016 and 2017 by 0.25 % each, there has been a rise in gold prices. In 2019 and 2020 following aggressive repo rate cuts of more than 1 % each, gold prices shot up by 38 % and 12 % each year. When the repo rates were increased in the years 2018 and 2022 gold prices also increased on the back of rising inflation. In the years 2023 & 2024 although the rates were held steady, international gold prices were rising due global recession fears and geopolitical disturbances.

We may conclude interest rates when reduced it may raise gold prices, however the other factors if present overshadow the impact of rate changes

ISSN 2394 - 7780

Fig 5.1

Year	RBI Repo Rate (Range)	Avg. Annual Gold Price (₹/10g)	Gold Price Change (%)	Relationship with Repo Rate
2016	6.50% → 6.25% (Cut)	₹28,623	+9.0%	Inverse: Rate cut, Gold price rose.
2017	6.25% → 6.00% (Cut)	₹29,667	+3.7%	Inverse: Rate cut, Gold price rose.
2018	6.00% → 6.50% (Hike)	₹31,438	+5.9%	Contradictory: Rate rose, Gold price also rose (driven by global uncertainty & weak Rupee).
2019	6.50% → 5.15% (Aggressive Cuts)	₹35,220	+12.0%	Inverse: Rate cut, Gold price rose sharply.
2020	5.15% → 4.00% (COVID Cuts)	₹48,651	+38.1%	Strong Inverse: Major rate cuts led to a massive gold surge (Global safe-haven demand).
2021	4.00% (Held Steady)	₹48,720	+0.1%	Neutral: Rate held steady, Gold price stabilized after the 2020 rally.
2022	4.00% → 6.25% (Aggressive Hikes)	₹52,670	+8.1%	Contradictory: Aggressive rate hikes, yet Gold price continued to rise (Global inflation, Russia-Ukraine conflict).
2023	6.50% (Mostly Held Steady)	₹63,820	+21.2%	Contradictory: High rates, but Gold surged to new highs (Global recession fears, US Fed uncertainty).
2024	6.50% (Held Steady)	₹77,560	+21.5%	Contradictory: High rates maintained, but Gold reached a historic peak (Geopolitical tension, Central Bank buying).

6. Central Bank gold purchase

Central banks purchase gold to rejig their portfolios, bring changes in macroeconomic parameters and stabilize the markets. They buy in huge quantity and plays an important role in influencing the world gold prices.

In 2016, Central banks of Russia and China purchased around 395 tonnes of gold towards portfolio diversification in a move to move away from US Dollar. It led to an increase of rise by USD 1245/oz. In 2017, central banks of Turkey and Russia buys 378 tonnes of gold and lifts the gold prices by USD 1257/oz for the purpose of building strategic reserves against trade wars. Russia continued the spree buying 656 tonnes of gold in 2019 raising the USD prices by 1393/oz. In 2021 India joins the race along with Brazil buying around 450 tonnes of gold to act as hedge against inflation from the pandemic raising the rates by around 1700 USD /oz. Several central banks continue the buying in 2022 buying reportedly 1080 tonnes of gold raising the gold prices by 1800 USD /oz.

Post pandemic induced inflation and Russia Ukraine war, the dedollarisation initiave by BRICS came into focus. The yellow metal was perceived as the natural hedge against the structural volatility building up in the global financial systems. People's Bank of China became very aggressive buyers of gold. Central banks' purchase of gold was reportedly 1050 tonnes in 2023 and 1089 tonnes in 2024, raising the gold prices by 1940 and 2400 USD /oz respectively. Trade wars initiated by USA against all major economies ignites surge for gold. Poland targets 30% of its reserves in gold. The central bank buying coupled with trade negotiation uncertainties lifts gold prices by 3000 USD/Oz approximately.

We may conclude central banks' buying of gold as the major factor for sudden surges in gold prices internationally.

Summary of analysis:

The above analysis clearly proves that the hypothesis that international and domestic gold prices are affecting the Indian gold prices:

1 Gold is not available in India to the extent it may meet the demand. It is imported and Indian gold prices are having close direct relation with the international prices.

ISSN 2394 - 7780

2 Macroeconomic fundamentals like inflation and interest rates have a correlation with gold prices. Reducing repo rates have contributed to rise of gold prices.

3 Equity markets are inversely related to gold prices in India. In India as the derivative markets are not so developed in Western nations, the alternative to equity investment in terms of risk is considered as gold. Gold is the most popular destination for risk averse investors.

4 Central banks' purchase of gold has contributed to be the most significant factor which is directly adding to the largescale demand of gold. The decision of central banks are influenced by strategic reasons, e.g building a reserve to replace the USD holdings, investment in stable assets, correct structural volatility, etc

CONCLUSION

Under such circumstances, considering the findings, trends this research wishes to suggest that gold is the universal asset which is both important for consumption and as a financial asset. Indian gold prices track the international prices. The investors in India considers gold purchase as a continuous process thus providing a retail upward thrust. International gold prices are influenced by central bank purchases and global inflation. While uncertainities and geopolitical tensions are existing today, signals of detoriations are absent. Growth is expected and with betterment of international relations a conducive stable environment will stabiles the gold prices. It is advisable to include gold as part of investment portfolio and use it for diversifying risks.

REFERENCES

1. International Monetary Fund library
2. World Gold Council archives
3. MSCI and NIFTY50 indices
4. US Geological Survey records

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

IMPACT OF A SIMPLE GAME ON MENTAL HEALTH: AN ANALYTICAL STUDY

Ms. Zakiya Khan
Assistant Professor, Department of Economics, Thakur College of Science and Commerce, Mumbai

ABSTRACT
This study examines whether a simple interactive game can reduce stress, concentration improve mental health and coping among participants. A pre- and post-intervention survey was conducted using Likert-scale responses to measure changes in stress levels. Chi-square analysis was used to test the association between pre- and post-game stress. Results indicate a statistically significant improvement in stress reduction after playing the game. The study provides insights into low-cost, non-clinical stress-management tools suitable for students and working individuals.

REVIEW OF LITERATURE
Research on the relationship between gaming and mental health has steadily grown over the past two decades. Early studies demonstrated that casual digital games can reduce physiological stress responses. Russoniello, O'Brien, and Parks (2009) found that playing simple casual games for short periods significantly lowered heart rate and improved overall mood among adult participants. Their findings suggested that low-complexity games may serve as convenient stress-relief tools.

In another study, Li, Liau, and Khoo (2011) examined adolescents and found that video gameplay enhanced emotional regulation abilities, allowing players to better manage negative feelings. They argued that interactive digital environments may support healthy coping strategies in young individuals.

More recent evidence continues to support these findings. A systematic review by Jones et al. (2021) concluded that digital games contribute to psychological resilience, particularly when the game design includes calming visuals, positive feedback, and cognitive engagement. The review emphasized that gaming can help reduce short-term stress by offering distraction, enjoyment, and a sense of achievement.

In addition, Pine et al. (2020) investigated the impact of interactive digital tasks on attention and anxiety. Their results confirmed that digital gameplay can improve focus, reduce anxiety symptoms, and increase mental clarity. These benefits were especially noticeable when participants engaged in games involving simple tasks, puzzles, or light strategy elements.

Kowal et al. (2021) further highlighted that gaming may provide feelings of social connectedness. Their study found that individuals who engage in cooperative or casual multiplayer games report higher levels of social engagement, which indirectly reduces feelings of stress and loneliness.

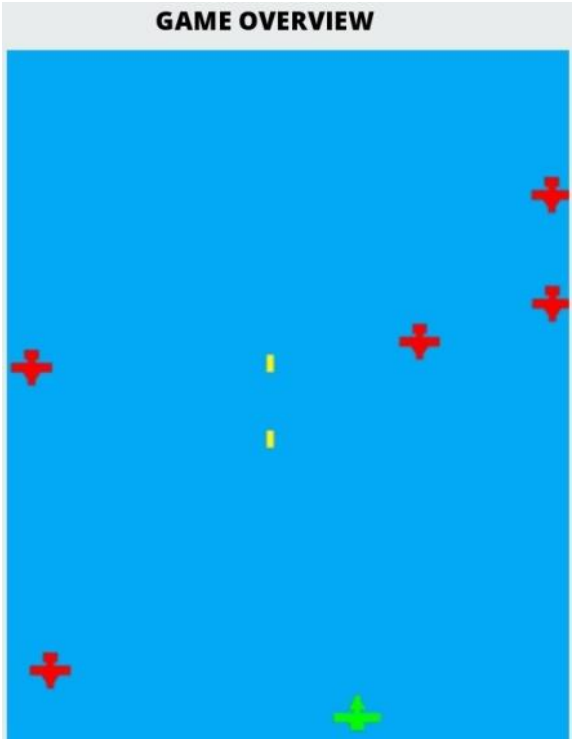
Another important contribution comes from Villani et al. (2018), who explored the emotional benefits of mindful and relaxing games. They found that games designed with soothing music, nature imagery, or slow-paced gameplay promote emotional well-being and serve as effective relaxation tools.

Collectively, these studies suggest that gaming—particularly casual, low-stress, or mindful game formats—may positively influence mental health by reducing stress, improving mood, increasing concentration, and promoting emotional regulation. The existing literature provides strong support for investigating the before-and-after mental health conditions of individuals who engage in short-duration gameplay.

OBJECTIVES OF THE STUDY
- To measure the stress levels of participants before the game.
- To measure the stress levels after playing the game.
- To determine whether there is a significant association between pre- and post-game stress using chi-square analysis.
- To explore the potential of simple games as stress-management tools.

ISSN 2394 - 7780

Overview of the Game



The game used in this study is a simple, fast-paced interactive shooting game designed to engage players through quick reflexes and visual focus. The player controls a green aircraft positioned at the bottom of the screen, while multiple red enemy aircraft move across the play area from different directions. The objective of the game is to avoid incoming enemies and shoot them using yellow projectiles that travel upward from the player's aircraft. The bright blue background and minimalistic design create a clean and distraction-free visual environment, helping players stay focused on movement and timing. The gameplay is straightforward, intuitive, and requires continuous attention, making it suitable for evaluating changes in concentration, stress relief, and motivation. Its simple interaction style ensures that players of all age groups can participate without prior gaming experience, which aligns effectively with the mental-health–oriented goals of the study.

DATA ANALYSIS

The study used Likert-scale responses for a pre-game stress question (Q6) and a post-game stress question (Q11). The categories were collapsed into two groups: High Stress and Low Stress. A chi-square test of independence was performed to determine whether stress levels differed significantly after the game.

Hypotheses

H0: There is no significant association between stress levels before and after playing the game.

H1: There is a significant association between stress levels before and after playing the game.

Chi-Square Test Summary

Observed Table:

High Stress Before: 9 → After: 3

Low Stress Before: 32 → After: 38

Chi-square value (χ^2) = 6.39

p-value = 0.0114 (< 0.05)

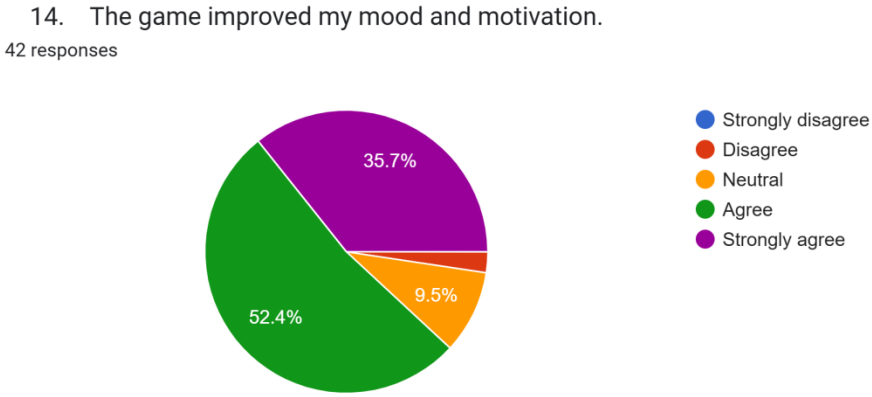
Conclusion: Stress levels decreased significantly after the game.

CONCLUSION

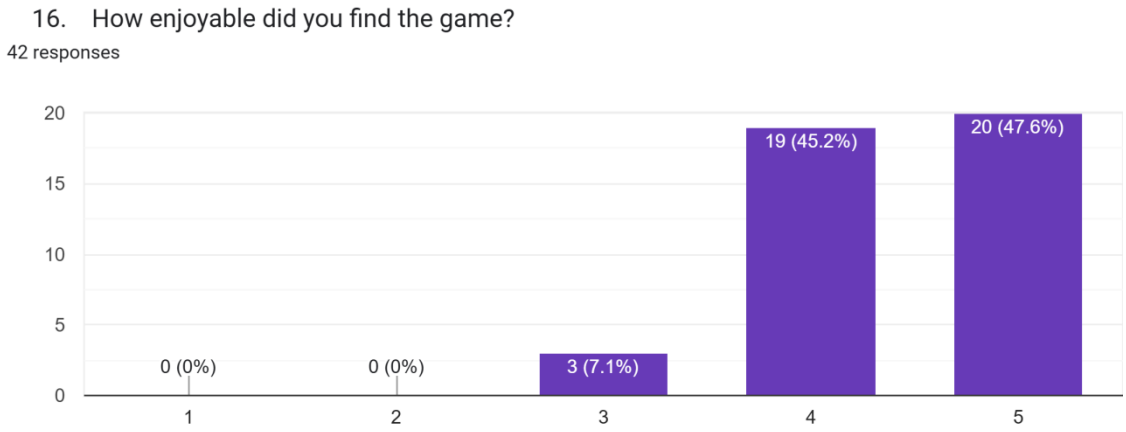
The study concludes that the simple game had a statistically significant effect on reducing participants' stress levels. Participants who initially exhibited higher stress reported lower stress after the short intervention. This suggests that brief, easy-to-implement activities can be useful tools in educational and workplace environments to support emotional well-being.

ISSN 2394 - 7780

Effect of the game



The analysis of responses to Question 14, *"The game improved my mood and motivation,"* shows a strongly positive impact of the game on participants' emotional well-being. Out of 42 respondents, a combined 88.1% agreed or strongly agreed that the game enhanced their mood and motivation, with 52.4% selecting Agree and 35.7% selecting Strongly Agree. Only 9.5% remained neutral, and notably, there were no negative responses (Disagree or Strongly Disagree). This distribution clearly suggests that the game served as an effective tool for uplifting emotional states, promoting motivation, and generating a positive psychological experience. The overwhelmingly favorable responses support the study's assumption that short, interactive gameplay can contribute to improved mental well-being and can be considered a beneficial low-intensity intervention for enhancing mood.



The responses to Question 16, *"How enjoyable did you find the game?"*, indicate that participants found the game highly enjoyable. Among the 42 respondents, nearly all rated their experience positively, with **47.6% giving the maximum enjoyment rating (5)** and **45.2% rating it a 4**. A small proportion, **7.1%**, selected a neutral rating of 3, while **no participants rated the game at the lowest levels (1 or 2)**. This distribution demonstrates extremely high satisfaction with the gameplay experience, suggesting that the game successfully engaged users and created a positive, enjoyable environment. High enjoyment levels also enhance the credibility of the study's findings, as participants who are more engaged and entertained are more likely to experience emotional and motivational benefits. Overall, the data strongly suggests that the game was well-received and effective in creating a positive user experience.

REFERENCES

- Jones, M., Cooper, P., & Turner, K. (2021). *Digital gaming and psychological resilience: A systematic review*. Journal of Media Psychology, 33(4), 215–230.
- Kowal, M., Conroy, E., & Collins, E. (2021). *Social connectedness through gaming: Mental health benefits of cooperative play*. Computers in Human Behavior, 120, 106745.

ISSN 2394 - 7780

- Li, D., Liau, A., & Khoo, A. (2011). *Examining the influence of video gaming on emotional regulation among adolescents*. Cyberpsychology, Behavior, and Social Networking, 14(9), 523–528.
- Pine, R., Fleming, T., & McAllister, F. (2020). *Anxiety reduction through interactive digital tasks: Evidence from experimental studies*. Journal of Affective Computing, 12(3), 142–150.
- Russoniello, C. V., O'Brien, K., & Parks, J. (2009). *The effectiveness of casual video games in reducing stress and improving mood*. Journal of CyberTherapy & Rehabilitation, 2(1), 53–66.
- Villani, D., Carissoli, C., & Riva, G. (2018). *Relaxing games and emotional well-being: A review of mindful digital experiences*. Frontiers in Psychology, 9, 2129.

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

ROLE OF DIGITAL LITERACY IN STRENGTHENING MENTAL HEALTH CARE FOR VIKSIT BHARAT

Dr. Hetal Kherala
Assistant Professor (Commerce) (GES Class-II), Govind Guru University, Godhra, Shri C.H. Bhil Govt. Arts and Commerce College, Naswadi

ABSTRACT
As India moves closer to Viksit Bharat, digital literacy continues to influence mental health care. The ability to understand and make use of digital tools has become important due to the increase in psychological problems, the scarcity of mental health specialists, and the quick growth of technological advances. Individuals who are digitally literate can make educated decisions about their well-being, use mental health apps, access trustworthy online resources, and participate in tele counselling . AI-based platforms, mobile apps, and government programs like MANAS and Tele-MANAS are revolutionizing mental health care by making it more individualized and accessible. But there are still concerns with the accuracy, safety, and moral application of AI-powered mental health solutions, as well as dangers like false information and privacy issues. This study highlights that although digital solutions have a lot of potential, they should be used in conjunction with professional care rather than in place of it. Therefore, improving digital literacy is essential to improving mental health outcomes and creating a population in India that is mentally resilient.

Keywords: *Digital Literacy (DL), Mental Health, NIMHANS, wellbeing, Tele-manas*

INTRODUCTION
"India's vision of good health implies not just being free of disease but to ensure wellness and welfare for everyone. The goal is to ensure physical, mental and social wellbeing."

Shri Narendra Modi, PM of India (Santosh Kumar, 2025, 7th Ferbruary)

Digital technologies are growing into crucial facilitators in the social, economic, and healthcare domains as India grows towards to the dream of Viksit Bharat—a technologically advanced, independent, and inclusive nation. Among these, rising psychological challenges, expanded digital connectivity, and changing socio-economic backdrops have made mental health interventions more important than ever. In this regard, digital literacy—the aptitude to utilize, understand, assess, and use digital platforms in an appropriate manner—actively and significantly influences mental health.

As a result, digital literacy emerges as a social competency, a behavioral influence, and a policy accelerator in the larger context of Viksit Bharat's purpose. Digital literacy becomes a crucial factor for assessing mental health outcomes by enhancing people's cognitive resilience, media appraisal skills, and self-regulation in digital environments. Its active adoption into mental health policies has made it possible to empower mental health services, lessen disparity, and cultivate a populace that is psychologically resilient—all of which are necessary for India to be prepared for the future.

Often, we have gone through the news of students, celebrities, families and many other people are suffering from various psychological issues like anxiety, depression, loneliness, exam, related stress, career related stress, bullying, digital addiction and trauma.

As per the National Studies 15 percentage of country's adult population is facing mental health issues and need intervention. In the study it has been found that 70 percentage to 92 percentage mental health patient has not receive the accurate treatment because of unawareness, stigma and lack of professional experts. The reputed journal of psychiatry India mentioned that 0.75 psychiatrists are working for per 1,00,000 people (Welfare, 2025). After observing the seriousness of the issue, the government, and educational stakeholders has started many innovative strategies as a solution. In the era of digital revolution, digital technology and digital literacy is a game changer.

The relationship between digital literacy and mental health is essential for developing effective interventions and policies that can bridge the digital divide and promote mental well-being. As digital literacy becomes increasingly integral to daily life, its potential to improve mental health outcomes presents a vital area of research with significant implications for public health and social equity. As per the survey done by the government, it is reported that mental well-being in the country is lower in 2023 than it was in 2020, which is worsening between the age group of 18-24 (Chandola, 2024). In this paper researcher attempted to explores that what are the different kind of mental health application are and its ecosystem. Further, this study investigates the active role of digital literacy in strengthening mental health.

ISSN 2394 - 7780

What is Digital Literacy? A Multifaceted Construct…

Digital literacy encompasses a range of skills and competencies that enable individuals to effectively and responsibly use digital technologies. It has multifaceted construct, extending beyond basic technical skills. It encompasses cognitive, social, and emotional dimensions. Key dimensions include:

- **Informational Literacy:** The ability to locate, evaluate, and synthesize information from digital sources.
- **Communication Literacy:** The ability to effectively communicate and collaborate using digital tools.
- **Content Creation:** The ability to create and share digital content responsibly and ethically.
- **Critical Thinking:** The ability to analyse and critically evaluate digital information, including identifying misinformation and bias.
- **Online Safety and Privacy:** The ability to protect personal information and navigate online risks, including cyberbullying and scams.

In nutshell, it can be understood that digital literacy is an ability to use, understand and critical evaluate the digital tools and information, which has components like information literacy, technical skills, safety practices and critical thinking skills (Academy, 2024).

What is Mental Health? : It is person's emotional, psychological and social well-being. It affect how an individual think, feel and behave in routine life, making decisions, managing stress, and relationships. According to WHO 'mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well and contribute their community (Santosh Kumar, 2025, 7th Ferbruary)

Source: *(Types of Mental Health Issues www.pib.gov.in)*

Present Scenario:

The country is facing mental health crisis due to various reasons such as, stressful life, financial instability, high penetration of mobile phones, dying academic competition, peer pressure, career pressure, family pressure and lack of robust mental health support system. . It is obvious that mentally ill persons cannot work effectively, resulted in decrease in the productivity. It can increase the absenteeism, presenteeism, and increased staff turnover. (India, 2025).The World Health Organization has reported that poor mental health is prime reason for the disability, and it has been estimated that one among seven people worldwide were living with mental health issue. In our country approx. 11 in 100 people are suffering from mental health disability (Verma, 2025). This scenario is worst in case of young generation.

The students suicide rate is dreadful condition in our country. During the past decade there is a shocking hike in the students' suicide rate of 65 % (8423 students) 2013 to (13,892) 2023 the NCRB reported. During 2019 to 2023 it rose by 34% which indicates that the crisis of mental health issue accelerated in India (India T. o., 2025)

ISSN 2394 - 7780

The report of NCRB (National Crime Records Bureau) has reported the students suicide rate was 7.6%, and by the year 2022, 13000 students are making the suicides in India. (Krishnan, 2025). This harsh reality has shaken the country, which is known as 'Youngest Country' with 65% of its citizens are under the age of 35 but its younger generation is ending their life, which is an alarming situation for all of us.

On the other side, the pandemic of 2020 has stimulus the uses of digital technology, which has gradually increased the digital literacy too. As it is mentioned in one of the government reports that 38% of households in India are digitally literate. It is higher in urban area at 61% comparing with the rural area is just 25% (Ministry of Labour and Employment). Further, the study of Centre for Economic and Social Studies reported that only 12% of people having 15 years of age in India possessing the ICT (Information and Communication Technologies) skills (Kashyap, 2024).

With 1.4 billion human beings, India is experiencing a serious mental health problem. Over 80% of the 200 million Indians who suffer from mental health issues fail to get professional therapy. Over sixty-five percent individuals belong to rural areas, where the inequality is much more pronounced (Thakur, 2024). Those who suffer from the mental health issues either they are not getting professional therapy or they don't want to speak up due to social stigma. By observing this condition scenario government has launched e-Manas (an online portal) (by Government of Karnataka launched on 26th June 2020), on April 2021 "Mental Health and Normalcy Augmentation System (MANAS)", and National Tele Mental Health Programme (launched in October 2022) (Welfare, 2024). Digital literacy plays a crucial role in mitigating the negative impacts of digital engagement on mental well-being. Individuals with strong digital literacy skills are better equipped to:

- Identify and avoid cyberbullying and online harassment
- Critically evaluate online information and recognize misinformation
- Manage their screen time and avoid digital addiction
- Protect their privacy and security online
- Use digital tools to promote mental wellness

Further, the knowledge of digital literacy skills is need of an hour to enhance social support and proved as a protective factor in favour for mental health issues. It is also suggested that the educational stakeholders, from both the sector public and private should develop New Media Literacy skills(Dee Emeralda, 2025).

- **Present Mental Health Condition of India's (Rajan, 2025)**

In 2025, India's mental health situation has been defined by a high disease burden, rising awareness, and a concerning treatment gap. It is estimated that 197 million individuals, or 14.3% of the population, suffer from mental illnesses. The most prevalent are substance use disorders, depression, and anxiety. Significant rates of schizophrenia (1.4–2.5%), bipolar disorder (0.3–0.5%), intellectual impairments (1.8%), and autism (1–1.5%) are also seen in large nationwide surveys (Rajan, 2025).

Mental disorders are an important cause of in decades lived with disability and currently comprises 4.7% of India's overall disease burden, about twice as much as in 1990.

Despite this load, 80% of patients receive no care, and the treatment gap is still very significant (70–92%). Access is significantly restricted by a lack of psychologists and psychiatrists (0.3–0.75 per lakh population), the concentration of services in urban areas, stigma, limited insurance coverage, inadequate infrastructure, and insufficient funding (less than 1% of the health budget) (Rajan, 2025).

Though such efforts are still in their early stages, India is making attempts in the areas of primary healthcare integration, legislative reforms, and digital mental health (such as Tele-MANAS). Early detection, diagnosis, and long-term therapy are still severely hampered by systemic issues (Rajan, 2025).

- **Role of online application for Mental Well-being:**

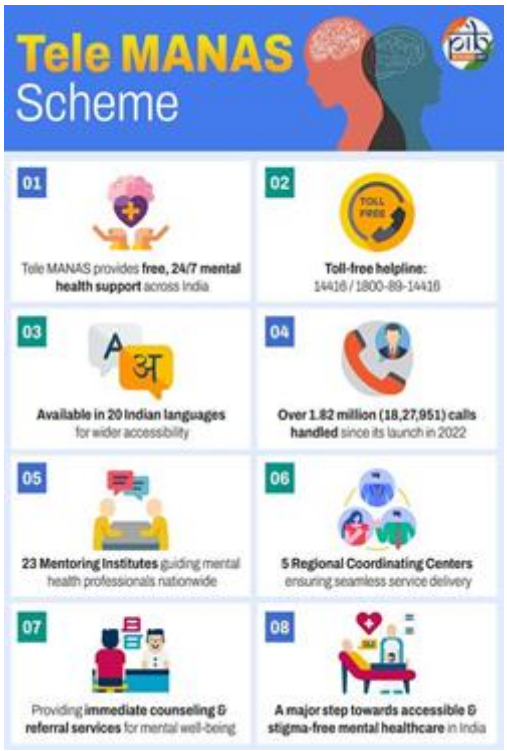
1) Government's strategies

- **Mental Health and Normalcy Augmentation System (MANAS) :** A national platform aimed for strengthening the mental wellbeing of citizen of the country on 14th April 2021 the Govt. of India has launched the MANAS, which is headed by the office of the Principal Scientific Adviser and developed in collaboration with the National Institute of Mental Health and Neuro Sciences (NIMHANS)Bengaluru was declared an Institute of National Importance, the Centre for Development of Advanced Computing (C-DAC), Bengaluru and the Armed Forces Medical College (AFMC) Pune.

ISSN 2394 - 7780

Key Features:

- Collaborative Effort: MANAS is the result of a collaboration between various government ministries, national bodies, and research institutions.
- Target Audience: The initial version of the MANAS mobile app targets individuals aged 15-35 years, promoting positive mental health.
- Future Expansion: The platform plans to be multi-lingual and integrate with public health schemes like the National Health Mission (NHM), National Nutrition Mission (Poshan Abhiyan), and e-Sanjeevani.



Source: www.mohfw.gov.in

By integrating these efforts, MANAS aims to provide comprehensive mental health support and resources to a wide audience, contributing to the overall well-being of the Indian population

- The National Tele Mental Health Programme (Tele MANAS) launched on October,2022 providing 24/7 free services to the mental health patients. From October 10, 2022 to February7,2025 it has received over 1.81 million (18,27,951) calls from across India (Santosh Kumar, 2025, 7th Ferbruary). This program is supported by 23 mentoring institutes from across India.

State Governement Initiatives

- **E-Manas Karnataka:** The initiative taken by the Karnataka state for mental illness wherein the experts professionals are providing various services(Chandola, 2024).
- **Delhi CARES:** After pandemic students focused tele counselling helpline has been designed.
- **Rajasthan's Mansanwad:** This is the India's first state-level mental health helpline which was started in the year 2017.
- **Maharashtra's BMC-Mpower:** After Covid started a psychiatric teleconsultation service. (Revolution, 2025)

2) Mobile Apps Specific to Indian Users

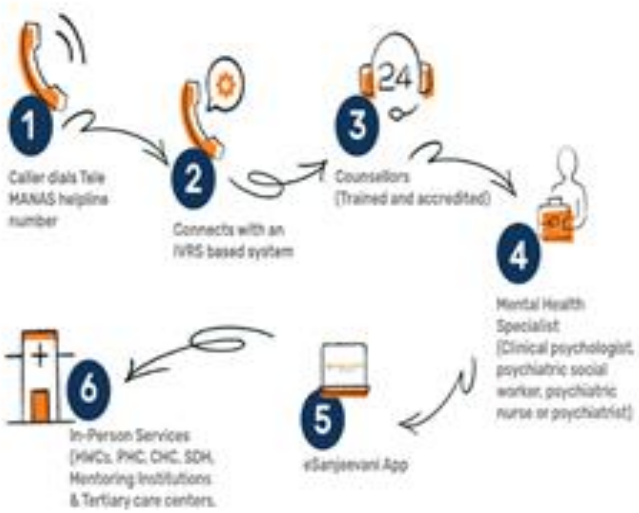
- **Wysa:** An AI-powered chat-bot offering CBT-based mental health support and stress management techniques. For providing immediate assistance on mental health Wysa is widely used in globally as well as in India. As per the website of t (Wysa, 2024)
- **Your DOST:** A chat or phone service that links people with mental health specialists.

ISSN 2394 - 7780

- **Mind Piper:** This app provides tools for therapy, evaluations, and guided meditations with an emphasis on emotional well-being.
- **E-Psyclinic:** Offers teleconsultations with mental health professionals, such as psychiatrists and therapists.

3) Teletherapy Platforms

- **Inner Hour:** A self-help app with resources for anxiety, depression, and stress management, designed by Indian psychologists.
- **Practo:** Offers online consultations with licensed psychiatrists and therapists.
- **Manasthali:** Provides therapy sessions and wellness programs tailored to Indian cultural contexts.
- **Tele-MANAS:** After the pandemic by observing an increasing in the number of mental health patient the finance minister has presented in 2022-23 budget a "National Tele Mental Health Programme" for mental health counselling and care services. It includes 23 tele-mental health centres and the National Institute of Mental Health and Neurosciences (NIMHANS) where in a Bangalore based institute IITB (International Institute of Information Technology) is providing all the necessary technical support. A teleconsultation service providing 24/7 mental health support through toll-free helplines.
- In May 2024, there were nearly over 10 lakh calls on the Tele MANAS platform, with an average of 3,500 calls per day. In the time frame of December 2022 and May 2024, the number of persons using the helpline rose from 12,000 to over 90,000 (Chandola, 2024).



Source: https://telemanas.mohfw.gov.in/about

- It aims to expand the access of Tele MANAS to mental health care nationwide, especially to the marginalized groups.
- The recent data of National Tele Mental Programme (Tele Manas,2022) Tele Manas helpline has received over 1.81 million (18,27,951) calls since it launches. (Santosh Kumar, 2025, 7th Ferbruary).
- The government has also launched Tele MANAS Mobile App & Video Consultation in October 2024.

4) Online Counselling Platform

There are quite a good number of online commercial platforms are working in India for mental well ness like Amaha Health, TalktoAngel, Better LYF, Your DOST, Manochikitsa, HopeQure, Medavas, Click2Pro. This is not the end there are many government and NGO initiatives like Tele MANAS, Vandrevala Foundation, iCALL, Live Love Laugh Foundation, SAMVAAD, and Ripples of Change Foundation.

- **Hope Qure:** A digital platform where a mental health patients can get online counselling from certified psychologists situated at Noida, Uttar Pradesh. They offered 24*7 online counselling for marriage issues, felling lonely, emotional trauma, overthinking patient, issue of sadness, anxiety, sleep disorders and insomnia and stress being treated. Almost more than 201K chat conversations, more than fifteen thousand therapy sessions have conducted. (www.HopeQure.com, n.d.)

ISSN 2394 - 7780

- **TalktoAngel:** It is a one stop solution for the mental health online counselling through online therapist, relationship counsellors and expert psychiatrists. At present they have 750+ Trained Therapists, more than 45+ area of expertise and available in more than 24+ languages. (www.talktoanagel.com, 2025)
- **IWill Therapy:** A platform providing therapy and emotional wellness programs.

5) Wearable Devices: In India, a lot of people use gadgets like the GOQii Smart Band and Fitbit to monitor their stress levels and level of exercise, which indirectly supports mental health by fostering physical well-being.

6) AI-Powered Chatbot

- **Wysa:** A very well-liked app in India that provides interactive chat support for depression and anxiety.
- **Tattva.ai:** Offers resources for mental wellness and mindfulness with a touch of Indian culture.

7) Digital Therapeutics

- **Smiles:** Provides digital programs designed specifically for Indian people to improve happiness and reduce stress.
- **Emoha:** Provides digital wellness solutions, including mental health support, with an emphasis on senior adults.

8) Online Mental Health Communities

- Websites like YourDOST and White Swan Foundation raise awareness of and offer resources for the mental health issues that Indian society faces.
- NGO-Led Forums: Free online resources and hotlines are offered by groups like Sangath and Aasra.

9) Language-Accessible Tools

- A wider audience can access several platforms and apps, such MANAS and Wysa, because they are available in multiple Indian languages.

10) Crisis Helplines and Support

- AASRA Helpline: Provides those in crisis with round-the-clock phone counseling.
- Vandrevala Foundation Helpline: Offers free, private assistance for mental health crises.

11) Academic and Corporate Wellness Programs

- Inner Hour and Practo are two platforms that many Indian corporations and institutions use to provide employees and students with mental health tools.

12) Social Media Initiatives

- Campaigns for mental health awareness on social media sites like Facebook, Instagram, and Twitter include young people in India and lessen stigma.

- **Digital literacy's active involvement in providing care for individuals with poor mental health:**

Here, the researcher attempts to find out the data that how many users are there who are aware as well as using the mental health application. Now the people are breaking the silence and freely and openly talking about the mental health problems. There are about 10% of Indian adults has been diagnosed with the poor mental health condition and there is treatment gap also. In 2023, 71% of Indians had smartphones. The number of downloads for mental health apps has gone up by 30%, with over 200,000 new users in 2023 alone. By 2032, the digital mental health sectors in India are estimated to generate US $62.86 million in sales, growing at a compound yearly growth rate of 28.16%(Seema Mehrotra, 2025).

When trying to manage their mental health issues, young Indians increasingly utilize apps and AI-powered solutions. But on the next side they are not well-informed about how these digital tools handle user data. (Kohli, 2025)

- However, we cannot neglect the fact that though, the number of mental health apps has skyrocketed in recent years, and a lot of them were created with little to no input from mental health specialists. This can raise major concerns regarding the reliability and suitability of the recommendations, messages, and suggestions found in the apps. Even when the nature and severity of the issue call for expert assistance, poorly tailored recommendations can prolong the time spent relying solely on self-help and postpone seeking professional assistance (Seema Mehrotra, 2025).

ISSN 2394 - 7780

CONCLUSION

A revolutionary step toward timely, personalized, and easily accessible help is the incorporation of mobile applications and artificial intelligence into mental health care. These technologies have shown tremendous potential in behavioral therapies, self-monitoring, early symptom identification, and putting people in touch with expert resources. Though AI-driven platforms can improve the accessibility and responsiveness of mental health care, concerns about the tools' accuracy, safety, and therapeutic validity still exist.

Algorithms could misread complex emotions, be insensitive to context, or miss difficulties that call for human assistance. The need for precaution is further highlighted by issues with data privacy, ethical use, and the lack of regulatory norms. Therefore, rather than serving as stand-alone replacements for qualified specialists, mobile and AI-enabled mental health solutions should be viewed as complementing tools.

REFERENCES

1. (n.d.). Retrieved from www.HopeQure.com: https://www.hopequre.com/
2. (2025). Retrieved from www.talktoanagel.com: https://www.talktoangel.com/best-therapists-in-india
3. Academy, G. (2024, February 21). Digital Technologies v/s Digital Literacy. Retrieved from www.nationaleudcaionsummit.com: https://www.nationaleducationsummit.com.au/nes-blog/digital-technologies-vs-digital-literacy#:~:text=Digital%20literacy%20and%20digital%20technologies%20are%20both,be%20explicitly%20taught%20across%20all%20learning%20areas.
4. Chandola, B. (2024, October 9). Mind Matters : Tech for India's Mental Health. Retrieved from www.orfonline.org: https://www.orfonline.org/english/expert-speak/mind-matters-tech-for-india-s-mental-health#:~:text=Karnataka%20e%2DManas:%20This%20initiative%20is%20a%20state%2Dlevel,including%20keeping%20track%20of%20their%20treatment%20records.
5. Dee Emeralda, A. H. (2025, February 7). The Connection between Digital Media Literacy and Mental Health in The Digital Era. Retrieved from www.iaesjournal.com: https://www.iaesjournal.com/the-connection-between-digital-media-literacy-and-mental-health-in-the-digital-era/
6. India, P. B. (2025). Understanding Mental Health : Global Perspectives and Indian Initiatives. New Delhi: Ministry of Health and Family Welfare. Retrieved from https://www.pib.gov.in/PressReleasePage.aspx?PRID=2188003
7. India, T. o. (2025, Ocotober 01). Student Suicides up 65% in a decade, NCRB data shows sharper rise than overall suicides . Retrieved from www.timesofindia.com: https://timesofindia.indiatimes.com/education/news/student-suicides-up-65-in-a-decade-ncrb-data-shows-sharper-rise-than-overall-suicides/articleshow/124248503.cms
8. Kashyap, A. (2024, November 04). Only 12 percent Indians over 15 years are computer literate : CESS study. Retrieved from www.newindianexpress.com: https://www.newindianexpress.com/states/telangana/2024/Nov/04/only-12-per-cent-indians-over-15-years-are-computer-literate-cess-study
9. Kemp, S. (2024, January 31). Digital 2024 : India. Retrieved from www.datareportal.com: https://datareportal.com/reports/digital-2024-global-overview-report?utm_source=DataReportal&utm_medium=Country_Article_Hyperlink&utm_campaign=Digital_2024&utm_term=India&utm_content=Global_Overview_Link
10. Kohli, K. (2025, August 03). As Young Indins turn to AI 'therapists', how confidential is their data? Retrieved from www.scroll.in: https://scroll.in/article/1085095/as-young-indians-turn-to-ai-therapists-how-confidential-is-their-data
11. Krishnan, M. (2025, July 07). India: What is behid the rise in student suicides? Retrieved from www.dw.com: https://www.dw.com/en/india-what-is-behind-the-rise-in-student-suicides/a-73383151
12. Ministry of Labour and Employment, G. o. (n.d.). Digital Literacy. CBWE (Central Board for Workers Eudcation Recruitment).
13. Rajan, A. (2025, September 10). Treatment Gap for Mental DIsorders remains high, with over 80% of people needing care not receiving it. Retrieved from Healthcare Executive: https://www.healthcareexecutive.in/blog/mental-disorders-

ISSN 2394 - 7780

remains#:~:text=It%20(%20The%20National%20Tele%20Mental%20Health,tools%20and%20video%20consultations%20in%20select%20states.

14. Revolution, I. T. (2025, July 21). India's Tech Mental Health Revolution. Retrieved from www.community.nasscom.in: https://community.nasscom.in/communities/diversity-and-inclusion/indias-tech-mental-health-revolution
15. Santosh Kumar, S. M. (2025, 7th Ferbruary). Advancing Mental Healthcare in India. New Delhi: Ministry of Health and Family Welfare. Retrieved from https://mohfw.gov.in/?q=en/pressrelease-206
16. Seema Mehrotra, R. T. (2025). Mental Health Apps Available in App Stores for Indian Users: Protocol for a Systematic Review. JMIR Publications Advancing Digital Health and Open Science, 14 (2025). Retrieved from https://pmc.ncbi.nlm.nih.gov/articles/PMC12044312/#ref2
17. Singh, A. (2022, October 9). Deepila Padukone on Mental Health: "Had My Mother not Identified my Symptoms...". Retrieved from www.ndtv.com: https://www.ndtv.com/entertainment/deepika-padukone-on-mental-health-had-my-mother-not-identified-my-symptoms-3414624
18. Thakur, M. (2024, December 23). Can digital therapy platforms in India set a new global mental health care standard? Retrieved from www.theweek.in: https://www.theweek.in/news/health/2024/12/23/can-digital-therapy-platforms-in-india-set-a-new-global-mental-health-care-standard.html
19. Verma, M. (2025). Understanding Mental Health Global Perspectives and Indian Initiatives. New Delhi: Press Information Bureau Ministry of Health and Family Welfare. Retrieved November 28, 2025, from https://www.pib.gov.in/PressReleasePage.aspx?PRID=2188003
20. Welfare, M. o. (2024, December 16). Stpes taken by the Government to address Mental Health problems in the country. Retrieved January 10, 2025, from www.mohfw.gov.in: https://www.mohfw.gov.in/?q=bn/node/7977
21. Welfare, M. o. (2025, 11 02). Advancing Mental Healthcare in India. Retrieved November 27, 2025, from www.mohfw.gov.in: https://mohfw.gov.in/?q=en/pressrelease-206
22. Wysa. (2024). Mental Health refined. Retrieved from www.wysa.com: https://www.wysa.com/

International Journal of Advance and Innovative Research
Volume 12, Issue 4 (II): October - December 2025
ISSN 2394 - 7780

ATTITUDINAL DIFFERENCES IN PARENTS AND CHILDREN ON MARRIAGE

Ms. Anuradha Hait
Assistant Professor, Department of Statistics, Thakur College of Science and Commerce, Kandivali-East

ABSTRACT

Marriage and Its Social Dimensions
Marriage is a socially and legally recognized union between two individuals, often marked by ceremony, cohabitation, and shared responsibilities. It serves as a foundation for family life, emotional companionship, and societal continuity. While the definition may appear simple, its meaning, value, and function differ widely across societies and generations.

1. Society and Cultural Impact
Society and culture play a powerful role in shaping ideas about marriage. In traditional Indian society, marriage is not just a bond between two people but a union of families, deeply rooted in customs, rituals, caste considerations, and religious norms. Cultural expectations often prioritize arranged marriages, early unions, and gender roles within marriage. These cultural pressures influence how individuals, especially youth and parents, perceive marriage, its necessity, and its purpose. Over time, however, increasing globalization and exposure to diverse lifestyles have begun to shift these long-standing beliefs.

2. Prejudice Towards Marriage
Despite being a widely accepted institution, marriage is not free from prejudice. Social judgments often fall on those who choose to marry outside their religion, caste, or gender norms. Unmarried individuals beyond a certain age, especially women, may face stigma. Divorcees or those choosing live-in relationships are frequently misunderstood or discriminated against. These biases restrict personal freedom and can create psychological and emotional stress. Prejudice also reinforces patriarchal standards, particularly in cultures where marriage is seen as a woman's ultimate role in life.

Qualitative and Quantitative analysis has been done for Attitudinal differences in parents and children on marriage.

For my research, I have chosen the topic 'Attitude towards Marriage' for which a questionnaire and structured interview schedule was created and distributed among a total sample size of 100 including 50 parents and 50 students. I have made use of a 5 point rating scale:

1- strongly disagree, 2 - disagree, 3 - neutral, 4 - agree, 5 - strongly agree. There are 10 statements in the questionnaire. There are 3 interview questions in the structured interview schedule. The data has been analysed first individually and then as a group - both qualitatively and quantitatively to identify if there is an attitudinal difference between parents and their children towards marriage. Simple arithmetic formula has been used:

- *Individual mean attitudinal score = total attitudinal score / number of statements*
- *Group mean attitudinal score = total attitudinal score / number of participants*

Difference in mean attitudinal score is calculated. The attitudinal difference is represented graphically.

In conclusion, the findings suggest that the attitudinal difference between teenagers and parents on the subject of marriage exists, but not in an extreme or absolute way. The hypothesis holds true to a degree, but shared human concerns and evolving mindsets are gradually narrowing the generational divide.

INTRODUCTION

Marriage serves as a foundation for family life, emotional companionship, and societal continuity. Society and culture play a powerful role in shaping ideas about marriage. Attitudinal differences between parents and children on marriage often reflect generational, cultural, social, and economic changes.

Marriage and Its Social Dimensions

Marriage is a socially and legally recognized union between two individuals, often marked by ceremony, cohabitation, and shared responsibilities. It serves as a foundation for family life, emotional companionship, and societal continuity. While the definition may appear simple, its meaning, value, and function differ widely across societies and generations.

ISSN 2394 - 7780

1. Society and Cultural Impact:
Society and culture play a powerful role in shaping ideas about marriage. In traditional Indian society, marriage is not just a bond between two people but a union of families, deeply rooted in customs, rituals, caste considerations, and religious norms. Cultural expectations often prioritize arranged marriages, early unions, and gender roles within marriage. These cultural pressures influence how individuals, especially youth and parents, perceive marriage, its necessity, and its purpose. Over time, however, increasing globalization and exposure to diverse lifestyles have begun to shift these long-standing beliefs.

2. Prejudice Towards Marriage:
Despite being a widely accepted institution, marriage is not free from prejudice. Social judgments often fall on those who choose to marry outside their religion, caste, or gender norms. Unmarried individuals beyond a certain age, especially women, may face stigma. Divorcees or those choosing live-in relationships are frequently misunderstood or discriminated against. These biases restrict personal freedom and can create psychological and emotional stress. Prejudice also reinforces patriarchal standards, particularly in cultures where marriage is seen as a woman's ultimate role in life.

3. Media Influence:
The media plays a dual role in shaping perceptions about marriage. On one hand, films, television, and social media romanticize marriage, often depicting it as the ultimate goal of life or a fairy-tale event. On the other, modern content is also beginning to challenge traditional narratives, showcasing themes like inter-caste marriage, same-sex unions, live-in relationships, and personal choice. As a result, youth are exposed to contrasting messages: the ideal of traditional marriage and the possibility of redefining it. This exposure can create conflict between generational beliefs and lead to evolving attitudes.

In conclusion, marriage as a concept is undergoing transformation. While it continues to be an essential social institution, modern influences, cultural shifts, and increasing individual awareness are reshaping its relevance and meaning, especially for today's youth.

THE TRENDS OF MARRIAGE:

Marriage, as a human institution, has continuously evolved. It reflects the social, cultural, religious, and economic norms of a society. Over time, the form and function of marriage have undergone significant changes, from strict tradition-based unions to more diverse and choice-driven partnerships. Understanding these trends offers insight into how societies have developed and adapted.

1. Types of Marriage:
Different types of marriage have existed based on cultural and social contexts. The most common form is *monogamy*, where an individual has only one spouse at a time. *Polygamy* includes *polygyny* (one man with multiple wives) and *polyandry* (one woman with multiple husbands), though these are rarer today and often culturally specific. *Arranged marriages*, especially in countries like India, are based on family selection and traditional compatibility, while *love marriages* prioritize individual choice and romantic connection. In recent years, *same-sex marriages* and *live-in relationships* are also gaining legal and social recognition in various parts of the world, pointing to a broadening definition of marriage.

2. Marriage throughout History:
Historically, marriage was less about love and more about duty, alliance, and survival. In ancient societies, marriages were arranged to strengthen political ties, transfer property, or continue lineage. Love was often considered secondary or even irrelevant. In many parts of the world, especially during feudal times, women were married off early and had limited autonomy. Over time, with the rise of individual rights, education, and gender equality movements, marriage began to include aspects of emotional companionship and consent. The 20th century marked a shift with more emphasis on personal happiness, equality, and emotional bonds in marital relationships.

3. Current Trends and Perspectives:
Today, the concept of marriage is rapidly changing, especially among younger generations. People are choosing to marry later in life due to career aspirations, personal growth, or financial independence. In urban areas, love marriages are becoming more common, and individuals are increasingly prioritizing compatibility over social expectations. There's also growing acceptance of diverse forms of unions like same-sex marriages, interfaith and intercaste marriages, and couples opting to stay unmarried or live together without formal ties. Additionally, awareness of issues like marital consent, mental health, and gender roles is reshaping expectations

ISSN 2394 - 7780

within marriage. Social media and global exposure are also influencing perspectives, offering alternatives to conventional norms.

In summary, while marriage continues to hold cultural and emotional value, its meaning is no longer fixed. It is becoming more inclusive, flexible, and aligned with personal freedom and mutual respect. The trends reflect a shift from obligation-based unions to partnerships built on equality, understanding, and shared goals.

Marriage attitudes often differ between generations because of changes in **values, social exposure, education, lifestyle, and economic independence**. Below is a comprehensive comparison:

Key Areas of Difference

Aspect	Parents' Perspective	Children's Perspective
Type of Marriage	Preference for arranged marriages based on family, caste, or community ties.	Preference for love marriages or partner choice regardless of caste/community.
Timing of Marriage	Early or socially acceptable age to avoid societal pressure.	Delaying marriage to focus on career, education, or personal growth.
Criteria for Partner	Emphasis on family background, religion, and financial stability.	Emphasis on compatibility, shared values, and emotional connection.
Role of Gender	Traditional gender roles and expectations.	Egalitarian views on gender roles and responsibilities.
Divorce and Separation	Often seen as taboo or failure.	More accepting of divorce as a personal choice for well-being.
Interfaith/Intercaste	Often resisted due to cultural or community boundaries.	Increasingly open to diverse and inclusive relationships.

METHODOLOGY

- Created a questionnaire (a 5 point rating scale) and a structured interview schedule among 50 parents and 50 teenagers.
- Independent Variables are: emotional compatibility, communication between partners, mutual understanding and respect, conflict resolution ability, psychological readiness for marriage, time spent together, family or cultural background, etc.
- Dependent Variable is: is marital success or satisfaction.
- Control Variables are: socioeconomic background, cultural context, educational exposure and language of the questionnaire
- Descriptive and Inferential statistical tests

HYPOTHESIS

- There is a significant attitudinal difference between teenagers and parents regarding the concept of marriage, with teenagers displaying more progressive and individualistic views, while parents tend to uphold traditional and socially rooted perspectives.

ANALYSIS

Participant 1 (Teenager)

Quantitative

Score	Rating Scale	Tally Marks	Total
1	Strongly Disagree	I	1
2	Disagree	II	4
3	Neutral	I	3
4	Agree	II	8
5	Strongly Agree	IIII	20

Mean Attitudinal Score: = 3.6

Participant 1(Teenager)

Qualitative

The participant's response reflects a progressive and empathetic outlook on marriage and related social norms. They believe that divorce is ethical if one is unhappy in a relationship and strongly oppose the stigma attached to women who choose to separate. While they acknowledge that a child benefits from having both parents, they

ISSN 2394 - 7780

also accept that single parenting is valid. Furthermore, the participant emphasizes that being unmarried or alone is acceptable if it supports personal growth and self-discovery. Overall, the response highlights a belief in emotional well-being, individual choice, and the importance of breaking rigid societal expectations.

Mean Attitudinal Score For Teenagers = 3.72

Participant 1 (Parent)

Quantitative

Score	Rating Scale	Tally Marks	Total
1	Strongly Disagree	-	-
2	Disagree	II	4
3	Neutral	III	9
4	Agree	II	8
5	Strongly Agree	III	15

Mean Attitudinal Score: = 3.6

Participant 1 (Parent)

Qualititative

The participant's response shows a more traditional and structured view on marriage and its social role. They consider divorce acceptable if staying in a broken marriage is harmful, framing it as a healthier option. However, they also believe that marriage is important for procreation, suggesting that children born within marriage contribute to a stronger society. Their emphasis on permanence in relationships and preference for marital bonds over casual ones reveals a belief in marriage as a stabilizing force for families and society, contrasting it with the perceived chaos and stress of informal relationships.

Mean Attitudinal Score For Parents= 3.65

- For all participants (teenagers) the average Attitudinal Score is 3.72 and for parents 3.65.
- T test applied for testing the hypothesis.
- P value =0.815
- Since p value is more than 0.5, we accept the Null Hypothesis.

Group Qualitative Analysis (Teenagers)

Among the 100 participants, the first 50 were teenagers belonging to the age group of 16-17 years and grades 11-12th. Here is their qualitative analysis:

1. **"Women in India have faced fierce social stigmatization for getting divorced. However, divorce rates have increased by a lot recently. Do you feel that divorce is unethical? Justify."**

Teenage participants overwhelmingly viewed divorce as not unethical, emphasizing that it is a personal choice essential for protecting one's mental health, dignity, and happiness. They strongly supported the idea of individual autonomy, rejecting the notion that societal norms should dictate personal relationships. Many showed empathy toward the stigma faced by divorced women in India, calling it unjust and outdated. Their responses reflected a progressive mindset, valuing emotional well-being over societal approval, and recognizing that the rising divorce rates may signal greater empowerment and changing attitudes, especially among the younger generation.

2. **"Do you believe that marriage is important for procreation? Justify."**

In response to whether marriage is important for procreation, most teenage participants felt that marriage is not a necessity for having or raising children. While a few acknowledged that in Indian society marriage traditionally ensures legal rights or social acceptance, many emphasized that individuals are fully capable of raising children independently, with or without a formal marital bond. Their answers reflected a shift toward personal agency, challenging conventional norms and underlining that procreation and parenting are not bound by marital status but by one's ability and commitment to nurture a child.

3. **"Is it important for someone to have a permanent partner in their life? Is the validity of a couple defined by marital status? Express your views."**

Most teenage participants expressed that having a permanent partner is emotionally valuable for support, companionship, and stability, but they emphasized that marital status does not determine the legitimacy of a relationship. Many believed that trust, mutual understanding, and commitment define a couple's bond more than

ISSN 2394 - 7780

legal or social labels. Some acknowledged that society may view non-married couples differently, but they personally rejected this bias. Overall, their responses revealed a modern and inclusive outlook, placing greater importance on emotional connection than formal validation.

Overall Analysis

Overall, the teenage participants demonstrated a progressive and emotionally aware perspective on marriage, divorce, and relationships. They widely rejected the notion that divorce is unethical, instead emphasizing the importance of personal well-being and the right to leave unhappy or harmful relationships. Most did not see marriage as essential for procreation, arguing that parenting depends more on one's capabilities than marital status. They also valued emotional connection and long-term commitment but believed that a couple's legitimacy is defined by mutual trust and understanding, not by legal or societal recognition. Their responses reflect changing attitudes and a shift toward individual freedom and equality in relationships.

Group Qualitative Analysis (Parents)

Among the 100 participants, the last 50 were parents belonging to the age group of 46-56 years. Here is their qualitative analysis:

1. **"Women in India have faced fierce social stigmatization for getting divorced. However, divorce rates have increased by a lot recently. Do you feel that divorce is unethical? Justify."**

Most parents agreed that divorce is not unethical, especially when the marriage becomes toxic or unsustainable. While a few viewed divorce as a last resort, the majority emphasized that personal peace, mutual respect, and emotional safety are more important than maintaining a dysfunctional marriage. Several parents acknowledged the growing independence of women, especially financially, as a factor enabling higher divorce rates. They generally supported the idea that people should not be forced to stay in unhappy marriages for the sake of social approval, reflecting a relatively practical and empathetic view.

2. **"Do you believe that marriage is important for procreation? Justify."**

Many parents viewed marriage as socially and legally important for procreation, citing concerns like child legitimacy, inheritance, and societal acceptance. However, several respondents also noted that marriage is not biologically necessary for having or raising children. While the importance of social structure was acknowledged, there was also an understanding that emotional readiness and responsibility matter more than marital status in parenting. This suggests a blend of traditional values with growing openness to modern realities.

3. **"Is it important for someone to have a permanent partner in their life? Is the validity of a couple defined by marital status? Express your views."**

Most parents felt that having a permanent partner is valuable for emotional and practical support. While some believed that marriage offers structure and social legitimacy, many also acknowledged that a strong relationship can exist outside of marriage. They emphasized the importance of trust, loyalty, and companionship over legal titles. Some also noted that while society may still judge unmarried couples, personal happiness and understanding within the relationship are what truly matter. Overall, their responses balanced realistic life experience with evolving social views.

Overall Analysis

The overall responses from parents show a thoughtful and adaptive perspective toward marriage, relationships, and societal change. While many still hold on to the structural and cultural significance of marriage, especially for matters like procreation, child legitimacy, and social acceptance, they also recognize that personal happiness, emotional compatibility, and individual freedom are equally important. Divorce, once considered taboo, was largely seen as justified if the relationship turns unhealthy, with most parents prioritizing mental peace over social pressure. Their views on long-term partnerships showed a shift from rigid traditional norms to a more flexible and emotionally mature understanding, acknowledging that trust and mutual respect can exist with or without legal marriage. Overall, their responses reflect a generation in transition, rooted in tradition but increasingly open to modern values and the complexities of human relationships.

Inference

Hypothesis: There is a significant attitudinal difference between teenagers and parents regarding the concept of marriage, with teenagers displaying more progressive and individualistic views, while parents tend to uphold traditional and socially rooted perspectives.

Result: The hypothesis is partially correct.

ISSN 2394 - 7780

LIMITATIONS

1. **Small Sample Size** – The study was based on responses from only 100 participants (50 teenagers and 50 parents), which may not fully represent wider societal views.
2. **Subjective Interpretation** – Since the analysis is qualitative, interpretations of responses may carry a degree of personal bias.
3. **Limited Demographic Diversity** – Participants may belong to similar cultural or socio-economic backgrounds, which can limit the generalizability of the findings.
4. **Honesty of Responses** – Some participants may have given socially desirable answers instead of expressing their true opinions due to the sensitive nature of the topic.
5. **Time Constraints** – The project was conducted within a limited timeframe, which restricted deeper probing into more complex aspects of the subject.

CONCLUSION

This project set out to explore whether there exists a significant attitudinal difference between teenagers and parents regarding the institution of marriage. Based on the qualitative analysis of participant responses, the hypothesis was found to be partially correct. While some generational differences were evident, particularly in how marriage is perceived in terms of choice, independence, and relevance. There were also surprising similarities in core values such as the importance of emotional support, mutual respect, and individual happiness.

Teenagers largely emphasized personal freedom, emotional connection, and compatibility over societal expectations. Many questioned the necessity of marriage, especially if a relationship is already fulfilling without formal commitment. Their responses reflected a more liberal, self-driven outlook shaped by modern influences and changing social structures.

Parents, on the other hand, acknowledged the emotional aspects of marriage but also placed emphasis on its practical and social dimensions, such as family structure, societal validation, and stability. However, several parents also expressed understanding of changing times, with some even agreeing that love and companionship could exist outside traditional marriage norms.

Therefore, while the generational gap in attitudes was present, especially in the degree of emphasis placed on tradition versus individualism, it was not absolute. The overlap in values, especially regarding emotional well-being, trust, and respect, shows that both groups are adapting, albeit at different paces and from different starting points.

In conclusion, the findings suggest that the attitudinal difference between teenagers and parents on the subject of marriage exists, but not in an extreme or absolute way. The hypothesis holds true to a degree, but shared human concerns and evolving mindsets are gradually narrowing the generational divide.

BIBLIOGRAPHY

- https://ijssrr.com/journal/article/download/2348/1706
- https://www.researchpublish.com/upload/book/Increasing%20Rate%20of%20Divorce-2695.pdf
- https://www.iosrjournals.org/iosr-jhss/papers/Vol.%2023%20Issue3/Version-6/F2303062544.pdf
- https://www.researchgate.net/publication/368608917_Perception_of_Youth_Towards_Live-In_Relationships_in_India
- https://ijip.in/articles/relationship-between-general-attitude-towards-marriage-and-aspects-of-marriage-in-young-adults
- https://www.sociologylens.in/2025/03/changing-attitudes-of-youths-towards-marriage.html
- https://journals.sagepub.com/doi/abs/10.1177/10664807241312194
- https://pmc.ncbi.nlm.nih.gov/articles/PMC11788393

MANUSCRIPT SUBMISSION

GUIDELINES FOR CONTRIBUTORS

1. Manuscripts should be submitted preferably through email and the research article / paper should preferably not exceed 8 – 10 pages in all.
2. Book review must contain the name of the author and the book reviewed, the place of publication and publisher, date of publication, number of pages and price.
3. Manuscripts should be typed in 12 font-size, Times New Roman, single spaced with 1" margin on a standard A4 size paper. Manuscripts should be organized in the following order: title, name(s) of author(s) and his/her (their) complete affiliation(s) including zip code(s), Abstract (not exceeding 350 words), Introduction, Main body of paper, Conclusion and References.
4. The title of the paper should be in capital letters, bold, size 16" and centered at the top of the first page. The author(s) and affiliations(s) should be centered, bold, size 14" and single-spaced, beginning from the second line below the title.

First Author Name1, Second Author Name2, Third Author Name3

1Author Designation, Department, Organization, City, email id

2Author Designation, Department, Organization, City, email id

3Author Designation, Department, Organization, City, email id

5. The abstract should summarize the context, content and conclusions of the paper in less than 350 words in 12 points italic Times New Roman. The abstract should have about five key words in alphabetical order separated by comma of 12 points italic Times New Roman.
6. Figures and tables should be centered, separately numbered, self explained. Please note that table titles must be above the table and sources of data should be mentioned below the table. The authors should ensure that tables and figures are referred to from the main text.

EXAMPLES OF REFERENCES

All references must be arranged first alphabetically and then it may be further sorted chronologically also.

- **Single author journal article:**

Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

Bateson, C. D.,(2006), 'Doing Business after the Fall: The Virtue of Moral Hypocrisy', Journal of Business Ethics, 66: 321 – 335

- **Multiple author journal article:**

Khan, M. R., Islam, A. F. M. M., & Das, D. (1886). A Factor Analytic Study on the Validity of a Union Commitment Scale. *Journal of Applied Psychology*, *12*(1), 129-136.

Liu, W.B, Wongcha A, & Peng, K.C. (2012), "Adopting Super-Efficiency And Tobit Model On Analyzing the Efficiency of Teacher's Colleges In Thailand", International Journal on New Trends In Education and Their Implications, Vol.3.3, 108 – 114.

- **Text Book:**

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2007). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd ed.). New York: McGraw-Hill.

S. Neelamegham," Marketing in India, Cases and Reading, Vikas Publishing House Pvt. Ltd, III Edition, 2000.

- **Edited book having one editor:**

Raine, A. (Ed.). (2006). *Crime and schizophrenia: Causes and cures.* New York: Nova Science.

- **Edited book having more than one editor:**

Greenspan, E. L., & Rosenberg, M. (Eds.). (2009). *Martin's annual criminal code:Student edition 2010.* Aurora, ON: Canada Law Book.

- **Chapter in edited book having one editor:**

Bessley, M., & Wilson, P. (1984). Public policy and small firms in Britain. In Levicki, C. (Ed.), *Small Business Theory and Policy* (pp. 111–126). London: Croom Helm.

- **Chapter in edited book having more than one editor:**

Young, M. E., & Wasserman, E. A. (2005). Theories of learning. In K. Lamberts, & R. L. Goldstone (Eds.), *Handbook of cognition* (pp. 161-182). Thousand Oaks, CA: Sage.

- **Electronic sources should include the URL of the website at which they may be found, as shown:**

Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap

- **Unpublished dissertation/ paper:**

Uddin, K. (2000). A Study of Corporate Governance in a Developing Country: A Case of Bangladesh (Unpublished Dissertation). Lingnan University, Hong Kong.

- **Article in newspaper:**

Yunus, M. (2005, March 23). Micro Credit and Poverty Alleviation in Bangladesh. *The Bangladesh Observer*, p. 9.

- **Article in magazine:**

Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

- **Website of any institution:**

Central Bank of India (2005). *Income Recognition Norms Definition of NPA.* Retrieved August 10, 2005, from http://www.centralbankofindia.co.in/ home/index1.htm, viewed on

7. The submission implies that the work has not been published earlier elsewhere and is not under consideration to be published anywhere else if selected for publication in the journal of Indian Academicians and Researchers Association.

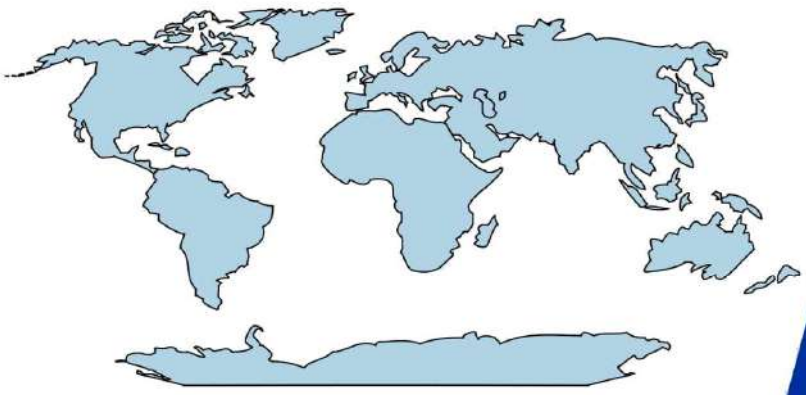
8. Decision of the Editorial Board regarding selection/rejection of the articles will be final.

www.iaraedu.com

Journal

ISSN 2322 - 0899

INTERNATIONAL JOURNAL OF RESEARCH IN MANAGEMENT & SOCIAL SCIENCE



Volume 8, Issue 2
April - June 2020

www.iaraedu.com

Journal

ISSN 2394 - 9554

International Journal of Research in Science and Technology

Volume 6, Issue 2: April - June 2019

Indian Academicians and Researchers Association
www.iaraedu.com

INDIAN ACADEMICIANS AND RESEARCHERS ASSOCIATION

Membership No: M / M – 1365

Certificate of Membership

This is to certify that

XXXXXXXX

is admitted as a

Fellow Member

of

Indian Academicians and Researchers Association

in recognition of commitment to Educational Research

and the objectives of the Association

Date: 27.01.2020

Director

President

INDIAN ACADEMICIANS AND RESEARCHERS ASSOCIATION

Membership No: M / M – 1365

Certificate of Membership

This is to certify that

XXXXXXXXXX

is admitted as a

Life Member

of

Indian Academicians and Researchers Association

in recognition of commitment to Educational Research

and the objectives of the Association

Date: 27.01.2020

Director

President

INDIAN ACADEMICIANS AND RESEARCHERS ASSOCIATION

Membership No: M / M – 1365

Certificate of Membership

This is to certify that

XXXXXXXX

is admitted as a

Member

of

Indian Academicians and Researchers Association

in recognition of commitment to Educational Research

and the objectives of the Association

Date: 27.01.2020

Director

President

IARA Organized its 1st International Dissertation & Doctoral Thesis Award in September'2019

1st International
Dissertation & Doctoral Thesis Award
(2019)

Organized By

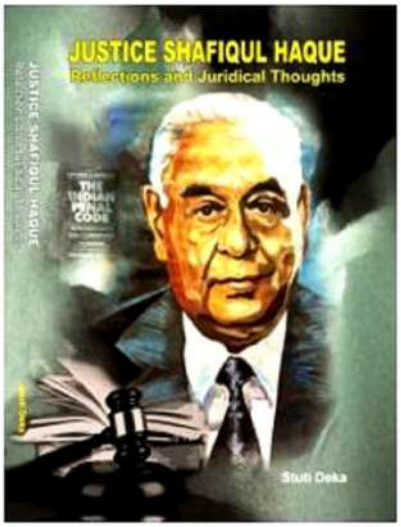
Indian Academicians and Researchers Association (IARA)

EMPYREAL PUBLISHING HOUSE

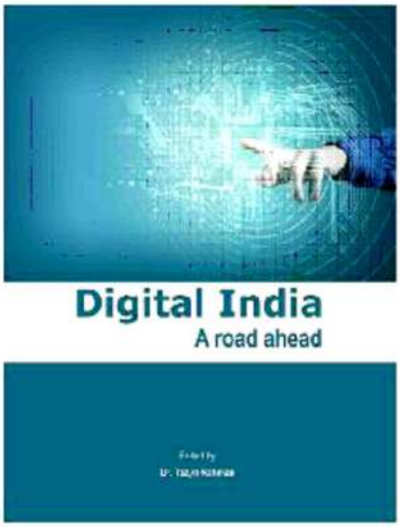
www.editedbook.in

Publish Your Book, Your Thesis into Book or Become an Editor of an Edited Book with ISBN

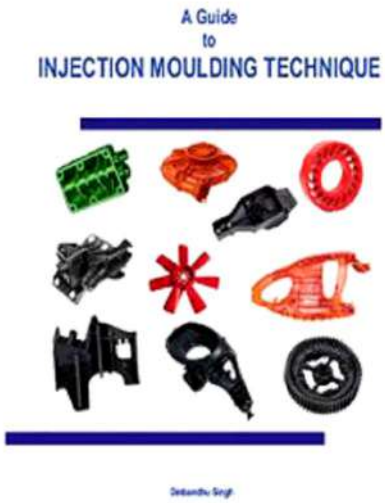
BOOKS PUBLISHED



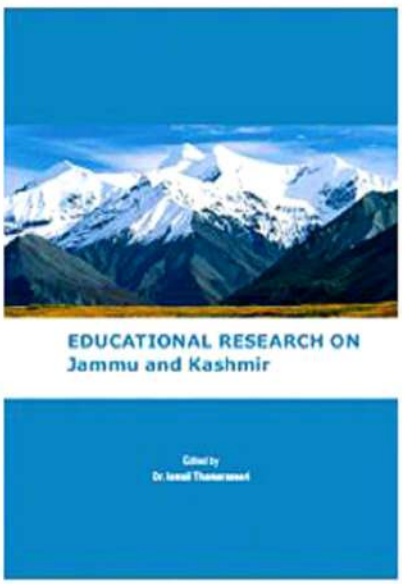
Dr. Stuti Deka
ISBN : 978-81-930928-1-1



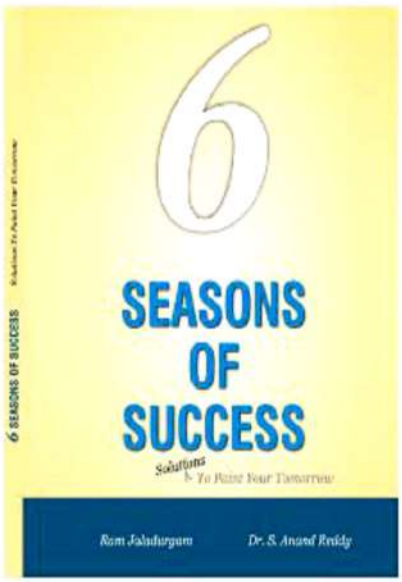
Dr. Tazyn Rahman
ISBN : 978-81-930928-0-4



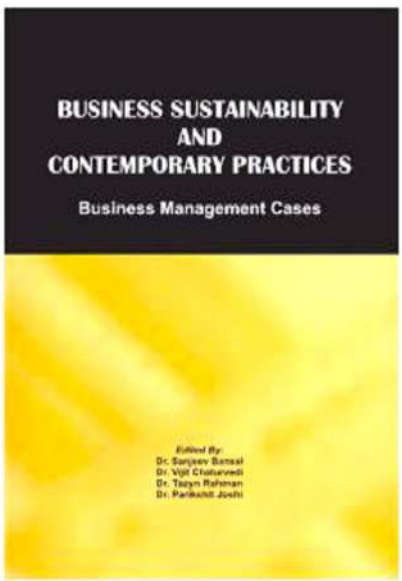
Mr. Dinbandhu Singh
ISBN : 978-81-930928-3-5



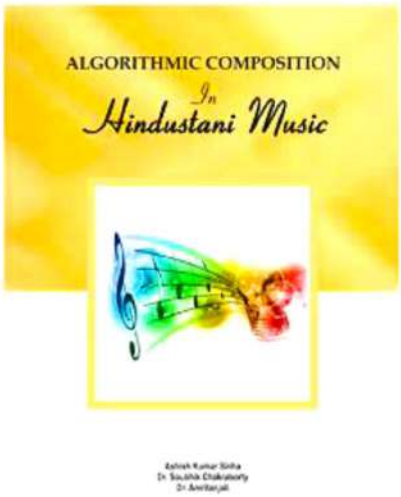
Dr. Ismail Thamarasseri
ISBN : 978-81-930928-2-8



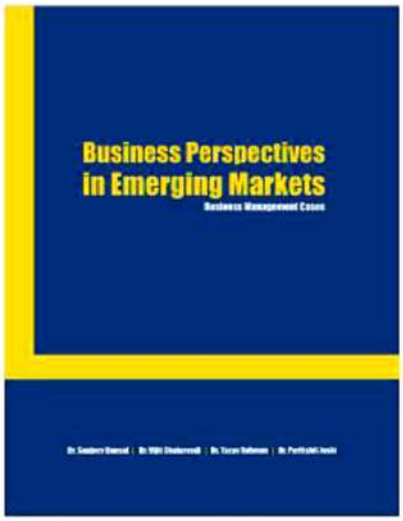
Ram Jaladurgam
Dr. S. Anand Reddy
ISBN : 978-81-930928-5-9



Dr. Sanjeev Bansal, Dr. Vijit Chaturvedi
Dr. Tazyn Rahman, Dr. Parikshit Joshi
ISBN : 978-81-930928-6-6

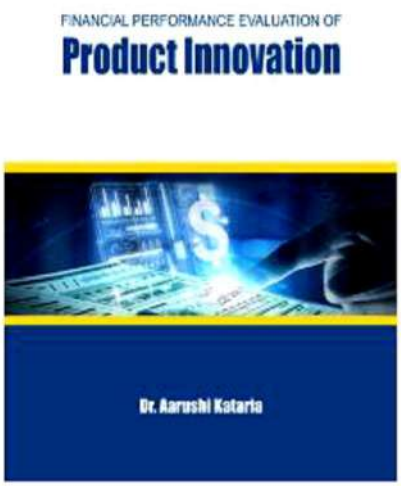


Ashish Kumar Sinha, Dr. Soubhik Chakraborty
Dr. Amritanjali
ISBN : 978-81-930928-8-0

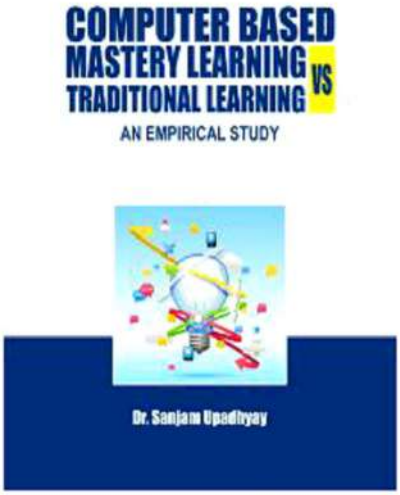


Dr Sanjeev Bansal, Dr. Vijit Chaturvedi
Dr. Tazyn Rahman, Dr. Parikshit Joshi
ISBN : 978-81-936264-0-5

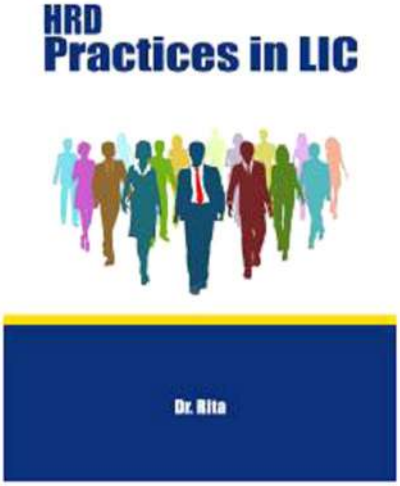
Dr. Jyotsna Golhar
Dr. Sujit Metre
ISBN : 978-81-936264-6-7



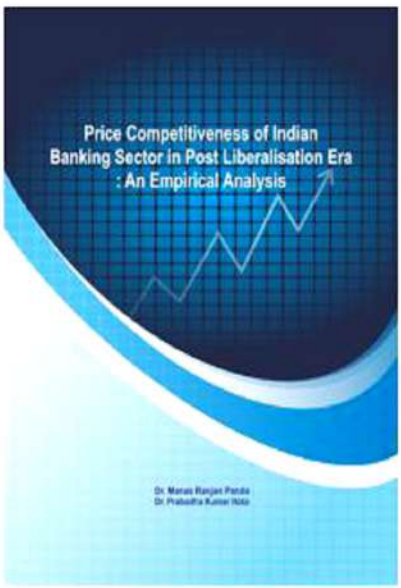
Dr. Aarushi Kataria
ISBN : 978-81-936264-3-6



Dr. Sanjam Upadhyay
ISBN : 978-81-936264-5-0



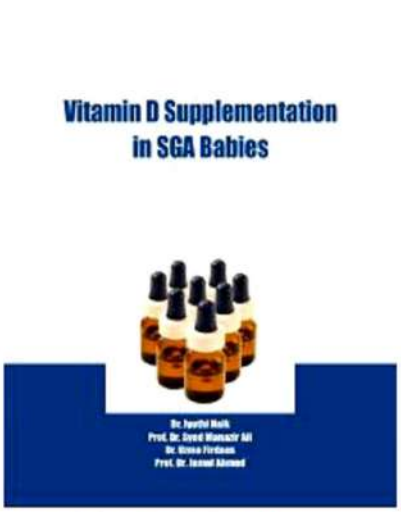
Dr. Rita
ISBN : 978-81-930928-7-3



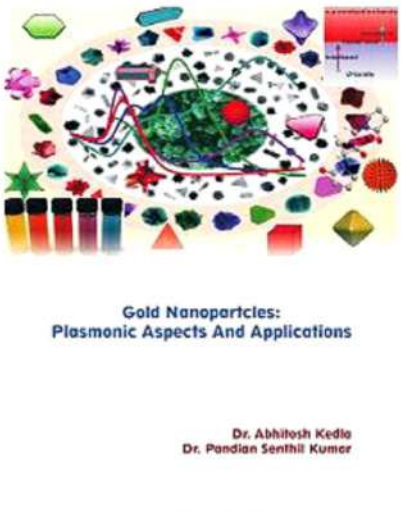
Dr. Manas Ranjan Panda, Dr. Prabodha Kr. Hota
ISBN : 978-81-930928-4-2

Poornima University
ISBN : 978-8193-6264-74

Institute of Public Enterprise
ISBN : 978-8193-6264-4-3



Dr. Jyothi Naik, Prof. Dr. Syed Manazir Ali
Dr. Uzma Firdaus, Prof. Dr. Jamal Ahmed
ISBN : 978-81-936264-9-8



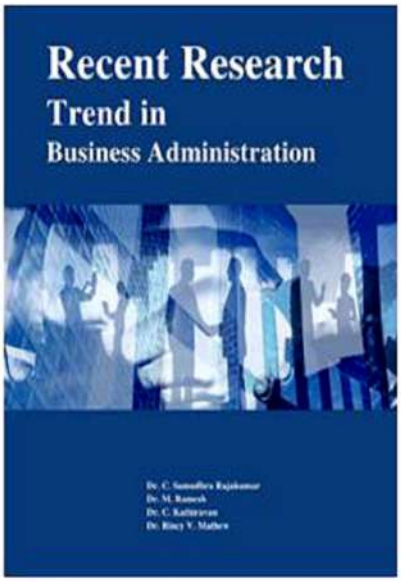
Dr. Abhitosh Kedia
Dr. Pandian Senthil Kumar
ISBN : 978-81-939070-0-9

Dr. Vinod
S. Chandwani
ISBN : 978-81-939070-2-3

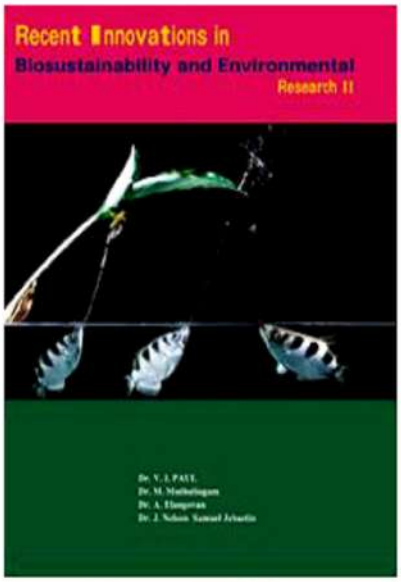
Prof. Dr. Dhananjay
Awasarikar
ISBN : 978-81-939070-1-6

Dr. C. Samudhra Rajakumar, Dr. M. Ramesh
Dr. C. Kathiravan, Dr. Rincy V. Mathew
ISBN : 978-81-939070-4-7

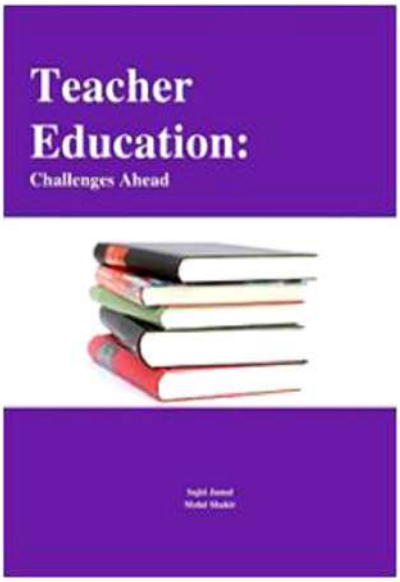
Dr. C. Samudhra Rajakumar, Dr. M. Ramesh
Dr. C. Kathiravan, Dr. Rincy V. Mathew
ISBN : 978-81-939070-6-1



Dr. C. Samudhra Rajakumar, Dr. M. Ramesh
Dr. C. Kathiravan, Dr. Rincy V. Mathew
ISBN : 978-81-939070-7-8

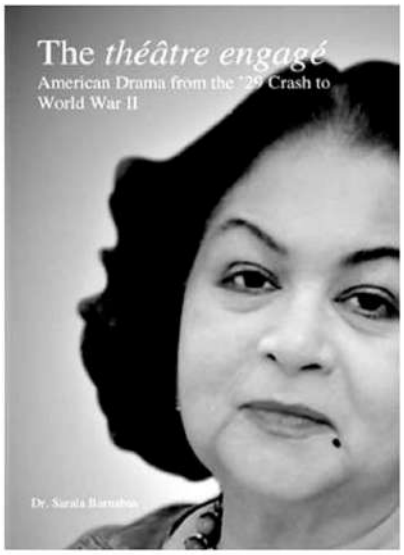


Dr. V. I. Paul, Dr. M. Muthulingam
Dr. A. Elangovan, Dr. J. Nelson Samuel Jebastin
ISBN : 978-81-939070-9-2



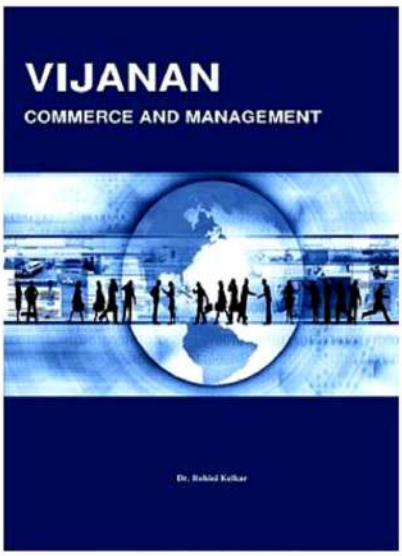
Sajid Jamal
Mohd Shakir
ISBN : 978-81-939070-8-5

Dr. R. Emmaniel
ISBN : 978-81-939070-3-0



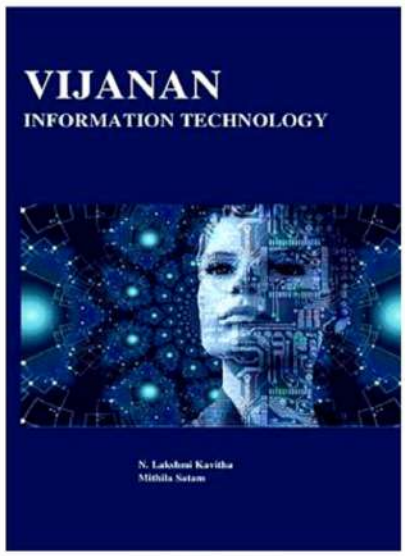
Dr. Sarala Barnabas
ISBN : 978-81-941253-3-4

Dr. M. Banumathi
Dr. C. Samudhra Rajakumar
ISBN : 978-81-939070-5-4

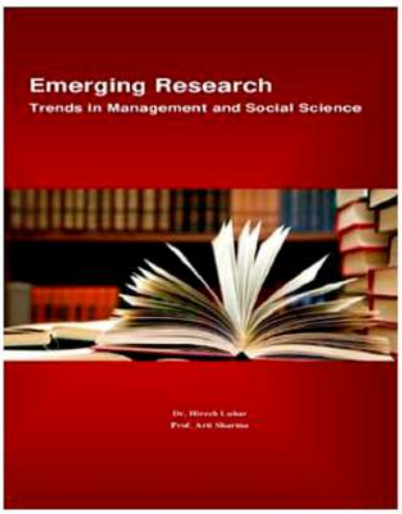


Dr. (Mrs.) Rohini Kelkar
ISBN : 978-81-941253-0-3

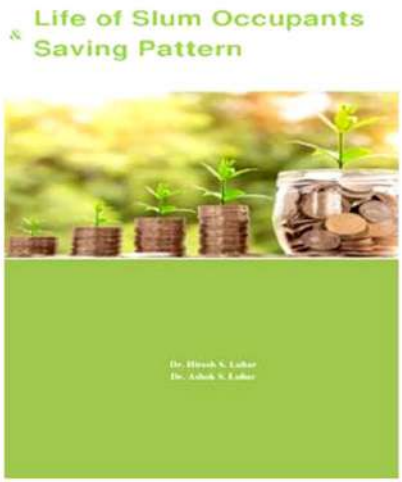
Dr. Tazyn Rahman
ISBN : 978-81-941253-2-7



Dr. N. Lakshmi Kavitha
Mithila Satam
ISBN : 978-81-941253-1-0

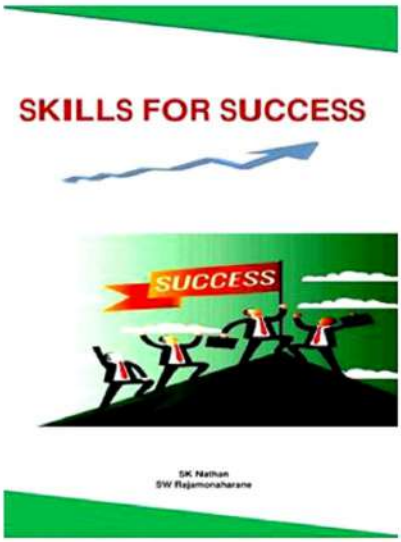


Dr. Hiresh Luhar
Prof. Arti Sharma
ISBN : 978-81-941253-4-1



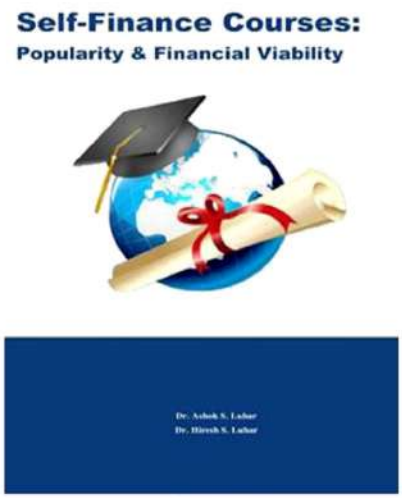
Dr. Hiresh S. Luhar
Dr. Ashok S. Luhar
ISBN : 978-81-941253-5-8

Dr. Babita Kanojia
Dr. Arvind S. Luhar
ISBN : 978-81-941253-7-2

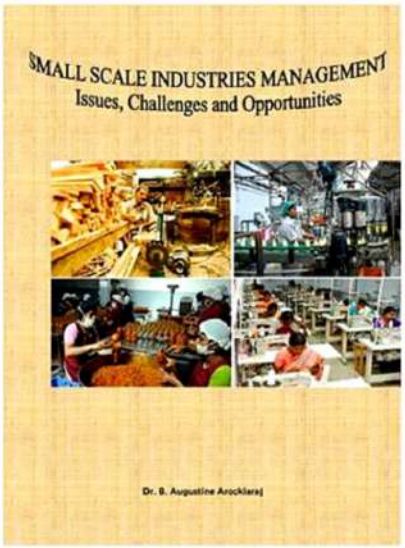


Dr. Sw Rajamonaharane
SK Nathan
ISBN : 978-81-942475-0-0

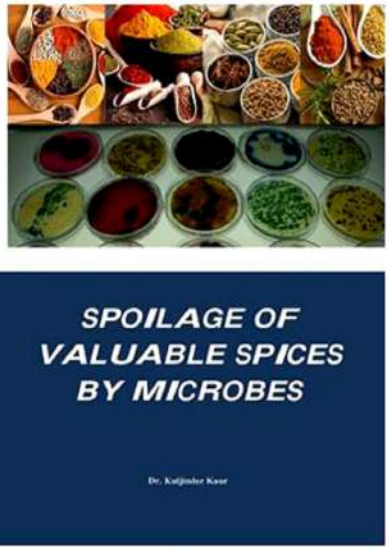
Aditi Sharma
ISBN : 978-81-941253-8-9



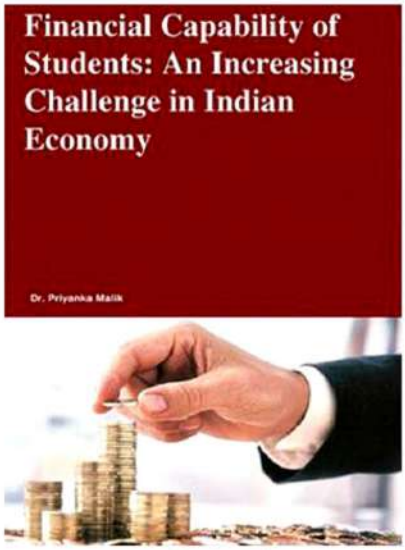
Dr. Ashok S. Luhar
Dr. Hiresh S. Luhar
ISBN : 978-81-941253-6-5



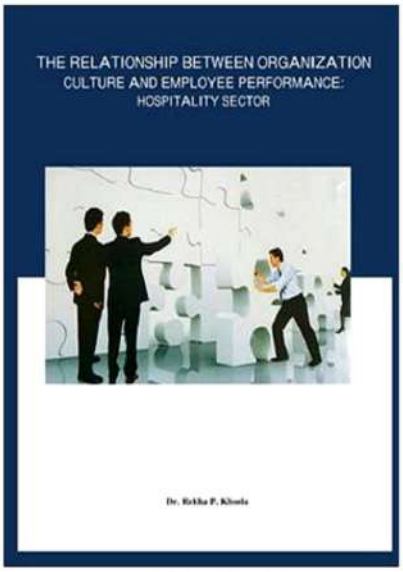
Dr. B. Augustine Arockiaraj
ISBN : 978-81-941253-9-6



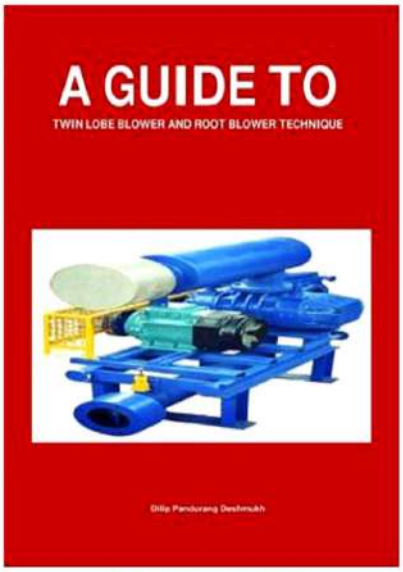
Dr. Kuljinder Kaur
ISBN : 978-81-942475-4-8



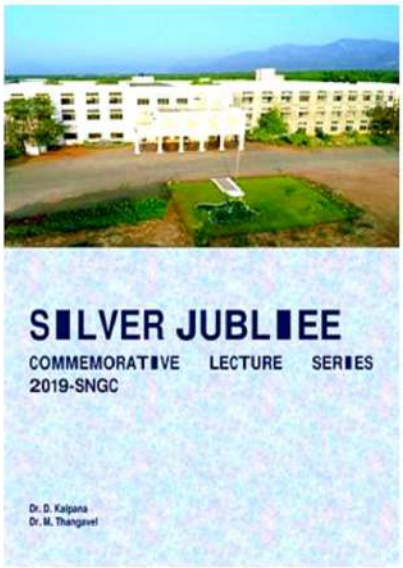
Dr. Priyanka Malik
ISBN : 978-81-942475-1-7



Dr. Rekha P. Khosla
ISBN : 978-81-942475-2-4

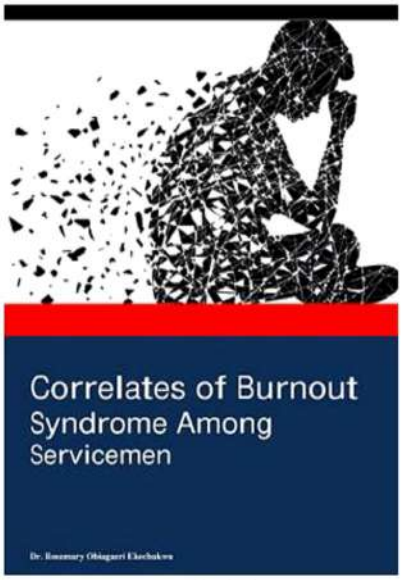


Dilip Pandurang Deshmukh
ISBN : 978-81-942475-3-1

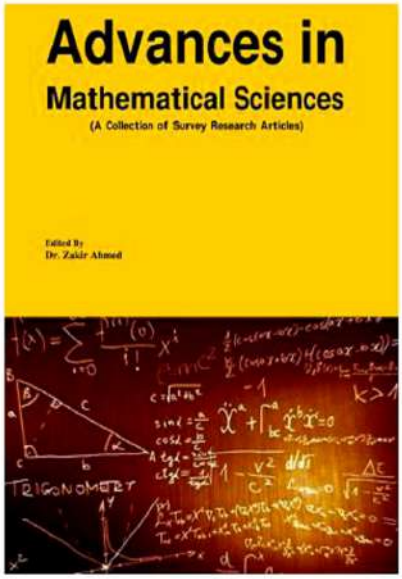


Dr. D. Kalpana, Dr. M. Thangavel
ISBN : 978-81-942475-5-5

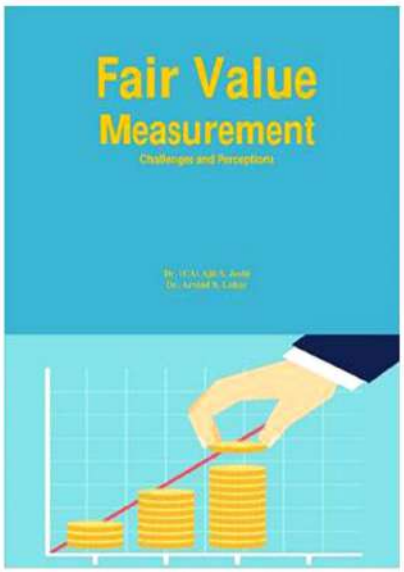
Dr. Aloysius Edward J.
ISBN : 978-81-942475-7-9



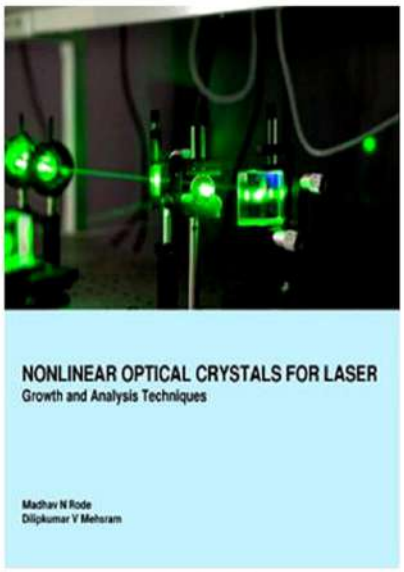
Dr. R. O. Ekechukwu
ISBN : 978-81-942475-8-6



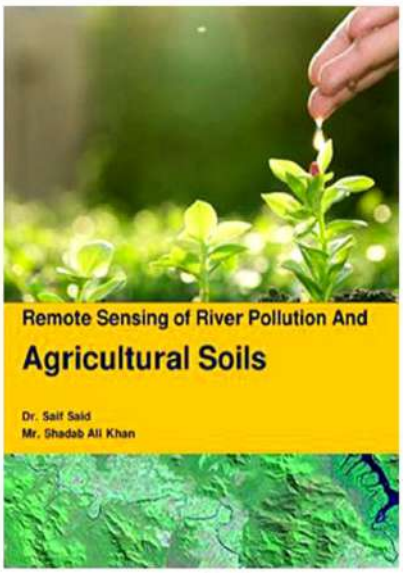
Dr. Zakir Ahmed
ISBN : 978-81-942475-9-3



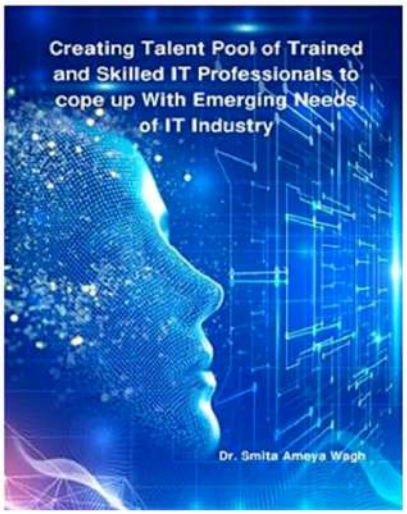
Dr. (CA) Ajit S. Joshi
Dr. Arvind S. Luhar
ISBN : 978-81-942475-6-2



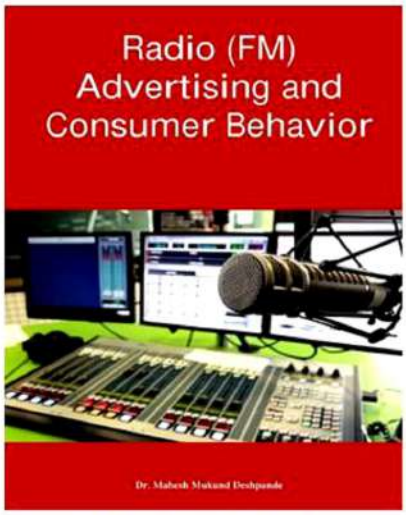
Madhav N Rode
Dilip Kumar V Mehsram
ISBN : 978-81-943209-6-8



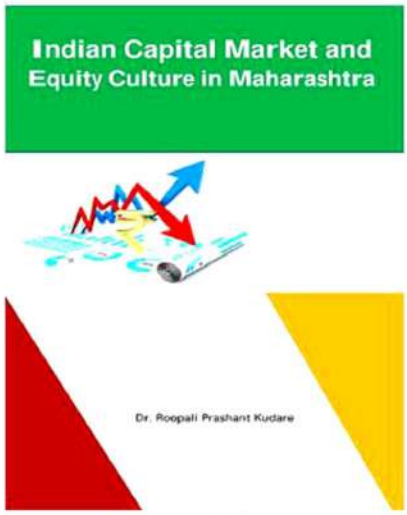
Dr. Saif Said
Shadab Ali Khan
ISBN : 978-81-943209-1-3



Dr. Smita Ameya Wagh
ISBN : 978-81-943209-9-9

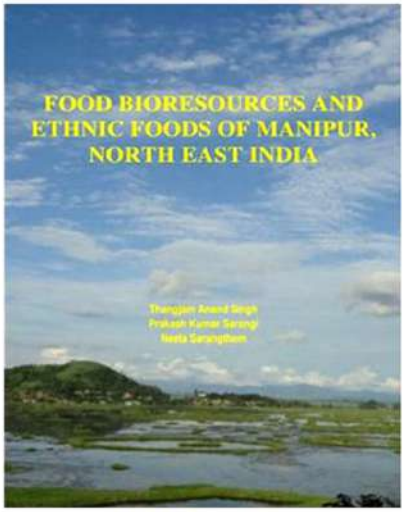


Dr. Mahesh Mukund Deshpande
ISBN : 978-81-943209-7-5

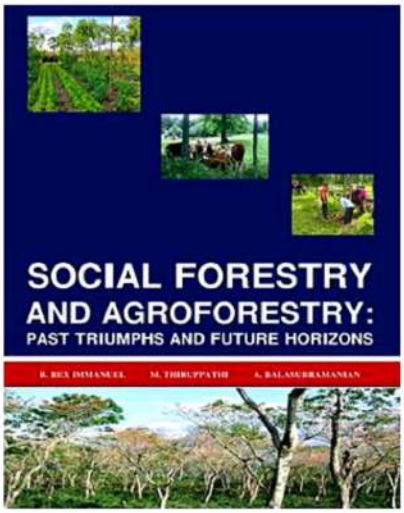


Dr. Roopali Prashant Kudare
ISBN : 978-81-943209-3-7

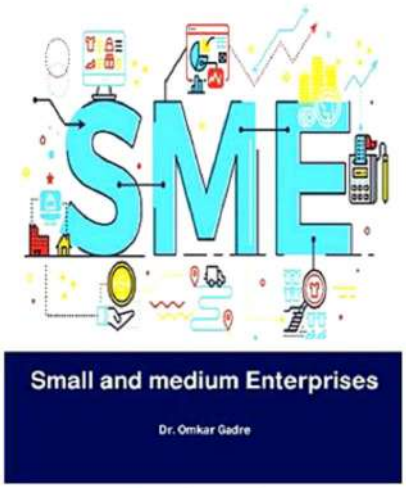
M. Thiruppathi
R. Rex Immanuel
K. Arivukkarasu
ISBN : 978-81-930928-9-7



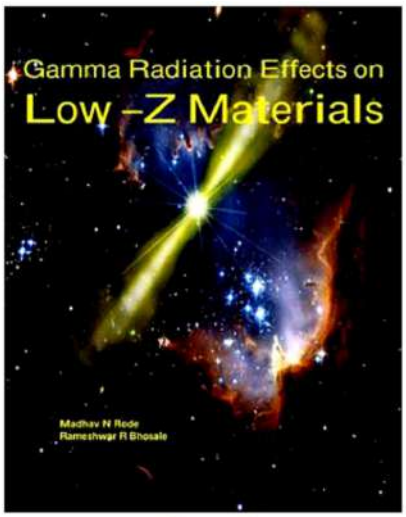
Dr. Th. Anand Singh
Dr. Prakash K. Sarangi
Dr. Neeta Sarangthem
ISBN : 978-81-944069-0-7



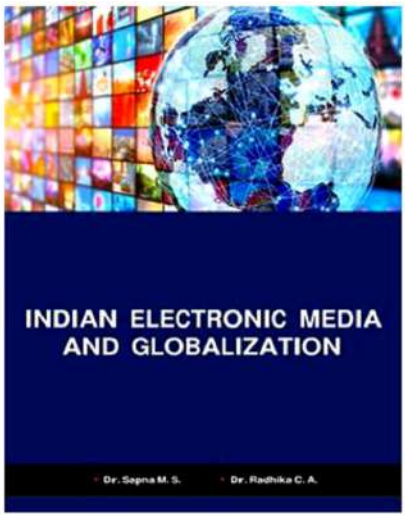
R. Rex Immanuel
M. Thiruppathi
A. Balasubramanian
ISBN : 978-81-943209-4-4



Dr. Omkar V. Gadre
ISBN : 978-81-943209-8-2

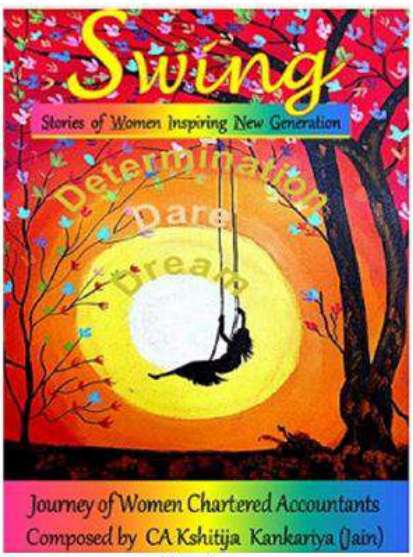


Madhav N Rode
Rameshwar R. Bhosale
ISBN : 978-81-943209-5-1

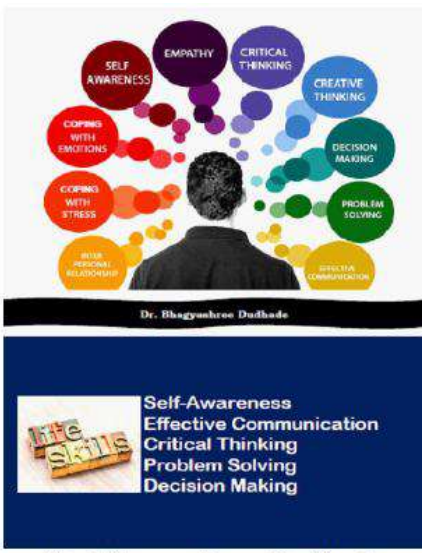


Dr. Sapna M S
Dr. Radhika C A
ISBN : 978-81-943209-0-6

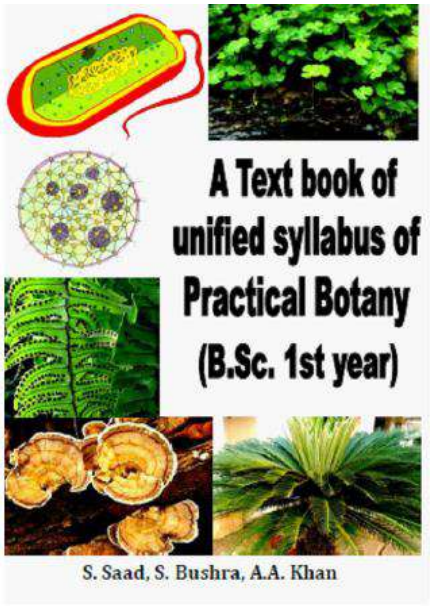
Hindusthan College
ISBN : 978-81-944813-8-6



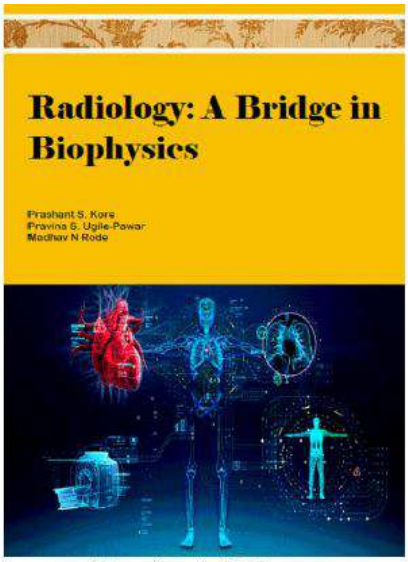
Swing
ISSN: 978-81-944813-9-3



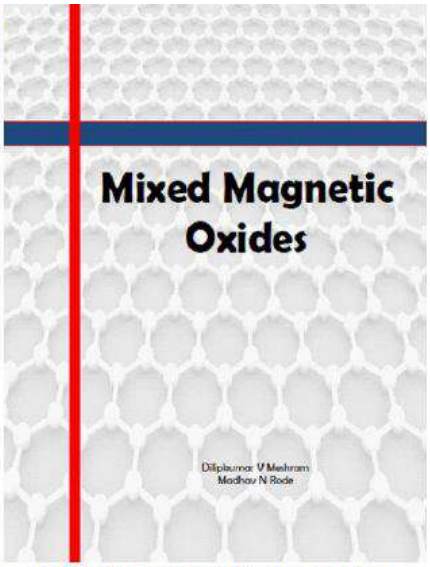
Dr. Bhagyashree Dudhade
ISBN : 978-81-944069-5-2



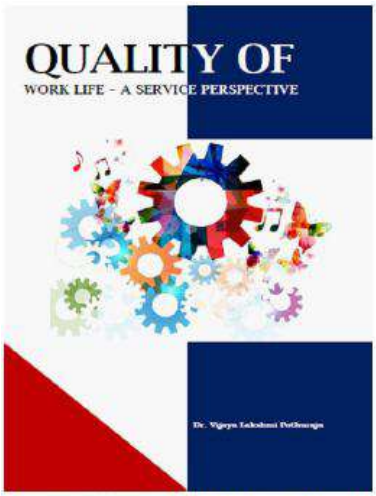
S. Saad, S. Bushra, A. A. Khan
ISBN: 978-81-944069-9-0



Prashant S. Kore
Pravina S. Ugile-Pawar
Madhav N Rode
ISSN: 978-81-944069-7-6



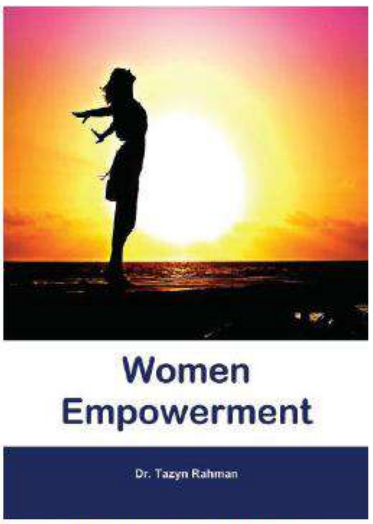
Dilipkumar V Meshram and
Madhav N Rode
ISSN: 978-81-944069-6-9



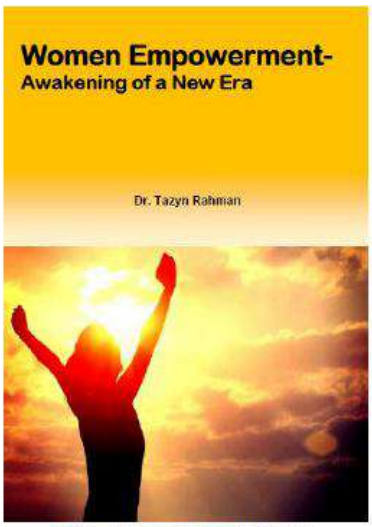
Dr. Vijaya Lakshmi Pothuraju
ISBN : 978-81-943209-2-0

Pratibha College
ISBN : 978-81-944813-2-4

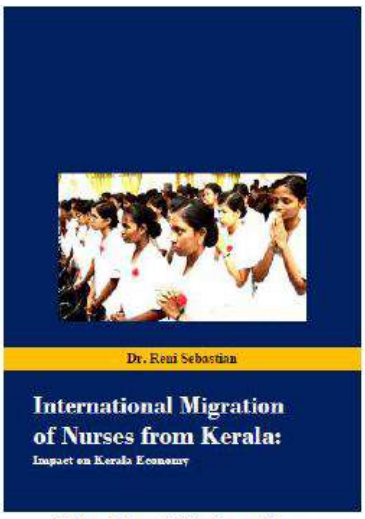
Pratibha College
ISBN : 978-81-944813-3-1



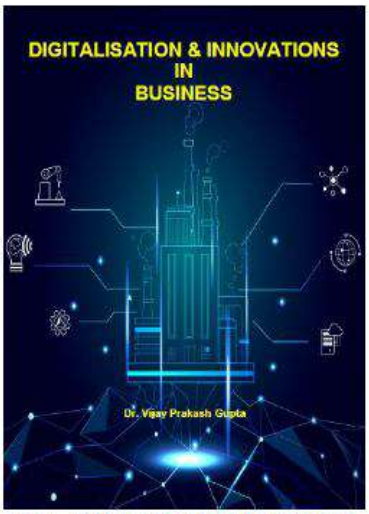
Dr. Tazyn Rahman
ISBN : 978-81-936264-1-2



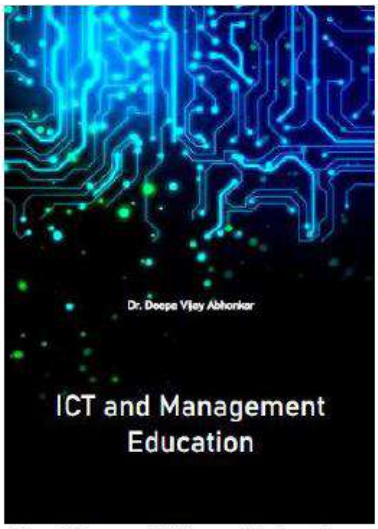
Dr. Tazyn Rahman
ISBN : 978-81-944813-5-5



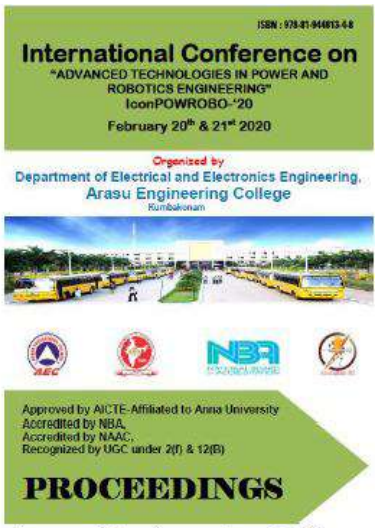
Dr. Reni Sebastian
ISBN : 978-81-944069-2-1



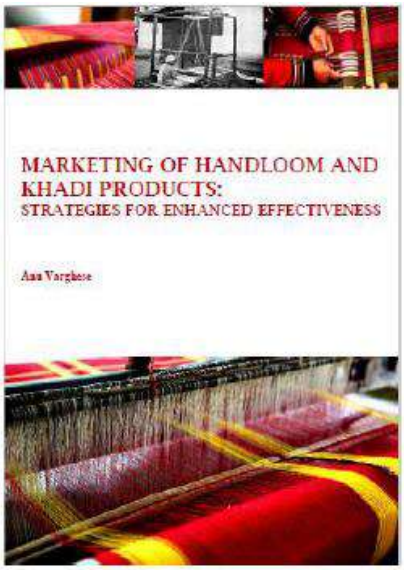
Dr. Vijay Prakash Gupta
ISBN : 978-81-944813-1-7



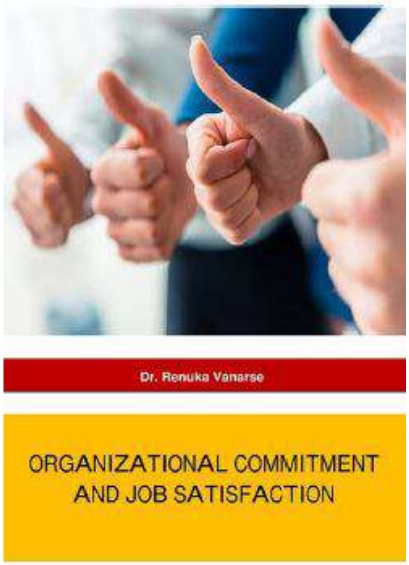
Dr. Deepa Vijay Abhonkar
ISBN : 978-81-944813-6-2



Arasu Engineering College
ISSN: 978-81-944813-4-8



Dr. Anu Varghese
ISBN : 978-81-944069-4-5



Dr. Renuka Vanarse
ISBN : 978-81-944069-1-4

Indian Academicians and Researchers Association
www.iaraedu.com