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EDITORIAL

Advancing Research and Practice in Commerce and Management

In the contemporary era of globalization and digital transformation, the fields of commerce and management are undergoing significant shifts. The Odisha Journal of Commerce and Management (OJCM) remains committed to fostering rigorous research, innovative ideas, and practical insights that contribute to academia, industry, and society. This issue continues our tradition of publishing scholarly articles that reflect emerging trends, contemporary challenges, and progressive solutions in the domains of business, finance, marketing, entrepreneurship, and management sciences.

The current volume of OJCM includes a diverse range of research papers that provide new perspectives on sustainable business practices, financial inclusiveness, entrepreneurial development, and the digitalization of commerce. Sustainability has become a cornerstone of corporate strategy, and our contributors have explored its impact on various facets of economic growth and business performance. Likewise, financial inclusiveness, a vital factor in economic development, has been analyzed in depth, particularly in the context of rural and tribal communities.

Entrepreneurship, as a key driver of innovation and employment generation, remains a crucial theme in this issue. Several studies delve into the challenges and opportunities faced by small businesses, start-ups, and MSMEs in the evolving business landscape. The role of technology in transforming business models, enhancing operational efficiency, and influencing consumer behavior is another focal point of this edition.

OJCM continues to provide a platform for researchers, academicians, and practitioners to engage in meaningful discourse and contribute to the enrichment of knowledge in commerce and management. We extend our gratitude to the esteemed contributors, reviewers, and editorial board members for their dedication and commitment to maintaining the quality and relevance of the journal.

As we move forward, we encourage scholars to engage in interdisciplinary research that bridges theoretical advancements with practical applications. The ever-changing business environment demands adaptive strategies and resilient leadership, and it is our collective responsibility to advance knowledge that addresses these dynamic challenges.

We look forward to continued collaboration and scholarly contributions that shape the future of commerce and management.

Editor-in-Chief
Odisha Journal of Commerce and Management

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We express our sincere gratitude to the **Indian Council of Social Science Research (ICSSR)** for providing publication grant for **Odisha Journal of Commerce and Management (OJCM)** (ISSN: 0976-8599). This funding has been instrumental in facilitating the publication and dissemination of quality research in the field of commerce and management.



Factors Influencing Entrepreneurial Culture Among College Students in Sambalpur

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Abstract: The study analyses the factors influencing entrepreneurial culture among college students in Sambalpur. This study aims to investigate the impact of educational institutions, social media, and family background, on college students towards entrepreneurship. This study is descriptive as well as empirical in nature. For this study, the structured questionnaire has been framed for the collection of primary data. The study is analysed by collecting the data from 50 respondents of Sambalpur town by conducting an online survey using Google Forms. The study uses Regression to analyse the influence of several factors like educational institutions, social media, and family background towards students' entrepreneurial culture using IBM SPSS statistical software and Microsoft Excel. The results show that the educational institutions, societal factors, and family background influence the students' interest towards entrepreneurship.

Keywords: Entrepreneurship, Social media Influence, Higher Education

JEL Codes: L26, M13, I23

1. INTRODUCTION

Entrepreneurship is increasingly recognized as a driving force behind economic development, innovation, and job creation worldwide. In the context of Sambalpur, a city situated in the western part of the Indian state of Odisha, fostering an entrepreneurial culture among college students holds immense potential for socio-economic growth and empowerment. Entrepreneurship plays a crucial role in boosting output, making better use of resources, generating employment, and addressing unemployment issues (Engidaw, 2021). The primary objective of promoting entrepreneurship is to equip society with the necessary tools to develop productive human resources while mobilizing and sustaining them for future development (Begam, 2006). The entrepreneurial culture among college students is shaped by numerous factors that influence their attitudes, behaviours, and aspirations. As young minds prepare to enter the professional world, college students are particularly susceptible to various influences

that shape their perceptions of entrepreneurship and determine their inclination toward starting their ventures. One significant factor is the educational environment, where institutions that offer entrepreneurship programs, courses, and extracurricular activities help cultivate a mindset conducive to innovation, risk-taking, and opportunity recognition. Additionally, exposure to role models and mentors, both within and outside the college community, significantly impacts students' entrepreneurial aspirations. Inspirational figures and mentors provide guidance, support, and real-world insights, shaping students' perceptions of entrepreneurship as a viable career path. Technological advancements have also played a vital role in making entrepreneurship more accessible. The rapid progress in technology has lowered barriers to entry across various industries, providing students with access to tools, resources, and online platforms that enable them to turn their ideas into tangible businesses with minimal initial investment. Furthermore, cultural attitudes and societal norms toward risk-taking, failure, and success influence students' willingness to pursue entrepreneurship. Societies that celebrate innovation, creativity, and resilience tend to nurture a stronger entrepreneurial spirit among students. Economic factors such as job market conditions, income inequality, and the availability of funding sources also impact students' entrepreneurial intentions. In times of economic uncertainty or limited job opportunities, entrepreneurship can emerge as an attractive alternative for students seeking autonomy and financial independence. Personal traits and motivations further play a crucial role in shaping students' entrepreneurial aspirations. Characteristics such as ambition, creativity, and risk tolerance, along with personal experiences and passions, drive students to identify entrepreneurial opportunities and pursue ventures aligned with their interests and values. Moreover, networking opportunities provided by colleges through alumni networks, industry events, and entrepreneurship clubs expose students to diverse perspectives and foster a culture of collaboration and innovation. These connections with like-minded peers, professionals, and potential collaborators are instrumental in shaping their entrepreneurial journeys. Understanding the interplay of these factors is essential for educators, policymakers, and stakeholders aiming to promote an entrepreneurial culture among college students. By addressing these influences and providing support mechanisms, colleges can empower students to harness their entrepreneurial potential, ultimately contributing to economic growth and innovation. This study highlights the importance of examining these factors in the context of Sambalpur, setting the stage for a deeper understanding of how to nurture entrepreneurship among college students in the region.

2. REVIEW OF LITERATURE

Several studies have examined the factors influencing entrepreneurial attitudes, education, and intentions among college students. Fasla (2017) analyzed entrepreneurship attitudes among college students in Mannarkkad Municipality, collecting 50 responses through a structured

questionnaire. The study revealed that despite facing barriers, students maintained a positive attitude toward entrepreneurship. Oosterbeek *et al.* (2008) assessed the impact of a leading entrepreneurship education program on students' entrepreneurial competencies and intentions using an instrumental variable approach within a difference-in-differences framework. The survey, conducted among 562 students across four study programs, found that the program did not achieve its intended effect. Similarly, Miaomiao Yin and Yang Wang (2017) examined how entrepreneurial education influences entrepreneurial capabilities among college students. Through a questionnaire survey, they identified key entrepreneurial capabilities and developed a research model to understand the process of capability development and enhancement. Their findings contribute to both theoretical research and practical applications in entrepreneurship education. Yuen-Ping Ho *et al.* (2014) investigated the relationship between entrepreneurship education programs and students' entrepreneurial behaviour by analyzing data from 836 students at the National University of Singapore (NUS). Using linear regression models, the study demonstrated that participation in university entrepreneurship programs, particularly experiential learning programs, significantly influenced students' entrepreneurial engagement. Lu *et al.* (2021) further explored students' evaluations of university entrepreneurship support and its effect on entrepreneurial intentions. Their study, based on a sample of 13,954 college graduates from Chinese higher education institutions, examined students' perceptions of university support and its impact on their entrepreneurial aspirations. Likewise, Georgescu and Herman (2020) analyzed the key factors influencing students' entrepreneurial intentions, with a particular focus on family background. Their study, which involved 617 Romanian high school and university students, highlighted that those with an entrepreneurial family background demonstrated higher entrepreneurial intentions compared to those without such a background. Other studies have focused on the role of entrepreneurial literacy and psychological factors. Winarno *et al.* (2019) examined the level of business and entrepreneurial literacy as an outcome of training and learning processes among students from various private universities. Hong *et al.* (2012) investigated the personal backgrounds, psychological traits, and behavioural characteristics of student entrepreneurs, analyzing how external factors influenced their entrepreneurial motivation and decision-making. Keat *et al.* (2011) studied entrepreneurial inclination among university students in the northern region of Peninsular Malaysia, emphasizing the relationship between entrepreneurship education and students' inclination toward starting their businesses. Lastly, Ladislav (2015) explored students' attitudes toward developing entrepreneurial skills in an e-commerce subject, assessing whether and to what extent this approach contributed to entrepreneurship-related competencies. The findings indicated that while entrepreneurial skills were being developed, students lacked motivation to engage in the competitive and risk-prone business environment. These studies collectively underscore the diverse influences on students' entrepreneurial culture, including education,

mentorship, family background, institutional support, and psychological traits. The findings highlight the importance of targeted interventions to foster entrepreneurship among college students.

3. OBJECTIVES AND HYPOTHESES OF THE STUDY

3.1. Objectives of the Study

- To analyse the various factors influencing entrepreneurial culture among college students in Sambalpur
- To assess the impact of educational programs and institutional support on fostering an entrepreneurial mindset
- To examine the challenges opportunities and barriers hindering the development of an entrepreneurial culture and propose strategies for overcoming them

3.2. Hypotheses of the Study

- H_1 : There is a significant difference between societal factors and entrepreneurship
- H_2 : There is a significant difference between the college environment factor and entrepreneurship

4. RESEARCH METHODOLOGY

The research adopts a descriptive research methodology to investigate the effects of education systems together with family inheritance and social media usage on undergraduate student entrepreneurship dreams. An empirical investigation of how these factors relate to each other is included in the research. The study gathers its primary data from a special questionnaire that researchers created to meet these research objectives. The survey design combines closed-ended sections with open-ended questions to receive detailed information from the respondents. The survey includes 50 college students who reside in Sambalpur town as part of its sampling technique. The researcher collected data by using convenience sampling which allowed participants who were interested or knowledgeable in entrepreneurship to participate. An online survey based on Google Forms collected data through questionnaires to reach a wider population of students in the research area effectively. The data collection entered regression analysis to determine how distinct variables affect the entrepreneurial culture of students. The statistical analysis was conducted by using IBMS SPSS and Microsoft Excel software. The study has employed regression analysis to determine both the statistically important and quantitatively strong links between the independent and dependent variables. The research method enables researchers to determine how much students' entrepreneurial aims depend on their education system together with

societal influences and family settings. The research examines the entrepreneurial inclination of Sambalpur town college students while its results only apply to this demographic group. Result generalization to a wide population becomes limited by the selection of convenience sampling as the research data collection method. The findings need to be expanded through additional variables which might impact entrepreneurship in future research studies. This methodological system sets a clear framework for examining entrepreneurial culture factors that affect college students within Sambalpur while advancing research about entrepreneurship education and its power for self-employment development and innovation.

5. DATA ANALYSIS AND INTERPRETATION

Table 1: Rotated Component Matrix

	<i>Component</i>	
	<i>Social support</i>	<i>Entrepreneurial culture</i>
Uses of social media to learn Entrepreneurial Skills		.641
Taking new ideas from Social Media		.708
Social media helps Innovating New Ideas		.835
Educational Institutions promote Entrepreneurial Culture	.795	
Teachers Encourage Entrepreneurial Culture	.892	
Friend circle keeps Entrepreneurial Spirit	.753	
Curriculum Promotes Entrepreneurial Culture	.907	
Accessible resources of the Institution	.813	
Government Initiatives	.756	
Family Support	.632	
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		
<i>Source: Authors' Compilation</i>		

The rotated component matrix, sometimes referred to as the loadings, is the key output of principal components analysis. It contains estimates of the correlations between each of the variables and the estimated component.

Table 2: Model Summary

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>	<i>Durbin-Watson</i>
1	.537 ^a	.289	.274	.43699	1.804
a. Predictors: (Constant), Social support					
b. Dependent Variable: EC (entrepreneurial culture)					
<i>Source: Authors' Compilation</i>					

R-square is a goodness-of-fit measure for linear regression models. This statistic indicates the percentage of the variance in the dependent variable that the independent variables explain collectively. In our model r square is .289 which represents a 28.9% change in the EC can be explained by social support.

Table 3: ANOVA Results

<i>Model</i>		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	3.723	1	3.723	19.496	.000 ^b
	Residual	9.166	48	.191		
	Total	12.889	49			

a. Dependent Variable: EC (Entrepreneurial Culture)

b. Predictors: (Constant), Social support

Source: Authors' Compilation

ANOVA (Analysis of Variance) is a framework that forms the basis for tests of significance & provides knowledge about the levels of variability within a regression model. The significant value is 0 which is less than 0.05, this indicates the model is significant.

Table 4: Calculation of Coefficients

<i>Model</i>		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
1	(Constant)	2.948	.275		10.702	.000
	Social support	.303	.069	.537	4.415	.000

Source: Authors' Compilation

A significant value of social support is 0.00 which is less than 0.05 which means it is significant. The beta value for social support is .303, which means for one unit increase in social support, increases by 0.303 units.

6. FINDINGS AND IMPLICATIONS

Research findings demonstrate multiple elements which substantially affect the development of entrepreneurial culture among college students in Sambalpur. Educational institutions remain essential because they develop students' entrepreneurial intentions through accessible entrepreneurship courses mentorship resources and networking platforms. Young people who receive. Structured entrepreneurship training makes them more likely to launch their business ventures (Kusio & Fiore, 2019). Social media functions as a strong platform through which students develop their entrepreneurial views as it enables them to find educational content and exposure opportunities (Bharti *et al.* 2024). The entrepreneurial inclination of individuals

heavily depends on their family background. A positive attitude towards entrepreneurship becomes stronger in students who come from entrepreneurial family backgrounds according to regression analysis results which show significant statistical significance at $p < 0.05$. Societal outlook strongly influences student entrepreneurial aspirations according to the majority (over 60%) of survey respondents. The investigated data proves that entrepreneurship education should receive better institutional incorporation within academic curriculums. Programs should be conducted that allow students to gain hands-on experience through mentoring initiatives and industrial partnerships to develop their entrepreneurial potential (Lahikainen, 2021). Digital platforms deployed for entrepreneurship awareness will support the growth of student engagement. Community members together with family members need to create platforms which support both innovation and risk-taking behaviours. The study demonstrates that building an entrepreneurial culture between college students in Sambalpur demands a combined effort through educational pathways with societal backing and technological influence.

7. CONCLUSION

A comprehensive measure is needed to establish entrepreneurial culture development among Sambalpur college students according to the research findings. Three key influencing factors for students' entrepreneurial ambitions are their educational background and experiences with social media and their family-related environment. The combination of structured education programs builds student knowledge and self-assurance but social media gives them essential platforms for innovation and educational growth. Family backing and social surroundings create essential conditions which help develop entrepreneurial tendencies within students (Huang, *et al.* 2024). The entrepreneurial ecosystem needs enhancement through curricular additions of useful learning methods, mentorship services and digital educational tools at colleges. The entrepreneurial spirit of students will receive further enhancement through the dual strategies of promoting risk-taking behaviour along with innovation and networking opportunities. The development of a successful entrepreneurial environment needs attention to these essential elements and requires alliance from educational leaders together with policymakers and industrial experts.

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Impact of Digital Marketing on The Adoption of E-Commerce Among the Indigenous Micro and Small Businesses in West Singhbhum, Jharkhand

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Abstract: Digital marketing involves utilizing online platforms, tools, and technologies to advertise products, services, or brands to specific audiences. Digital marketing has become one of the most favored and efficient methods for promoting businesses, especially via social media and mobile advertising. These tools, known for their ease of use and cost-effectiveness, have demonstrated significant potential in fostering entrepreneur engagement—an essential factor influencing the adoption of e-commerce. By enabling businesses to promote their products efficiently and motivate entrepreneurs at minimal costs, digital marketing tools contribute to increased sales and business growth. This study investigates the impact of digital marketing—specifically social media and mobile marketing—on the adoption of e-commerce among indigenous micro and small businesses in West Singhbhum, Jharkhand. The study seeks to provide theoretical understanding regarding the relationships between digital marketing, entrepreneur engagement, and e-commerce adoption intention, while offering practical implications for sustained application of these findings. Data for this research were gathered via an offline survey filled out by 230 participants, consisting of prospective clients of local micro and small enterprises. The study was performed utilizing the Partial Least Squares Structural Equation Modelling (PLS-SEM) method via Smart-PLS software. This study primarily focuses on elucidating the influence of digital marketing on entrepreneur engagement and its subsequent impact on the adoption of e-commerce in indigenous micro and small business contexts.

Keywords: Digital Marketing; Social Media Marketing; Mobile Marketing; E-commerce Adoption Intention.

JEL Codes: M31, L81, O33, L26

INTRODUCTION

The emergence of the Internet has transformed the way information is accessed and has greatly aided community and business growth globally, including in India. As per Internet World Stats, by June 2023, India boasted more than 900 million Internet users, marking a

significant technological progress in the nation (Internet World Stats, 2023). In Jharkhand, swift advancements in information technology have impacted business practices and consumer habits, especially regarding how local micro and small enterprises function and interact with clients. Technology has become an integral source of information and communication, transforming the way businesses approach their marketing strategies.

These developments have underscored the significance of utilizing digital marketing strategies to improve customer engagement, especially for local micro and small enterprises in areas like West Singhbhum. Digital marketing, which includes tools such as social media and mobile marketing, provides a means to engage with online consumers who cannot be reached through conventional marketing techniques. This trend reflects the growing realization among businesses about the effectiveness of digital marketing in expanding market reach and improving adoption of e-commerce solutions. As a result, numerous companies, including local enterprises, are shifting from traditional marketing approaches to digital marketing as they seek to harness the potential of e-commerce for growth and sustainability.

The most commonly used digital marketing tools around the world are mobile marketing and social media. Research shows that mobile marketing stands out as one of the most effective methods for connecting with customers and impacting their choices. Mobile marketing enables businesses to engage with prospective e-commerce users, especially within indigenous micro and small enterprises, by providing tailored and focused promotional materials. Consumers who actively interact with mobile marketing campaigns are more likely to adopt e-commerce solutions. Similarly, social media plays a pivotal role in fostering entrepreneur engagement (Pütter, 2017), which is a critical factor in enhancing e-commerce adoption intention (Bismo & Putra, 2019). Moreover, mobile marketing has been shown to significantly impact the adoption of e-commerce platforms, particularly in the context of micro and small businesses (Sekarintias & Kusumawati, 2017). These results highlight the significance of utilizing digital marketing tools to enhance e-commerce uptake among indigenous micro and small enterprises in West Singhbhum, Jharkhand.

2. LITERATURE REVIEW

2.1. Review of literature on the basis of Social Media Marketing

Kaplan and Haenlein (2010) investigate the growth of social media, emphasizing its advantages and difficulties for companies. They offer a structure for comprehending social media platforms and their ability to improve customer interaction and brand presence. The authors highlight the significance of incorporating social media into marketing tactics while tackling concerns such as privacy and content management. Dissanayake *et al.* (2019) highlighted the active relationship between companies and consumers on social media. It emphasizes how successful social media approaches cultivate deeper connections, brand loyalty, and customer retention. The authors

also highlight research deficiencies, recommending future investigations to examine new trends and the lasting effects of social media marketing on business outcomes. Similarly, Ismagilova *et al.* (2016) examine the effectiveness of electronic word-of-mouth (eWOM) messages within social media environments. The writers investigate essential elements that affect the efficacy of eWOM, including source reliability, message excellence, and platform features. They emphasize the vital importance of eWOM in influencing consumer perceptions and buying choices. The study highlights existing gaps, such as the necessity for more in-depth investigation of cultural variations and enduring effects. Their research provides significant insights and acts as a basis for further studies on eWOM's impact in digital marketing approaches. Nuseir (2020) examines the impact of digital media and online marketing techniques on promoting brand loyalty and retaining customers. The research highlights how companies can utilize digital resources, like tailored content and engaging platforms, to create more robust relationships with clients. It emphasizes the importance of social media, email marketing, and mobile apps in improving customer engagement and maintaining loyalty. Nuseir additionally investigates the strategic incorporation of analytics to customize marketing strategies. The study offers practical guidance for companies looking to adjust to the digital environment and highlights the significance of innovation for sustaining competitive edge.

2.2. Review of literature on the basis of Mobile Marketing

Shankar *et al.* (2010) investigate the influence of mobile marketing in the retail sector, highlighting its significant effect on consumer behaviour and retail approaches. The research highlights crucial factors like location-oriented services, customization, and interactivity that improve the efficacy of mobile marketing. It also addresses the issues of privacy worries and technological constraints. The authors provide an extensive framework for grasping the existing applications of mobile marketing and suggest future research paths to explore new trends and opportunities in the sector. Wang *et al.* (2013) explore the elements affecting mobile app usage, emphasizing the significance of consumption values. The research classifies these values into functional, emotional, and social aspects, highlighting their importance in influencing user behaviour. Functional aspects like convenience and usability are emphasized as key motivators, whereas emotional and social factors boost user satisfaction and involvement. The study offers insights into creating mobile applications that meet user expectations, providing practical implications for marketers looking to enhance mobile app adoption and ongoing user engagement. Ransbotham *et al.* (2018) investigate the distinct features of mobile word-of-mouth (WOM) by analysing mobile reviews. The research emphasizes the differences between mobile reviews and conventional online reviews regarding content generation, usage behaviours, and user interaction. Their findings give an important information for companies to efficiently utilize mobile WOM strategies, enhancing consumer trust and intention to purchase in mobile-

oriented settings. Kewat *et al.* (2023) also observed that elements like online advertisements has a significant impact on the consumer buying behaviour. Kannan (2017) provides an extensive framework for grasping digital marketing, delivering an in-depth analysis of its development, present trends, and future prospects. The research emphasizes the incorporation of essential digital tools, such as social media, mobile advertising, and data analysis, in influencing consumer experiences and marketing approaches. Kannan highlights the significance of customization, interactivity, and immediate involvement in digital marketing strategies. Sahu *et al.* (2024) also found that customers are preferring online market places and factors like price, security and feedback mechanism have a significant impact on the buying behaviour.

2.3. Review of literature on the basis of Entrepreneur Engagement with Social-media and mobile marketing

Ashley and Tuten (2015) investigate innovative tactics in social media marketing and their influence on consumer interaction. By analysing branded social media content, the research uncovers important elements like visual attractiveness, narrative, and interactivity that boost engagement. The writers highlight the significance of harmonizing content strategies with brand goals to cultivate genuine relationships with consumers. This study offers important insights for companies looking to enhance their social media presence and utilize innovative content to boost consumer engagement and brand loyalty. Hollebeek *et al.* (2014) explore the consumer brand engagement (CBE) in the context of social media, creating and validating a measurement scale. The study highlights the cognitive, emotional, and behavioural aspects of CBE, underscoring their significance in building robust consumer-brand connections. By conducting thorough empirical analysis, the authors illustrate how social media platforms can enhance brand engagement and loyalty. Shahbaznezhad *et al.* (2021) investigate the impact of social media content types and platforms on user engagement activities. The research emphasizes that content attributes, including images, videos, and interactivity, greatly influence engagement rates on various platforms. Platforms such as Instagram and YouTube, recognized for their robust media features, exhibit greater engagement than text-centric platforms. Alhakimi and Alwadhan (2021) suggests that social media serves as a crucial facilitator for informed decision-making, especially in areas with restricted access to conventional marketing avenues. This study provides important perspectives on utilizing social media as a strategic instrument to effectively shape consumer behaviour.

2.4. Review of literature on the basis of E-Commerce Adoption Intention

Azam and Quaddus (2009) explore how SMEs in Bangladesh adopt e-commerce, highlighting the impact of innovation traits and perceived risks. The research highlights elements like relative advantage, compatibility, and complexity as essential influences on the intention to adopt. It further emphasizes the influence of perceived risks, such as security issues and financial doubts,

in obstructing e-commerce adoption. Shemi and Procter (2013) investigate the contextual elements affecting e-commerce uptake in SMEs within Botswana. The research underscores that organizational preparedness, technological framework, and external influences, like competition and consumer demand, considerably affect the advancement of e-commerce adoption. It also highlights the difficulties encountered by SMEs, such as restricted resources and a shortage of skilled workers. Pham *et al.* (2018) explore the factors influencing e-commerce adoption in Vietnamese SMEs, emphasizing both internal and external elements. The research highlights technological readiness, organizational capabilities, and perceived advantages as essential factors influencing adoption. Furthermore, outside factors like customer demands, market rivalry, and government assistance are demonstrated to greatly affect the adoption of e-commerce. The study highlights the interaction between these elements in influencing adoption intention, underscoring the vital importance of management commitment and resource distribution. Their results offer valuable guidance for policymakers and business executives looking to enhance e-commerce integration in SMEs located in developing countries. Haryanti & Subriadi (2020) observed that trust becomes an important factor at the beginning of the introduction phase of e-commerce. Meanwhile, user experience as part of the technological dimension becomes an important factor in the determination phase of e-commerce based on its market. Daniel & Wilson (2002) found that factors like efficient service, supply improvement and attractiveness determines the e-commerce adoption. Sustainable e-commerce enhances customer satisfaction, fosters loyalty, and builds trust by providing strong customer support, ultimately encouraging long-term online shopping (Amornkitvikai *et al.*, 2022).

3. RESEARCH MODEL/Framework:

Based on review of literature following research model has been proposed.

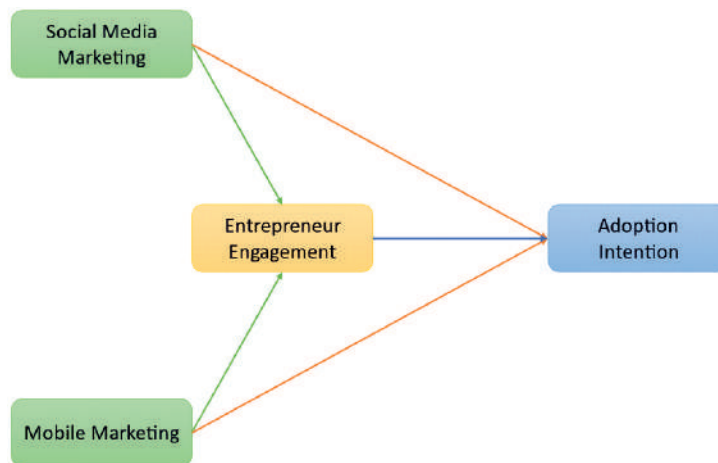


Figure 1: Research Model

Source: Compiled by authors

4. OBJECTIVES OF THE STUDY

- To analyse the influence of social media and mobile marketing on the adoption of e-commerce by indigenous micro and small businesses in West Singhbhum, Jharkhand.
- To examine the role of entrepreneur engagement as a mediator between digital marketing tools and the intention to adopt e-commerce.
- To identify key strategies and implications for optimizing digital marketing efforts to enhance e-commerce adoption among indigenous micro and small business owners.





5. METHODOLOGY

This study adopts a quantitative approach with an associative method to achieve its research objectives, utilizing a cross-sectional technique for the time horizon. Primary data was gathered through an offline survey using a five-point Likert scale targeted at indigenous micro and small business owners in West Singhbhum, Jharkhand, who utilize social media or mobile marketing. A simple random sampling method was employed, aiming for 250 respondents, ultimately yielding 240 responses, 230 of which were valid. Data validity was assessed using Average Variance Extracted (AVE), with reliability confirmed via Cronbach's alpha and composite reliability. The hypotheses were tested to determine the relationships between social media marketing, mobile marketing, entrepreneur engagement, and the adoption intention of e-commerce. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed for data analysis using SmartPLS 4.0 software. Mostly used in exploratory research, PLS is a prediction-oriented SEM technique that can also be used in confirmatory research (Hair *et al.*, 2017; Sarstedt *et al.*, 2014). The analysis included results for R-square values and path coefficients (original sample, sample mean, standard deviation, T-statistic, and P-value). These results were used to establish correlations between the variables. Finally, the findings were discussed and summarized to provide practical managerial implications for enhancing e-commerce adoption among indigenous micro and small businesses in the region.

6. FINDINGS & DATA ANALYSIS







6.1. Demographic Analysis

The demographic analysis shown below utilizes primary data gathered from indigenous micro and small business owners in the West Singhbhum district of Jharkhand, emphasizing attributes like gender, age, education, experience, revenue, type of business, and geographical location. Table-1 shows that the demographic examination of the participants highlights a notable gender imbalance, with a predominance of males.

Graphical Table 1- Gender of the Respondents			
	Frequency		Percent
Male		172	 74.8
Female		58	 25.2

Source: Compiled by authors

In particular, 172 participants (74.8%) were male, whereas 58 participants (25.2%) identified as female. This suggests that male entrepreneurs lead the indigenous micro and small business scene in West Singhbhum, Jharkhand. The gender breakdown indicates possible societal and cultural influences on entrepreneurial involvement in the area, where men might have more access to resources or chances for business ownership than women.

Graphical Table 2-Age of Respondent			
	Frequency		Percent
18-25 years		33	 14.3
26-35 years		160	 69.6
36-45 years		37	 16.1

Source: Compiled by authors

Table-2 indicates that the largest portion of respondents falls within the 26-35 years age group, representing 69.6% (160 respondents). This indicates that young to mid-career entrepreneurs are the most active group in embracing e-commerce and utilizing digital marketing tools. The 18-25 age range accounts for 14.3% (33 respondents), symbolizing younger entrepreneurs or newcomers to the business sector, while the 36-45 age range comprises 16.1% (37 respondents), indicating more seasoned business owners. This age breakdown emphasizes that younger, tech-savvy entrepreneurs predominantly lead e-commerce adoption, while there is a visible, though smaller, involvement of older business owners in these activities.

Table 3 indicates that most respondents possess basic levels of formal education. A total of 104 respondents (45.2%) have finished higher secondary school, whereas 92 respondents (40%) have attained a secondary school education. This suggests that the majority of entrepreneurs within the indigenous micro and small business sector in West Singhbhum, Jharkhand, possess

Graphical Table 3-Educational Qualification			
	Frequency		Percent
Secondary school		92	40.0
Higher secondary school		104	45.2
Bachelor's degree		24	10.4
Master's degree and above		10	4.3







Source: Compiled by authors

a fundamental educational background. A lesser percentage has sought higher education, with 24 individuals (10.4%) possessing a bachelor's degree and merely 10 individuals (4.3%) achieving a master's degree or above. This indicates that even though advanced education might not be common among these entrepreneurs, their basic educational backgrounds are adequate for embracing e-commerce methods.

Graphical Table 4-Experience of the Respondents			
	Frequency		Percent
Below 1 year		35	15.2
1-4 Years		138	60.0
5-9 years		32	13.9
10 years or more		25	10.9









Source: Compiled by authors

Table-4 indicates that regarding experience, the information reveals that most respondents are fairly new to entrepreneurship. A total of 138 respondents (60%) possess 1-4 years of experience, reflecting an increasing trend of newcomers entering the business sector. A total of 35 respondents (15.2%) possess under one year of experience, indicating that there are novice entrepreneurs probably analysing e-commerce for business development. A lesser percentage possesses greater experience, with 32 respondents (13.9%) reporting 5-9 years of experience and 25 respondents (10.9%) indicating 10 or more years in the industry. This distribution showcases a vibrant and evolving entrepreneurial landscape, fueled by recent entrepreneurs utilizing digital resources such as e-commerce to grow their businesses.

Table 5-Location of the Business			
	Frequency		Percent
Urban		80	 34.8
Rural		120	 52.2
Semi-Urban		30	 13.0

Source: Compiled by authors

Table-5 shows that the location data reveals the geographic distribution of businesses, with a majority, 52.2% (120 respondents), situated in rural regions. This highlights the dominance of rural entrepreneurship in the indigenous micro and small business sector of West Singhbhum, probably fueled by local demand and restricted urban migration options. 34.8% (80 respondents) function in urban regions, potentially offering improved access to infrastructure, markets, and technology. At the same time, 13% (30 participants) reside in semi-urban regions, reflecting a modest yet notable presence of enterprises that blend rural and urban traits. This distribution illustrates a varied entrepreneurial environment influenced by unique local opportunities and obstacles in embracing e-commerce practices.

Table 6-Nature of Business			
	Frequency		Percent
Retail		117	 50.9
Agriculture		61	 26.5
Manufacture		39	 16.9
Services		13	 5.6

Source: Compiled by authors

Table-6 indicates that the nature of business data demonstrates that retail enterprises prevail, making up 50.9% (117 respondents) of the overall total. This suggests a significant inclination towards retail among indigenous micro and small enterprises in West Singhbhum, probably stemming from the direct customer engagement and simplicity of establishing themselves in local markets. Businesses tied to agriculture account for 26.5% (61 respondents), highlighting the rural backdrop of the area where farming and agribusinesses serve as major livelihoods. Manufacturing companies make up 16.9% (39 participants), representing a smaller yet significant portion involved in production work, whereas services only represent 5.6% (13 participants), suggesting a reduced emphasis on service-based enterprises.

Table 7-Annual Revenue			
	Frequency		Percent
Less than Rs 1 lakh		143	62.2
Rs 1-5 lakhs		47	20.4
Rs 6-10 lakhs		24	10.4
More than Rs 10 lakhs		16	7.0

Source: Compiled by authors

Table-7 indicates that the yearly revenue assessment reveals that 62.2% (143 respondents) of companies earn under Rs 1 lakh each year, implying that a majority of businesses are small-scale and function with restricted income. A lesser fraction, 20.4% (47 participants), make between Rs 1-5 lakhs, indicating a marginally improved financial status. 10.4% (24 participants) receive Rs 6-10 lakhs, while just 7% (16 participants) surpass Rs 10 lakhs each year, indicating that only a small fraction of businesses reach elevated revenue figures. This revenue distribution shows that, although numerous businesses are small in scale, there is opportunity for growth, particularly by embracing e-commerce strategies to enhance their market reach and revenue sources.

6.2. Descriptive Analysis

6.2.1. Validity and Reliability Test Result

The validity and reliability results show in the Table 8 indicating different degrees of consistency among the constructs. The reliability test results, as shown in Table 8, indicate that all the variables, Entrepreneur Engagement, Mobile Marketing, Adoption Intention, and Social Media Marketing, are reliable, as their Cronbach's alpha and Composite Reliability values are all greater than 0.60. According to Taber (2018), construct reliability is considered adequate if the Cronbach alpha value is more than 0.58.

Table 8: Validity and Reliability

	Cronbach's alpha	Rho_a	CR	AVE
Adoption Intention	0.609	0.632	0.790	0.557
Entrepreneur Engagement	0.627	0.656	0.667	0.375
Mobile Marketing	0.682	0.654	0.784	0.485
Social Media Marketing	0.695	0.714	0.762	0.448

Source: Compiled by authors

6.2.2. R Square and Adjusted R Square Results

Table 9: R Square and Adjusted R Square Results

	<i>R-square</i>	<i>R-square adjusted</i>
Adoption Intention	0.454	0.415
Entrepreneur Engagement	0.494	0.459

Source: Compiled by authors

The structural model was evaluated to ascertain the R-square values, with findings displayed in Table 9. The R^2 value for Adoption Intention is 0.454, suggesting that the independent factors (Social Media Marketing and Mobile Marketing) can account for 45.4% of the variability in Adoption Intention. This indicates that Social Media Marketing and Mobile

Marketing has a considerable impact on Adoption Intention. In the meantime, the R^2 value for Entrepreneur Engagement stands at 0.494, indicating that these independent variables account for 49.4% of the variability in Entrepreneur Engagement. Both outcomes suggest that the independent variables possess significant explanatory strength, surpassing 40%.

6.2.3. Estimated Results of Path Coefficient

The results of the path coefficient and hypothesis testing are shown in Table 10 and are visually represented in Figure 2, which illustrates the path coefficients and alpha values associated with the variables. Moreover, Figure 2 visually depicts the T-statistic values concerning the relationships between variables in the research, namely Social Media Marketing, Mobile Marketing, Entrepreneur Engagement, and E-commerce Adoption Intention. These results provide a clear visualization of the statistical relationships and significance levels which are explained below:

Table 10: Estimated Results of Path Coefficient

	<i>Path Estimation (O)</i>	<i>Standard deviation (STDEV)</i>	<i>T statistics (O /STDEV)</i>	<i>P values</i>
Entrepreneur Engagement -> Adoption Intention	0.364	0.077	4.739	0.000
Mobile Marketing -> Adoption Intention	0.339	0.080	4.237	0.000
Mobile Marketing -> Entrepreneur Engagement	0.252	0.075	3.336	0.001
Social Media Marketing -> Adoption Intention	0.259	0.098	2.642	0.008
Social Media Marketing -> Entrepreneur Engagement	0.134	0.073	1.838	0.066

Source: Compiled by authors

H1: Social media has a significant impact on adoption intention

The first hypothesis testing, the effect of Social Media Marketing on Adoption Intention, derived a T-statistic value of $2.642 > 1.96$ and a P value of 0.008, indicating a significant and positive relationship with a coefficient value of 0.259. Thus, this hypothesis is accepted.

H2: Mobile Marketing has a significant impact on adoption intention

The second hypothesis testing, the effect of Mobile Marketing on Adoption Intention, yielded a T-statistic value of $4.237 > 1.96$, with a P value of 0.000, also below the 5% threshold. The coefficient value of 0.339 indicates a significant and positive relationship between Mobile Marketing and Adoption Intention, leading to the acceptance of this hypothesis.

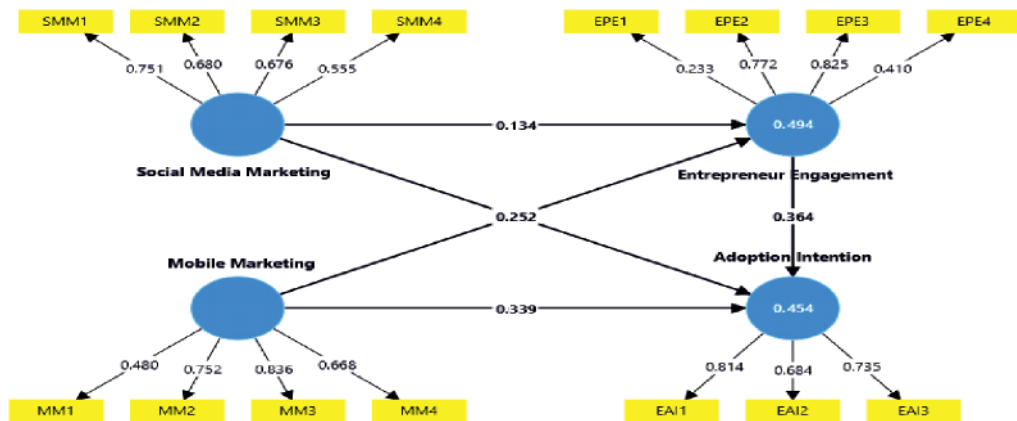


Figure 1: Estimated Results of Path Coefficient

Source: Compiled by authors

H3: Mobile marketing has a significant impact on Entrepreneur engagement

For the third hypothesis, the effect of Mobile Marketing on Entrepreneur Engagement, the results showed a T-statistic value of $3.336 > 1.96$ and a P value of 0.001. These values confirm a significant effect, with a positive coefficient value of 0.252, supporting the hypothesis.

H4: Entrepreneurs engagement has a significant impact on adoption intention

The third hypothesis testing, the effect of Entrepreneur Engagement on Adoption Intention, derived a T-statistic value of $4.739 > 1.96$, with a P value of 0.000, which is lower than the 5% significance level. Both values indicate a significant influence between the variables. The coefficient value of 0.364 confirms a significantly positive relationship between Entrepreneur Engagement and Adoption Intention. Hence, the hypothesis is accepted.

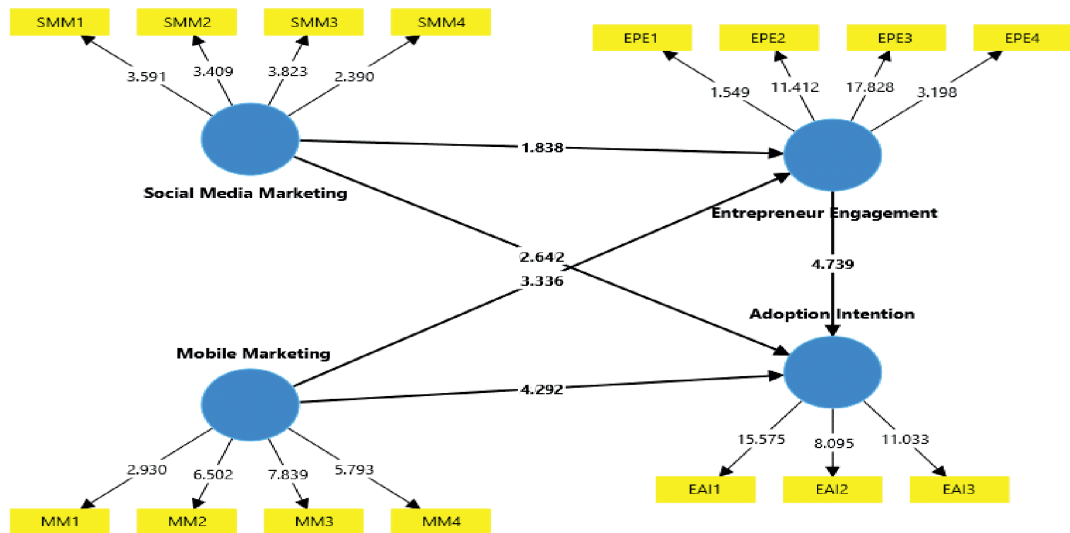


Figure 2: Estimated Results of Path Coefficient

Source: Compiled by authors

H5: Social media marketing has a significant impact on Entrepreneur engagement

Lastly, the fifth hypothesis testing, the effect of Social Media Marketing on Entrepreneur Engagement, resulted in a T-statistic value of $1.838 < 1.96$ and a P value of 0.066, which is slightly above the 5% significance level. This indicates that Social Media Marketing has a positive but insignificant effect on Entrepreneur Engagement, leading to the partial rejection of this hypothesis.

7. CONCLUSION

This study has demonstrated the significant impact of digital marketing, particularly social media and mobile marketing, on entrepreneur engagement and their intention to adopt e-commerce. Enhanced engagement of entrepreneurs, driven by mobile and social media marketing, significantly enhances the intention of use of e-commerce among indigenous micro and small enterprises in West Singhbhum, Jharkhand.

The effect of each variable's indicators was also analysed. It was found that mobile marketing plays a crucial role, with a strong influence on both entrepreneur engagement and adoption intention, emphasizing its importance for businesses aiming to adopt e-commerce solutions. Meanwhile, social media marketing positively impacts adoption intention but shows a weaker and statistically insignificant influence on entrepreneur engagement. This suggests that while social media can enhance visibility and outreach, its engagement effectiveness may require improved strategies.

In conclusion, digital marketing has a significant and positive impact on both entrepreneur engagement and e-commerce adoption intention. Studies have found that e-commerce has a significant impact on business (Gao *et al.*, 2023). Businesses in West Singhbhum need to adapt to new marketing approaches by effectively utilizing mobile and social media marketing tools to increase their digital presence. Considering the increasing significance of e-commerce, small and micro businesses should prioritize developing engaging, value-oriented content to improve their adaptability and competitiveness in the marketplace.

8. LIMITATION OF THE STUDY

The research emphasizes particular variables Social Media Marketing, Mobile Marketing, Entrepreneur Engagement, and Adoption Intention which might not fully encompass all elements affecting e-commerce adoption. Additional important factors, including technological preparedness, infrastructure availability, and financial limitations, were omitted, which could restrict the range of insights.

The research utilizes information gathered from 230 participants chosen from native micro and small entrepreneurs in West Singhbhum, Jharkhand. Although the sample offers important insights, its size and scope might not entirely capture the varied business dynamics present in different regions or sectors.

The research is restricted to West Singhbhum, Jharkhand, which restricts the applicability of results to other districts or states that have varying economic, technological, or cultural circumstances. Wider geographical scope would provide a deeper insight into e-commerce adoption within indigenous enterprises.

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E-Commerce for Non-Timber Forest Products: Prospects and Challenges

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Abstract: The increased global awareness of sustainable development has attracted people to explore NTFPs as an alternative to traditional timber harvesting. There is much diversity in forest goods, such as the array of medicinal plants, mushrooms, resins, and fibers, that e-commerce can easily present to a greater market. Here, this paper focuses on successful marketing strategies for NTFPs through e-commerce. It emphasizes storytelling, certification, and ethical branding as prerequisites for trust building and ultimate demand generation. The paper also discusses how social media, SEO, and digital marketplaces can be used to increase the accessibility and visibility of NTFPs. Finally, successful case studies of e-commerce ventures in the NTFP sector have been evaluated for best practice extraction. The results reveal that a holistic electronic marketing approach can significantly increase the market spread and profitability of NTFPs, thus enhancing sustainable forest management and community livelihood.

Keywords: Non-Timber Forest Products (NTFPs), E-commerce, Sustainable marketing, Digital marketing, Ethical branding, social media marketing, SEO

JEL Codes: L81, Q23, O13

1. INTRODUCTION

NTFPs became essential in managing forest resources in the vibrant world of sustainable development and environmental conservation. Unlike the conventional timber origin that serves to result in a significant percentage of deforestation and habitat destruction, Saxena (2003) stated that NTFPs involve a wide range of goods and services derived from forests that do not pollute the ecosystem. Sundar (2001) listed the range from medicinal plants, fruits,

nuts, resins, and fibers, for example, and provide substantial economic, ecological, and cultural benefits.

Various authors have emphasized the significance of NTFPs in terms of biodiversity and contributions to local economies. According to Belcher *et al.* (2005), NTFPs are essential for the rural community's livelihoods due to income, food security, and cultural value. Furthermore, Shackleton *et al.* (2011) emphasize that NTFPs greatly contribute to the household economies of millions of people around the globe, especially in the developing world. Murthy *et al.* (2005) studied the importance of NTFPs in western ghats and found that technology innovation in business should work towards the forest's protection and conservation. Mahapatra and Tewari (2005) on the varieties of NTFPs in Odisha, India. The aspects of NTFPs as a contribution to rural livelihoods and forest conservation are very widely discussed. Starting with the beginning of digital technology, the marketing and distribution of non-timber forest products have been transferred under a transformation. E-commerce platforms present an unprecedented opportunity for connecting local producers with global markets, enhancing the visibility and accessibility of this unique forest product. Belcher and Schreckenberg (2007) stated that for sustainable development of NTFPs, market access is important and that e-commerce can do this efficiently by bridging the gap between the remote producers and consumers. Pradhan and Rout (2016) from the context of Odisha stated that e-commerce gives greater scope for overcoming shortcomings in the market access of local NTFP producers, enabling better prices and stable demand. Sahoo and Nayak (2015) focus their attention on the traditional and emerging markets for NTFPs within Odisha, with a focus on how technology can catalyze expansion. Panda and Patel (2018) look into the socio-economic impacts of NTFPs in tribal areas of Odisha, suggesting recommendations for integrating e-commerce platforms to enhance local economic output. Das and Behera (2017) analyze the challenges and opportunities within the Odisha NTFP sector, advocating the use of e-commerce tools for sustainable development and poverty improvement. This study aims to establish whether digital platforms can change the dynamics of the market for NTFPs through e-commerce. It explores various marketing approaches, such as the development of appealing online presences, social media marketing, search engine optimization, and even direct-to-consumer sales. Rasul *et al.* (2012) present case examples from NTFP e-commerce success stories and gives practical lessons for producers to thrive in the electronic marketplace. Implementing e-commerce by NTFP producers can benefit local livelihoods but also contribute to global sustainability efforts at large.

Belcher and Schreckenberg (2007) have noted the wide market access opportunities that e-commerce can offer to the producers of NTFPs. They can reach a global market and avoid the constraints of local markets. According to Pradhan and Rout (2016), e-commerce can provide better prices and stable demand for the products of local NTFP producers by directly linking them with consumers, thus avoiding intermediaries. Sahoo and Nayak (2015) opine

that e-commerce can help to expand the traditional and emerging markets for NTFPs in Odisha. It enables supply chains to be smarter and markets to be more remote reach. Panda and Patel (2018) opine that integrating e-commerce in the NTFP sector could spur local economic growth in tribal areas of Odisha through new means of income generation and poverty reduction. Behera's (2017) verdict on strategic use of e-commerce for the growth of sustainable development and poverty alleviation in the NTFP sector. They focus on addressing digital literacy and infrastructure challenges. Upon transferring the gains, Arora & Kaur (2007) found that the NTFP producers can connect effectively with the power of e-commerce to transform their business practices and enhance economic flexibility toward attaining sustainable development goals.

2. BACKGROUND OF THE STUDY

The non-timber forest products, or NTFPs, are various biological materials derived from forests, from traditional timber and fuel wood. The products included fruits, nuts, seeds, mushrooms, medicinal plants, resins, latexes, fibbers, animal products like honey and wild game. According to Shackleton *et al.* (2011), NTFPs provide livelihoods for more than 1.5 billion people worldwide, often in rural settings where they can account for up to 40% of family income. In India, NTFPs currently provide annual employment for approximately 275 million people, emphasizing the importance of NTFPs in the rural economies of this country (Tewari & Campbell, 2014). NTFPs play a vital role in sustaining forest management and contribute to ecological, economic, and social sustainability. NTFPs contribute to biodiversity conservation, economic benefits, social and cultural preservation, and environmental sustainability (Ahvazi *et al.*, 2012).

3. REVIEW OF LITERATURE

Kanhu Charan Purty (2022) discussed how e-commerce enables the facilitation of Non-Timber Forest Product (NTFP) producers in market access in Odisha in his study on Online Shopping Behaviour. The paper portrayed that e-commerce facilitates its producers to bridge over the geological barriers, in addition, as it also attracts the customer base along with national and international markets. It also enhances market information by giving time-related data on prices and demand, thus enabling producers to stay in the competition and make appropriate decisions. Furthermore, e-commerce reduces transaction costs by eliminating intermediaries, which can potentially increase profits and lower prices for both producers and buyers. Additionally, it facilitates direct connections between producers and buyers, enabling better negotiations on prices and terms and fostering long-term partnerships. Moreover, e-commerce platforms often require detailed product information, ensuring the quality and authenticity of products, which in turn builds consumer trust. In conclusion, the study demonstrates how

e-commerce greatly increases market accessibility for NTFP producers in Odisha, providing a cost-effective and efficient route to reach wider markets, improve the knowledge of the market, and develop direct relationships with buyers. Pramod Kumar Singh and S. Vijayakumar (2023) provide information about the impact of e-commerce on rural development. According to the authors, e-commerce can have a number of impacts on rural development. It enables rural producers to access bigger markets beyond the locality, thus increasing sales and income. E-commerce can also reduce transaction costs, as it eliminates the use of middlemen. Another important point highlighted by the authors is that e-commerce platforms can impart market information that can be useful for rural producers. Pokhrel *et al.* (2019) provided information that will enable them to make decisions on what to produce and where to sell their produce. More so, e-commerce empowers the rural producers by providing them with access to the buyers directly. This bypasses all the barriers and saves them from negotiations. The growth of e-commerce can contribute to the development of the infrastructure in the rural areas. This includes internet connectivity and logistics, which help the whole community. Also Giri (2024) explores Jharkhand's Minor Forest Produce (MFP) sector, highlighting its economic potential, challenges like market access and climate risks, and solutions, including institutional support, value addition, and community empowerment for sustainable rural development.

Kumari and Singh (2019) investigated the improvement of market access and sustainable development for NTFP producers in Odisha through e-commerce. E-commerce does not only increase market reach, but also improves price realization by saving on the length of intermediaries and provides logistics solutions which are convenient. Additionally, it fosters sustainable practice along with financial inclusion. The study findings showed that for TRIFED, a collaboration that marketed products resulted in increased sales and income-generating activities, thus significantly impacting livelihoods and also improving conservation efforts. Also, Patnaik and Jena (2021) found that e-commerce helped in transforming market access for the Odia tribals; thereby, it brought socio-economic benefits to its stakeholders in the form of reaching wider markets, fewer intermediaries, and steady revenues. It provides real-time market data, educational resources, and in-built logistics solutions. Digital payments promote financial inclusion, whereas digital records support credit access. Programs such as TRIFED and 'Tribes India' bring about manifold sales and revenue generation and support economic empowerment, sustainable livelihoods, and improved livelihoods. Chaudhary and Bhatia (2018) reported the impact of e-commerce on NTFP marketing. Through e-commerce, more NTFP producers can access wider markets and market directly, thus potentially increasing their income. Paul *et al.* (2015) stated that a few other challenges limit its spread. These include technological barriers as well as concerns over sustainability. Consequently, NTFP producers need to be part of capacity-building and awareness activities so as to effectively use the e-commerce platform.

Singh and Das, in a study conducted in 2020, noted that tribal communities engaged in e-commerce experienced a significant increase in income when compared to others who didn't use e-commerce. In particular, the NTFP producers noted direct sales, better prices, and a larger market. The study also highlighted that e-commerce allowed these communities to reach markets beyond their local areas, resulting in more sales opportunities and higher income. Mahapatra and Sahoo (2019) explored the role of e-commerce in enhancing market access and income for tribal farmers in Odisha, likely including NTFP producers. Their findings supported that e-commerce expands market reach and improves income levels by providing direct marketing opportunities and better price realization. Similar to this, Sahu and Mohanty (2018) emphasized the financial inclusion of tribal communities in Odisha through e-commerce. As their study does not focus on income generation, their study puts light on the fact that how e-commerce can integrate tribal communities into the financial structure, which indirectly contributes positively to their income levels. Chaudhary and Bhatia (2018) found out that through e-commerce, NTFP producers can expand their market to reach and engage in direct marketing, national, and international potentially raising profit margins. However, challenges hindering the adoption of e-commerce are issues such as technological barriers and logistical ones. Patnaik and Jena (2021) investigated the Finding that e-commerce randomly improves access for tribes living in Odisha to online markets that include NTFP producers. This study likely deals with the issues regarding how e-commerce platforms open up market access and sales opportunities for tribal communities to utilize new technology to create an even more profitable business of nontimber forest products and introduce cloud-based marketing in the global index and set up the new venture of the tribals Nontimber forest product along with the specific name of the product. The findings of Singh and Das (2020) show that the adoption of E-commerce could increase the income significantly for the people of the tribal community in Odisha, including NTFP producers. This increase is directly due to better realizations of the price and wider market access through e-commerce platforms, as well as other similar market opportunities that enhance the 3rd party engages while purchasing raw materials from direct raw material collectors from across the Odisha.

Along with these a study by Kumari and Singh (2019) found that E-commerce can contribute towards the sustainable development of NTFPs by expanding markets and improving access to market for producers of Odisha. Specific examples set up the outcomes and parameters of this impact are likely to be discussed in this study. This means that the producers of NTFP will be provided with more strategies of marketing in monitoring the online and line business to figure out the target marketing management by using the business CRM.

Again, Sahoo and Mohanty (2018) focused a study on financial inclusion and socio-economic development in the tribal communities of Odisha. While the fundamental focus of the study may not be on environmental sustainability, the study most likely would conclude

that e-commerce initiatives contribute to financial inclusion and socio-economic development among the tribal communities of Odisha. NTFPs will be able to go directly to the product market, to brand their raw materials, and build on their sale-making capabilities to further maximize the benefits of their products through online marketing strategies. Patnaik and Jena (2021) probably found a positive impact of NTFP e-commerce initiatives on the socio-economic sustainability of tribal communities in Odisha. Generally, it improves market accessibility with increase in income generation and enhancement of livelihoods. Cutting out the middleman in this respect, e-commerce sites put producers of NTFPs directly in touch with consumers, allowing for higher profit margins and lower costs. In turn, increased income would improve access to basic amenities, education, and health services, thereby improving livelihoods. Moreover, e-commerce empowers tribal communities by displaying their products and skills, thus advancing economic independence and self-reliance. Conclusively, NTFP e-commerce initiatives are significant to the enhancement of the socio-economic sustainability of tribal communities in Odisha. Chaudhary and Bhatia (2018) reported on the potential for market expansion and direct marketing of NTFP e-commerce initiatives. However, they face barriers like technological barriers and regulatory constraints that will impact the overall sustainability. The very initiatives have introduced the power of producers to access a wider clientele and maximize sales and income. Limited access to technology and internet connectivity in rural areas are major barriers to adoption and effectiveness. Further, open-ended regulatory frameworks and compliance issues with certification and quality standards leave uncertainty regarding the produce's legality. The sustainability of NTFP e-commerce initiatives can be ensured only if these challenges are overcome through capacity-building programs which focus on digital literacy and e-commerce skills.

4. CHALLENGES IN THE TRADITIONAL MARKETING OF NTFP

Traditional marketing of NTFPs in India, especially in the state of Odisha, continues to face persistent hurdles that do not allow these products to reach their full potential and continue to impact livelihoods based on forest products. These can be subdivided into market access, value addition, regulatory issues, socio-economic factors, as well as environmental and seasonally variability.

The subsequent paragraphs will give concreted contents of different challenges based on the literatures' reviewed:

In India and Odisha, many communities heavily rely on NTFPs for their livelihoods. However, these are often neglected communities that are either located distant from the mainstream or are poorly developed, implying difficulties for accessibility and more transport costs to reach markets. For example, in Kandhamal, tribal communities in the district encounter problems transporting turmeric and wild honey because of the absence of proper

roads (Reddy *et al.*, 2011). In addition, these producers often receive no timely and relevant market information, thus leading to poor decision-making and exploitation by intermediaries. Further, the disconnection between the producers and buyers restricts their wider market access further, and this is made worse by the lack of organized rural marketplaces.

Many NTFPs are processed so as to meet the required market standards. However, a lack of skills and infrastructure of producers generally limits the price of their output. For example, for Mahua flowers sold raw in Odisha, there is an acute deficiency of processing facilities which greatly lowers its value (Sahoo & Naik, 2017). The same happens in India due to differences in the quality of honey and medicinal plants, decreasing the confidence among buyers. The quality of the kendu leaf in Chhattisgarh often varies and thus affects both the market value and the collectors' income (Pandey *et al.*, 2016).

The regulatory issues vary from state to state in India NTFP, making collection, transportation, and selling challenging. In Odisha, the process of getting permits is time-consuming as well as costly and creates a delay in marketing products like Sal seeds (Singh *et al.*, 2012) and also lowers the profit. Additionally, small producers struggle to understand and obey the scheme, which deters them from entering the formal market.

Lack of finance is another challenge that is faced by the NTFP producers in India in the state of Odisha. Therefore, this financial constraint prevents them from investing in necessary tools and marketing strategies. Therefore, tribal communities in Odisha have to rely on traditional methods to cope with the financial constraints of the producers. This weakens their bargaining power and income, as small-scale production tends to do. Besides, unavailability for education and training establishes restraints in terms of their ability to innovate and subsequently compete in the market. This, in turn, is particularly evident in the Sundarbans, with a lack of current beekeeping training impairing the quality of honey produced (Saha & Sundaram, (2018).

The availability of NTFPs in India and Odisha is volatile, sensitive to environmental and seasonal factors which makes the case of stable market relationships quite elusive. For example, the production of lakha and resin in Odisha has certain seasons: Mitra *et al.*, 2015). Climate variations add to this situation by influencing the germination and availability of NTFPs, thus undermining long-term sustainability.

5. CONCLUSION

Adoption of e-commerce solutions for NTFP marketing stands to shift the industry in a major way as it will be presenting the opportunity to the producer to get to the global market with rather priced products without fluctuating economics. Digital goals and methods like being more accessible online, communicating with the consumer through social networks, and e-commerce operating SEO-search engine Optimization are precious. Therefore, the

acceptance of these approaches would help the NTFP producers advance and enhance their economic growth as well as their living standards, increase privileges to the sustainability of forests, and supply wider economic and environmental objectives as we find the future of NTFPs in the digital marketplace with proper marketing strategies.

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Navigating Challenges and Seizing Opportunities: Local Initiatives and Bottom-Up Development in Local Transport with special Reference to Mo Bus of Odisha

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Abstract: The Mo Bus service, operated by Odisha's Capital Region Urban Transport (CRUT) authority, has received international recognition as one of the ten global recipients of the United Nations Public Service Awards for 2022. Global urbanization is accelerating, making effective and sustainable urban transit systems essential. In this study a thorough development plan is designed specifically for the Indian state of Odisha, with an emphasis on raising the efficacy and sustainability of the state's urban transportation system with special reference to Mo Bus. The Sustainable Urban Transit Improvement Plan for Odisha integrates technology, community engagement, and environmental sustainability to enhance efficiency and inclusivity. By prioritizing stakeholder involvement, skill development, and service quality, the plan fosters economic growth and improves residents' quality of life, making Odisha's urban transport a model for sustainable development.

Keywords: Sustainable urban transit, Community involvement, Environmental sustainability, Cutting edge technology, Service quality.

JEL Codes: R41, R42, O18.

1. INTRODUCTION

Launched on November 6, 2018, the Mo Bus service aims to revolutionize urban public transport in the city and its surrounding areas by incorporating smart technology, setting service benchmarks, and prioritizing customer satisfaction. The United Nations has acknowledged Mo Bus, operated by Odisha's Capital Region Urban Transport (CRUT) authority, as one of

the ten global recipients of the 2022 Public Service Awards. The recognition was awarded for the service's role in "advancing gender-responsive public services to support the achievement of the Sustainable Development Goals (SDGs)," according to a report from June 22.

In 2010, the Bhubaneswar Puri Transport Services (BPTS) was established to manage bus operations in Bhubaneswar and Puri, Odisha. Initially focused on improving local transit, BPTS transformed into the Capital Region Urban Transport (CRUT) on May 4, 2018. Since then, CRUT has become the main provider of public transportation in Bhubaneswar, Odisha's capital, as well as in nearby cities like Cuttack, Puri, and Rourkela. CRUT is dedicated to revolutionizing "The Way We Move," offering a variety of mobility options for residents. This vision aims to foster a sustainable and inclusive future. The organization strives to provide excellent public transit services and continuously improve the transportation system in the Capital Region. With a skilled team in transportation planning, operations, technology, and communications, CRUT has expanded the scope of public transit services.

The organization now incorporates multimodal solutions, catering not only to the local population but also to tourists. On November 6, 2018, CRUT introduced its new buses, branded as "Mo Bus," meaning "my bus." Later, on November 26, 2018, CRUT launched Odisha's first public bicycle-sharing system, Mo Cycle. In 2019, the organization also introduced Mo E-Ride, an e-rickshaw service. On January 5, 2023, Mo Bus expanded its services to Rourkela. By March 2023, Mo Bus had a fleet of 200 buses, operating 44 routes in Bhubaneswar. The service recorded a total ridership of 2.6 lakhs in Bhubaneswar (CRUT, 2022).

An efficient and well-planned urban transit system can help alleviate traffic congestion. A well-functioning public transit system can have positive economic effects. Public transportation is a key element in promoting social inclusion. A comprehensive improvement plan may address issues related to accessibility for people with disabilities, affordability for low-income populations, and equitable distribution of transit services across different communities. Sustainable transit studies often consider how transportation planning integrates with urban development.

The scope of the present study encompasses various dimensions related to the enhancement and sustainability of the Mo Bus system in the state of Odisha. The study covers a wide range of aspects, including Service Quality, Cutting Edge Technology, Community Development, and Environmental Sustainability. By addressing these aspects, the study aims to provide a holistic and actionable plan for the sustainable development and improvement of the Mo Bus system in Odisha. It considers not only the technical and operational aspects but also the social, economic, and environmental dimensions crucial for a comprehensive and effective transit system.

This particular research is predominantly carried out in Tamil Nadu, Lucknow, and Himachal Pradesh and Maharashtra with limited presence in Odisha. The study of satisfaction level of local bus transport passengers in terms of service quality, cutting-edge technology, and environmental sustainability, mainly conducted in Tamil Nadu, Luknow, and Himachal Pradesh but not found in Odisha. In this context, the study aims to explore the satisfaction level of Mo Bus passengers in terms of service quality, cutting-edge technology, and environmental sustainability, challenges faced by Mo Bus (Odisha) in terms of service quality, cutting-edge technology, and environmental sustainability, effectiveness of Mo bus in terms of community development and offer few suggestions for overcoming the challenges faced by Mo Bus.

2. LITERATURE REVIEW

Li *et al.* (2020) conducted a study to explore the factors influencing passenger satisfaction with bus transit in small to medium-sized cities. The research was based on data collected in Weinan, China. It examined individual characteristics, travel activity details, and perceived service quality. To identify significant factors, the study used the ordered logit (OL) model and ordered probit (OP) model. The odds ratio (OR) was applied to quantitatively assess the impact of these factors. The study's findings showed that the OL model outperformed the OP model. Several factors were found to significantly affect passenger satisfaction, including age, daily average waiting time, perceived waiting time, transfer convenience, driver attitude, intelligent travel information services, bus cleanliness, ticket prices, bus route design, and bus stop settings. Among these, ticket price, perceived waiting time, bus stop design, intelligent travel services, transfer convenience, and bus route planning were especially influential. Weng *et al.* (2018) developed a comprehensive satisfaction evaluation framework focused on passenger perceptions throughout the entire travel process. The framework includes six main indicators: timeliness, safety, convenience, comfort, reliability, and economy. These indicators are further broken down into 21 secondary indicators. To account for Beijing's extensive bus network, the study used stratified sampling. It surveyed 100 bus lines and collected 3,012 field questionnaires. Using multivariate analysis of variance, the study identified factors that influence satisfaction. Timeliness received the lowest satisfaction score, which was primarily affected by factors such as passenger age, travel purpose, and time constraints. This research contributes to the standardization of performance assessments for public transportation, supporting the sustainable development of bus services.

Gupta & Nag (2017) conducted a study to assess passenger satisfaction concerning the Himachal Pradesh Road Transport Corporation. The research employed a descriptive survey approach using probability sampling, with a sample size of 400 respondents. To measure

passenger satisfaction, eight service quality indicators were developed, including “Passengers comfort, punctuality and regularity, safety and reliability, satisfaction with driver/conductor, and social responsibility.” The results revealed that passengers exhibited a lack of awareness regarding basic services. In summary, the study suggests that interventions are needed in the areas of service quality, driver knowledge and skills, and the ethical conduct of service providers. The limited quality of services in various dimensions contributes to customer dissatisfaction within the transport sector. Dharmaraj and Malarkodi (2017) explored the concepts of service quality and their implementation in both government and private bus transport within the Thiruvannamalai district. The study employs a straightforward comparison approach to evaluate the disparity between customers’ general expectations of a service and their actual perceptions of the service provided by a specific service provider. The research delves into the alignment between customer expectations and the frontline employees’ perceptions of these expectations. While this approach is commonly used to assess the quality of services in the private sector, its application in government services is less prevalent. In today’s competitive market environment, firms are delivering services to society worldwide. However, the nature of services provided may vary under different economic conditions. Singh (2016) studied public bus transport in Lucknow, surveying 148 respondents across five major bus stops. Using PCA and descriptive analysis, the study found significant passenger dissatisfaction. Key factors influencing satisfaction included comfort and safety, bus capacity, cleanliness, design, and accessibility. Addressing these issues could improve service quality.

Rahatgaonkar and Mathankar (2016) aimed to assess the satisfaction level of passengers with the services provided by the Maharashtra State Road Transport Corporation (MSRTC) and also examine the awareness of passengers about its services. The study utilized a sample size of 240 and applied the chi-square test to test the hypotheses. The analysis revealed a significant difference between the services of MSRTC and the railway system. The research indicates that there are notable distinctions in the satisfaction levels of passengers between MSRTC and the railway services. The findings from the chi-square test suggest that these differences are statistically significant. Gajendran & Kaliyaperumal (2012) studied a segment of an ongoing investigation into passenger satisfaction within the current service quality of the bus transport industry in Tamil Nadu, particularly focusing on the Chennai Mofussil Bus Terminus (CMBT). The primary objective of this research is to assess the extent of changes in bus passenger satisfaction. The research article aims to offer a comprehensive perspective on the diverse attitudes of bus passengers and the quality of service provided by entities such as the State Express Transport Corporation (SETC), Tamil Nadu State Transport Corporation (TNSTC), and private Omni bus transport companies in Tamil Nadu, with a specific emphasis on Chennai.

Shiau & Liu (2013) inferred that the expansion of mass rapid transit (MRT) lines was expected to yield the biggest improvements, bus-only lanes would yield the least improvement, and the integration of Fu-Kang bus resources and the promotion of cleaner vehicles would produce comparable results in terms of enhancing transportation sustainability.

May (2013) highlights that the key areas where urban transport policy innovation is required and, in its capacity as the backdrop for a special issue on modelling, proposes the ensuing model development requirements. Dickinson & Dickinson (2006) highlighted that individuals' sentiments do not always translate into predictable patterns of behaviour. The social and cultural presumptions that underpin stated attitudes toward transportation have not been examined, despite the fact that travel is a social and cultural phenomenon. This study questions the underlying presumptions of existing research and suggests a method that investigates the variety of social realities that influence our perceptions of travel, transportation, and behavior in general. Ryley *et al.* (2014) the sustainability of DRT by assessing its influence on the environment, social benefits, and economic feasibility. It draws attention to issues with financial sustainability, especially in rural areas, while highlighting viable fixes such as alternate funding sources and social entrepreneurial operations. Future research, according to the paper, should concentrate on establishing sustainability measures for DRT, removing institutional obstacles, and enhancing environmental and economic evaluations.

Sultana *et al.* (2019) examines urban transportation sustainability using three frameworks, emphasizing two important paradigms—sustainable travel behaviour and sustainable transport technology—as well as environmental, economic, and social issues. It also looks at the Planner's Triangle, which shows how sustainability strategies involve trade-offs, and ends with suggestions for further research on sustainability and urban mobility. Sushchenko *et al.* (2023) examines cutting-edge strategies for maximizing urban traffic and tourism flows, highlighting the value of rail transportation and intelligent transportation systems. It underlines important elements that affect the dynamics of urban traffic and points out possibilities for rural growth, especially when considering the logistical difficulties associated with conflict. Banister & Stead (2004) examines the influence of information and communications technologies on transport, considering both direct and indirect effects of technological innovation. It explores three spheres of impact—production, living, and working—while highlighting unresolved questions and future opportunities for improving transport efficiency.

Too & Earl (2010) use the SERVQUAL framework to evaluate service quality in an Australian master-planned community and investigate how public transportation contributes to the attainment of sustainability goals. The results show a large discrepancy between commuter expectations and actual service quality, emphasizing the necessity of responsiveness

and dependability enhancements to encourage increased use of public transportation. Bakti & Sumaedi (2015) examined the P-TRANSQUAL service quality model for public land transportation was put to the test. Comfort, tangible, personnel, and reliability are the four dimensions that make up P-TRANSQUAL. When it comes to assessing the quality of paratransit services in Indonesia, the model has demonstrated strong validity, reliability, and stability. Mugion *et al.* (2018) employ surveys and geographical analysis to empirically examine Rome's metropolitan public transportation system. It looks at how people perceive the quality of services and how inclined they are to use public transportation more, rely less on private vehicles, and embrace sustainable options like carpooling. Dell'Olio *et al.* (2011) suggested that waiting times, travel times, and most importantly, occupancy level are the more significant factors for prospective users when determining the quality they can expect from public transportation. They believe that when defining an effective public transportation service, the other factors are not very important.

3. DATA AND METHODOLOGY

This study heavily relies on primary data obtained through questionnaires using google form administered to Mo Bus passengers between October and November 2023 with the sample size of 79. The questionnaire was structured into four parts. Part I focuses on elucidating the demographic profile of the respondents, while Part II assesses the service quality of Mo Bus. Additionally, Part III explores the impact of cutting-edge technology, and Parts IV and V delve into community development and environmental sustainability. Reliability analysis is essential to ensure that survey data accurately reflects the actual conditions of the subject being studied. In this research, the reliability of the satisfaction questionnaire was assessed using Cronbach's Alpha coefficient. Cronbach's Alpha is particularly effective for measuring the internal consistency of a questionnaire. Given that the bus passenger satisfaction evaluation matrix encompasses a multi-level index system for comprehensive evaluations, it is essential to conduct reliability analyses separately for each sub aspect. The data collected from the survey underwent rigorous reliability analysis. Table 2 shows the Cronbach's Alpha values for each index in the questionnaire, with all values exceeding 0.6. This outcome signifies high internal consistency within the questionnaire. As a result, the collected data demonstrates strong reliability, suggesting that it accurately represents the satisfaction levels of Mo Bus passengers.

Table 1: Satisfaction Evaluation Index

<i>First Level</i>	<i>Second Level</i>
Service Quality	1.1 Fare 1.2 Cleanliness 1.3 Personal Safety 1.4 Frequency of bus service 1.5 Peak hours rush
Cutting Edge Technology	2.1 User friendly app 2.2 Fare payment option 2.3 Locating the bus using app 2.4 Locating bus route using app 2.5 Locating reaching time of bus using app
Community Development	3.1 Behavior of Mo bus conductors Drivers 3.2 Driving by Mo-Bus drivers 3.3 Adherence to traffic rules
Environmental Sustainability	4.1 Environmental Sustainability 4.2 EV 4.3 Air quality Index

Source: Compiled by authors

Table 2: Reliability Statistics

<i>Cronbach's Alpha</i>	<i>N of Items</i>
0.929	14

Source: Compiled by authors

Table 3: Reliability Analysis

<i>Criteria</i>	<i>Cronbach's Alpha</i>	<i>Sub criteria</i>
Service Quality	0.898	5
Cutting Edge Technology	0.956	5
Community Development	0.889	5
Environmental Sustainability	0.606	5

Source: Compiled by authors

Table 4: Correlation Matrix of service quality of Mo-bus passengers

		Correlations																	Total
		Fare	Cleanliness	Personal Safety	Frequency of bus service	peak hours rush	User friendly app	Fare payment option	Locating the bus using app	Locating bus route using app	Locating reaching time of bus using app	Behaviour of Mo bus conductors and Drivers	Driving by Mo-Bus drivers	Adherence to traffic rules	Environmental Sustainability	EV	Qir quality index		
Fare	Pearson Correlation	1	.758 ^{**}	.674 ^{**}	.690 ^{**}	.391 ^{**}	.321 ^{**}	.472 ^{**}	.476 ^{**}	.376 ^{**}	.423 ^{**}	.335 ^{**}	.300 ^{**}	.313 ^{**}	.053	1.000 ^{**}	.758 ^{**}	.741 ^{**}	
	Sig. (2-tailed)		.000	.000	.000	.001	.007	.000	.000	.002	.000	.004	.011	.007	.661	.000	.000	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Cleanliness	Pearson Correlation	.758 ^{**}	1	.752 ^{**}	.674 ^{**}	.541 ^{**}	.443 ^{**}	.509 ^{**}	.595 ^{**}	.531 ^{**}	.548 ^{**}	.373 ^{**}	.251 ^{**}	.368 ^{**}	.152	.758 ^{**}	1.000 ^{**}	.804 ^{**}	
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.001	.033	.001	.202	.000	.000	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Personal Safety	Pearson Correlation	.674 ^{**}	.752 ^{**}	1	.650 ^{**}	.668 ^{**}	.360 ^{**}	.491 ^{**}	.572 ^{**}	.506 ^{**}	.519 ^{**}	.279 ^{**}	.366 ^{**}	.370 ^{**}	.116	.674 ^{**}	.752 ^{**}	.752 ^{**}	
	Sig. (2-tailed)	.000	.000		.000	.000	.002	.000	.000	.000	.000	.018	.002	.001	.332	.000	.000	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Frequency of bus service	Pearson Correlation	.690 ^{**}	.674 ^{**}	.650 ^{**}	1	.591 ^{**}	.258 ^{**}	.473 ^{**}	.511 ^{**}	.445 ^{**}	.448 ^{**}	.351 ^{**}	.440 ^{**}	.427 ^{**}	.038	.690 ^{**}	.674 ^{**}	.763 ^{**}	
	Sig. (2-tailed)	.000	.000	.000		.000	.031	.000	.000	.000	.000	.003	.000	.000	.751	.000	.000	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
peak hours rush	Pearson Correlation	.391 ^{**}	.541 ^{**}	.668 ^{**}	.591 ^{**}	1	.335 ^{**}	.444 ^{**}	.469 ^{**}	.477 ^{**}	.473 ^{**}	.322 ^{**}	.452 ^{**}	.340 ^{**}	.108	.391 ^{**}	.541 ^{**}	.633 ^{**}	
	Sig. (2-tailed)	.001	.000	.000	.000		.005	.000	.000	.000	.000	.006	.000	.003	.366	.001	.000	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
User friendly app	Pearson Correlation	.321 ^{**}	.443 ^{**}	.360 ^{**}	.258 ^{**}	.335 ^{**}	1	.755 ^{**}	.702 ^{**}	.705 ^{**}	.740 ^{**}	.620 ^{**}	.440 ^{**}	.554 ^{**}	.406 ^{**}	.321 ^{**}	.443 ^{**}	.698 ^{**}	
	Sig. (2-tailed)	.007	.000	.002	.031	.005		.000	.000	.000	.000	.000	.000	.000	.000	.007	.000	.000	
	N	70	70	70	70	70	70	68	68	68	67	70	70	70	70	70	70	70	
Fare payment option	Pearson Correlation	.472 ^{**}	.509 ^{**}	.491 ^{**}	.473 ^{**}	.444 ^{**}	.755 ^{**}	1	.837 ^{**}	.802 ^{**}	.839 ^{**}	.595 ^{**}	.621 ^{**}	.709 ^{**}	.233	.472 ^{**}	.509 ^{**}	.818 ^{**}	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.056	.000	.000	.000	
	N	68	68	68	68	68	68	68	68	68	67	68	68	68	68	68	68	68	
Locating the bus using app	Pearson Correlation	.476 ^{**}	.595 ^{**}	.572 ^{**}	.511 ^{**}	.469 ^{**}	.702 ^{**}	.837 ^{**}	1	.847 ^{**}	.830 ^{**}	.487 ^{**}	.428 ^{**}	.563 ^{**}	.245	.476 ^{**}	.595 ^{**}	.816 ^{**}	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.044	.000	.000	.000	
	N	68	68	68	68	68	68	68	68	68	67	68	68	68	68	68	68	68	
Locating bus route using app	Pearson Correlation	.376 ^{**}	.531 ^{**}	.506 ^{**}	.445 ^{**}	.477 ^{**}	.705 ^{**}	.802 ^{**}	.847 ^{**}	1	.815 ^{**}	.604 ^{**}	.526 ^{**}	.664 ^{**}	.285	.376 ^{**}	.531 ^{**}	.794 ^{**}	
	Sig. (2-tailed)	.002	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.017	.002	.000	.000	
	N	68	68	68	68	68	68	68	68	68	67	68	68	68	68	68	68	68	
Locating reaching time of bus using app	Pearson Correlation	.423 ^{**}	.548 ^{**}	.519 ^{**}	.445 ^{**}	.473 ^{**}	.740 ^{**}	.839 ^{**}	.830 ^{**}	.815 ^{**}	1	.533 ^{**}	.568 ^{**}	.612 ^{**}	.228	.423 ^{**}	.548 ^{**}	.803 ^{**}	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.063	.000	.000	.000	
	N	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	
Behaviour of Mo bus conductors and Drivers	Pearson Correlation	.335 ^{**}	.373 ^{**}	.279 ^{**}	.351 ^{**}	.322 ^{**}	.620 ^{**}	.595 ^{**}	.487 ^{**}	.604 ^{**}	.533 ^{**}	1	.693 ^{**}	.723 ^{**}	.339 ^{**}	.335 ^{**}	.373 ^{**}	.653 ^{**}	
	Sig. (2-tailed)	.004	.001	.018	.003	.006	.000	.000	.000	.000	.000		.000	.000	.004	.004	.001	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Driving by Mo-Bus drivers	Pearson Correlation	.300 ^{**}	.251 ^{**}	.366 ^{**}	.440 ^{**}	.452 ^{**}	.440 ^{**}	.621 ^{**}	.428 ^{**}	.526 ^{**}	.568 ^{**}	.693 ^{**}	1	.795 ^{**}	.251 ^{**}	.300 ^{**}	.251 ^{**}	.629 ^{**}	
	Sig. (2-tailed)	.011	.033	.002	.000	.000	.000	.000	.000	.000	.000	.000		.000	.033	.011	.033	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Adherence to traffic rules	Pearson Correlation	.313 ^{**}	.368 ^{**}	.370 ^{**}	.427 ^{**}	.340 ^{**}	.554 ^{**}	.709 ^{**}	.583 ^{**}	.664 ^{**}	.612 ^{**}	.723 ^{**}	.795 ^{**}	1	.338 ^{**}	.313 ^{**}	.368 ^{**}	.690 ^{**}	
	Sig. (2-tailed)	.007	.001	.001	.000	.003	.000	.000	.000	.000	.000	.000	.000		.004	.007	.001	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Environmental Sustainability	Pearson Correlation	.053	.152	.116	.038	.108	.406 ^{**}	.233	.245	.288	.228	.339 ^{**}	.251 ^{**}	.338 ^{**}	1	.053	.152	.308 ^{**}	
	Sig. (2-tailed)	.661	.202	.332	.751	.366	.000	.056	.044	.017	.063	.004	.033	.004		.661	.202	.008	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
EV	Pearson Correlation	1.000 ^{**}	.758 ^{**}	.674 ^{**}	.690 ^{**}	.391 ^{**}	.321 ^{**}	.472 ^{**}	.476 ^{**}	.376 ^{**}	.423 ^{**}	.335 ^{**}	.300 ^{**}	.313 ^{**}	.053	1	.758 ^{**}	.741 ^{**}	
	Sig. (2-tailed)	0.000	.000	.000	.000	.001	.007	.000	.000	.002	.000	.004	.011	.007	.661		.000	.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Qir quality index	Pearson Correlation	.758 ^{**}	1.000 ^{**}	.752 ^{**}	.674 ^{**}	.541 ^{**}	.443 ^{**}	.509 ^{**}	.595 ^{**}	.531 ^{**}	.548 ^{**}	.373 ^{**}	.251 ^{**}	.368 ^{**}	.152	.758 ^{**}	1	.804 ^{**}	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.033	.001	.202	.000		.000	
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	
Total	Pearson Correlation	.741 ^{**}	.804 ^{**}	.752 ^{**}	.763 ^{**}	.633 ^{**}	.698 ^{**}	.818 ^{**}	.816 ^{**}	.794 ^{**}	.803 ^{**}	.653 ^{**}	.629 ^{**}	.690 ^{**}	.308 ^{**}	.741 ^{**}	.804 ^{**}	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.008	.000	.000		
	N	72	72	72	72	72	70	68	68	68	67	72	72	72	72	72	72	72	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Compiled by authors

Table 5: Descriptive statistics

Statements	Criteria	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Service Quality	Fare	79	1	5	3.444	1.462	-0.624	-0.975
	Cleanliness	79	1	5	3.333	1.364	-0.495	-0.902
	Personal Safety	79	1	5	3.083	1.319	-0.195	-1.079
	Frequency of bus service	79	1	5	3.167	1.364	-0.208	-1.197
	peak hours rush	79	1	5	2.389	1.369	0.714	-0.703
	User friendly app	79	1	5	3.514	1.213	-0.787	-0.302
Cutting Edge Technology	Fare payment option	79	1	5	3.779	1.049	-1.220	1.214
	Locating the bus using app	79	1	5	3.603	1.174	-0.883	0.050
	Locating bus route using app	79	1	5	3.676	1.085	-0.832	0.043
	Locating reaching time of bus using app	79	1	5	3.627	1.204	-0.845	-0.086
	Behaviour of Mo bus	79	1	5	3.556	1.099	-0.603	-0.178
	Driving by Mo-Bus drivers	79	1	5	3.458	1.233	-0.621	-0.429
Community Development	Adherence to traffic rules	79	1	5	3.889	1.001	-1.159	1.377
	Environmental Sustainability	79	1	5	3.792	1.221	-0.877	0.022
	Air Quality Index	79	1	5	3.444	1.462	-0.624	-0.975
Environmental Sustainability	EV	79	1	5	3.444	1.462	-0.624	-0.975
	Air Quality Index	79	1	5	3.333	1.364	-0.495	-0.902

Source: Compiled by authors

Table 6: Analysis of Descriptive Statistics

Statement	Criteria	Mean	Criteria	SD
Service Quality	Fare	High: 3.44	Fare	High: 1.462
	peak hours rush	Low: 2.38	Personal Safety	Low: 1.319
Cutting Edge Technology	Fare payment option	High: 3.77	Locating reaching time of bus using app	High: 1.2
	User friendly app	Low: 3.51	Fare payment option	Low: 1.04
Community Development	Adherence to traffic rules	High: 3.88	Driving by Mo-Bus drivers	High: 1.23
	Driving by Mo-Bus drivers	Low: 3.45	Adherence to traffic rules	Low: 1.001
Environmental Sustainability	Environmental Sustainability (openion)	High: 3.79	EV	High: 1.462
	Air Quality Index	Low: 3.33	Environmental Sustainability	Low: 1.221

Source: Compiled by authors

Table 7: Demographic Profile

<i>Demographic Characteristics</i>		<i>Frequency</i>	<i>Percentage</i>
Gender	Male	41	51
	Female	38	48.1
Age	Below 20	21	26.6
	21 - 30	49	62
	31 - 40	2	2.5
	41 - 50	5	6.3
	51 - 60	1	1.3
	61 - 70	1	1.3
	Above 71	0	0
	Student	58	73.4
Occupation	Govt Employee	1	1.3
	Pvt Employee	18	22.8
	Business	0	0
	Professional	1	1.3
	Others	1	1.3
	Below Matriculation	0	0
Educational Qualification	Intermediate	12	15.2
	Graduate	29	36.7
	Post Graduate	34	43
	Doctorate (PhD)	4	5.1
Income	Below 2.5 Lakh	18	22.8
	2.5 Lakh - 5 Lakh	14	17.7
	5 Lakh - 10 Lakh	2	2.5
	Above 10 Lakh	0	0
	Others(student, not yet employed)	45	57

Source: Compiled by authors

4. RESULTS & DISCUSSION

Maintaining consistent service quality across all routes and schedules can be challenging, as variations may arise due to factors such as traffic conditions, weather, or unexpected incidents. Ensuring that all Mo Bus staff members are adequately trained and updated on customer service standards is crucial. Challenges may arise in keeping the entire team aligned with the organization's service goals. Adapting and integrating cutting-edge technologies into the existing transportation system can pose challenges. Issues such as compatibility, cost, and staff training may arise during the up-gradation process. Ensuring that passengers, including those with diverse technological backgrounds, can easily access and utilize the technological features integrated into Mo Bus services. Engaging with the community to gather feedback and involve them in decision-making processes may be challenging. Effective communication

strategies are needed to reach a diverse audience. Implementing sustainable practices, such as the development of eco-friendly bus stops or charging stations for electric buses, may face obstacles related to infrastructure development and regulatory approvals.

5. SUGGESTIONS

Certainly, here are some suggestions for Mo Bus operators in Odisha to enhance service quality, embrace cutting-edge technology, foster community involvement, and promote environmental sustainability. In terms of service quality the mean of the peak hour rush is low in comparison to other variables. So it is suggested that to increase the number of buses during peak hours. As personal safety is a major concern for the passengers. So, CRUT should focus on enhancing the coverage of CCTV in the bus. Implement regular training programs for Mo Bus staff, focusing on customer service, communication skills, and conflict resolution. Well-trained staff contributes significantly to a positive passenger experience. Establish a system to monitor and evaluate the performance of bus routes, schedules, and staff by collecting passenger feedback in regular intervals. More updation is needed for the existing App to make it more user –friendly. Work towards creating green infrastructure at bus stops, including solar-powered amenities, rainwater harvesting, and green spaces. This not only promotes sustainability but also enhances the overall aesthetics of bus stops. By focusing on these areas, Mo Bus operators in Odisha can create a more robust and sustainable public transportation system that not only meets the needs of the community but also aligns with global trends in technology and environmental conservation.

6. CONCLUSION

The study provides a foundation for an action plan to elevate Mo Bus services further. By addressing the identified areas for improvement, embracing technology, fostering community engagement, and promoting sustainability, Mo Bus can not only meet but exceed passenger expectations. By leveraging the insights gained from this survey, Mo Bus has an opportunity to refine and optimize its services, ensuring a seamless and satisfying experience for passengers while contributing positively to the broader goals of sustainable, efficient, and community-oriented public transportation.

In future research endeavors, the assessment of normalization could be extended by applying a satisfaction evaluation index system across multiple cities. This would allow for a comparative analysis of service quality levels among different urban centers. Additionally, exploring the correlation between passengers' individual characteristics and their perception of service quality could prove beneficial. Such an investigation would contribute to the development of a more scientifically grounded method for evaluating service performance, helping identify specific indicators that may require optimization.

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Empowering Women: A Comprehensive Analysis of Self-Help Groups in Economic Progress

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Abstract: This analytical review examines the impact of self-help groups (SHGs) on advancing women's economic empowerment. The review examines current literature regarding the role of SHGs in improving women's financial autonomy, decision-making authority, influence, and overall welfare. It explores the fundamental ways in which SHGs empower women, the obstacles they encounter, and the possibilities for future studies in this field. SHGs are essential in promoting women's economic empowerment, providing a space for women to work together on financial issues. The review aims to provide insights into the effectiveness of SHGs in advancing gender equality and sustainable development. SHGs act as catalysts for skill development, providing women with opportunities to acquire entrepreneurial expertise and financial literacy. Through collective savings and microcredit initiatives, SHGs empower women economically by fostering financial independence and creating financial independence and creating avenues for income generation.

Keywords: Self-help groups, women's economic empowerment, financial inclusivity, gender equality and sustainable development.

JEL Codes: J16, D63, G21, J78, Q01

1. INTRODUCTION

The emergence of self-help groups (SHGs) for women's economic empowerment has indeed been a notable advancement in recent years. These organizations offer a space for women to unite, combine resources, exchange knowledge and skills, and assist one another in their business ventures. The emphasis on community building and collective action within SHGs aligns well with theories of social capital and collective action.

Social capital theory highlights the value of social networks and relationships in facilitating cooperation and achieving common goals. SHGs, by fostering bonds among members and encouraging collaboration, effectively harness social capital to empower women economically. Through regular meetings, discussions, and joint activities, members build trust, solidarity, and a sense of belonging, which can be instrumental in overcoming barriers to economic empowerment.

Moreover, collective action theory underscores the importance of collective efforts in addressing shared challenges. SHGs provide a platform for women to collectively identify and address economic issues that they may not be able to tackle individually. By leveraging their combined resources, skills, and experiences, members of SHGs can access markets, negotiate better prices for their products, and implement collective projects for the benefit of the entire community.

In addition to tangible economic benefits, participation in SHGs can lead to broader socio-economic empowerment for women. Beyond financial gains, women may experience increased decision-making power, enhanced self-confidence, and greater social recognition within their communities. These non-economic dimensions of empowerment are equally important in transforming gender relations and promoting women's rights and dignity.

However, while there is growing evidence of the positive impact of SHGs on women's economic empowerment, it is essential to critically assess their effectiveness and identify areas for improvement. Factors such as group dynamics, leadership, external support, and institutional linkages can influence the outcomes of SHG interventions. Additionally, attention must be paid to the inclusion of marginalized groups within SHGs, such as women from minority communities or those with disabilities, to ensure that empowerment efforts are truly inclusive and equitable.

Overall, SHGs represent a promising approach to women's economic empowerment, grounded in theories of social capital and collective action. By providing women with a platform to collaborate, learn, and support each other, SHGs have the potential to not only improve individual livelihoods but also contribute to broader socio-economic development and gender equality.

2. REVIEW OF LITERATURE

Sharma and Varma (2008) discussed that empowering women through the entrepreneurial initiatives of Self-Help Groups, along with income-generating activities and entrepreneurship development, presents a viable approach for women's empowerment. Agrawal (2003), in his article noted that in nearly all societies, women possess less power than men, have reduced control over resources and earn lower wages for their labor. Koandal (2024) examined Women's Empowerment via Self Help Groups in Andhra Pradesh, India, focusing on the study of women's empowerment through self-help groups in the Gajwel mandal of Medak District in Andhra Pradesh. Sahoo (2013) examined the topic of Self-Help Groups and Women's Empowerment: An analysis of specific SHGs in his article. The main aim of the study is to examine the operating system of HG for gathering savings, providing credit to those in need, loan repayment, and shaping the views of HG members about enhancing their decision-making authority. Mehta, Mishra, and Singh (2011) examined the role of Self-Help Groups in the socio-economic transformation of vulnerable poor individuals in the Jammu

region. The study's overall findings indicate that the Self-Help Group Bank Linkage Program has markedly enhanced access to financial services for the rural poor, resulting in substantial positive effects on the socio-economic status and poverty alleviation of SHG members and their families. Mohanty and Mishra (2018), in their article examined Self-Help Groups and Women Empowerment: A Study of Khordha District in Odisha. The purpose of the study is to analyze the functioning of SHGs and to comprehend the effects of SHGs on the psychological, economic, and social well-being of women in rural areas.

Kumar *et al.*, (2021) emphasized that over the past three decades, women's groups have rapidly gained prominence as rural social and financial institutions, particularly in South Asia. In India, many women's groups programs are implemented through self-help groups (SHGs). SHGs are groups of 10–20 women that meet at regular intervals to deposit money into a group-held account from which loans can be requested in times. Dutta (2015) identified that in India, around 70% of people reside in villages. Most residents of rural areas continue to be shut out of financial inclusion. SHGs, a government program, offer their members some financial support. The growth of savings accounts, credit, and Kisan credit cards is indicative of broader social and economic progress, which fuels the daily expansion of SHGs and their growing financial ties. Hossain *et al.*, (2022) found that the collectivization of women into self-help groups (SHGs) for their socioeconomic empowerment has received a lot of attention and legislative support over the past three decades, and as a result, the number of SHGs in the nation has increased. Sharma & Kanta Varma (2008) viewed that in order to support the general development of society, women must be empowered by improving their awareness, knowledge, abilities, and efficiency in using technology. The idea of Self-Help Groups (SHGs) is turning out to be a useful tool for empowering women. SHGs are groups for the impoverished in rural areas, especially women, that provide microloans so they can start their own businesses. Desai & Joshi (2014) studied that Many nations are working to organize the impoverished through “self-help groups” (SHGs), membership-based organizations that seek to foster social cohesion through a combination of education, financial access, and connections to broader development initiatives, in response to the issues of high coordination costs among the poor. Das (2015) defined, A self-help group (SHG) is a village-based financial intermediary usually composed of 10–20 local women. Self-help groups (SHGs) have appeared as popular method of working in the company of people in recent years. This movement comes from the people's desires to meet their needs and determine their own destinies through the principle “by the people, for the people and of the people”. Tesoriero (2006) opined that SHGs have emerged as a prominent, significant, and successful tool for empowering women in regions of the majority world. When implemented in supportive partnerships and along participative lines, they can help Indian women's strengths move them from marginalization to becoming change agents and engaged citizens. Shukla & Narayan (2024) observed that Microfinance and self-help

groups (SHGs) have emerged as powerful tools for promoting economic empowerment and inclusive development, particularly for underserved populations. Suprabha (2014) viewed that only when microfinance is utilized to support the growth of revenue-generating microenterprises can it be a strategic tool for reducing poverty. Since SHG members are from the weaker and poorer segments of society, the organization's future and existence ultimately rest on its ability to graduate toward microenterprise growth in order to generate revenue and raise its members' standard of living. Rao (2024) opined that in India, self-help groups (SHGs) play a crucial role in both community development and microfinance. They are small, unofficial groups of people who get together to discuss shared problems and strive for mutual growth. They are typically from comparable socioeconomic backgrounds. SHGs give their members a place to save money, get credit, and take part in a range of revenue-generating activities. These organizations usually receive backing from financial institutions, NGOs, and government agencies. Al-Kubati & Selvaratnam (2023) found that with approximately 10 million self-help groups covered, the Self-Help Group Bank Linkage Program is currently the biggest microfinance initiative in the world. Swarnalatha & Anuradha (2017) suggested that the SHG-Bank Linkage Program has greatly enhanced rural poor people's access to financial services, improved socioeconomic conditions, and reduced poverty among SHG members and their households. Additionally, it has significantly boosted the self-confidence of women members and led to beneficial behavioural changes in the post-SHG era compared to the pre-SHG era. After joining SHG, all respondents (100%) reported better financial circumstances. Sundaram (2012) have also identified that the Self-Help Group (SHG)-Bank Linkage Program is becoming a viable and affordable way to offer financial services to the "Unreached Poor." It has been successful in addressing the financial needs of rural impoverished women while also enhancing their collective self-help capabilities, which has resulted in their empowerment. Gupta & Singh (2012) confers that NABARD's SHG-Bank Linkage Program has become the nation's main paradigm for offering Micro-Finance (MF) services. Raman *et al.*, (2019) viewed that Self-help groups that empower women will benefit not only the women and women's organizations but also the families and community at large by fostering collective action for development. Chandra (2023) opined that in order to prove their status, women's empowerment has become a popular topic in recent years. The analysis's objectives are to replicate the social impact of women's self-help groups, examine shifts in the social clause of SHGs, evaluate how SHGs affect people's social standing, and discern how people feel about SHGs and their social impact. Women now have a vital sense of self-assurance in their pursuit of independence because to the revolutionary impetus of SHGs. Narang (2012) found that in many regions of the nation, SHGs and women have been successful in integrating women into the decision-making process. In our nation, Self-Help Groups (SHGs) have emerged as a source of inspiration for women's welfare. SHG formation is a practical way to accomplish rural

development goals and get community involvement in all programs related to rural development. Bhatia & Matloob (2024) found that Microfinance's impact on poverty and socioeconomic vulnerability contributes to women's empowerment by enabling group-based microloans. Brody *et al.*, (2017) reveals that while SHG membership may initially lead to conflict in households, particularly between husbands and wives, it does not, over time, contribute to domestic violence. Additionally, meta-analysis shows no indication of statistically significant effects of SHGs on the likelihood of domestic violence. R & Delrose Noronha (2023) found that Women in the agarbatti sector have seen substantial social improvement because of empowerment through SHGs. The SHGs serve as forums for solidarity, information exchange, and capacity building. They offer a network of support that empowers women to express their thoughts, exchange stories, and look for answers to shared problems. Jaiswal *et al.*, (2024) conducted a systematic review on women empowerment through SHG. The study highlights 21 important antecedents and early results of women's empowerment through self-help groups, along with six major characteristics of women's empowerment and the indicators that go along with them. To enhance the conversation on this crucial topic, the study also suggests six potential directions for further research. Sandhu (2015) opined that through the use of Self-Help Groups (SHG), women's economic empowerment can be formalized. The SHGs are distinguished by their concentrated efforts to provide job prospects through training to produce both revenue and employment. SHGs are currently the biggest Microfinance (MF) program globally. Because empowerment is one of the most important components of reducing poverty. With the aid of an NGO, ten self-help organizations were established in the Jalandhar District's villages of Lohiyan and Rerwan to increase women's access to the economy. Mandal (2013) concluded that the SHG approach gives women access to educational programs and raises knowledge of topics like family planning, literacy, and drinking water and sanitation. Additionally, the organization facilitates women's interactions with one another and increases their involvement in various developmental activities. Women can take social action against drunkenness, illiteracy, and other social evils since they are empowered with information resources. Karunarathne & Praveena (2024) focuses on how Self-help Groups (SHGs) affect women's empowerment, particularly in the setting of a multiethnic hamlet in the Paschim Medinipur district of West Bengal's Janglemahal area. The authors emphasize that since the 9th Five Year Plan, women's empowerment has been a crucial tactic in India's development process, and the SHG approach has grown in popularity as a way to achieve this goal, especially among the impoverished. Mishra & Pati (2023) opined that in rural households where men predominate, it is an essential tool for women to build self-esteem. Additionally, the SHG membership promoted institutional loan sources and made them easier to acquire. SHGs emerged as a powerful instrument for ending poverty and empowering the weak in the new economic era.

3. OBJECTIVES OF THE STUDY

1. To assess the impact of Self-Help Groups on women's empowerment.
2. To analyze the facilitation of income generation activities, entrepreneurship development, and access to financial services such as microcredit and savings.

4. RESEARCH METHODOLOGY

The study is of a descriptive kind and employs both primary and secondary information. The area chosen for study is the Mayurbhanj District of Odisha, which has a notable tribal population that makes up over 60% of the entire population. Respondent's data is gathered from 90 participants in Mayurbhanj district, covering a wide array of demographics such as age, occupation, income level, risk tolerance, leadership skills, and decision-making abilities. The respondents who were surveyed are chosen at random. Secondary data is sourced from multiple references such as books, journals, websites, and other pertinent literature.

5. DATA ANALYSIS

Table 1: Age of Participants

<i>Age</i>	<i>Frequency</i>	<i>Percentage</i>
Below 25	15	16.67
25-50	35	38.88
50-75	30	33.33
Above 60	10	11.12
Total	90	100

Source: Authors' Own Compilation

The table shows that 38.88% of participants are aged between 25 and 50 years, 33.33% are within the 50 to 75 years age bracket, 16.67% are below 25 years, and 11.12% are older than 60 years. It seems that most women in SHGs are relatively.

Table 2: Educational background of the participants

<i>Educational level</i>	<i>Frequency</i>	<i>Percentage</i>
No formal education	32	35.56
Primary	19	21.12
Upper Primary	11	12.23
Secondary	13	14.45
Higher Secondary	7	7.78
Graduation	08	8.88
Total	90	100

Source: Authors' Own Compilation

The table above illustrates that 35.56% of respondents have no formal education, while 21.12% have completed primary education. Additionally, 12.23% of respondents have attained upper primary education, 14.45% have completed secondary level education, 7.78% have achieved higher secondary education, and 8.88% hold a graduate degree.

Table 3: Category of the respondents

<i>Category</i>	<i>Frequency</i>	<i>Percentage</i>
OBC	10	11.12
SC	22	24.44
ST	58	64.44
Total	90	100

Source: Authors' Own Compilation

The table above indicates that 64.44% of the respondents belong to scheduled tribes, 24% belong to scheduled castes, and 11.12% belong to the Other Backward Class category. Therefore, according to data given in the table, most of the respondents come from marginalized communities.

Table 4: Occupation of the participants

<i>Occupation</i>	<i>Frequency</i>	<i>Percentage</i>
Agriculture	20	22.22
Unemployed	40	44.44
Other	30	33.34
Total	90	100

Source: Authors' Own Compilation

The table indicates that 44.44% of the respondents are unemployed, 33.34% belong to other sources of income, and 22.22% are engaged in agriculture. Therefore, the majority of respondents are involved in agricultural occupations.

Table 5: Income of the respondents

<i>Income</i>	<i>Frequency</i>	<i>Percentage</i>
Less than 4000	23	25.56
4001-6000	49	54.44
6001-8000	10	11.12
8000 above	8	8.88
Total	90	100

Source: Authors' Own Compilation

The table illustrates that 54.44% of respondents earn less than 4000 rupees, while 25.56% earn between 4001 to 6000 rupees. Additionally, 11.12% of respondents earn between 6001 to 8000 rupees, and 8.88% earn above Rs 8000.

Table 6: Factors/Reason for joining self-help groups

<i>Factors/Reason</i>	<i>Frequency</i>	<i>Percentage</i>
Family Support	30	33.34
Increased Saving	13	14.45
Access to loan	17	18.88
Use For business	12	13.33
Other purposes	18	20
Total	90	100

Source: Authors' Own Compilation

Self-help groups (SHGs) are frequently joined for a range of reasons, as indicated by the data. The primary factor is family support, representing 33.34% of those surveyed, indicating that numerous individuals participate to fulfil family expectations or enhance household welfare. Access to loans serves as another key motivator, as 18.88% joined for this reason, underscoring the importance of SHGs in offering financial support. Likewise, 20% of participants engage for different reasons, indicating a range of individual or community needs. An increase in savings (14.45%) and the utilization of funds for business (13.33%) suggest that many consider SHGs as avenues for economic empowerment and entrepreneurial opportunities. Overall, the data underscores the multifaceted benefits SHGs offer to members, from financial access to personal and familial support.

Table 7: Investment to grow money

<i>Investment purpose</i>	<i>Frequency</i>	<i>Percentage</i>
Yes	56	62.23
No	34	37.77
Total	90	100

Source: Authors' Own Compilation

The information indicates that a substantial majority of people, 62.23%, engage in self-help groups (SHGs) for the purpose of investment. This suggests that numerous members perceive SHGs as a dependable avenue for financial development and resource sharing to reach sustainable economic objectives. On the other hand, 37.77% do not participate in SHGs primarily for investment purposes, indicating that these individuals might prioritize other advantages like social support, loan access, or urgent financial requirements. The results

emphasize the twofold function of SHGs in tackling both investment-related and non-investment incentives of their members.

Table 8: Respondents' awareness regarding society and community

<i>Awareness</i>	<i>Frequency</i>	<i>Percentage</i>
Yes	65	72.23
No	25	27.77
Total	90	100

Source: Authors' Own Compilation

The data reveals that most respondents, 72.23%, recognize societal and community concerns, reflecting a high degree of awareness and involvement with their environment. This awareness indicates that many people in the group are probably knowledgeable about social dynamics and might actively engage in community-related activities or decisions. Conversely, 27.77% of those surveyed do not possess this awareness, suggesting potential deficiencies in information access or restricted engagement with societal issues. These findings highlight the need to enhance awareness among all participants to encourage more inclusive and knowledgeable community involvement.

6. FINDINGS

The highest age group among respondents is 25-50 years, accounting for 38.88%, while the lowest age group is above 60 years, comprising 11.12% of the respondents. 35.56% of respondents have no formal education, while 7.78% have completed higher secondary education. 64.44% of respondents belong to Scheduled Tribes (ST), and 11.12% belong to Other Backward Classes (OBC). 44.44% of respondents are unemployed, and 22.22% are engaged in agriculture. 54.44% of respondents have an income ranging from 4001 to 6000, while 8.88% have an income above 8000. 33.34% of respondents seek family support, and 13.33% engage in business activities. 62% of respondents invest their money to grow it, while 37.77% do not invest for growth. 72.23% of respondents are aware of society and community, while 27.22% are not aware.

7. CONCLUSION

In conclusion, the comprehensive analysis of self-help groups (SHGs) in economic progress reveals their profound impact on empowering women and fostering inclusive development. Through SHGs, women gain not only financial independence but also cultivate entrepreneurial skills and expand their social networks. However, while SHGs present immense opportunities for women's economic empowerment, challenges persist, necessitating sustained efforts for

optimization. Future endeavors should focus on longitudinal studies to gauge long-term impacts, policy analysis to strengthen supportive frameworks, and innovative interventions to enhance SHG effectiveness. By addressing these aspects, SHGs can continue to serve as transformative platforms, driving significant strides in women's economic empowerment and contributing to overall socioeconomic progress.

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Mapping the Research Landscape of Home Decor Consumer Behaviour: A Bibliometric Approach

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Abstract: The paper aims to analyse the trend of research, top cited authors, top cited documents and important themes in the area of customer behaviour for home décor products through bibliometric analysis. The data for this study has been collected from Dimensions database. We have considered 91 documents for this study. These documents were analysed with the Biblioshiny software. The study will be helpful for the future researchers in choosing the right themes and direction.

Keywords: Home Decor Market, Consumer Behaviour, Sustainability in Home Décor, Interior Design Trends

JEL Codes: M31, D12, L81

1. INTRODUCTION

A good atmosphere and positive environment lead to a home heaven. Everyone wants a decorated home which provides them with a comfortable and peaceful time with their family member. Home decoration items transform your house into a beautiful home which may have a positive impact on your mood and influence your personality by providing a comfortable, relaxing and attractive environment. A well-decorated home can contribute to reducing stress and enhancing your spirit. Under home decoration, many items were included like wall art, wall décor, decorative mirrors, vases and flora arrangement, decorative pillows and throws, rugs and carpets, photo frames, decorative lights etc. In today's competitive market, there are many factors such as social, economic, personal, cultural and psychological factors which may affect consumer attitude, perception and buying behaviour towards any product. There is a rise in demand for home decoration items due to innovative products and the shifting of preferences of people towards urbanisation. Change in the lifestyle of people leads to more demand for home decoration product which influence the market to grow more. The world's home decoration market size was valued at USD 647.4 million in 2022, and it is estimated to grow to USD 1.1 billion by 2032. Moreover, we can estimate the highly increasing demand and growth of the market in the home décor industry. The trendy, fashionable and customised

home décor products influence the customer to purchase more. In this context, the present study attempts to explore the trends, important themes and top cited documents through bibliometric analysis.

2. PRIOR LITERATURE

Luo & Yang (2019) examined the effect of socio demographic characteristics of consumers of China, on homeland products with regard to Swedish furniture and home decoration products and its effect on purchasing habit of consumer. The study found that various factors like age, education and multinational experience, scale of city have a significant effect on the origin product of the country. On the other hand, income of the person and their age has no significant influence on purchasing original product. The study used the quantitative method of research and collected data through a questionnaire. A pilot test survey was also conducted before regulating the final study. By applying Convenience sampling of Non – Probability Sampling method data has been collected. For data analysis Partial Least Square (PLS) path modelling through smart PLS 3 software and SEM- PLS were used. Zahang (2019) analysed the buying behaviour of female in U.S country towards home décor & textiles. The study also based on effect of price and fashion on consumer purchasing behaviour with referencing to different group of people. The research applied descriptive analysis and ANOVA, Correlation for analysing and interpreting the data. The data has collected through questionnaire and Likert scale were used to measuring the questions. Aspfors (2010) studied the customer's attitude towards the store, product image and different services. The study also analysed the best way to develop the business by providing best services after sale to the customer. The author considered the retail shop relating to furnishing and interior planning. The research is based on descriptive study by collecting data through quantitative questionnaire. Various research methods like Telephone interviews, Personal interviews, Self-completion questionnaire, Depth interview and Focus groups were used. The data collected were analysed by applying SPSS and Excel. The study found that existing customer have positive attitude towards the image of the store.

Pomeltsova (2017) studied the taste and preference of customers towards home decor products. The study is based on qualitative research by taking into account various features like people's lives, their perspective and contextual conditions of people. The study revealed that the taste of consumer relating to home décor products are influenced by social groups around them, and meeting outside for dinner, for moving together etc. Lack of finance is also a factor which have an effect on buying behaviour of home decoration products. Nigar (2021) examined the customer's decision towards purchasing of furniture in relation to studying various factors affecting the buying attitude like demographic factors, price, quality & comfort of production, furniture material and design, brand image and equal monthly instalment facility, store display etc. The research was conducted in Bangladesh. The collected data were analysed

with the help of SPSS by using questionnaire. The study revealed that the buying behaviour of consumer for furnishing product are affected by mentioned factors and customer are aware about the factors. These factors can help the companies to build a competitive position. Gurzel (2020) studied the perception and preferences of consumer towards wooden products and furniture in the area of Kayseri (Turkey). The paper was based on effect of various factors like knowledge, attitude, demographic factors and income level of consumer on buying behaviour of customers on wooden product. The study used one way ANOVA for analysis of data. The result found that higher income level people preferred more wooden products which provides more mental and emotional relaxation as compare to other product. Khare (2011) studied the mall shopping behaviour of consumers in a small city. The study has also analysed the factors influencing behaviour on the basis of different age group & gender. ANOVA test was used to analyse the data. The result of the research shows a positive impact of buying behaviour on factors on the basis of age & gender. Various factors like décor, layout, services, entertainment facility & variety of stores have more effect on consumer's buying behaviour.

Dash (2018) analysed the effect of attitude and lifestyles of consumers on online shopping. The research was conducted in Bhubaneswar, Odisha. The data collected were analysed by using ANOVA and Factor analysis and SPSS. The author used Convenience Sampling method for collection of data which is based on Likert scale through a questionnaire. The result of the paper showed that combination of attitude and lifestyle has a positive impact on online shopping through mobile phones. Only attitude has no impact and only lifestyle has more impact on buying behaviour of customer through online mode. Kanungo et al. (2020) studied the socio-economic status, welfare schemes, and the employability structure of Pattachitra artist in Puri district of Odisha. The study also focused on various problems faced by the artist in their sustainability of crafts. The data collected through purposive sampling. The data collected through purposive sampling. The results emphasized the capital requirement, decision making power of women, use of machine tools are the main problem for developing the handicraft product. The author suggested that government should provide more financial help and subsidies for raw material. Pani & Pradhan (2016) explored the preference of consumers towards purchasing tribal handicrafts products. And impact of various demographic factors like age & gender. The study was conducted in Rayagada district during Chaiti festival. The research is a descriptive research & collected data by five point likert scale. Various statistical tools like Mean, Standard deviation, ANOVA, Regression analysis & SPSS were used for analysis. The data revealed that age and gender have no significant effect on the buying habit of consumer for handicraft product. But the design of product, their creativity and cultural influences and impact of eco-friendly product has more impact on consumer buying behaviour.

Dhal & Majhi (2024), analysed the behaviour of customers towards shopping malls in the twin cities of Odisha that is Cuttack & Bhubaneswar. The paper focused on various

social, cultural, economic factors which may affect the customer's decisions, perceptions & satisfaction levels. The study also relates to effectiveness of marketing strategies towards shopping mall. For collecting data Purposive Random sampling have adopted and analysed by using ANOVA, Regression analysis, Factor analysis & Correlation analysis. The research found that service quality and shopping expenses has positive effect on buying behaviour. There is a significant association between brands, promotional activity and consumer buying behaviour etc. Paul (2017) analysed the opinions of consumer in relation to interior design products made from handlooms. The paper also focused on awareness levels, preferences & satisfaction of consumers regarding this product. Data were collected from Secondary sources. The result of the study specified that the young generation at present are not much attracted to handloom products, due to the lack of new designs, colours and expense than other products.

Mishra & Das (2021) studied the effect of Sambalpuri handloom on the growth of income, employment and financial obligation of the weavers. The study was conducted in the Bargarh district of Odisha. Data were collected through weavers through questionnaires. Pradhan (2012) analysed the impact of income and employability on the consumption habit of rural people under the Sundargarh district of Odisha. It also emphasized the factors affecting the consumption pattern in rural people. An engle ratio used for every item of expenditure to total expenditure has been estimated. Bansal & Dewan (2017) studied the buying behaviour of Hindu working women of Uttar Pradesh. The paper also studied the clothing style and costume accessories used among these working women. The researcher revealed that the Hindu working women have varieties in their taste of clothing according to their situation that is on the basis of duty, functions and home.

Mahmoud Al-Azzam (2014) examined the purchasing behaviour of home furnishing products. The study also analysed the impact of socio-demographic factors on consumer's decision-making on buying such products. The study is based on a quantitative research method and collected data through questionnaire in the area of Jordan (Amman). For analysis of data various statistical technique like SPSS, Correlation, Regression and Factor analysis were applied. The paper revealed that the reference group, family, price and quality, colour factors were the most important factor to determine the consumer behaviour towards home furnishing product. Dogli (2013) examined the relationship between interior design and company image. The paper also studied the effect of interior design on customer perception towards the company. The research was based on the interior design of Garanti Bank. Tang et al. (2023) analysed the relationship between consumer satisfaction and various factors like aesthetics, ease of use & information quality in digital marketing. The study analysed the data by using Structural equation modelling which interpreted that these factors mentioned have a positive impact on customer satisfaction with an Interactive virtual reality (IVR) interior design. The data were analysed by using SPSS, IBM and AMOS. Amin & kumar (2023)

studied the in-store customer perception towards home furniture. The paper also analysed various factors affecting customer perception for purchasing home furniture. The paper found that for better sale of customised furniture at the retail level every retailer should adopt a selling model which is developed by the author known as the ABCD model that is also known as Advantages, Benefits, Constraints, and Disadvantages. Under Advantages, it covered employment opportunities, increasing number of work from home, maximum number of people transferred to another place and operational maintenance is very low. Benefits model includes variety of furniture at low rate, well trained employee, and customised furniture with more choices of colours and design. On the other hand, under various Constraints like high establishment cost of furniture showroom, high delivery cost, fluctuating prices of furniture should be considered. Like competitive prices of rival firms, unemployment and payment of EMI's on time, creation of unique product and fulfilment of changing govt. policy are the most important disadvantages which should be taken into consideration.

3. METHODOLOGY

The research data required for this study was collected from the Dimension database for the period from 2005 to 2024. The study has applied bibliometric analysis tools with biblioshiny by observing the previous studies. The keywords used for the search are "Home decoration" and "consumer behaviour". We have considered 91 documents for this study. These documents were analysed with the Biblioshiny software.

4. RESULTS AND DISCUSSIONS

Table 1 presents the trend of the research. It can be observed that the trend is increasing.

Table 1: Trend of Research

<i>Year</i>	<i>Articles</i>
2005	1
2006	1
2008	1
2009	4
2011	1
2012	5
2013	1
2014	4
2015	2
2016	2
2017	6
2018	1

<i>Year</i>	<i>Articles</i>
2019	6
2020	13
2021	8
2022	6
2023	14
2024	15

Source: Compiled by author

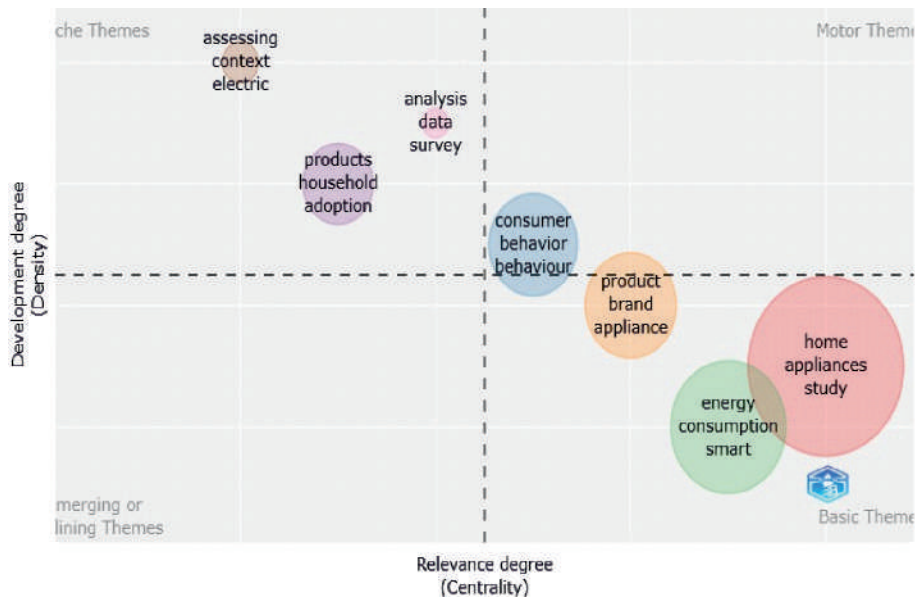


Figure 1: Thematic map based on density and centrality

Source: Author's compilation

The depiction in Figure 1 classifies research fields according to their density (development level) and centrality (relevance). While “consumer behavior” and “product brand appliance” reflect new conversations, the big cluster on “home appliances study” points to fundamental research. Specialized topics such as “assessing context electric” draw attention to certain methods of analysis. In order to map the academic ecosystem and provide insights into the market dynamics and consumer preferences of Odisha, your study will examine publishing patterns, prominent authors, and recurrent keywords. The study finds important themes, significant fields of study, and new trends using bibliometric mapping. Research subjects are categorized in the graphic according to density (degree of development and specialization) and centrality (relevance to the larger field). In this particular context: Fundamental Themes: Less established but highly relevant themes, such as “home appliances study,” point to basic research fields

influencing consumer decisions. Themes for Motors: Well-developed and important themes, such as “consumer behavior,” suggest considerable research momentum. Niche Themes: Less relevant yet extremely specialized themes like “assessing context elect...”

Country Scientific Production

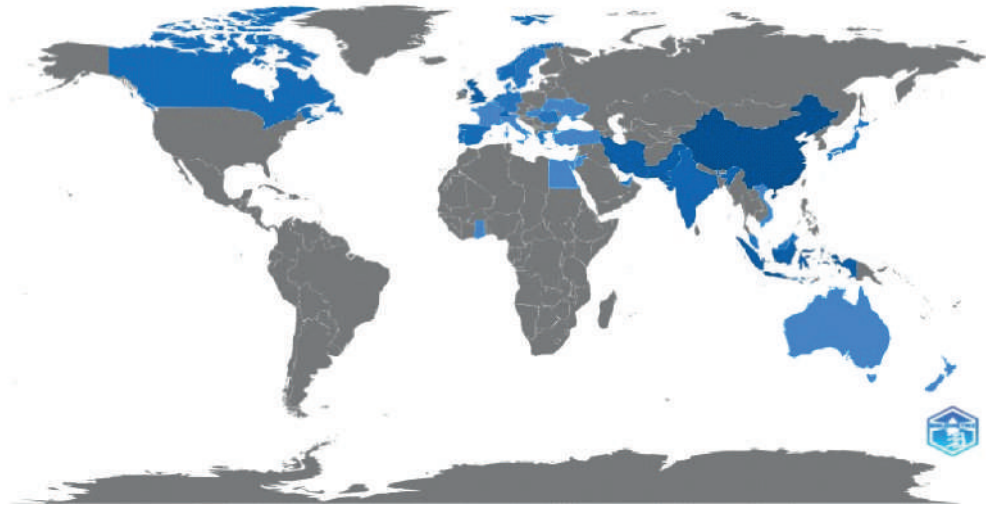


Figure 2: Country Scientific Production

Source: Author's compilation

Global research contributions in the areas of consumer behavior and home décor purchases are depicted in Figure 2's "Country Scientific Production" map. The blue-highlighted countries are those that are actively creating scientific literature on the topic, whereas the gray-highlighted countries have little or no published works. Principal Contributors: The countries that do the most scientific research include the United States, China, India, and a number of European countries, including the United Kingdom, Germany, and France. These nations are renowned for their robust research funding and academic institutions. Canada and Australia also make substantial contributions, demonstrating their importance in research on consumer behavior. Emerging Research Hubs: Several nations in the Middle East (Turkey, Iran, and Saudi Arabia) and Southeast Asia (Malaysia, Indonesia) exhibit rising contributions. This implies an increased interest in consumer market studies, potentially due to economic expansion and altering customer tastes. The low participation of many South American and African countries suggests either a lack of interest in this field of study or underrepresentation in international databases. By pointing researchers toward significant studies, joint ventures, and gaps in the literature, this map assists in identifying important research-producing nations. It draws attention to the

wider academic environment and possible cross-regional comparisons for a research centered on Odisha, India.

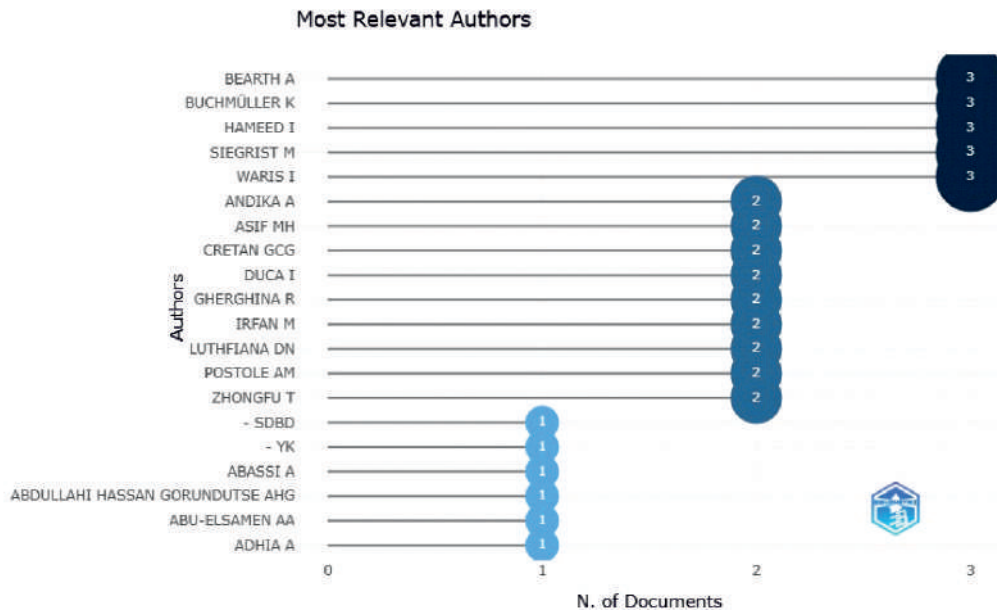


Figure 3: Most relevant authors

Source: Author's compilation

Important contributors to studies on consumer behavior, home décor purchases, and related topics are depicted in Figure 3. Authors are ranked according to the quantity of papers they have contributed to the field in the horizontal bar chart. Principal Contributors: The most prolific authors are Siegrist M, Waris I, Hameed I, Bearth A, and Buchmüller K, each of whom contributed three documents. The study of consumer behavior, brand image, home appliance energy efficiency, or purchase decisions has benefited greatly from the work of these scholars. Moderate Contributors: Each author has written two papers, including Andika A, Asif MH, Cretan GCG, Duca I, Gherghina R, Irfan M, Luthfiana DN, and Postole AM and others. Their work probably focuses on certain facets of market trends, product acceptance, or customer preferences. Emerging Contributors: A number of writers have contributed one document each, including Abu-Elsamen AA, Adhia A, Abdullahi Hassan Gorundutse AHG, Zhongfu T, SDDDB, YK, and Abassi A. These writers can be fresh to the industry or have studied specialized subjects like home décor and consumer behavior. Relevance to Bibliometric Analysis: The work of important thought leaders in the field can be used as a basis for more study, and this ranking aids in identifying them. It is easier to investigate co-citation networks, collaboration patterns, and knowledge gaps in the subject when one is aware of significant

authors. An examination of the writings of the leading contributors may yield important theoretical and empirical insights if your research focuses on the purchasing habits of Odisha consumers. In conclusion, the most significant academics and possible partners are identified by this bibliometric study, which aids in mapping research production in the subject.

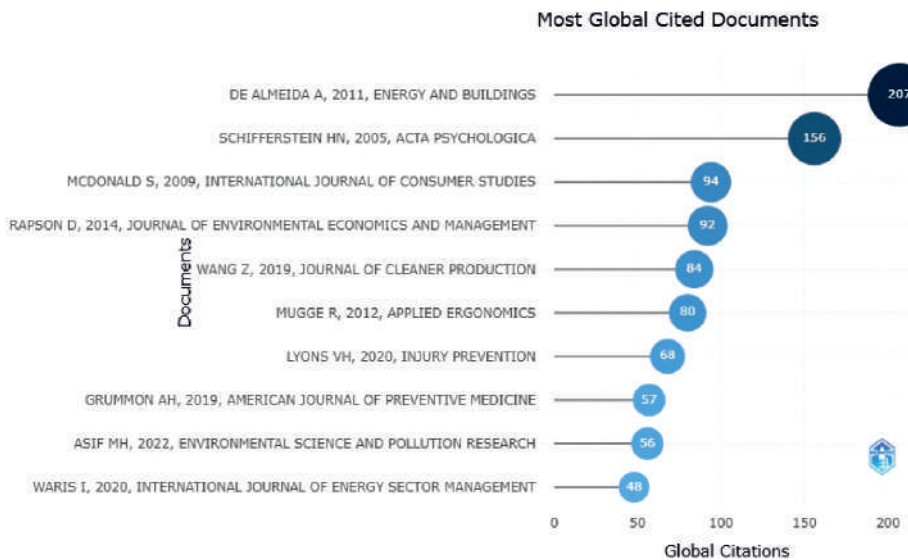


Figure 4: Most Global Cited Documents

Source: Compiled from Biblioshiny

In a particular field of study, Figure 3 shows a bibliometric examination of the most widely referenced papers. It aids in comprehending the most significant research according to the quantity of worldwide citations obtained. With 207 citations, the most referenced work is De Almeida (2011), which was published in Energy and Buildings. Other widely referenced works on psychology, consumer studies, and environmental economics include Schifferstein (2005), McDonald (2009), and Rapson (2014). The influence of the work on influencing future research increases with the number of citations. While fresh articles (Asif, 2022) are still getting recognition, older works (Schifferstein, 2005) have had more time to amass citations. Major research interests are shown by the dominance of papers on energy, the environment, consumer behaviour, and ergonomics. Reviews of the literature, the identification of foundational publications, and the tracking of the development of research can all benefit from this data.

CONCLUSION

The study finds that the research trend in the area of consumer behaviour on home décor product is increasing suggesting that researchers should explore more in this area. countries like

USA, China and India are most productive counties in the area of consumer behaviour and home décor products. Themes like consumer behaviour, brand and energy consumption are found to be important. So future researchers should focus on these themes.

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The Impact of Digital Learning on Student Literacy and Engagement in the 21st Century

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Abstract: The paper aims at analysing a comprehensive picture of the changing nature of education through students' digital literacy and engagement. The study explores the impact of technology integration on students' digital literacy. This study also aims to study the impact of technology integration on students' engagement. The results offer significant perspectives to educators, policymakers, and educational technology developers, enabling them to make evidence-based choices that maximise the integration of technology in educational environments. Through a knowledge of the complex relationships between digital literacy outcomes and technology use, educators may create a learning environment that embraces technological innovations while simultaneously giving students the essential digital skills they need to succeed in the digital age.

Keywords: Students, Digital Learning, Literacy, Engagement, Technology.

JEL Codes: I21, I23, O33

1. INTRODUCTION

Technology integration has become a revolutionary force in the ever-changing educational scene, transforming old pedagogical techniques and igniting a new era of learning (Buckingham, 2015; Biag & Castrechini, 2016). Education and technology have come together to alter the classroom experience (Maier, 2015) and play a major role in improving students' digital literacy and engagement (Bryk *et al.*, 2010). The objective of this study is to analyse the multiple impacts of technology integration on students' digital literacy and engagement (Barton, 2001; Hague & Payton, 2010; Valli *et al.*, 2018). In the twenty-first era, digital literacy—which includes the capacity to assess, produce, and communicate information in a variety of digital formats—has grown to be an essential talent (Crawford, 2011; Cavanagh, 2017). The task of equipping children to adapt to an increasingly digital and information-driven culture falls to teachers as technology continues to advance at an unparalleled rate (Hobbs, 2010; Bulger *et al.*, 2014). Teachers, administrators, and stakeholders must know the effects of technology integration on students' digital literacy (Lee, 2014; Nogueron-Liu, 2017). The

term “technology integration” defines the process of integrating digital resources, tools, and apps into learning environments to improve communication (Anderson-Butcher *et al.*, 2018). The opportunities for integrating technology into a course of study are boundless, ranging from fully engaged modelling techniques and educational software to interacting smart boards and virtual forums for collaboration (Harkavy & Hartley, 2009; McCloskey *et al.*, 2018). This study looks at how students’ learning and application of digital literacy abilities are influenced by the ethical utilisation of technology in the learning environment (Mossberger *et al.*, 2012; Officer *et al.*, 2013). Moreover, a key component of this research is how technology influences student engagement. Participation (Kearns, 2017) in educational events is only one aspect of student engagement; further characteristics include learners’ level of dedication, desire, and determination (Jacobson, 2018). It is suggested that integrating technology into education can provide students with a variety of engaging and dynamic learning opportunities, which may result in an overall shift (Epstein, 2019) in the education system just like during the pandemic-19. Through an examination of the relationship between technology integration and student involvement, this study seeks to throw light on the multidimensional variables that exist today in modern education (Blank *et al.*, 2012).

Generation Z and Alpha, who were reared in digital environments, have great digital literacy, which boosts student engagement. Gen Z values interactive, gamified learning, whereas Gen Alpha thrives on AI-powered, immersive education. Digital tools encourage participation by incorporating multimedia, customisation, and instant feedback, resulting in dynamic, accessible, and technology-integrated learning experiences for both generations (Cirilli *et al.*, 2019). Generation Z (born 1997-2012) are digital natives who lived up with smartphones, networking on social media, and immediate accessibility. They are technologically adept, diverse, and socially concerned, campaigning for inclusivity, sustainability, and psychological awareness while incorporating digital learning, entrepreneurial activity, and global connectedness into their daily lives (Gentina, 2020). Generation Alpha (2013-2025/2030) is the first generation to grow up completely in a world dominated by automation, robotics, artificial intelligence (AI), and advanced learning technologies. Grown along with smart devices, digital assistants, and fully immersive devices, they are projected to be exceptionally equipped with technology age. Their education, social relationships, and everyday activities are all strongly affected by digital advancements and automation (Ziatdinov & Cilliers 2022). In this context, the study wants to explore the impact of technology integration on students’ digital literacy and the impact of technology integration on students’ engagement.

To do this, the study will employ a qualitative examination of the learning experiences of the students. Therefore, it is necessary to learn how technology integration affects students’ digital literacy and engagement as the world of education changes (Anton *et al.*, 2016; Valli *et al.*, 2016). The goal of this research is to provide useful information that will help teachers

decision-makers, and researchers optimise the use of technology in the classroom and develop a generation of digitally literate, actively engaged students who are ready to take on the challenges of a rapidly changing digital environment.

2. REVIEW OF LITERATURE

2.1. Technology Integration and Students' Digital Literacy

The fast-evolving nature of modern education calls for the use of technology and the development of digitally literate students (Barton, 2001; O'Malley *et al.*, 2005). For use in classroom settings and student learning, mobile technology, digital storytelling, augmented and virtual reality, and blended learning are just a few of the tools, activities, and platforms that are always evolving (Anderson-Butcher *et al.*, 2018). The use of cell phones and cell phones has mostly transformed Internet access, communication strategies, and education (Starr, 2018). According to research, 91% of students report occasionally using a mobile device to access the Internet, and 90% of students send and receive text messages (Racz, Johnson, Bradshaw, & Cheng, 2017). In the modern educational environment, integrating technology into learning environments has emerged as an essential approach for changing conventional teaching approaches (Blank *et al.*, 2012). Technology and education together have the potential to develop students' digital literacy, which is a necessary skill set for negotiating the complexity of the information age of the twenty-first century (Bryk *et al.*, 2010; Buckingham, 2015). The capacity to use digital tools and platforms for information creation, communication, and critical evaluation is referred to as digital literacy (Epstein, 2019). In a time when knowledge is plentiful and changing quickly (Dryfoos & Maguire 2019), students need to become adept at locating, evaluating, and combining digital content (Heers *et al.*, 2016). Technology integration acts as a spark to develop these abilities by giving students the resources they need.

2.2. Technology Integration and Students' Engagement

Technology integration plays an essential role in assessing the most recent developments in digital learning (Greene *et al.*, 2014; Hanies *et al.*, 2015) as well as the forecasts for the eventual integration of a technology curriculum before delving into the usage of technology in the education environment (Park, 2016; Cavanagh, 2017). Thus, technology integration makes collaborations between large technology corporations which advantages cooperative connections and student engagement (Maier *et al.*, 2017). echnology promotes student engagement because it is a tool that allows students to design, build, and do things that would be difficult for them to complete without access to technological resources (Bokony & Pettit 2014). When students connect and find it easy to use technology for literacy, they feel accomplished, which naturally increases their engagement in digital literacy (Slopen *et al.*,

2010). With integration technology, students can select their preferred learning style based on their aptitude and interests, and the technology will keep them interested (Hockly, 2018; Xie *et al.*, 2018). Pandemic-19 causes a need for digital literacy, which accelerates the environmental revolution in education (Biag & Castrechini, 2016). Along with the growing demand for digital literacy, students' engagement has improved and they have a responsibility to adapt to dynamic educational methods ((Bulger *et al.*, 2014; Anton *et al.*, 2016).

A review of the relevant literature has revealed that previous studies examined the effect of technology integration (Warshauer & Newhart, 2015; Mossberger *et al.*, 2018; Palladino & Guardado, 2018)) but only a few studies have been done in this area, specifically impact on digital literacy and students engagement (Statti & Torres, 2020). Technology integration combines various digital channels that make students' work easier (Katz & Gonzalez, 2016; Racz *et al.*, 2017). Thus, it becomes necessary to clearly understand the conceptualization of technology integration in the field of education. This type of research may also provide answers to certain pertinent questions. For example, does technology integration impact students' digital literacy and engagement? To answer these questions, the research work was conducted.

3. DATA AND METHODOLOGY

The research work is theoretical. It made an effort to explain the Impact of Technology Integration on Students' Digital Literacy and Engagement. For this purpose, 46 research papers are reviewed from secondary sources like journals, articles, etc.

4. RESULTS AND DISCUSSIONS

4.1. Impact of Technology Integration on Digital Literacy

Positive Impact

Enhanced Teaching and Learning: Technological developments like digital cameras, projectors, mind training software, computers, PowerPoint presentations, 3D visualization tools have become great sources for teachers to help students grasp a concept easily. It has to be understood that visual explanation of concepts makes learning fun and enjoyable for students. They're able to participate more in the classroom and even teachers get a chance to make their classes more interactive and interesting.

Globalization: When schools in different parts of the state, students can "meet" their counterparts through video conferencing without leaving the classroom.

No Geographical border: With the introduction of online degree programs there is hardly any need of being present physically in the classroom. Even several foreign universities have started online degree courses that student can join. Distance learning and online education have become very important part of the education system nowadays.

Access to Information: Students have access to a vast amount of information online, enabling them to conduct research and explore topics beyond traditional classroom resources. Digital textbooks and online libraries provide convenient access to a wide range of educational materials.

Cost-Effective Solutions: Technology enables the creation and sharing of open educational resources, reducing costs associated with traditional textbooks. Virtual classrooms and online resources can offer cost-effective solutions, especially in situations where physical infrastructure is limited.

Preparation for the Digital Workplace: Integration of technology in education equips students with digital literacy skills essential for the modern workplace. Educational technology often includes coding and programming opportunities, preparing students for careers in technology.

Immediate Feedback and Assessment: Technology allows for real-time feedback on assessments, helping students identify and correct misconceptions promptly. Adaptive testing adjusts difficulty based on individual performance, providing a more accurate measure of understanding.

Leads to innovation and creativity: Technology empowers students to create digital content, including multimedia presentations, videos, blogs, and podcasts. Creative software tools allow students to express themselves artistically and develop digital storytelling skills.

Negative Impact

Decline Writing Skills: Due to the excessive usage of online chatting and shortcuts, the writing skills of today's young generation have declined quite tremendously. These days, children are relying more and more on digital communication that they have totally forgot about improving their writing skills. They don't know the spelling of different words, how to use grammar properly or how to do cursive writing

Increasing Incidents of Cheating: Technological developments like graphing calculators, high tech watches, mini cameras and similar equipment have become great sources to cheat in exams. It is easier for students to write formulas and notes on graphing calculators, with least chances of being caught.

Lack of Focus: SMS or text messaging has become a favourite pastime of many students. Students are seen playing with their cell phone, iPhones day and night or driving and very often even between lectures. Being ever-connected to the online world has resulted in lack of focus and concentration in academics and to some extent, even in sports and extracurricular activities.

4.2. Impact of Technology Integration on Digital Literacy

Technology enables the simulation of real-world scenarios, allowing students to apply theoretical knowledge in practical situations. In short, the integration of technology to simulate real-world

scenarios enhances the educational experience by making learning more practical, engaging, and applicable to the complexities of professional life. This approach not only strengthens theoretical knowledge but also cultivates the skills and mindset necessary for success in various fields.

Technology allows for personalized learning experiences, adapting content and pace to individual student needs. The ability of technology to support personalized learning has been associated with improved academic outcomes. Some researchers emphasized the positive impact of personalized learning technologies on student achievement.

Educational games and interactive simulations make learning enjoyable, turning lessons into engaging experiences. Gamification elements and educational games make learning more enjoyable, turning lessons into interactive challenges. Incorporating reward systems and achievements in educational apps or platforms motivates students to actively participate and progress.

Thus, the analysis shows that both students' digital literacy and engagement are positively impacted by integration technology.

4.3. Challenges

Expensive infrastructures cost not just as costs but as investments in the future. The benefits of improving digital literacy, such as increased educational outcomes, enhanced workforce readiness, and improved societal well-being, often outweigh the initial financial investments. Policymakers, educational institutions, and communities need to consider the long-term impact of digital literacy initiatives and allocate resources accordingly.

Training teachers to integrate digital literacy into their instruction and keeping them updated on the latest technologies requires ongoing professional development programs, which can incur expenses. Developing and implementing effective digital literacy programs often involves costs related to curriculum development, educational software, and training materials for both educators and students. Regularly updating and replacing outdated technology to keep pace with advancements may contribute to ongoing expenses. Developing and implementing policies that address digital literacy in educational institutions or at a broader societal level may require resources for drafting, enforcing, and monitoring compliance.

6. IMPLICATIONS

Selecting an appropriate platform for integration is a primary focus for institutions. Thus, technology integration is key area for all stakeholders. Teachers and parents must keep a close eye on students' perspectives towards digital education. This would bring communication smooth and error free. This study contributes to the existing knowledge of teachers, and academicians because the effect of technology integration on digital literacy and engagement

has directed a focus on the growth and development of the education system in India with technologically advanced facilities.

7. CONCLUSION

The study examines the changing nature of learning through the prism of digital literacy and student participation, emphasizing the need of technological integration. While digital literacy improves learning results, its impact varies by generation. Generation X adapted to digital tools later in life, whereas Generation Alpha is accustomed to AI-driven and immersive learning settings. The findings highlight the importance of personalized solutions for bridging generational digital divides and optimizing educational technology utilization. Through a knowledge of the complex relationships between digital literacy outcomes and technology use, educators may create a learning environment that embraces technological innovations while simultaneously giving students the essential digital skills they need to succeed in the digital age. Despite digital literacy having challenges, there is a significant impact of technology integration on students' digital literacy and students' engagement.

Distance and hybrid learning will become more prevalent. Teachers and students should take advantage of this in a good light and eliminate the drawbacks that are pulling back many students as well as schools from achieving excellence. It is thus time for every country to introduce a more technologically equipped education sector in the future.

8. SCOPE FOR FUTURE RESEARCH

Future research might examine Generation X and Alpha's digital adaptability, looking into how earlier tech exposure influences digital literacy. Intergenerational learning models and the impact of AI-driven education on cognitive development, critical thinking, and social involvement among digital natives require further investigation.

The future study may also include particular institutes or education centres. Further it extend to cover a specific area of learning software or its application towards students engagement. It would be more convenient if it were done for a specific age group of learners. The study may be conducted on different variables or factors than those taken into account in my study.

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