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Executive President's Message

The Marathwada Mitra Mandal was established with a deep sense of commitment towards uplifting the underprivileged sections of the Marathwada region. The motto of Welfare of Masses began a modest initiative that has grown into a distinguished educational movement, rooted in the ideals of service, inclusivity, and social responsibility. Over the decades, we have strived to create an environment fostering not just academic excellence but also the holistic development of all our stakeholders.

It gives me immense pride and joy to witness the release of the first edition of our interdisciplinary, peer-reviewed research journal Welfare of Masses. This journal stands as a testimony to our commitment towards promoting research, innovation, and dialogue across diverse fields for the betterment of society. I extend my heartfelt congratulations to the editorial board, contributors, and reviewers who have dedicated their expertise and energy to bring this scholarly endeavour to fruition.

As we move forward, we envision our research journal Welfare of Masses growing into a respected platform that inspires original thought, bridges academic disciplines, and addresses real-world challenges. With the spirit of Jai Jawan, Jai Kisan, Jai Vigyan, Jai Anusandhan, let us continue to unite our efforts for the progress of our nation and the welfare of humanity at large.

Prin B. G. Jadhav
Hon. Executive President
Marathwada Mitra Mandal

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From Editor's Desk

It is our privilege to present this journal as a platform for academic excellence & interdisciplinary research. Guided by the vision of "Welfare of the Masses" we strive to promote knowledge that is innovative, inclusive, and socially relevant.

Our focus spans across a broad spectrum of disciplines—including Commerce, Management, Social Sciences, Physical Sciences, Engineering, Humanities,& Education.

We firmly believe that real progress emerges when diverse fields of knowledge interact & collaborate, offering fresh perspectives and holistic solutions to complex issues.

By engaging with national & international academic communities, we seek to foster dialogue, exchange of ideas, and meaningful research contributions. We welcome original works that embody integrity, innovation, & impact, and remain committed to nurturing a research culture that serves society and contributes to global knowledge.

On behalf of the Editorial Board, we extend our sincere gratitude to the authors, reviewers, & readers whose support strengthens this platform. We warmly invite scholars & practitioners to join us in this endeavour of knowledge creation & dissemination, with the hope that our collective efforts will inspire meaningful change and academic progress.

Dr. Ganesh Patare
Chief Editor

ISSN: 3108-1134 (Online)

Index

Sr. No.	Title	Page Number
1	Smartphones & Political Communication: Making Sense of the Political Forwarded Posts & Memes in the Online Space among Urban Youth of Pune *Dr. Swapnil Kamble*	1-8
2	Statistical Analysis Of Milk Production Of State Government Of Maharashtra *Ms. Komal Galande*	9-11
3	Neuromarketing in the Age of Metaverse and Virtual Reality *Dr. Ashwini Kulkarni & Mr. Pankaj Ghorpade*	12-14
4	Evaluating the Role of Hybrid Machine Learning Models in Online Educational Environments *Mrs. Meenal Kabra*	15-20
5	ICC Cricket World Cup 2019 Top Batsman Consistency Analysis *Ms. Charushila Nigudkar*	21-22
6	Exploring the Arts & Crafts of Chhattisgarh: Empowering Skill Development and Entrepreneurial Ventures through Experiential Learning *Dr. Swapna Kolhatkar, Dr. Kalpana Vaidya & Mrs. Manjiri Deshmukh*	23-26
7	Financial Literacy Awareness and Practice Among Students: Issues and Insights *Dr. Punam Shinde*	27-29
8	A Study On Evaluating Challenges Faced By Users Of Quick Commerce *Mrs. Yogita Renuse*	30-34

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Smartphones & Political Communication: Making Sense of the Political Forwarded Posts & Memes in the Online Space among Urban Youth of Pune

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ABSTRACT

The image of the internet has shifted radically since the late 1990s. It was termed cyberspace. Space plays a crucial role in our everyday life including leisure, work and especially for privacy. The Internet space is particularly (privately) popular among urban youth globally. The twenty-first century`s digital revolution is proliferated by the consumption of smartphones and the wireless mobile internet. The urban `digital natives` operate in the digitally networked ecosystems as human actors. The research paper is a part of a doctoral thesis; a qualitative exploration of 49 college-going respondents of urban Pune, about their social media usage, reasons, and perceptions about their meaning-making of the political content and forwarded post-politics in the context of social media use. The paper also explores the city locality and mobile internet usage among youth in Pune Caste (ism) and religious tensions are the main content and the driving force.

INTRODUCTION

Social media content is triggered through the proliferation of mobile internet and smartphones. Multiple users can create, share and post multiple social, political and cultural memes with a variety of contexts and intentions. India is a multilingual, multicultural country. *A report published by Reuters on 27th May 2024 authored by Vijdan Kawoosa, highlights there were 744 registered political parties in the Indian election of 2024 and the expected winners are not going to change. This number is sufficient to just imagine the level and the online content of the political memes in India.

The word 'meme' is used first time in a book titled '*The Selfish Gene*' authored by Richard Dawkins in 1976. He has described the word meme as an idea, behavior or style shared by person to person within a [common] culture. The memes have a psychological effect (Das, 2023). Memes are used mainly for fun and for entertainment. The power of memes is that they spread (viral online) so fast. Most of the visual memes are seen as a combination of two images with some superimposed. The contexts are easy to understand with the contemporary issues in a specific culture or country. Political memes are created intentionally. First to create a clear impact of a politically powerful and influential personality or to defame a political person who already has such influence on the public. The real concern is hateful political memes. The growing number of hateful memes on social media is a challenge. Political memes have the potential power to play with prejudice, memories and emotions (Kumar et al. 2024). The memes especially target powerful politicians, journalists, persons and people who have strong public and policy opinions. As we are living in a global village in a networked society, international political memes are shared on social media. There is a tremendous level of creation and distribution of political memes in the online world. Hence, there is an academic urgency to study the topic critically and contextually. The paper explores the dynamics of politically forwarded posts and memes in the local context.

About the field: The strategic importance of Pune city as per digital infrastructure and SMART projects and a city of cultural capital with a substantial number of young people make it relevant for such research. Young people access digital gadgets like smartphones for making friendships and relationships online. It resulted in moral panics due to the social institutional context of society. Youth culture is a global phenomenon but at the local level, it is dealing with other social aspects like moral panics. The researcher recruited *ordinary* college-going students. Pune city is known as *Oxford of the East* because of the large number of schools, colleges, and universities situated in the core of the city. Pune is one of the biggest markets for education and related competitive exams UPSC (Union Public Service Commission) and MPSC (Maharashtra Public Service Commission). Pune City is known for its culture and legacy of social, and educational reformers including Jotiba Phule and Savitribai Phule. University of Pune has changed its name to Savitribai Phule Pune University in Honor of Savitribai Phule the first lady teacher of India on 9th August 2014. Many colleges were founded in British India including Deccan College, Fergusson College, COEP (College of Engineering Pune) College in the late nineteenth century, and the University of Pune. The university is one of the biggest universities in

Maharashtra. The University affiliates 811 colleges and stands as the second largest in the country. Hence Pune city is popular for higher education among youth in the country.

In the present study, the participants are in the age group between 18-22. The researcher does not reveal any personal, social, or religious identity in the research paper in any form because it is committed to ethical guidelines and consent from the participants. The respondents are from lower middle-class and middle-class families. Their families are in Pune city and few of them stay in Pune for just educational purposes. The respondents have shared personal views and experiences with the researcher in an incredibly open and friendly manner. Researchers have interviewed students to get more friendly interactions in which the respondents were comfortable without disturbing their *natural settings.* Respondents are from other villages and districts of Maharashtra where education facilities are rare. Pune is the most important city in terms of education and culture of Maharashtra after the financial capital Mumbai. Pune is a *dream* city for the villagers of Maharashtra where education and job opportunities are available. Students talk in the Marathi language. Very few students responded in Hindi and English. Most of them are first-generation learners and first-generation users of information technology like Smartphones and the Internet. They also teach their parents how to operate Smartphones for social media applications including Facebook and WhatsApp. Every respondent has multiple social media accounts. The socio-economic and cultural variety and heterogeneity in terms of class and caste are easily seen in the social educational ecosystems. The respondents were asked about their most preferred use of mobile internet and social media. Interestingly, the *meaning* of smartphone usage is more than mere access to telephone technology for the urban boys and girls of Pune. Researchers interpreted their access to smartphone use in a variety of contexts and negotiations. The usage-location context in which people access differently in different locations. The college canteens, classrooms, computer labs, libraries, tea stalls, gardens and their hostel rooms, homes, streets, and public transport. The access, usage, connectivity, and mobility all together make multiple contexts of the reasons for the use and negotiations. Mainly the negotiations are found in a moral dilemma of being a traditional and ethical person in a college setting, and another side of their online world is fundamentally different than the traditional ethical practices and behavior. Their access becomes impulsive, private, liberal, and global as the medium itself can offer such things on their smartphones. Switching into the online and offline world within a second is the most interesting negotiation for the urban youth. They think, behave, act, and react differently in the online world than in their social settings. They spend most of their time in the online world; especially on social media.

SMARTPHONE: GLOBAL TECHNOLOGY AND ITS LOCAL SETTINGS

The college youth from Pune City experience media convergence in their everyday life by using smartphones. Researchers have observed that students wear wireless headphones, connect Bluetooth speakers, connect classroom devices to their smartphones, and experience digital *compatibility.* Their smartphones are connected through the mobile internet. They communicate, share, consume, and produce digital content. Smartphones are an essential multipurpose communication device of the postmodern digital era youth. It reflects the way these digital manufacturing companies advertise such aspirations. India is one of the biggest consumer markets for digital goods. Manufacturing multinational companies associate the use of digital devices with success. The influence of such multinational advertisements can be easily seen. The economic and political importance of India as a market especially as an important location in the global south gets highlighted. The urban youth of Pune operates in a context of global pressures and the social settings of the locality.

The Internet is an essential enabling element for young people. Mobile internet is enabling us to fulfil several everyday needs. The study resembles Katz and Rice (2002) talk about the role of the internet and the understanding of the outside world. It is perception and at the same time becomes an obstacle [Digital Divide].

It may be that people who have been using the Internet for some time develop a different understanding, and experience of the Internet, and have different perceptions of relevant benefits and obstacles (Katz and Rice 2002).

The Hindu religious and caste-based ethos in the online world of the urban youth of Pune is a dominating discourse. The (Hindu) boys and girls (and of various castes) experience their religious values and beliefs as a hindrance in making friendships and relationships. No matter if they are of the same religion the caste has more veto power to determine the duration of their relationships. Many of them experienced short-term casual inter-caste, inter-religious relationships that hid it from their parents. The intersectionality of the possibilities of such relations and the available digital ecosystem such as connectivity and online presence become a modern global phenomenon. The meaning of being modern and global for the urban youth of Pune is associated with their relationship status and sharing among their peers and networks. The everyday negotiations between the value systems of being a rural traditional versus being urban and global become multi-contextual. The mediation of their everyday college life in the online world goes through negotiations. Romance and romantic relationships are amplified due to facilitated privacy due to mobile phones in India. Young Boys in slum areas hardly talk with young girls in their lives. Now mobile phones and social media give a private space where they talk freely without fear (Arora & Rangaswamy, 2015). In these responses, their father is a person who is controlling the privacy of the young girl. There is a collective consciousness (Walker, 2018) of patriarchy which is associated with the *ideal* role of genders. Patriarchy is always the source of women's oppression. At one point in time, the user who is a girl is enjoying the freedom and privacy that is not there in the traditional patriarchal discourses among Indian families which are challenged by mobile internet use. It allows the user to interact and connect with anyone anytime and anywhere.

The internet was a tool to create an enabling environment for people to enjoy long, healthy, and creative lives (UNDP, 1999,

p.1). Mobile phone usage is playing a crucial role in India. Mobile phones are an enabler for young people in terms of privacy. The notion of *privacy* is not considered so seriously in Indian middle-class families (Agrawal, 2018) due to Indian traditional and orthodox nature and the joint family system. A movie titled *Parched* (2016) directed by Leena Yadav depicts the role of mobile phones which enable privacy for ordinary Hindu women from (Gujrat) India who rarely experience private space in their families due to the stronghold of patriarchy. The situation of young girls and women is the worst in India in terms of privacy and sexuality. Males of the family always dominate it. Another context of private space and its implication is the ban on the usage of [1]smart smartphones among girls in India. There is a much-debated incident happening in Rajasthan where the upper caste community decided to ban smartphone use among unmarried young women. This incident is enough to comment on the role of mobile and the internet in facilitating an extension of privacy. From the point of view of the (upper caste) Thakur community mobile phones are making the young girls mad and they develop relationships with other men and run away. But they have given a reason that girls should focus on their studies wasting time on mobile phones. A member of parliament from Rajasthan also supports this judgment though it is illegal. Technology is power; it works as an enabler. Young girls use this power to go beyond the social cultural and institutional norms and behave as per their desire. Indian orthodox patriarchal mindset never accepts that young girls are behaving as per their own. So, the optimum level of use of mobile internet in India especially for young girls is far miles away than present. There is not much difference when it comes to urban young women. Though there is no ban as such, their usage is constantly under parental surveillance compared to young males. Smartphone is a personal device. The user must be in a private space to use it at an optimum level. Parents are the biggest threat to the college-going youth. However, they have interesting digital solutions to overcome such problems. They don't want to reveal their digital identity in front of their parents. Every ordinary Indian teenager pretends to be an ideal child in front of their parents but at the same time, his/her social media profile can show the real identity in terms of aspirations and desires. The normality of political communication over smartphones contains an archival value. Hence the usage itself basically is political. It goes through a variety of contexts and negotiations.

TEXT, CONTEXTS, AND INTERTEXTUALITIES: CASTE AND ANIMOSITY IN THE DIGITAL SPACE

Pune is a city known for patriotic social reformers, and nationalists, and a place of radical social reformers especially in the eighteenth and nineteenth centuries. In this context, not just social factors but political factors also affect, and shape communication technology on local levels. B.R. Ambedkar (1936) in his book *Annihilation of Caste* (1936) commented scholarly upon the social issue of caste in India. Indian caste structure and democracy are paradoxes. The existence of both will never achieve the objective of social welfare, equality, and social democracy. Marxist scholarship on class and exploitation is merely unable to overcome Indian social issues because of caste. No other country in the world shares common characteristics with the caste structure in India. Hence, the incorporation of caste in the social shaping of technology remains important and unavoidable. Respondents reported on multiple *social* factors, caste-based discriminations, and most of the social factors are deeply rooted in the *social consciousness* of Indian society. Their responses highlight it.

"Once, a [A Hindu, upper caste, right wing] teacher scolded me badly on social media, when I posted my views regarding an anti-rightist [online] post" (Rohit, 21)

In this regard, the marginal, vulnerable communities, minorities, and underprivileged members are easily trolled by the dominating political, and cultural discourses. The proliferation of mobile media has the potential to transform how people organize, interact, and come together in public places. Urban spaces are dynamic in terms of social contexts like education, employment, political ideology, class [Caste in India], and gender (Humphreys, 2010). According to Wallace (1999), the internet is an [social] environment but people behave differently because real-time contexts and identity are absent.

The internet is an environment that allows people to act and interact with other people in ways that they are not normally able to do…people behave differently on the internet like putting on `masks` and it is different than they are in real life. (Wallace, 2015)

Social factors like values, beliefs, religion, caste, gender, morals, and even the age of the users affect online usage. The choices are central to their social shaping. The *choices* are there and when they get *selected* by the individuals then the context gets created. The location, the person, and associated social institutional factors shape the usage of the technology. Technology impact may vary as per the social groups. Mobile Phone technology is *telematics* (Williams, 1997) and it is used for social communication. As per the Marxist analysis of technology, the supplier and the customer are very much indirect. There is no direct exploitation. The user is not being ordered to do so but the user has his/her *conscious* selection strategy to select and appropriate the technology. Hence, the customized and configured communication technology should be examined with the latest technological innovations and within the locality-specific social contemporary contexts. Indian caste-specific heterogeneity, hierarchal, and social contexts are fundamentally different from the homogeneous Western and other Asian societies. The study of mobile communication requires research attention on these authentic contexts. This research is one of the uncommon scholarships that combines science and technology with a locally unique political-caste context in terms of the usage and access of global technologies. Sociologically the caste-based structure of Indian society and sociality is the prominent yet more influential (in terms of power) actor that *shapes* the usage. The users operate the communication technology as per their social institutional identities. The caste (Identity) remains the most powerful element in the online space too since the Indian social structure is still caste-driven even in twenty-first-century Digital India, though caste-based discrimination is considered `illegal` as per

the laws of the Indian government.

The respondents were asked about their awareness, experiences regarding caste, and animosity in their social media usage. Rahul (19) responded openly about his caste identity and his inter-caste family.

"My parents are from different castes, my father is from a different caste, my mother even my aunts, one is from Brahmin (Name of a caste) and the other is Lingayat (Name of a Caste), the mother is Maratha (Name of a Caste), my grandmother is also Brahmin I am Dhungar (Name of a Caste) and my father. So, it is a caste Khichadi [Hindi word] (Meaning: Mixture) in my family. But everyone has their [Online] caste groups, and everyone knows that we are from different caste [Identity]." (Rahul, 19)

In an in-depth interview with Rahul (19), the researcher observed that teenagers like him are well-conditioned and nurtured traditionally when it comes to their caste identity. His understanding and knowledge, perceptions about caste as a prominent social institutional hierarchical setting were much deeper than his academic domain-specific knowledge. His family is a multi-caste cultural family and all are Hindus. Interestingly every member has their caste-specific online/social media group. A teenager who has just entered a formal educational institution is a global aspirant but he is aware of his caste roots. This awareness is well enough to manipulate and negotiate their caste identities, friendships, and relationships. The digital online space is an additional and indirect way that holds the capacity and potential to manifest and create hatred and caste discrimination. Social hierarchies, social institutions, caste, and kinship are influenced by the domestication of technology (Tenheunen, 2008). Social media is also a manifestation of caste categories like Scheduled Caste, Scheduled Tribes, and Other Backward Classes in India. Social media is a best practice for trolling politicians in India. (Venkatraman, 2017).

Another response upon animosity, religious hatred, and mob lynching. The *indirect* and *invisible* forms of caste notions, social discriminations, and superiority caste consciousness are *visible* enough on social media spaces more saliently than in real-life situations in urban localities.

These two responses particularly about the animosity and hatred indicate the religious dominating discourses, cultural politics, and fear. The urban youth is seriously aware of such political critical issues. There is a sense that something like war is happening over social media. Smita (21) responded with anxiety.

"I have seen videos [ONLINE] mentioning the scenario of Kashmir [North Indian State], and somebody put a counter video…all are keyboard warriors now…in my observation, the things are happening in a particular year only [There were elections in the year 2019]*"* (Smita, 21)

The young generation of urban localities is aware of the social, political, and religious tensions because they get the information on social media in a more realistic way than the mass media. Their political, and religious consciousness is seen more prominently than any other information. It is because of the political power shift. The presently ruling party BJP (Bhartiya Janata Party) of India, is right-wing, and its core values of masculinity, patriotism, and patriarchy are reflected in the views and online posts of urban youth. It is a cultural politics of Hindu dominating discourse in contemporary India through the digital media and space.

Technologies produced and used in social contexts, and the processes of technological change are intrinsically ***social*** rather than simply driven by a technical logic. Technological change is always part of a *socio-technical* transformation technology and social arrangements are *co-produced* in the same process. (Russell & Williams, 2002)

The social constructivist approach draws on the sociology of scientific knowledge. The inequalities of internet users may affect how people get access to education, employment, and health. The internet is unique in assembling people sharing common thoughts and ideas and making *homogeneous* online communities. The Internet enhances social capital by facilitating people to build their own social and professional networks. The internet's cultural effects will vary among user groups. (DiMaggio et al. 2001). Technologies are basic needs. It provides food, shelter, and clothes to entertain and heal us (Makenzie, 1999) the sociology of technology is a broad field. It is concerned with how social processes, actions, and structures relate to technology and this is concerned with technological determinism (Mackay & Gillespie, 1992). The Internet is used for a variety of reasons, but the *social* usage of the Internet is prominent. It is a source of information, it is a tool for communication, it enables human interactions, and it is a social system in which there is no need to meet people. The Internet is a tool for social learning (Maignan & Lukas, 1997). The design and implementation of technology are patterned by various social and economic factors as well as technical considerations. (Williams and Edge, 1996). The internet is a critically important site for sociology researchers to test technology diffusion and media effects particularly because of media convergence and integrating modes of communication and various forms of content (DiMaggio et al. 2001). The proliferation of mobile media has the potential to transform how people organize, interact, and come together in public places. Urban spaces are dynamic in terms of social contexts like education, employment, political ideology, class [Caste in India], and gender. (Humphreys, 2010). The unique structure of the internet demands user-generated content and supports the free exploitation of free labour and producers and the exploitation rate is virtually infinite (Feenberg, 2017). Social factors are crucial in the social shaping of technology. Each factor of the societal element is invested in making any kind of technology. The internet is a techno-social dynamic system. With the rise of information capitalism, the exploitation of commons became a central process in capital accumulation. The technological infrastructures enable and constrain forms of communication. It enables the subjectification of objective knowledge in the minds of people. People think, behave, and project how the knowledge is stored in the techno systems (Fuchs, 2007). Social dynamics work between potential users and their social environments, household and social networks, designers, producers, and policy makers' managers that *shape* which kind of technology will be used and what type of society will emerge (Haddon, 2016).

The caste-based discrimination in the online and offline world affects the mental health of the youth and might result in some serious outcomes. College campuses are politically sensitive in this regard because all types of castes and religions are represented through every individual and in the absence of secular and democratic values the educational institutions might be converted into a place and locations of injustice, hatred, and intolerance. Respondents were reported about political memes. Their understanding of contemporary national and local politics is associated with the memes. It is one of the fastest ways to understand political contemporaries. The memes work as a multiplier effect of an ideology or a message. It forms the opinion of the user. It carries politically and ideologically loaded messages.

"I don't watch TV news. I come to know about politics through the memes on Instagram" (Pramod, 19)

A teenager responded to the political and religious memes and forwarded posts. The online discourse reflects the core public religious sentiments.

"I receive many posts against the Muslims… Some agencies work for them. It is not direct but THEY [Emphasized by Researcher] create some sort of Nationalism or Patriotic Facebook pages and religious messages can easily be injected." (Chinmay, 21)

Wiggins (2019) in the book titled: *The Discursive Power of Memes in Digital Culture: Ideology, semiotics, and Intertextuality* (2019). According to the author, memes are discursive and an important part of the digital culture. Most of the time it is public criticism of a politician, celebrity, and other influential public figures, sometimes advertisements and brands. The image-based memes are clear to understand with a small text added by the users. According to Cannizzaro (2016), internet memes are a part of semiotic studies. It is widely shared in the digital culture. Its applicability is socio-political and contemporarily contextual.

Memes in the digital culture expertly contextualize theories and sociocultural framework (Vickery, 2015). It is a participatory culture where users or online citizens (Popularly termed as Netizens) comment through satirical yet humorous and it contains the accurate message. Sharing of political memes and forwards are common practice among the urban youth of Pune. The memes are mostly based on contemporary social-political situations. The urban youth of Pune shared that they come to know about political issues more accurately than the mainstream media news. The meme became a public opinion of the online community. The young generation of urban localities is aware of the social, political, and religious tensions because they get the information on social media in a more realistic way than the mass media. Their political, and religious consciousness is seen more prominently than any other information. It is because of the political power shift. The ruling party (Bharatiya Janata Party) of India, is right-wing, and their core values of masculine patriotic, and patriarchal are reflected among the urban youth. It is a cultural politics of Hindu dominating discourse in contemporary India. The social constructivist approach draws on the sociology of scientific knowledge. The inequalities of internet users may affect how people get access to education, employment, and health. The internet is unique in assembling people sharing common thoughts and ideas and making *homogeneous* online communities. The Internet enhances social capital by facilitating people to build their own social and professional networks. The internet's cultural effects will vary among user groups. (DiMaggio et al. 2001). Technologies are basic needs. It provides food, shelter, and clothes to entertain and heal us (Makenzie, 1999) the sociology of technology is a broad field. It is concerned with how social processes, actions, and structures relate to the technology and this is concerned with technological determinism (Mackay & Gillespie, 1992). The Internet is used for a variety of reasons, but the *social* usage of the Internet is prominent. It is a source of information, it is a tool for communication, it enables human interactions, and it is a social system in which there is no need to meet people. The Internet is a tool for social learning (Maignan & Lukas, 1997). The design and implementation of technology are patterned by various social and economic factors as well as technical considerations. (Williams and Edge, 19996). The internet is a critically important site for sociology researchers to test technology diffusion and media effects particularly because of media convergence and integrating modes of communication and various forms of content (DiMaggio et al. 2001). The proliferation of mobile media has the potential to transform how people organize, interact, and come together in public places. Urban spaces are dynamic in terms of social contexts like education, employment, political ideology, class [Caste in India] and gender. (Humphreys, 2010). The unique structure of the internet demands user-generated content and supports the free exploitation of free labour and producers and the exploitation rate is virtually infinite (Feenberg, 2017). Social factors are crucial in the social shaping of technology. Each factor of the societal element is invested in making any kind of technology. The internet is a techno-social dynamic system. With the rise of information capitalism, the exploitation of commons became a central process in capital accumulation. The technological infrastructures enable and constrain forms of communication. It enables the subjectification of objective knowledge in the minds of people. People think, behave, and project how the knowledge is stored in the techno systems (Fuchs, 2008). Social dynamics work between potential users and their social environments, household and social networks, designers, producers, and policy makers' managers that *shape* which kind of technology will be used and what type of society will emerge (Haddon, 2016).

The caste-based discrimination in the online and offline world affects the mental health of the youth and might result in some serious outcomes. College campuses are more sensitive in this regard because all types of castes and religions are represented through every individual and in the absence of secular and democratic values the educational institutions might be converted into a place and locations of injustice, hatred, and intolerance. Youth are distinctive adaptors of mobile internet. We should theoretically marry youth and mobile phones (Goggin, 2008). Global communication technologies like mobile internet, search engines, social media applications, various Smartphone manufacturing companies, content producers, and advertisers form a digital ecosystem where the end user becomes more vital because they are the producer's

consumers and distributors at the same time. Youth as a generation uses these global technologies at their optimum level. Mobile phones have become private devices and most people do not like to share their mobile phones (Chakraborty, 2006). It is also responded by most of the respondents from urban Pune youth. Whether the Smartphone user is a girl or a boy, or from a village, town, or metropolitan city, no matter from any caste or class they do not like any kind of surveillance in their internet private space. It is truly private and individualized due to their personalized self-controlled Smartphones. Youth from Pune reported that they do not even like it if their parents complain or ask them to show their phones. It gives them a sense of violation of their privacy and authoritarian hierarchical encroachment. It enables them to overcome many social barriers to interpersonal communication. Young Boys in slum areas hardly talk with young girls in their lives. Now mobile phones and social media give a private space where they talk freely without fear (Arora & Rangaswamy, 2015).

These themes have a specific focus in terms of Smartphone usage and political communication. It has explored the need for earnestness in any post, especially on *Insta*gram. It indicates the habitual need for instant gratification through social media comments and likes for the youth. It alters the way young people live their personal, social, and political lives. Everything including caste negotiations, friendships, relationships, break-ups, and patch-ups must be on the social media posts that are documented, and stored, as an archive on social media. It gives them a sense of digital presence. Not just communication but their moods are also highly interconnected with their overall usage of mobile internet. The virtuosity of reality is essential for young people without knowing its reason and need. They follow because of peer pressures, take it as a trend and fashion, and keep on doing any relevant or irrelevant activity there. They must be *online* all the time. There is a granted assumption that other people are already available online and I must see or let them see what I do in the online space. It may lead to over-communication.

DISCUSSION:

The nuances of digital literacy, the agency of young people, and their naturalized interactions should be recognized critically (Sarawate & Raman, 2022). It is a [political] symbolic interaction within the networks of human and non-human actors. The values and culture highlight the magnitude of technology in everyday life. The twenty-first-century global urban ecosystems are fabricated through the technology itself. The (Over) dependency on smartphone-based communication is a sign of a different society. The city ecosystem enforces the youth for perpetual connectivity and access without time and space and social institutional (Caste, religion in this context) constraints. Interestingly, the twenty-first-century global urban youth of Pune are still concerned about their political and caste identities, and Instagram-based (memes and posts) interactions become temporary in the online world.

The smartness of technology usage is embedded with the new possibilities and intersectionality of multiple possibilities. The convergence of media is well experienced through smartphone use. The media convergence process is not merely technological, but it has social, cultural, and political implications (Dwyer, 2010). The smarter use of smart people is crossing local and even national borders. The youth of Pune reported about their internationality in terms of friendships, followers, and posts, it all together makes them a global entity in a much-localized setting. Their education, art and culture, hobbies, ideologies, and entertainment are heavily mediatized. The glowing small screens of their smartphones make a variety of interventions. Urban college students of Pune were asked about their smartphone-based general everyday activities. They responded vividly. College campuses in Pune look politically very colorful because of the multiple vibrant colors of their student organizations, and the modern and traditional (religious) costumes of collegians. In a variety of multiple religious, class, caste, and cultural identities, and commonality among all is the smartphone in their hands. College campus as a location becomes a very crucial element in terms of smartphone use. The college campus becomes a liberal and democratic space for students who come from traditional families and villages. The value system of an urban locality is much different than parent-surveillance and morality policing. College campus becomes a space of youth-majority, urban codes, trends, fashions, and a place of newness. In these natural settings, the researcher approached the respondents and interacted with these `locations`.

According to Katz and Aakhus (2002), technology is a mind and society-altering technology. It is dramatically changing communication and relationships and people are more heavily dependent upon this kind of technology than ever before. Mobile phones' speed, efficiency, appropriation, access, and affordability everything counted in the light of research on mobile communication. Goggin (2013) notes an important observation that the category of youth is strategically important in the development of mobile communication and media research. Technology, particularly the mobile internet, is incorporated into the life of youth. Interdisciplinary research is a requirement in this field. Rich Ling (2004) has also pioneered writings and research in this area. The book *Youth Society and Mobile Media in Asia* by Donald, Anderson, and Spry (2010) explores Mobile, navigations, and innovations associated with mobile phone usage. It explores the importance of mobility in the lives of young people. Identity and how mobile internet usage makes their real identity among peer groups. Apart from this all intimacy and desires are also mobile mediated among young people. Mobile phones are Larissa Hjorth (2008). The personal and intimate discourses associated with mobile phones and it is a vast area for mobile communication research at the global level.

Despite the politically religious contemporary tensions between the Hindus and Muslims, the student of media and communication studies tells about a music composition which was designed and developed by a Pakistani friend. These inter-state and inter-religious interactions and intersectionality could take place in online spaces. These social, cultural, and religious intersectionality are characteristics of the smart people of the smart city. The ecosystem of digital is global in a real sense because of worldwide network capability. These two representative examples of millennials highlight the scope of intercultural communication research in a broader and

sustainable global digital society. *Participatory Culture in a Networked Era* (2015) by Jenkins, Ito, and Boyd explores the characteristics of internet culture which is participatory in Nature. A participatory culture embraces the values of diversity and democracy through every aspect of our interaction with each other. (Jenkins, et. al, 2015). The nature of the internet is user generated means the internet user individual must generate the content. Social media applications are merely *empty* applications that get *filled* by billions and trillions of kilobytes worldwide by users. This participatory-based engagement keeps young people, or the users of mobile media always engaged.

The Internet and the digital space are global communication technologies. It is fundamentally different from other mass media. Mobile Internet and Smartphones have revolutionized the way ordinary people communicate, work, and explore information and knowledge. Global technology has multiple facets. Technology-human relations are reaching new heights. Social appropriation of technology remains more important than mere technology and the medium. The local-level access to the internet gives an empowered sense in terms of global connectivity and modernity. The politics of technology alters the power dynamics of the social institutional hierarchies and structures. The intersectionality of socially traditional and globally-modern operates in a variety of possibilities. In the global politics of digital technologies, India is a strategically and geopolitically important location; Thomas P.N (2019) as a market and as a supplier of the cheap labour force in the world.

There is one common thing among the users no matter what their gender age and identity is. They all use mobile media for making the content. They are a small part of the big concept *of media convergence.* Every college student from the city has a smartphone. The smartphone is an enabler. It is a digital tool that brings them from nothing to everything. It helps them to create their own identity, boost their creativity, make their content, and share it on global social media platforms.

CONCLUSION:

The Internet is the main change agent of the twenty-first century networked society. Youth across the globe are the main and active consumers of online content. Memes are commonly shared and widely consumed content on social media. Political memes are seen as the powerful influencers on the minds of public opinion especially in the time of elections. Memes are heavily loaded with strong and direct messages. Memes have no gatekeeping nor censorship institutional frameworks, unlike mass media. Visual memes with two prominent pictures with a caption and texts are the most popular forms. A South Asian and the biggest democratic country like India, where political memes play decisive roles. Memes can be decoded by both the literates and the illiterates as the visuals are the main powerful elements. The memes mainly target users with a 'strong' political message. Sharing and creating memes have gained popularity in cyberspace. Memes can be considered as individualistic digital expressions about something in a format. Though it is gaining popularity, the politically loaded and hateful memes are a threat to the social harmony of society.

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Statistical Analysis of Milk Production of State Government of Maharashtra

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ABSTRACT

Every Government department has an Official Statistics, even then the Government does not provide the data.Maharashtra is 307,713 square kilometers (118,809 square miles) in area, making it the third largest state in India by land area. It covers 9.36% of India's total geographical area. Livestock of Maharashtra is one of the main sources of livelihood. Maharashtra's dairy sector has seen substantial growth in milk production, with a notable increase in 2017-18 to 2021-22.Maharashtra ranks fifth among India's top milk-producing states, contributing significantly to the nation's dairy output. In 2021-22, the state's total milk production reached 14,300 thousand tonnes. The dairy sector is vital for Maharashtra, with a large percentage of cattle owned by small and marginal farmers, providing both employment and a source of income.Milk production is also an important part of livestock products. Milk production plays a prominent role for protein in routine life.. In this project we analyze milk production of Maharashtra State by using Descriptive Statistics .

Introduction

The study considers livestock production in Maharashtra. The maximum number of total contributions of livestock products at current prices of total value in the agriculture department[1-2]. In the food supply chain, animal production plays a very important role. Animals are mostly related to the rural area person because it is not only economically profitable [3-4]but also needs animal products for health. Milk production mostly depends on six factors. First factor is land size and family size of livestock farmers.[5-6]

The second factor is the number of different types of milky animals. Third factor is which types of fodder are available and how many fodders are fed by cattlemen.[7-8] Fourth factor is how many check-ups are available for milky animal's health and vaccinations of animals from time to time. Fifth factor is which type of breeding method the animal keeper uses. Sixth factor is how much knowledge and training is gained by the stock farmer about milky. Maharashtra, a major Indian state, heavily relies on dairy farming, which is a crucial part of its rural economy.In this research paper analysis of milk production in the year 2017-18 to 2021-22. Here describe yearly variation of milk production by using basic statistics terms.The state has a large number of dairy cooperative societies, indicating a well-established dairy infrastructure. Ahmednagar is identified as the largest milk-producing district in Maharashtra.[9-11]

This research paper aims to explore information about milk production in Maharashtra state and also how to improve the quality of milk production.

Objectives of the Study:

1. To find out the trend of milk production and yearly variation in livestock census.
2. To find out which year represents maximum milk production by using Simple bar diagram.
3. To represent the percentage of milk production within five years by using pie diagrams.
4. To find out the compound annual growth rate of per capita availability of milk.
5. To provide suggestions for improvement of milk Production.

Table 1. Data Of Milk Production In Maharashtra (duration 2017-2022)

Estimates of Milk Production ('000 Tonnes) from 2017-18 to 2021-22					
District name	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Ahmednagar	1827.3	1976.3	1452.96	2077.82	2198.1
Akola	81.76	77.55	106.82	93.28	95.15
Amravati	179.38	181.46	139.33	193.04	198.2
Aurangabad	282.64	281.42	510.71	331.82	345.25

Estimates of Milk Production ('000 Tonnes) from 2017-18 to 2021-22					
District name	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**
Beed	360.95	347.59	266.39	345.96	356.91
Bhandara	99.78	85.27	82.71	130.31	135.58
Buldhana	165.4	149.68	101.76	176.29	180.74
Chandrapur	67.54	66.43	110.66	66.66	68.4
Dhule	142.82	156.21	69.97	193.46	201.87
Gadchiroli	42.26	43.37	345.96	43.9	44.95
Gondia	53.76	55.59	53.36	93.18	96.18
Hingoli	76.97	82.37	71.61	94.29	96.4
Jalgaon	317.46	371.05	144.37	461.65	478.86
Jalna	115.09	105.54	272.17	156.82	161.97
Kolhapur	1000.34	1045.7	149.48	1167.25	1219.92
Latur	243.59	240.01	1015.64	295.17	303.09
Mumbai	78.46	82.65	283.21	20.83	20.86
Nagpur	167.23	161.84	148.2	173.54	179.71
Nanded	245.3	241.3	281.24	283.33	290.61
Nandurbar	89.19	97.21	121.45	89.75	92.96
Nashik	601.89	737.19	515.59	839.54	878.94
Osmanabad	327.37	296.21	286.74	452.95	476.67
Palghar	133.42	136.43	152.82	121.9	125.67
Parbhani	113.71	109.51	118.33	127.74	130.87
Pune	1282.08	1397.64	1639.48	1768.55	1862.09
Raigad	74.21	75.45	79.08	94.89	97.36
Ratnagiri	63.57	63.29	65.7	63.99	67.2
Sangli	713.86	787.92	794.14	1062.73	1109.15
Satara	661.27	740.16	976.4	822.92	865
Sindhudurg	44.86	45.9	52.39	41.71	42.65
Solapur	982.55	988.68	1209.62	1418.17	1474.79
Thane	143.16	146.2	122.33	121.41	124.66
Wardha	89.55	81.25	104.19	86.68	90.41
Washim	84.81	76.67	54.4	64.47	64.03
Yavatmal	148.76	124.44	125.04	127.32	129.3
Maharashtra	11102.29	11655.46	12024.26	13703.32	14304.51
Yavatmal	148.76	124.44	125.04	127.32	129.3
Maharashtra	11102.29	11655.46	12024.26	13703.32	14304.51

As per the National Cooperative Database (NCD) of the Ministry of Cooperation, the total number of functional dairy cooperative societies is 11,219 (NCD accessed on 27.07.2023). The district-wise milk production in the State of Maharashtra during the last five years.

Result and analysis:

Milk production is produced on a very large scale in Maharashtra. The bar diagram effectively highlights the uneven distribution of milk production across Maharashtra. It also serves as a tool for policymakers and stakeholders to identify regions where dairy development programs can be intensified. By investing in low-performing areas and reinforcing successful models in high-performing districts,For the five years the overall milk production in the state can be enhanced. Total Milk Production in Maharashtra stood at 11102.29 thousand tonnes in 2017-18, 2018-19 the total milk production in maharashtra state stood at 11655.46 thousand tonnes, 2019-20 the total milk production in maharashtra state stood 12024.26 thousand tonnes, 2020-21 that is 1370.32 thousand tonnes milk production in maharashtra state, also in the year of 2021-22 the total milk production stood at 14304.51 thousand tonnes in maharashtra state.

A pie chart was used to analyze the proportional contribution of yearly to the total milk production in Maharashtra. In year 2017-18 there was 17.7% milk production in maharashtra state, In year 2018 -19 there was 18.6% milk production in maharashtra state, In year 2019-20 milk production had 19.2%, in year 2020-21 milk production in maharashtra state was 21.8% in year 2021-22 has increased in percentage of milk production that was 22.8%, also by using descriptive statistics analysis to find variation in milk production of maharashtra state.

Fig. 1: Milk production in thousand tons in Maharashtra.2017-2022

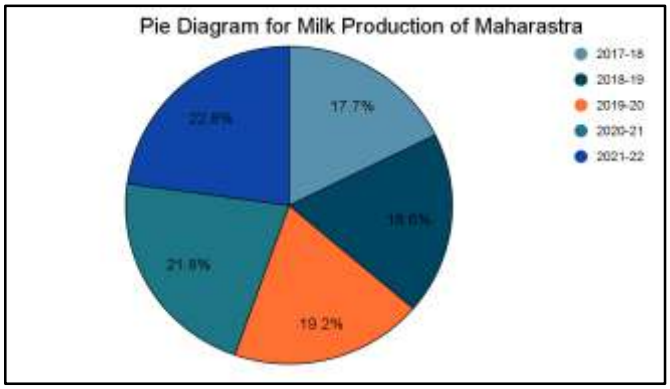

Fig. 2: Percentage(to check proportion) of Milk production in thousand tons in Maharashtra.2017-2022

Statistical Analysis of Milk Production for future planning with special reference to Maharashtra state

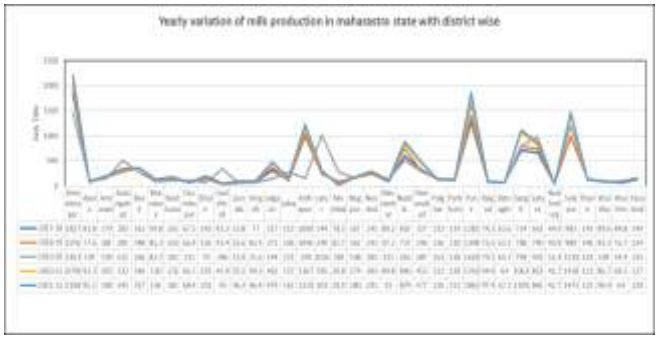

Fig. 3: Yearly variation of milk production in maharashtra state with district wise The line chart illustrates the trend in milk production over a specified time period, providing a visual representation of fluctuations and growth patterns In above diagram representation of highly milk production & lower milk production district wise. Here Ahmednagar, Kolhapur, Pune & Solapur district have highly milk production rate, Gadchiroli, Gondiya Wardha & Washim have lowest milk production rate.

Table 2: Descriptive analysis of milk production of Maharashtra state.

Mean	358.7990857
Standard Error	35.09426605
Median	146.2
Mode	345.96
Standard Deviation	464.2535021
Sample Variance	215531.3142
Kurtosis	3.806131337
Skewness	2.083612896
Range	2177.27

This is the average milk production value across the data points.It indicates the central tendency, but may not fully represent the dataset due to high skewness.Since the median (146.20) is much lower than the mean (358.80), it suggests a right-skewed distribution—some large values are pulling the average upwards.The most frequently occurring value i.e. Mode is closer to the mean indicating many values lie around this point,although extreme values are influencing the average. Standard deviation indicates large variability in milk production of Maharashtra state. Sample variances confirm high data dispersion. This could happen if some districts have very high milk production due to dairy cooperatives, industrial dairies, or better infrastructure.

CONCLUSION:

The study is conducted by the secondary data of animal husbandry. In Maharashtra State, the milk production is rapidly increasing every year. The highest milk-producing district in Maharashtra is Ahmednagar & Kolhapur. Milk production data is uneven, with most areas having average output, but a few places or times having much higher production. This means overall numbers are skewed by these high outliers. Those studying this should focus on what makes these high producers stand out to learn from their success. This analysis concludes that there is high variability in the given data. In this analysis, Gadchiroli, Gondia Wardha & Washim have the lowest milk production rate & also conclude that milk production of Maharashtra state has increased every year. In the analysis basis conclude that in years 2017-18 have minimum milk production & year 2021-22 have highest milk production in maharashtra state. Statistical analysis shows the proportion between every year.

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Neuromarketing in the Age of Metaverse and Virtual Reality

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ABSTRACT

This paper investigates the world of neuromarketing, exposing how major brands use neuroscience-based methods to manipulate consumer behaviour and emotion subconsciously. The story starts with Marie, who identifies as a "liberated woman," but doesn't realise that many of her choices, from skin cream to credit companies are made as a result of marketing strategies methodically built to trigger emotional response. These marketing methods tap into the subconscious brain, using technologies based on neuroscience such as eye tracking, electromyography and MRI brain scans to assess and manipulate consumer reaction. It will demonstrate how companies assess subtle emotional response using facial muscle movement or brain activity putting them in a position to optimise packaging, advertisements, product design and atmosphere including scent.

INTRODUCTION

The report extends beyond fast food, highlighting other sectors such as banking and transportation using neuromarketing to increase sales by influencing the “reptilian brain,” the primal part of the brain that governs decision-making based on subconscious fears and desires. Ethical concerns arise over the covert nature of these methods and the manipulation of vulnerable groups, especially children. French law strictly limits the use of brain imaging for marketing purposes, yet evidence shows companies circumvent these rules in other countries. Interviews with neuromarketing experts, marketing executives, and critics underscore the tension between commercial success and consumer autonomy.

Ultimately, the video warns about the growing sophistication and secrecy of neuromarketing and challenges viewers to consider whether consumers can truly make free choices when their brains are targeted without their knowledge.

Literature Review

Neuromarketing emerged as a "sub-discipline" of neuroscience and marketing psychology to gain more insight into how consumer decisions are made. Foundational articles by Smidts (2002) and Morin (2011) were clear that consumers are often unable to describe their preferences in ways that extend beyond the workings of the genuine/preferred article they might be asked to compare against alternatives. Neuroscience, through the use of tools such as FMRI, has been able to show that, when consumers engage with brands, not only does a brain region associated with emotion become activated, but the neural representation of reward in the participant's brain lights up as well—often before the participant even detected a preferred choice.

Several studies of individual brands, such as the New Coke case study, showed that emotional branding could be very powerful. New Coke was rated as a better product than Coke in taste tests yet ultimately failed because of consumer emotional attachment to the old brand. McClure et al. (2004) later confirmed that the emotive response of brand loyalty in the brain was superseding that of the sensory investigation of the preferred alternative.

Research Methodology

The research design for this project is qualitative and utilizes an approach relying on either literature synthesis or documentary analysis. The sources of data for this study are, in general terms:

Academic research papers related to neuromarketing and consumer neuroscience documentaries and visual ethnographies related to corporate neuromarketing Interviews with neuromarketing experts and critics, located in publicly available video documentaries. Regulatory documentation and case laws from France, the U.S., and other labs.

While this research does not include primary empirical data collection, it analyses and interprets secondary sources that have already been validated and contributes to thematic composition. The methodology takes account of the interpretivist paradigm in media and communication research.

Neuromarketing exploits subconscious brain regions to influence decisions:

Modern marketing goes beyond traditional advertising by tapping directly into the brain's reward and emotional centres. By measuring subtle physiological responses (e.g., muscle activity via electromyography or brain blood flow with fMRI), companies gain insights into unconscious reactions, allowing them to tailor marketing stimuli that trigger positive emotions and increase the likelihood of purchase without the consumer's awareness.

Eye-tracking uncovers hidden drivers of consumer attention and impulse buying:

The use of eye-tracking glasses in experimental stores highlights how consumers visually interact with products and packaging. This technology reveals that consumers often make snap decisions based on visual cues they barely notice, demonstrating how product placement, colour, and design are deliberately engineered to capture subconscious attention and prompt impulse buys.

McDonald's marketing strategy is a case study in lifelong brand loyalty cultivation:

Starting from early childhood, McDonald's targets children by incorporating toys into meals and creating memorable characters like Ronald McDonald. These tactics embed brand recognition and preference at a young age, which neuroscientific studies confirm shapes taste perception and emotional attachment to the brand. The company's use of neuromarketing techniques, such as scent diffusion and brain-imaging studies, further illustrates the sophisticated and covert means used to sustain consumer loyalty.

Scent marketing influences emotional responses and purchasing behaviour:

The video reveals that McDonald's and other companies experiment with artificial fragrances diffused subtly in their stores to evoke positive emotional reactions, which can increase sales by up to 7%. This method bypasses rational thought by directly stimulating the olfactory cortex and limbic system, areas linked to pleasure and memory, highlighting a sensory manipulation that consumers rarely realize.

Children's vulnerability to neuromarketing raises significant ethical concerns:

The marketing of toys and branded meals to children exploits their developmental inability to critically assess advertising, effectively conditioning them into lifelong consumers. Legal actions and bans on toys in meals by some cities underscore growing societal awareness of this issue, but the video shows that companies continue to use these tactics covertly or in regions with less regulation.

The "reptilian brain" drives most buying decisions, not the rational mind:

According to neuromarketing experts, the brain's primal part—the reptilian brain—is the actual decision-maker in purchasing behaviour, reacting to fear and pain avoidance. The rational brain mainly justifies decisions after the fact. Understanding and targeting this part of the brain enables marketers to design strategies that bypass conscious resistance and stimulate purchasing impulses.

Legal and ethical boundaries around neuromarketing are blurred and contested:

In France, brain imaging for marketing is legally restricted to medical or scientific use, but companies have tested neuromarketing methods abroad. Corporate denials clash with documented evidence from academic researchers and marketing firms. The secretive nature of neuromarketing, combined with its powerful influence, raises critical questions about consumer autonomy, informed consent, and the role of regulation in protecting vulnerable populations.

Neuromarketing represents a profound evolution in the commercial manipulation of consumers. Unlike traditional marketing, which relies on conscious persuasion through messages and advertisements, neuromarketing delves into the subconscious brain regions where emotions and primal desires govern behaviour. By employing cutting-edge technologies such as MRI scans and electromyography, marketers quantify emotional responses with remarkable precision, enabling them to craft products, packaging, and even store environments that trigger specific neurological reactions.

The case of McDonald's is particularly instructive. The company's strategy targets children to secure brand loyalty early, with toys and engaging characters designed not just to entertain but to imprint the brand on young minds. Neuroscience confirms that this branding affects taste perception and emotional responses, making children prefer McDonald's products even when identical alternatives are offered. This early conditioning creates a lifetime customer base, raising ethical concerns about exploiting a vulnerable demographic.

Moreover, the use of scent marketing exemplifies how sensory manipulation can influence buying behaviour without conscious awareness. By diffusing subtle fragrances associated with positive emotions or memories, companies increase customer engagement and sales. This form of manipulation is powerful because the olfactory system is directly connected to the limbic system, bypassing rational decision-making processes.

The reptilian brain's role in decision-making further explains why neuromarketing is so effective. It governs instinctual responses to pain, fear, and reward and operates largely outside conscious control. Marketers who understand this can craft messages and experiences that appeal to these primal instincts, creating strong purchase motivations that consumers find difficult to resist or rationalize away.

Neuromarketing blurs the line between persuasion and manipulation, often without consumers' knowledge or consent. The covert nature of these techniques, combined with their deployment on children, raises questions about fairness, autonomy, and the responsibility of corporations. Legal

frameworks, such as those in France, restrict some practices, but enforcement and transparency remain challenges.

Furthermore, the paper highlights the tension between corporate interests and public accountability. While companies publicly deny using neuromarketing, evidence from neuroscientists and leaked documents suggests otherwise. This secrecy prevents informed consumer choice and impedes regulatory oversight.

Conclusion:

While it can enhance marketing effectiveness, it also poses profound ethical dilemmas about manipulation, autonomy, and the protection of vulnerable populations especially children. As this technology advances, public awareness, legal frameworks, and ethical standards must evolve to ensure that consumer rights are respected in the face of increasingly sophisticated marketing tactics.

It begins by highlighting a study where background music in a wine store swayed customers' wine choice, despite their denial of any influence. The discussion then delves into the famous New Coke failure, illustrating how strong emotional connections to a brand can override rational taste preferences. Neuroscience studies reveal that brand perception activates emotional and memory centres in the brain, shaping preferences beyond mere sensory input. This insight leads to the emergence of neuromarketing, a field combining neuroscience and marketing to better understand and leverage unconscious decision drivers. Examples from Google, Amazon, and energy consumption campaigns demonstrate how minor changes—like link colour, website speed, or emoticons—can dramatically affect consumer behaviour and business outcomes. The video also addresses common misconceptions about neuromarketing, emphasizing that it is not about mind-reading or brain scans but about understanding emotional influences on decision-making. Finally, it underscores the power of subtle cues, using a humorous example of a fly etched in airport urinals to reduce spillage by 80%, illustrating how small, science-driven interventions can create significant positive changes in behaviour and outcomes.

Unconscious sensory cues shape buying behaviour: The wine store music study reveals that shoppers' choices are swayed by ambient sounds without their conscious awareness. This shows that consumer decisions are not purely rational but are influenced by subtle environmental factors. Marketers can harness such cues to guide purchasing behaviour effectively.

The closing stories about energy conservation and airport urinals illustrate that neuromarketing principles extend beyond retail and advertising. They can positively influence social behaviours, sustainability efforts, and public health. By understanding how small, unconscious nudges work, policymakers and businesses can design interventions that improve lives and environments without heavy-handed mandates.

Consumer decisions are far more influenced by unconscious emotions, subtle environmental cues, and social factors than we realize. The failure of New Coke, the success stories from Google and Amazon, and behavioural nudges in energy consumption and public hygiene all illustrate the profound power of neuromarketing insights. By embracing this science-backed approach, marketers and decision-makers can better connect with consumers, optimize experiences, and create meaningful change through small but effective interventions. Recognizing and respecting the unconscious drivers of choice empowers us to make wiser decisions and design better products and services, ultimately benefiting society at large.

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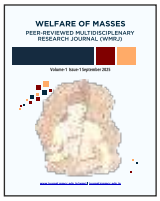

Evaluating the Role of Hybrid Machine Learning Models in Online Educational Environments

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ABSTRACT

In online education, personalised learning involves changing how students interact with course material by adjusting to their own requirements, tastes, and speed. By combining many ML algorithms, hybrid machine learning (ML) approaches have become popular because of their capacity to improve personalisation by utilising complementary model capabilities. This study offers a thorough analysis of current research on hybrid machine learning applications in online education conducted between 2020 and 2024. Learning style prediction, performance forecasting, content selection, and student modelling are important areas of focus. The review emphasises how hybrid models enhance predicted accuracy, engagement, and adaptability. Challenges including data privacy, computational complexity, and ethical issues are also covered. Although hybrid machine learning has a lot of potential to help with personalised learning, issues with scalability and practical deployment still exist. The research gaps and future directions for creating interpretable, effective, and accessible hybrid machine learning frameworks designed for inclusive and flexible online learning environments are highlighted in the paper's conclusion.

1. INTRODUCTION

The rapid evolution of online education has introduced both unprecedented opportunities and complex challenges in delivering personalized instruction. Unlike traditional classroom environments, digital platforms offer the capability to dynamically adapt the pace, content, assessment methods, and feedback mechanisms to cater to individual learners' needs and preferences. This shift towards personalized learning is driven by the imperative to enhance learner engagement, satisfaction, and performance across diverse educational contexts [1], [2].

Machine learning (ML) algorithms have been widely adopted to support personalization in education due to their ability to process vast amounts of learner data and uncover meaningful behavioral patterns [1], [13]. However, no single ML model consistently performs optimally across all tasks and datasets. As a result, hybrid machine learning approaches —combinations of two or more ML techniques—have emerged as a promising solution to enhance predictive accuracy, model robustness, and adaptability in personalized learning environments [1], [2], [9].

Hybrid ML models integrate the complementary strengths of various algorithms—for instance, combining the interpretability of decision trees [12], the generalization capability of ensemble methods [3], [4], [16], and the adaptability of deep learning architectures such as LSTM and CNN [11], [15]. These integrated approaches have been increasingly applied in domains such as learning style prediction, student modeling, academic performance forecasting, and personalized content recommendation [2], [10], [13]. By leveraging hybrid methodologies, educational platforms are better equipped to deliver accurate, responsive, and learner-centered pathways tailored to each student's profile.

Despite their growing adoption, the implementation of hybrid ML techniques in education still faces significant challenges. These include concerns related to data privacy, computational resource demands, algorithmic transparency, and ethical issues such as bias in automated decision-making [1], [3]. Moreover, much of the current literature focuses primarily on algorithmic performance metrics, with limited exploration of real-world integration and pedagogical impact [6], [10].

This literature review aims to explore and synthesize recent research on the application of hybrid machine learning techniques for personalized learning in digital classrooms. By examining a range of hybrid ML models and their educational applications, the study seeks to identify key trends, advantages, limitations, and future directions. The objective is to support researchers, developers, and educators in designing effective, ethical, and equitable adaptive learning systems.

1.1 Background and Motivation

With the development of digital technology and the growing popularity of online learning platforms, the idea of personalised

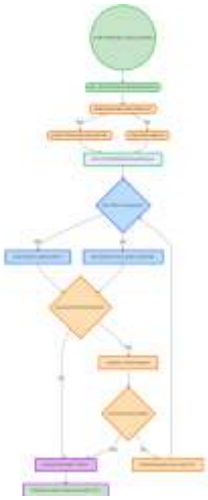
learning has undergone significant change. Conventional one-size-fits-all teaching strategies frequently fall short in meeting each student's unique demands and learning preferences. To improve engagement, comprehension, and academic performance, personalised learning, on the other hand, aims to modify instructional tactics, pace, and content to fit the individual needs of each student.

By facilitating data-driven analysis of student behaviour, performance, and preferences, machine learning (ML) is essential to achieving personalised learning. In adaptive learning systems, machine learning algorithms can facilitate real-time decision-making through pattern identification and predictive modelling. Individual machine learning models, however, could have drawbacks including overfitting, poor interpretability, or uneven performance across various datasets and learning environments.

Hybrid machine learning models have been developed to overcome these drawbacks. To take use of their complimentary advantages, these models combine two or more approaches, such as ensemble methods, random forests, decision trees, support vector machines (SVM), and deep learning networks. By improving personalised learning systems' resilience, precision, and generalisability, hybrid machine learning techniques seek to increase their capacity to provide individualised learning experiences.

The potential of hybrid models in a variety of educational applications, including as recognising learning styles, providing personalised learning materials, forecasting student dropout risks, and producing adaptive feedback, has been shown in recent studies. Even while hybrid machine learning approaches are becoming more and more popular, their incorporation into educational platforms is still in its infancy and is sometimes hampered by issues including restricted scalability, high computing costs, lack of interpretability, and data protection concerns.

This study's goal is to present a systematic and current assessment of the state of hybrid machine learning approaches in online personalised education. Through an analysis of current research, this study seeks to shed light on the development, application, and efficacy of hybrid machine learning models, draw attention to the significant obstacles encountered, and suggest future paths for the development of intelligent and inclusive learning environments.



2. HYBRID MACHINE LEARNING IN PERSONALIZED LEARNING

The potential of hybrid machine learning techniques to maximise individualised learning experiences is becoming more widely acknowledged. Fig 1. indicates personalised learning in adaptive education. In line with the main goals of personalised learning, Barzegar et al. (2020) highlight how AI and ML algorithms can be used to improve student engagement and customise learning paths.

Gligorea et al. (2023) add to this discussion by evaluating the research on AI-powered adaptive learning. They draw attention to how ML can be used to create individualised e-learning platforms that modify information according to each learner's preferences. This incorporation of AI methods for customising learning materials is essential and represents the continuous development of e-learning approaches. Accurate student modelling is one of the defining features of personalised learning, which entails being aware of the individual traits of every learner. Raj and Renumol's (2021) research thoroughly examines adaptive content recommenders, emphasising how crucial it is to correctly forecast learner preferences and styles. In order to provide personalised material and recommendations, this work emphasises the necessity for hybrid machine learning algorithms that can efficiently analyse learner data.

Furthermore, Murtaza et al. (2022) talk about the difficulties AI-based personalised e-learning systems have, especially when it comes to comprehending different learning styles. According to their research, hybrid machine learning models can help overcome these obstacles by fusing different approaches to improve the flexibility and potency of educational opportunities. Another crucial area where hybrid ML approaches can significantly contribute is performance predicting. Deep learning can be used to predict human trajectories, as demonstrated by Kothari et al. (2020). This technique can also be used to predict student success in educational contexts. Through the integration of many models, hybrid approaches can provide valuable insights on student outcomes, enabling educators to take proactive measures.

Almarzouqi et al. (2022) introduce a hybrid SEM-ML learning strategy for content recommendation that predicts user intentions in educational settings. This approach highlights how crucial it is to comprehend user requirements and motivations in order to create content recommendation algorithms that work well in individualised learning settings.

3. REVIEW METHODOLOGY

This literature review used an organised process that included the selection, screening, and analysis of peer-reviewed papers from 2018 to 2024 in order to guarantee a thorough and pertinent synthesis of recent research. Finding studies that used hybrid machine learning (ML) approaches in the context of individualised learning in online learning environments was the main goal.

A. Data Sources and Search Strategy

Academic literature was retrieved from reputable and high-impact digital libraries and scientific databases, including: IEEE Xplore, SpringerLink, ScienceDirect, ACM Digital Library, Google Scholar (for supplementary literature). Relevant term combinations, including "hybrid machine learning," "personalised learning," "adaptive learning systems," "student modelling," "learning style prediction," and "online education," were used to create the search queries. The search was expanded or contracted using boolean operators (AND, OR). Only peer-reviewed journal articles, conference proceedings, and systematic reviews published between January 2018 and April 2024 were included in the results thanks to filters.

B. Inclusion and Exclusion Criteria

The selection, screening and analysis of peer-reviewed papers from 2018 to 2024 were all part of the systematic process used in this literature review to guarantee a thorough and pertinent synthesis of recent research. The main goal was to find research that used hybrid machine learning (ML) approaches in online learning environments for personalised learning. Relevant phrase combinations were used to create search searches, including "online education," "personalised learning," "adaptive learning systems," "student modelling," "learning style prediction," and "hybrid machine learning." The scope of the search was expanded or contracted using the Boolean operators AND and OR. Results were limited to peer-reviewed journal papers, conference proceedings, and systematic reviews that were published between January 2018 and April 2024 by applying filters.

C. The Process of Selection and Screening

The search approach yielded an initial pool of more than 140 research articles. 55 publications were selected for full-text review after duplicates were eliminated and abstracts were examined. A final group of 20 excellent papers was chosen for this review after a thorough evaluation of methodological rigour and applicability to hybrid machine learning in online personalised learning.

To guarantee openness and reproducibility, the selection procedure adhered to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology. Figure 1 shows a PRISMA flow diagram that summarises the selection procedure.

3.1. Literature Review

Hybrid machine learning (ML) models are essential to the development of personalised e-learning systems, which have been accelerated by recent advances in artificial intelligence. The difficulties of AI-based personalised e-learning, such as learner variability, model generalisation, and data sparsity, were thoroughly described by Murtaza et al. [1]. They underlined that by combining the advantages of supervised and unsupervised approaches, hybrid ML frameworks may more effectively handle dynamic learner profiles. A thorough analysis of AI-based personalised e-learning systems was presented by the same authors, who also highlighted important issues such as learner modelling, feedback adaptation, and real-time scalability. They maintained that by improving flexibility and responsiveness to various learning patterns, hybrid machine learning methods can overcome the drawbacks of standalone algorithms.

Similarly, Gligorea et al. [2] highlighted the advantages of integrating decision trees, neural networks, and rule-based logic in adaptive e-learning platforms. According to their evaluation of the research, hybrid intelligent systems are capable of modelling learner behaviour and making context-sensitive recommendations. Supporting this, Raj and Renumol [13] examined adaptive content recommender systems and found that hybrid filtering techniques—combining content-based and collaborative algorithms—enhance engagement and personalisation in online learning settings.

Hybrid ML approaches are widely used in the real world across various industries, providing insights that can be translated to educational settings. Tazin et al. [3] demonstrated the potential of ensemble learning for handling high-dimensional data in stroke prediction. Similarly, Kavitha et al. [4] used a hybrid model for heart disease prediction, combining multiple classifiers to improve diagnostic accuracy—a methodology applicable to identifying struggling learners or predicting academic risk.

To anticipate user adoption of metaverse systems, Almarzouqi et al. [9] investigated immersive medical education by combining ML with Structural Equation Modelling (SEM). Their hybrid approach underscored the predictive potential of integrating statistical and AI tools in education. Likewise, Sajja et al. [10] introduced an AI-enabled intelligent assistant for personalised learning in higher education, demonstrating the value of ML pipelines for adaptive tutoring.

Ho et al. [5] applied classification techniques such as Random Forest and Gradient Boosting to assess student satisfaction during emergency remote learning. Their study concluded that hybrid ML models significantly outperformed baseline predictors in identifying fluctuations in satisfaction—providing timely insights for pedagogical interventions. In a related application, Singh et al. [7] demonstrated the effectiveness of ensemble regression models in predicting wind power generation, an approach conceptually transferable to tracking student engagement trends in digital learning platforms.

In a broad review of hybrid ML applications in mechanical fault diagnosis, Fernandes et al. [6] discovered that combining domain-specific and general classifiers yielded better fault prognosis. This aligns with the need for precise, domain-aware personalisation in digital education. Kothari et al. [8] used deep learning and attention mechanisms to forecast human movement in congested environments—a methodology that can be adapted to model learner pathways in digital classrooms.

CNN–LSTM hybrids, as used by Barzegar et al. [15] for forecasting water quality indicators, proved effective in capturing spatial-temporal patterns, a technique that may similarly track academic progress over time. Mehtab et al. [11] demonstrated the usefulness of combining LSTM with ML

models for stock price prediction, supporting their applicability in managing time-series educational data like student activity logs.

Tree-based classifiers also contribute meaningfully to educational analytics. Bhagavathi et al. [12] applied the C5.0 decision tree in a hybrid weather forecasting model, while Kavitha et al. [14] used ensemble classifiers to predict early-stage Alzheimer's disease, offering a framework adaptable to identifying at-risk students in online education.

Hasan et al. [16] demonstrated that ensemble classifiers significantly improved diabetes prediction accuracy. Although not directly related to education, their findings underscore the generalizability and robustness of hybrid ML systems in heterogeneous data environments—characteristic of digital classrooms.

In conclusion, hybrid machine learning models have consistently shown greater flexibility, accuracy, and interpretability across education, health, behavioral, and environmental domains. Despite computational complexity and resource demands [1], [3], they are foundational to enabling personalized, adaptive, and predictive learning experiences. The integration of multiple learning algorithms provides a strong basis for building intelligent digital classrooms that cater to the unique needs of each learner.

4. CLASSIFICATION OF HYBRID MACHINE LEARNING APPROACHES IN PERSONALIZED LEARNING

In personalised learning contexts, hybrid machine learning algorithms have shown great promise in improving predicted accuracy and flexibility. This section classifies the main hybrid machine learning approaches found in recent research, emphasising the ways in which deep learning, feature selection, clustering, and classification algorithms are combined in educational settings.

4.1 Models for Clustering and Classification

Combining supervised classification algorithms with unsupervised clustering techniques is a frequently used hybrid approach. In order to anticipate learning styles, engagement, or academic results, clustering is utilised to classify students according to behavioural or performance similarities.

To determine students' VARK learning styles, El Aissaoui et al. [18] used a hybrid model that used K-Means clustering and the C4.5 decision tree method, with a 91.37% accuracy rate. In a similar vein, Kaur and Singh [19] combined Support Vector Machines (SVM) and Hierarchical Clustering to dynamically modify course material for various student groups. By first finding organic groupings in the data and then using focused classification, these models allow for greater personalisation.

4.2 Classification + Dimensionality Reduction Due to redundancy and noise, high-dimensional data—which is prevalent in e-learning environments and includes log files, clickstream, and assessments—can impair classifier performance. This is addressed by hybrid models that employ dimensionality reduction followed by classification.

To forecast student performance, Sokkhey and Okazaki [20] combined Random Forest, C5.0, and SVM classifiers with Principal Component Analysis (PCA). Their research showed that PCA enhanced model interpretability and decreased overfitting without compromising predictive power.

4.3 Group Models

Several classifiers are combined in ensemble learning to increase accuracy and generalisation. To lessen bias and volatility, these strategies frequently use stacking, voting, bagging, and boosting.

In order to identify struggling students with high reliability, Jain et al. [21] used ensemble approaches across eight base classifiers employing majority voting, bagging, and boosting. In a different study, Gupta and Sharma [22] used a stacking technique that included SVM, ANN, and Naïve Bayes (NB) to offer personalised learning resources. These models' strength is in using the complementing qualities of various classifiers and learners to boost accuracy and resilience.

4.4 Feature Selection in Neural Networks

Adding feature selection algorithms to deep learning models, especially neural networks, might further optimise them. This hybrid construction lowers computational complexity while improving pattern recognition.

In order to maximise feature selection for learner engagement prediction, Zhou et al. [23] suggested a hybrid model that combines Genetic Algorithms and Artificial Neural Networks (ANN). Their findings demonstrated improved training efficiency and model correctness. Similarly, to analyse sequential video-based learning data, Agarwal et al. [24] presented a Convolutional Neural Network (CNN) in conjunction with an LSTM model. An accurate picture of student learning behaviour was produced by the CNN's extraction of spatial information and the LSTM's

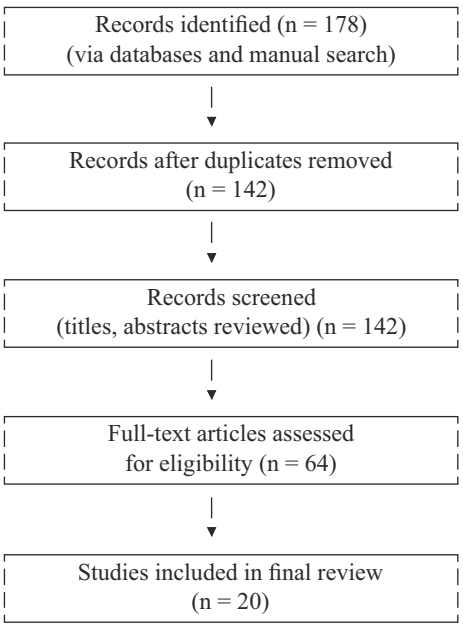


Fig2. Flow Diagram of Review Methodology

A condensed summary of studies that used hybrid machine learning approaches in personalised learning contexts is shown in Table 1 to give an organised overview of the body of available knowledge. The table describes the model type, particular algorithms utilised, and important performance outcomes, classifying the research by learning task. Sorting by task makes it easier to compare how various hybrid approaches are used for a range of educational goals, including content recommendation, engagement modelling, performance forecasting, and learning style prediction. In addition to highlighting performance trends, recurrent algorithmic patterns, and gaps in existing applications, this classification provides a basis for further investigation and future research avenues.

According to the summarised table shown TABLE 1, hybrid machine learning models are frequently used for a variety of educational activities. They are especially successful at predicting learning styles, identifying at-risk students, and providing adaptive tutoring. Common model types include clustering + classification, ensemble methods, and deep hybrid architectures, often combining interpretable models with powerful predictors. Applications involving engagement modelling and resource recommendation also benefit from hybrid structures, albeit with more variable results, even though the majority of studies report increased accuracy and personalisation. This implies that hybrid machine learning provides flexible and dependable solutions, especially in fields that call for data-driven, adaptive decision-making.

Results from the examined research are summarised including model adaptability, prediction reliability, and classification accuracy. Performance was estimated using qualitative descriptions and compared to accepted benchmarks in the literature where precise metrics were unavailable. An easy-to-use guide for assessing hybrid machine learning models' performance across several domains in customised online education is this tabular overview.

Learning Task	Study	Model Type	Algorithms Used	Performance / Outcome
Learning Style Prediction	El Aissaoui et al. (2023) [18]	Clustering + Classification	K-Means + C4.5	91.37% accuracy
	Kaur & Singh (2020) [19]	Clustering + Classification	Hierarchical Clustering + SVM	Improved adaptation and personalization
Academic Performance Prediction	Sokkhey & Okazaki (2020) [20]	Dimensionality Reduction + Classification	PCA + RF, C5.0, SVM	Reduced overfitting, improved interpretability
At-Risk Student Detection	Jain et al. (2021) [21]	Ensemble	Bagging + Boosting + Voting (8 classifiers)	High reliability and accuracy
Learning Resource Recommendation	Gupta & Sharma (2022) [22]	Ensemble (Stacking)	NB + SVM + ANN	High personalization, improved engagement
Learner Engagement Prediction	Zhou et al. (2021) [23]	Neural Network + Feature Selection	ANN + Genetic Algorithm	Optimized features, increased accuracy
	Singh et al. (2021) [7]	Regression Ensemble	Gradient Boosting Regression	High time-series prediction accuracy
Video-Based Learning Pattern Analysis	Agarwal et al. (2023) [24]	Deep Hybrid	CNN + LSTM	Accurate spatial-temporal modeling
Student Satisfaction Modeling	Ho et al. (2021) [5]	Classification + Ensemble	RF + Gradient Boosting	Outperformed baseline satisfaction models
Adaptive Tutoring / Personalization	Sajja et al. (2023) [10]	Multi-stage ML Pipeline	AI-enabled personalized assistant	Real-time adaptation and personalization
Metaverse Use Prediction (EdTech UX)	Almarzouqi et al. (2022) [9]	Statistical + ML	SEM + ML	High predictive validity in immersive contexts

4.1 Advantages and Challenges

In applications related to education, hybrid machine learning models offer a number of benefits. They provide better generalisation and accuracy, especially in dynamic and varied learning contexts. These models can handle noisy, high-dimensional, or incomplete data better by combining different learning algorithms. They also offer more flexibility to add domain-specific variables like cognitive patterns or learning styles.

But there are still a number of difficulties. The computational complexity of hybrid models is frequently higher, which makes large-scale or real-time deployment challenging. Another issue is model interpretability, particularly in deep hybrid architectures where accountability for schooling depends on transparency. Additionally, in order to effectively train these models, extensive labelled datasets are usually needed, which

may not always be accessible in all educational contexts.

4.2 Future Directions

Future studies should concentrate on the following areas to overcome current limitations and broaden the applicability of hybrid machine learning systems in education. First, the development of lightweight, portable hybrid models is essential for ensuring efficient performance in mobile and real-time classroom environments. Second, the integration of Explainable AI (XAI) techniques can enhance model transparency and trust between educators and learners. Third, building cross-platform adaptive systems that seamlessly connect learning management systems (LMS), mobile applications, and IoT-enabled classroom sensors will enable richer, more responsive learning experiences. Finally, incorporating affective computing—including emotional signals, facial expressions, and behavioral cues—can significantly enhance the depth of personalization and learner support.

These directions will help ensure that hybrid machine learning models evolve to support ethical, context-aware, and transparent personalization in digital learning environments.

5. CONCLUSION

In digital classrooms, hybrid machine learning approaches present a viable route to personalised and adaptable learning. This research shows that combining several machine learning algorithms produces better results in predicting academic achievements, modelling student engagement, and predicting learning styles. Through the utilisation of many learning paradigms, hybrid models have the potential to provide more precise, adaptable, and scalable educational solutions. The creation of interpretable, effective, and student-centered hybrid machine learning frameworks will be essential to the future success of intelligent learning environments as education continues to move towards digital and data-driven ecosystems.

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ICC Cricket World Cup 2019 Top Batsman Consistency Analysis

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ABSTRACT

In cricket, the batsman performances are compared with their averages (Arithmetic mean) runs they have scored over their careers. However, average is not sufficient to describe the data. Therefore we go to the next aspect and that is dispersion. Dispersion measures the spread of the data from their average. This study examines the consistency of the best batsmen in the 2019 ICC Cricket World Cup, with a particular emphasis on Shakib Al Hasan, David Warner, and Rohit Sharma.Shakib Al Hasan's outstanding average and all-around performance, as determined by statistical analysis, strongly support his claim of being more reliable in the competition.

1. INTRODUCTION

Cricket is a bat-and-ball game played between two teams, typically with eleven players each. The core objective is to score runs by hitting a ball bowled by the opposing team and running between wickets. Cricket has a rich history, originating in 16th century England, and has evolved into a globally popular sport with various formats like Test matches, one-day internationals, and Twenty20.

One of the most prominent international cricket competitions, the ICC Cricket World Cup showcases the prowess of elite players from all around the world. With exciting matches and standout individual performances, the 2019 edition was no different. A key component of cricket that distinguishes the great players from the good is consistency. By contrasting the performances of well-known players like Rohit Sharma, David Warner, and Shakib Al Hasan, this study seeks to examine the consistency of the best batsmen in the 2019 ICC Cricket World Cup. We can learn more about the main elements that lead to consistency in high-pressure cricket competitions by looking at their runs scored, averages, and unpredictability. We can identify the batsman who was most consistent throughout the competition with the aid of this research.

2. A BRIEF REVIEW OF LITERATURE [1]

Numerous studies that evaluated the players' performance and forecasts have been published.

The D/L technique, a mathematical formulation created by Duckworth and Lewis, is intended to determine the target score for the batting second in a limited overs contest that has been interrupted by inclement weather or other events [7]. Croucher has selected strike rate as well as the mean scores as a performance indicator [4].

Along with the strike rate on one axis and the likelihood of getting out on the other, Barr and Kantor employed a novel graphical approach [2]. A metric based on consistency and average was described by Barr and Van Den Honert [3]. In his research, Lemmer showed that the batting

average is unsatisfactory in this situation.[6]

3. OBJECTIVES OF THE PAPER

The following are the goals of the Top Batsman Consistency Analysis for the 2019 ICC Cricket World Cup:

1. To assess the ICC Cricket World Cup 2019 best batsmen's consistency.
2. To evaluate the performances of well-known batters like Shakib Al Hasan, David Warner, and Rohit Sharma.
3. To use statistical analysis to determine the tournament's most reliable batsman.
4. To examine the variation in runs scored by elite batsmen and how it affects their performance as a whole.

4. RESULT AND ANALYSIS

1. DIFFERENT MEASURES USED IN THE PRESENT STUDY

The measure, which is used in the present study is as follows :

The mean (or average) is the most popular and well known

measure of central tendency. So, if we have n values in a data set having values x1 , x2 , … , xn , then the mean, standard deviation and Coefficient of variation are respectively given by:

$$\text{Mean} = \frac{\Sigma xi}{n}\text{, standard deviation} = \sigma = \sqrt{variance}\text{, Variance} = \frac{\Sigma x_i}{n} - \bar{x}^2$$

$$\text{And Coefficient of variation} = \text{C.V} = \frac{\sigma}{|\bar{x}|} * 100\%$$

The coefficient of variance is the ratio of standard deviation to the mean. If the coefficient of variance is small then data is good that means observations are close to average.

2. PRE-REQUISITE TABLES RELATED TO THE PRESENT STUDY

Runs scored by cricketer are shown in the following table:[3]

Rohit Sharma	122	57	1	103	104	102	18	1	140	79
David Warner	9	122	16	53	166	26	107	56	3	89
Shakib Al	64	66	51	41	124	121	64	75	37	63

3. CALCULATIONS

- Taking Average(Mean) runs of Players :- Average runs of Rohit Sharma :- 72.7 Average runs of David Warner :- 64.7 Average runs of Shakib Al Hasan :- 70.6
- Taking Variance(σ^2) of runs of Players :- Variance of runs of Rohit Sharma :- 2327.61 Variance of runs of David Warner :- 2691.61 Variance of runs of Shakib Al Hasan :- 796.64
- Taking Standard Deviation(σ) of runs of Players :-

  S.D of Rohit Sharma :- 48.2453

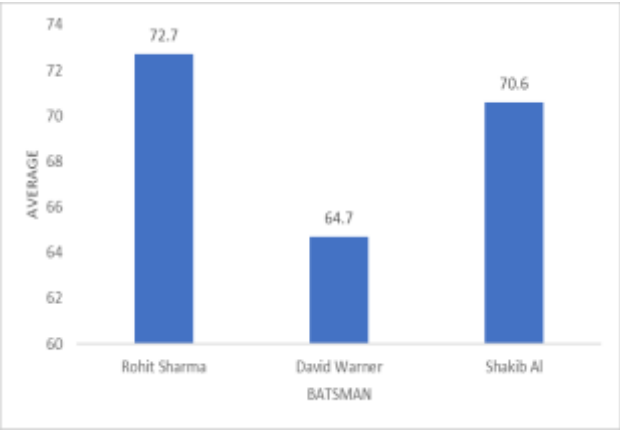
  S.D of David Warner :- 51.8807

  S.D of Shakib Al Hasan :- 28.2248
- Taking Coefficient of Variation (C. V) of runs of Players :-

  C.V of Rohit Sharma :- 66.3621%

  C.V of David Warner :- 80.1866%

  C.V of Shakib Al Hasan :- 39.9784%



5. CONCLUSIONS:

Based on the statistical evaluation of the runs that Shakib Al Hasan, David Warner, and Rohit Sharma have scored, the findings indicate that:

Shakib Al Hasan has been the most reliable batsman of the three, as evidenced by his lowest Coefficient of Variation (C.V.) of 39.9784%.

- David Warner's C.V. is 80.1866%, whilst Rohit Sharma's is 66.3621%, suggesting that Rohit Sharma has been more reliable than Warner.

In comparison to Rohit Sharma and David Warner, Shakib Al Hasan's lower C.V. value indicates that his runs are more reliable and less erratic. Shakib Al Hasan is therefore the most reliable batsman of the three, according to this research.

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Exploring the Arts & Crafts of Chhattisgarh: Empowering Skill Development and Entrepreneurial Ventures through Experiential Learning

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ABSTRACT

Through immersive and practical learning, this subject investigates Chhattisgarh's traditional arts and crafts. The study looks at how hands-on workshops improve enjoyment and knowledge of indigenous art forms, with a focus on crafts including Dhokra metalwork, bamboo weaving, terracotta, wood carving, and tribal painting. The study demonstrates how craft-based education fosters creativity, skill development, and entrepreneurship by fusing contemporary pedagogy with design thinking. It also looks at how traditional crafts may contribute to sustainable economic growth by reviving dwindling creative forms and bolstering local economies by fusing heritage with contemporary tools. The study, which is based on case studies and artisan interviews, emphasises how experiential learning strengthens cultural identity, fosters inclusive rural growth, and empowers people, particularly women and young people.

1. INTRODUCTION

A wide variety of indigenous arts and crafts that represent the state's strong tribal character may be found in Chhattisgarh, a state rich in cultural heritage and traditional handicraft. Experiential learning techniques, such practical workshops, craft tours, and skill-development training programs, have become more popular in recent years as creative ways to boost the crafts industry. In addition to conserving ancient knowledge, these programs promote hands-on learning, which helps local youngsters and craftspeople develop their technical and entrepreneurial abilities. The purpose of this study is to evaluate how well these experiential learning initiatives foster skill development, encourage craft-based entrepreneurship, and support the creation of jobs and revenue within the crafts ecosystem of Chhattisgarh. The study aims to shed light on these programs' contributions to community empowerment and the state's creative economy by statistically analysing their results.

2. OBJECTIVE

The primary goal is to investigate how hands-on training in Chhattisgarh's traditional arts and crafts improves craftspeople's abilities and encourages business endeavours.

2.1 Specific Objectives

- Evaluate Skill Development through Experiential Approaches: to measure how experiential learning techniques, such as craft villages and in-field workshops, enhance craftsmen' technical proficiency, self-assurance, and inventiveness.
- Assess Entrepreneurial Outcomes: Using data from experimental models like Kondagaon's "shilp gramme," examine if experiential training increases entrepreneurial self-efficacy, income generation, and market discovery.
- Examine how craft-centric learning designs integrate Indigenous Knowledge (IKS) frameworks in line with NEP 2020's holistic pedagogy, and how this combination promotes heritage preservation and market adaptability.
- Determine Policy and Institutional Support Mechanisms: to chart the functions of development organisations such as MGIRI and the Chhattisgarh Handicrafts Development Board in promoting hands-on learning and the expansion of craft businesses
- Determine whether experiential programs result in enduring revenue streams and replicable business models, backed by ongoing training and institutional infrastructure, by evaluating sustainability and scalability

- Analyse socio demographic dynamics to assess how age, gender, and education affect learners' outcomes, especially when it comes to turning craft skills into profitable ventures.

3. RESEARCH GAP

There is a lot to learn about the relationship between Chhattisgarh's arts and crafts, skill development, and business endeavours through practical learning. Despite several efforts, there are still a number of research gaps that need to be addressed:

- Integration of Experiential Learning in Traditional Crafts
- Sustainability of Skill Development Programs
- Digital Empowerment and Market Access
- Gender Inclusivity in Craft-Based Entrepreneurship
- Assessment of Government Initiatives

By filling in these research gaps, Chhattisgarh's rich craft traditions can be more successfully incorporated into modern frameworks for skill development and entrepreneurship, guaranteeing both cultural preservation and economic empowerment.

4 METHODOLOGY

The study concentrated on a set of clearly defined quantitative and qualitative indicators in three main areas: skill development, entrepreneurial impact, and experiential learning outcomes in order to assess the efficacy of experiential learning efforts in Chhattisgarh's crafts sector. The percentage of participants who learnt new technical skills, the frequency of in-person training sessions, and the quantity of crafts mastered over the program were all important indications of skill growth.. By comparing average monthly incomes before and after the intervention, counting the number of new craft-based goods that were presented to the market, and monitoring the percentage of people who started new businesses after receiving training, the entrepreneurial impact was evaluated. Furthermore, self-reported gains in confidence and market knowledge, the rate of repeat participation in craft programs, and participant satisfaction ratings on a scale of 1 to 10 were used to gauge the effectiveness of experiential learning. These factors offered a thorough framework for examining the programs' actual effects on people and the larger crafts ecosystem.

4.1 Data Collection

The present study was conducted across four key regions of Chhattisgarh—Bastar, Kondagaon, Raigarh, and Raipur—known for their rich tradition in arts and crafts. A total of 300 respondents were selected using purposive sampling to ensure representation across various stakeholder groups, including artisans (150), students (75), NGOs (25), and craft-based entrepreneurs (50). Data was collected between January and April 2025 through a combination of qualitative and quantitative tools. Structured surveys and in-depth interviews were used to gather insights on skill development, entrepreneurial engagement, and socio-economic outcomes. Additionally, feedback from workshop participants and market performance data were analyzed to assess the practical impact of experiential learning interventions. This multi-pronged data collection approach provided a comprehensive understanding of how experiential learning influences the crafts sector in Chhattisgarh

Category	Details
Study Regions	Bastar, Kondagaon, Raigarh, Raipur
Total Respondents	300 individuals
Groups Covered	Artisans: 150 - Students: 75 - NGOs: 25 - Entrepreneurs: 50
Sampling Method	Purposive Sampling
Data Collection Tools	Surveys, Interviews, Workshop Feedback, Market Data
Study Duration	January – April 2025
Focus Areas	Skill development, entrepreneurship growth, income and employment impact

4.2. RESULT FINDING AND ANALYSIS

The study's conclusions show that experiential learning programs significantly improve participants' skill development and entrepreneurial growth in the crafts industry in Chhattisgarh. The proportion of artisans utilising contemporary tools rose significantly from 22% prior to training to 68% following it, indicating a significant improvement in skill. Additionally, the average number of crafts practiced increased from 1.4 to 2.7, indicating a wider range of artisanal skills. There was also a noticeable increase in respondents' understanding of quality standards, as 79% of them showed awareness after training, up from 30% previously. Regarding entrepreneurship, 32% of participants registered on digital selling platforms, which is a necessary first step in expanding the market in the digital age, and 41% of participants reported launching their own businesses after completing the training programs. The economic advantages of these interventions are further demonstrated by the fact that 48% of respondents reported an increase in income of at least 30%. With average scores of 8.2 for skill transfer quality, 8.7 for hands-on exposure, and 9.0 for cultural awareness, feedback on experiential learning was likewise quite positive. Even while business readiness is a little lower at 7.5, it still shows that entrepreneurial readiness is on the rise. All things considered, the findings show how important experiential learning is in giving people the technical and entrepreneurial skills they need to succeed in the craft industry.

All things considered, the findings show how important experiential learning is in giving people the technical and entrepreneurial skills they need to succeed in the craft industry.

Category	Metric / Indicator	Before Training	After Training / % / Score
Skill Development	% of artisans using modern tools	22%	68%
	Average number of crafts practiced	1.4	2.7
	Awareness of quality standards	30%	79%
Entrepreneurial Growth	Started own enterprise post-training	—	41%
	Registered on digital selling platforms	—	32%
	Reported income increase ≥30%	—	48%
Experiential Learning	Skill Transfer Quality (scale 1–10)	—	8.2
	Hands-on Exposure (scale 1–10)	—	8.7
	Business Readiness (scale 1–10)	—	7.5
	Cultural Awareness (scale 1–10)	—	9.0

Table 2 : Result and finding

Strong positive correlations between important variables are revealed by the correlation analysis, highlighting the value of experience learning in promoting skill and entrepreneurial development. With a substantial positive correlation between skill development and entrepreneurial success (a Pearson correlation coefficient of +0.72), people who learn new or enhanced craft abilities are far more likely to launch or grow their businesses. Participation in workshops, practical training, and similar programs is strongly associated with higher wages, as seen by the corresponding +0.65 correlation between experiential learning and income growth. Additionally, a somewhat favourable correlation of +0.59 was found between the rates of company start-up and repeat participation in craft programs, suggesting that ongoing involvement in these learning efforts increases the possibility that people will establish their own businesses.

Variable Pair	**Pearson Correlation Coefficient (r)**	**Strength of Relationship**	**Interpretation**
Skill Development ↔ Entrepreneurial Success	+0.72	Strong Positive	Individuals with enhanced skills are more likely to start or grow businesses.
Experiential Learning ↔ Income Growth	+0.65	Strong Positive	Participation in training programs is closely linked to increased earnings.
Repeat Participation ↔ Business Start-up Rate	+0.59	Moderate Positive	Continued involvement in craft programs boosts chances of starting a business.

Table 3 : Pearson Correlation Analysis of Experiential Learning Variables and Economic Outcomes

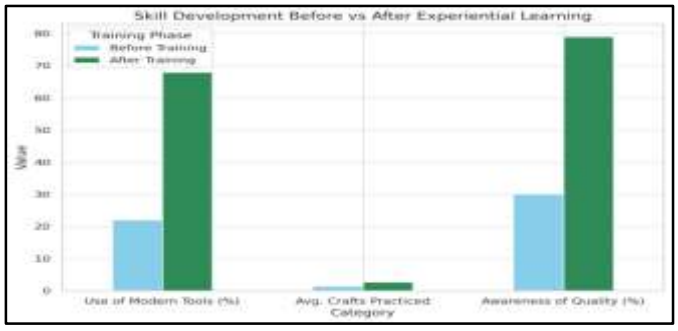
The study's analysis sheds light on a number of significant findings on the influence of experiential learning on Chhattisgarh's crafts industry. First of all, it was discovered that practical experiential programs greatly improved skill learning, allowing participants to more successfully develop both ancient and modern craft processes. The majority of craftsmen who participated in these programs showed appreciable gains in customer engagement tactics, digital sales platform use, and product innovation—all important markers of competitiveness in the modern market. Additionally, the data shows a strong relationship between self-employment and technical upskilling, highlighting the importance of skill development as a catalyst for entrepreneurship.Interestingly, it was discovered that young people who participated in field-based workshops were 40% more likely to think of making crafts their long-term career. This suggests that such programs have the ability to draw and keep young talent in the industry. These revelations support the idea that experiential learning may empower people and boost the creative economy.

6. VISUAL ANALYSIS AND INTERPRETATION

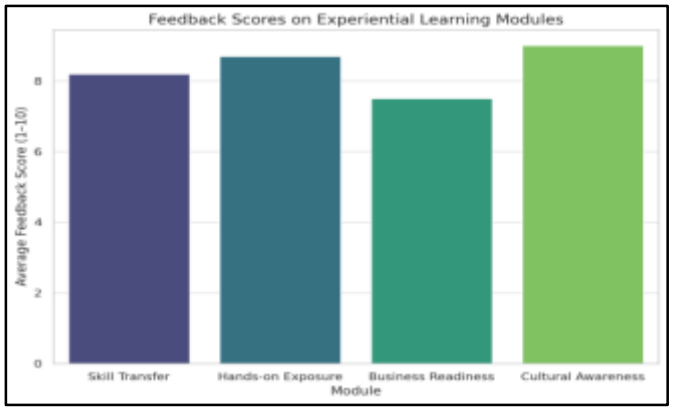
The statistical results of the study on experiential learning in the crafts sector of Chhattisgarh are well supported by the graphical representations. The bar graph for skill development makes it evident that after experience instruction, key indicators significantly improved. The average number of crafts practiced virtually doubled, the use of modern tools grew dramatically, and awareness of quality standards improved greatly—all of which demonstrate the real-world benefits of experiential learning. With 28.9% of participants launching their own businesses, 22.5% participating in online marketplaces, and 33.8% reporting revenue increases of 30% or more, the Entrepreneurial Growth pie chart highlights the results of this type of training even more.

In the meantime, participant satisfaction across a range of experiential learning modules is continuously high, as shown by the Feedback Score bar chart. Notably, the programs were both interesting and successful, as evidenced by the highest average score for cultural awareness, which was closely followed by hands-on exposure and skill transfer quality. The correlation heatmap, which is not displayed here, supports these images by demonstrating the strong positive relationships between skill development, income growth, and entrepreneurial success.

This highlights the role of experiential learning as a driver of economic empowerment and sustainable livelihoods in the area.



Following experiential learning programs, participants' skills have significantly improved, as seen by the skill development bar graph. Notably, more crafts were done, new tools were adopted more frequently, and people were more conscious of quality standards.



Strong participant satisfaction across all experiential learning modules is shown in the feedback score bar graph. The best grades went to hands-on experience and cultural knowledge, demonstrating the training's impact and efficacy.

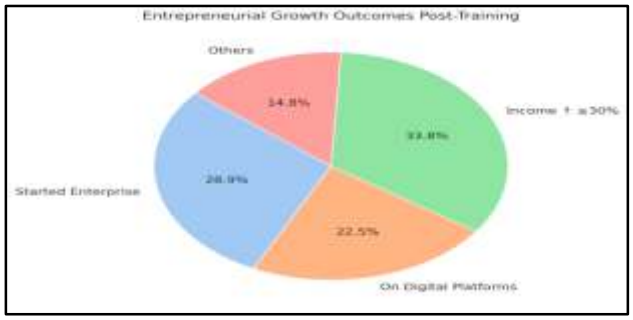


Fig1 : Entrepreneurial growth outcomes post-training

Important results after experiential training are depicted in the Entrepreneurial Growth Pie Chart. Positive entrepreneurial developments were shown by the large percentage of participants who reported income growth, firm initiation, and participation with digital markets.

7. CONCLUSION

The arts and crafts of Chhattisgarh offer a wealth of opportunities for skill development and business endeavours. Through experiential learning, people can not only maintain these long-standing customs but also turn them into successful contemporary enterprises. By means of immersive workshops, collaborations with regional craftspeople, and an emphasis on marketing and innovation, entrepreneurs may establish enduring businesses that honour customs while satisfying contemporary needs. The secret is to acknowledge the traditional significance of these crafts while modifying them to fit modern consumer preferences and commercial strategies..

Traditional knowledge and modern education are connected through hands-on learning opportunities focused on Chhattisgarh's arts and crafts. They promote a comprehensive view of craft practices as living traditions woven into the social, cultural, and economic fabric of society rather than just as beautiful manifestations. Through meaningful, practical interaction, these programs may preserve cultural heritage, empower local craftspeople, and spur innovation when thoughtfully incorporated into academic frameworks.

7. IMPLICATION

- Skill-building through real-world craft practice empowers artisans with both technical ability and entrepreneurial agency.
- Digital training is essential, but must be customized to meet artisans' starting proficiency.
- Gender-aware design in experiential learning fosters equitable entrepreneurial outcomes.
- Productivity and physical health can both be enhanced through ergonomic innovations.
- Institutional support is critical for market integration and scaling.
- Blending tradition with modern tech ensures cultural preservation and competitive innovation.

3. FUTURE FRAMEWORK

To improve the impact of experiential learning in Chhattisgarh's crafts industry, a number of strategic recommendations are put out in light of the study's conclusions and insights. First and foremost, in order to guarantee fair access to chances for skill development, experiential learning programs must be made more widely available, especially in isolated tribal areas. In order to support budding craft-based enterprises and encourage entrepreneurial growth, it is recommended that organised feedback mechanisms and continuing mentoring systems be established. Furthermore, developing business incubation networks that are specialised to a given region can provide local startups with traditional crafts-based businesses with specialised advice, market connections, and financial support.

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Financial Literacy Awareness and Practice Among Students: Issues and Insights

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ABSTRACT

Financial literacy plays a vital role in individuals decisions to take rights decisions about finance and achieve decided financial goals. Financial literacy is an important points in any individual's life. The aim of this study was to determine the awareness of financial literacy among the younger generation. The aim of this study is to provide more effective suggestions and initiatives on financial literacy.

1. INTRODUCTION

Financial Literacy is given more details and guidance for manage financial position or income any persons life. if a people not aware is financially literate then its affect on own income and also nation income. If any countries people income source and management proper manage this is god impact shown on national income. (Cullen, 2013).

According to the Organization for Economic Co-operation and Development (OECD), financial literacy is "the combination of awareness, knowledge, skills, attitudes and behaviours that are necessary to make sound financial decisions and ultimately achieve personal financial well-being." In the 21st century, financial literacy has become increasingly important as a fundamental life skill. However, despite its importance, numerous studies have highlighted the gap in the awareness and use of financial literacy, especially among students.

2. OBJECTIVES:

A. To study the awareness of financial literacy among college students.

B. To identify the major issues and challenges that students face in developing effective financial literacy.

3. REVIEW OF LITERATURE:

Sabri, M. F., M. MacDonald, T. K. Hira, and J. Masud, (2010) concluded that A study conducted in Malaysia on students from private colleges revealed that financial literacy levels were quite low. It also noted a lack of family discussions on financial matters such as saving.

Jorgensen and Savla (2010) proposed a conceptual model emphasising perceived parental influence on young adults' financial literacy..

Nugraha et al. (2023) highlighted his study about the essentiality for young individuals to increse financial related knowledge management and integrate it into their daily lives.

Chen and Volpe (1998) reported in their research that most students in the United States are not aware of financial literacy, which is reflected in personal income and its big impact on a global trend of insufficient financial education among youth.

Lusardi, Mitchell, and Curto (2010) reported in study that than 30% of young adults were able to given right answer about fundamental financial literacy questions such as interest rates, inflation, and risk diversification, further underlining the knowledge gap.

Stewart and Johnson (2024) explained that his study was about digital platforms as important tools for promoting financial literacy among college students.

4. RESEARCH METHODOLOGY

This research paper data collection form is a structured survey questionnaire designed to assess the basic knowledge about financial literacy of college students. The questionnaire was created using Google Forms, and a shareable link was distributed to participants for response collection. A total of 96 completed responses were collected for analysis. The questionnaire had two parts: The first part focused on demographic information (e.g., age, gender, education level), and the second part assessed the respondents' awareness and understanding of various financial literacy concepts. Both simple random sampling and convenience sampling methods

were used in this study. Randomly selected students from colleges in Pune city among undergraduate students.

5. DATA ANALYSIS:

All the standardised questionnaires were analysed and visualised using Excel charts and graphs to draw meaningful conclusions. The gender distribution of the respondents showed that 34.4% were male, while 65.6% were female.

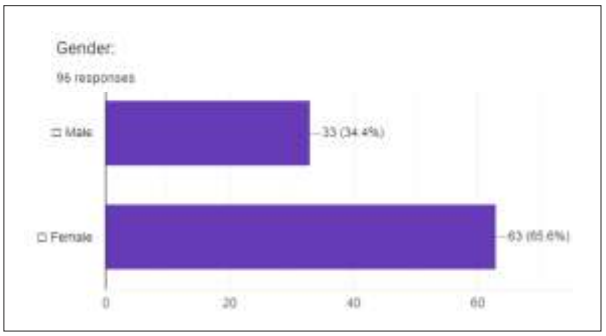

Figure No 1

According to the survey, most respondents were between the ages of 18-21. The second part of the survey focused on the main aspect of the research - assessing the awareness and understanding of respondents about financial literacy.

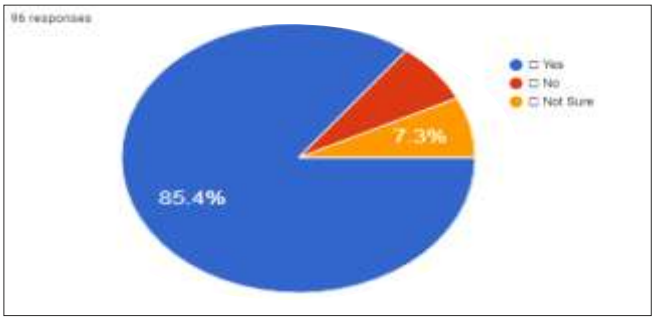

Figure No 2: Financial Literacy Concept

In Figure 2, 85.4% of respondents reported being aware of basic financial literacy. This is the largest portion of the pie chart, indicating that most individuals have a basic understanding of financial concepts. For financial literacy awareness, 7.3% of respondents are not aware of financial literacy. However 7.3% of students given the answer that they are unsure are aware of basic financial literacy. It's observed that few students are not aware, and most students know about the concept of financial literacy. This means that students are acknowledged to be aware of financial literacy, so the first goal is to maximize their benefits.

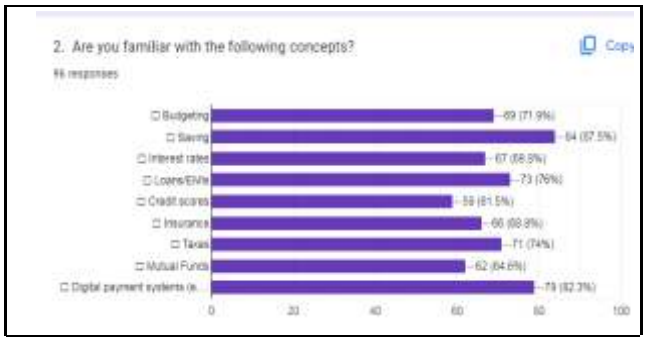

Figure No 3

This chart shows the responses given by 96 individuals regarding their familiarity with various financial concepts. The most familiar concept is savings (87.5%), followed by digital payment systems (82.3%), loans/EMIs (76%) and taxes (74%). The least familiar concept is credit score (61.5%)**.** Additionally maximum respondents understanding basic financial topics such as saving digital platforms and others but few studnets not aware credit score and mutual funds that menas it is knowledge gap about this concepts.

Figure No 4

Lack of knowledge (36.5%) and lack of financial education (35.4%) were identified as key challenges in schools/colleges. Other significant issues included poor savings habits (31.3%) and financial difficulties in the family (29.2%). This figure showing that we need mention structured financial literacy programme in the education all stream with financial skills.

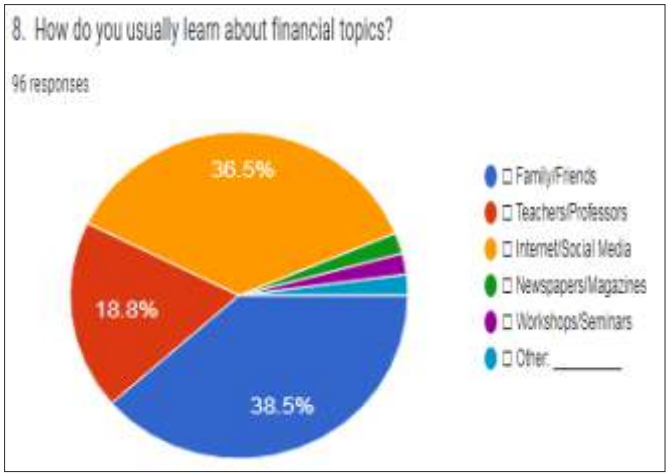

Figure No 5

The most common sources are family/friends (38.5%) and internet/social media (36.5%) followed by teachers/professors (18.8%). Very few people rely on newspapers, seminars or other sources. This shows that informal and digital channels play an important role in financial education, while formal education and traditional media are used to a lesser extent. This shows that personal networks and formal education play a major role in creating financial awareness, while mass media and organised events are used to a lesser extent as sources of financial education.

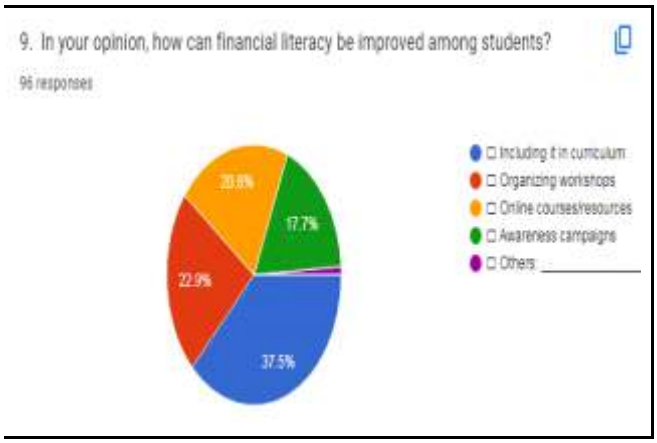

Figure No. 6

The chart shows students' views on how to improve financial literacy. The majority (37.5%) think it should be included in the curriculum, followed by workshops (22.9%) and online courses/resources (20.8%). A small proportion support awareness campaigns (17.7%), while very few chose other options. This shows a strong preference for structured and educational approaches to increasing financial literacy among students.

6. SUGGESTION

Student Suggestions on Financial Literacy from the Survey

As part of the survey, students provided several insightful suggestions to improve financial literacy:

Some students are given suggestions that introduce basic financial education from school age.

In education, not only the theoretical part is given, but also the practical part is mentioned, such as internship programs and exhibitions regarding savings, mutual funds, interest loans, and credit scores in the curriculum.

Provide free courses regarding financial courses; students receive knowledge about this concept and are also motivated to participate in any financial activities that are related to financial literacy.

Focus on rural and semi-urban areas through targeted campaigns and sessions.

Based on the students' suggestions, the researchers conclude that financial literacy should be included in the national education curriculum at all levels so that information is available early to students.

7. CONCLUSION

The survey shows that most of the students know basic financial concepts such as savings, digital payment apps, and budgeting, but some students are not aware of basic knowledge such as credit scores and mutual funds. More than students showing a response that they are learning about financial topics from informal ways such as family, friends, teachers, and social platforms.

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A STUDY ON EVALUATING CHALLENGES FACED BY USERS OF QUICK COMMERCE

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ABSTRACT

Financial literacy plays a vital role in individuals decisions to take rights decisions about finance and achieve decided financial goals. Financial literacy is an important points in any individual's life. The aim of this study was to determine the awareness of financial literacy among the younger generation. The aim of this study is to provide more effective suggestions and initiatives on financial literacy.

1. INTRODUCTION:

Quick commerce, or Q-commerce, has grown rapidly in India as a result of both technology developments and substantial shifts in consumer behaviour. Fast-paced lives are becoming more and more prevalent in urban areas, which has led to an unparalleled need for instant access to products and services. As a result, Q-commerce sites have surfaced, providing delivery periods for necessities as low as 10 to 15 minutes. Convenience is becoming more and more important to modern Indian consumers over conventional means of buying. According to a Bernstein survey, 64% of participants place at least one weekly meal delivery order. Because they are tech-savvy and need rapid gratification, millennials (those between the ages of 18 and 25) show a high affinity for Q-commerce platforms. This need is further fuelled by time-constrained urban lives. Customers are less likely to purchase at traditional brick-and-mortar establishments due to their busy job schedules and social obligations. Rather, they choose Q-commerce services, which effectively and conveniently meet their urgent demands and offer smooth answers to problems they face on a daily basis (Goyal, 2024).

The quick growth of Q-commerce in India is supported by technological innovation. App-based services are becoming more and more accessible due to the widespread usage of smartphones—more than 1 billion people own one—and reasonably priced internet connection. Businesses use cutting-edge technology like machine learning and artificial intelligence (AI) to improve delivery processes and inventory management. Strategically placed in metropolitan locations, micro-fulfillment centres enable businesses to process orders rapidly and satisfy customer demands for prompt delivery. Platforms like as Blinkit, for instance, use AI-driven inventory optimisation to make sure that popular goods are regularly supplied in nearby dark shopfronts so they can effectively fulfil strict delivery deadlines. Leading companies like Swiggy, Instamart, Blinkit, and Zepto use aggressive market penetration tactics to define the competitive dynamics of Q-commerce. These businesses employ strategies like steep discounts and partnerships with regional vendors to draw in and keep customers. For example, Q-commerce has grown by over 100% and, for businesses like Dabur, accounts for 25–30% of e-commerce income. Subscription-based services, which enable customers to get regular deliveries of necessities without having to place new orders, increase customer loyalty and provide a consistent flow of income for companies. (Goyal, 2024).

1.2 EXPANSION OF THE FAST-MOVING CONSUMER GOODS (FMCG) SECTOR IN INDIA

The fast-moving consumer goods (FMCG) sector in India is expanding significantly due to a number of causes, including:

1. **Expansion of Start-ups:** With significant financial backing, new companies are joining the market, escalating industry competitiveness.
2. **Development and hectic lives:** The need for swift commerce solutions has increased due to the fast urbanisation of societies and the resulting busy lives.
3. **Digital Advancement:** The rise of fast commerce is being

made possible by the development of internet accessibility, reasonably priced data plans, and smartphone technology.

4. **Increasing Leisure Buying:** The need for quick and easy shopping choices is being driven by an increase in discretionary spending among middle-class and upper-class consumers.
5. **Easy access for Customers:** Customers are increasingly choosing the ease of purchasing goods from the comfort of their homes, and doorstep delivery is quickly emerging as a major expectation.

1.3 CHALLENGES OF Q-COMMERCE INDUSTRY

The Q-commerce industry has a number of challenges to overcome despite its enormous development potential:

- **Sustainability challenges:** There are urgent sustainability challenges that call for aggressive solutions due to the environmental effect of increasing packaging waste and greater carbon emissions from frequent delivery.
- **Labour Practices:** Concerns regarding the working conditions of delivery workers have been brought to light by the increase in demand for quick delivery, underscoring the need for better labour practices.
- **Regulatory Obstacles:** As Q-commerce businesses grow throughout many states and must adhere to a variety of municipal and federal rules, navigating India's complicated regulatory environment poses significant obstacles.

1.4 FUTURE AHEAD OF Q-COMMERCE IN INDIA

A great deal of assumptions on the future of the quick commerce (Q-commerce) bubble in 2024, as the enthusiasm for safe and lightning-fast supermarket delivery has considerably diminished. However, retail analysts contend that the ease of fast home delivery will continue to drive demand, keeping the Q-commerce business from going completely extinct. The cost barriers that have impeded the sector's expansion may be lifted by elements like India's changing demography and the ensuing rise in income levels. Since the majority of Indians will be in the critical 15–59 age range till 2030, the increase in income is anticipated to push millions of households into middle-class spending, which is of interest to Qcommerce platforms. In order to balance expenses and profits, industry participants may find it practical to implement packaging and delivery fees while lowering discounts and freebies. Q-commerce platforms are investigating a number of tactics to improve profitability and appeal. (Gupta, S. 2024). Platforms are now advertising a lot of businesses to captive viewers in an effort to maximise ad monetisation. Albinder Dhindsa, the CEO of Blinkit, is leading the company's expansion by diversifying its offerings. He is starting with electricians, plumbers, and AC repair experts before branching out into at-home handyman services similar to Urban Company. The industry has advanced because to the exponential expansion in online purchasing and digital payments, even if crowded urban areas and Q-commerce's intrinsic low profit margins and high delivery costs present problems. With a Deloitte analysis predicting a $40 billion industry by 2030, up from $2 billion in 2022, and MarkNtel expecting a Compound Annual Growth Rate (CAGR) of almost 67% for Indian Q-commerce between 2023 and 2028, research companies anticipate strong growth. (Gupta, S. 2024).

2. REVIEW OF LITERATURE:

2.1 Rathee, R., Singh, M., et al. (2025) conveyed in their research study about the manner in which Quick Commerce is defined as paradigm changing model of business. The study explores the sentiments of the consumers regarding the sites for quick commerce as well as the manner in which the reviews online acts upon preferences as well as disposition in current period. The study conducts sentimental analysis regarding the consumer sentiments of quick commerce and elucidates primary sentiments as negative or positive. The report offers insightful information on the strategic obstacles and customer expectations that Q-commerce businesses face in a highly competitive and fast-changing environment. Customers have a generally poor opinion of Q-commerce platforms, according to the report, with criticisms focussing on customer service, delivery experience, and dependability.

2.2 Saad, S. (2025) examined in their research about the steps for improving the experience of the customers regarding the challenges faced by them, for which the business firms adopt Anthropomorphic Virtual Agents, that exhibits human traits like adaptability as well as empathy. The study explore the integrations of AVA within quick commerce so as in tackling the problems faced by the customers while shopping, for enhancing engagement of the consumers. The chapter explores how AVAs help provide a more individualised, effective, and human-like customer experience, drawing on an exploratory study on students' impressions of AVAs in online meal ordering. It also discusses Q-commerce's sustainability issues and operational difficulties, emphasising the necessity for creative solutions that strike a balance between environmental responsibility, customer happiness, and speed.

2.3 Sanchez, P. (2024) analysed in their research study about the manner in which the popularity of the quick commerce applications are on a rise and the importance of figuring the factors which influences the people in buying things from this platforms. The results derived from the research recommends that factors related to Technology Acceptance includes perceived ease of use as well as perceived usefulness, as well as factors related to mobile service quality includes quality of the information and interface quality, which is linked closely with the purchasing behaviour of the consumers. Curiously, because user tastes and expectations varied, interaction quality did not have a substantial impact on consumer purchase behaviour, even though it was identified as a determinant. This demonstrates how rapidly commerce platforms are dynamic. The implications are such about the consumer choices may not always be consistently influenced by criteria that are traditionally recognised as significant in m-commerce.

2.4 Astini, R., Royanti, I., et al. (2024) emphasized in their research about investigating the impact of significant factors like quality of e-Service, online Word-of-Mouth, as well as perceived ease of use on the process of decision-making by the consumers with respect to purchasing groceries online, especially through using the application of Astro. Furthermore, these elements have a big impact on customers' purchasing decisions when combined with e-trust itself. The study recommends enhancing compensation services, giving application usability first priority, and continuously monitoring all Astro-related data sobas for tracking the challenges and also providing solutions so as for providing better servhes to its consumers.

2.5 Ahmed, Faraz & Shafighi, Najla. (2022) determined in their research about the evaluation of the opportunities as well as challenges faced with respect to industry of quick commerce in South Asia. The consumers specifically depend upon the quick commerce sites as it provides convenience as well as faster delivery. The consumers are still facing challenges about the operations of the quick commerce industry. The research focuses to understand the need of the customers of quick commerce. The study's findings indicate that consumers encounter security issues when they believe that retailers ask for additional details than is required. Additionally, people still favour this alternative due to its ease and time-saving benefits, even though it is rather pricey.

2.6 Shafighi, N. & Shafighi, F. (2022) focused in their research so as to understand the need of the customers of quick commerce as well as the solutions which could be implemented for overcoming the problems faced in quick commerce by the customers. On the basis of regression analysis, the research concludes that three factors which is Security, Pricing & Convenience are related significantly with the decision making of the consumers so special attention should be given to the same. The study's findings indicate that consumers encounter security issues when they believe that retailers ask for more information than is required. Additionally, people still favour this alternative due to its ease and time-saving benefits, even though it is rather pricey.

2.7 Ehikioya, S. & Guillemot, E. (2020) examined in their research about the significant design challenges faced at various levels of the process design regarding the quick commerce apps. The study identifies problem of networking as well as security to be the important variables for indicating the application's success. Also the study identifies that the user interface and the language are also main challenges. The Web-specific user interface challenges designers to rethink the conventional end-user idea in favour of a more customer-centric one. Addressing consumer wants and ensuring the viability of e-commerce enterprises require this. The researchers also look at problems that the development team as well as e-commerce environment are facing.

2.8 Babatunde, A., Abikoye, O., et al. (2019) described in their research about the emergence of internet as a popular source in recent days. Various websites are developed in millions as well as ae applied for transacting the business of buy and sell online. Various designers have started in focusing attention towards testing the user satisfaction upon using the platforms for quick commerce. Therefore, a need for evaluating the experience of the users on quick commerce platforms is required. Five platforms—Jumia, Ali-Express, Konga, Amazon, and Jiji—are compared in this study based on customer reviews obtained via online surveys. For users to have a positive experience, attention should be paid to the designs of e-commerce platforms that are visually appealing and simple to use.

3. OBJECTIVES OF THE STUDY:

1. To evaluate the challenges faced by users of quick commerce.
2. To give suggestive measures for improving the user experience and addressing identified challenges in the quick commerce sector.

4. HYPOTHESIS:

H_0: There is no significant perception of challenges faced by users in Quick Commerce services.
H_1: There is a significant perception of challenges faced by users in Quick Commerce services.

5. RESEARCH METHODOLOGY:

The current study used Descriptive research design. The data was collected through primary (questionnaire) and secondary (journals, articles, thesis, etc) both. The sampling technique used in the current study is Non-Probability Purposive. This sampling technique is specifically used to target individuals actively who have specific characteristics that is most relevant to the purpose of the research. In the present study, 110 users of Blinkit, Zepto and Instamart from Mumbai Region were selected. The sample size was determined based on Faul et al. 2007 where in a minimum sample size of 45 is required for conducting a one-tailed one-sample t-test. The statistical technique used is a parametric one-sample t-test. This test is used to determine whether the mean of a simple sample has any significant difference from a known or hypothesized population mean. The R Studio Software which is most commonly used for commuting statistical data and visualisation and performing advanced data analysis.

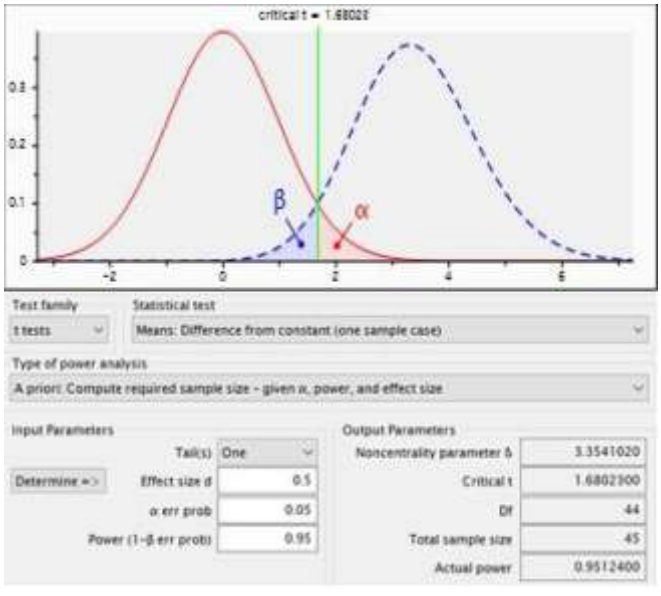


Table No: 1 Demographic Profile of the Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	60	54.5%
	Female	50	45.5%
Age Group	18–25	25	22.7%
	26–35	50	45.5%
	36–45	20	18.2%
	46–60	10	9.1%
	Above 60	5	4.5%
Occupation	Student	22	20.0%
	Working Professional	58	52.7%
	Business/Self-employed	18	16.4%
	Homemaker	12	10.9%
Most Used App	Zepto	50	45.5%
	Blinkit	35	31.8%
	Swiggy Instamart	25	22.7%

Challenges faced by users of Quick Commerce (Zepto, Blinkit, & Instamart)	Mean Value	t – statistics	P – value	Result
Limited product range	4.00	18.00	0.000	High Challenge
Higher prices	4.35	18.55	0.000	High Challenge
Service availability (Restricted to specific urban areas)	3.50	17.25	0.000	High Challenge

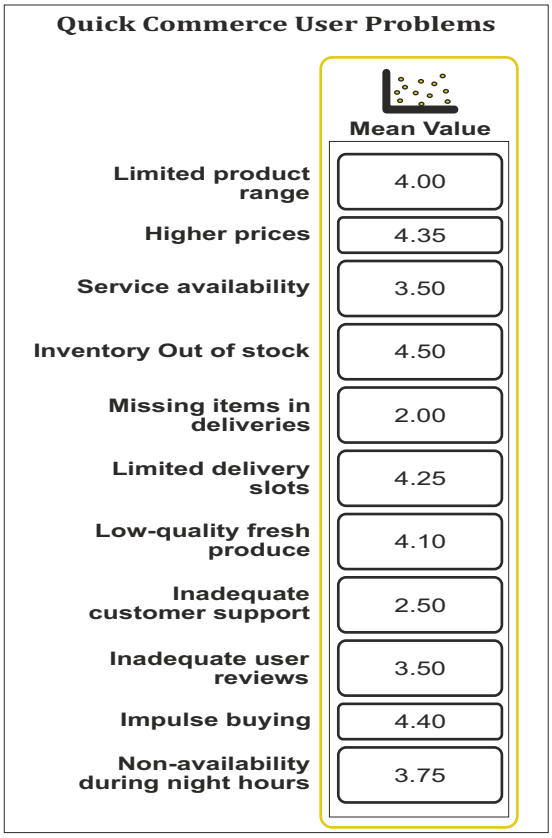
110 users of quick commerce services from Pune region were surveyed for the study. Of them, 45.5% were women and 54.5% were men. 26–35 years old made up the largest age group (45.5%), followed by 18–25 years old (22.7%). The majority of respondents (52.7%) were working professionals, followed by students (20%), business/self-employed people (16.4%), and stay-at-home moms (10.9%). Zepto was the most popular rapid commerce platform in terms of app choice (45.5%), followed by Blinkit (31.8%) and Swiggy Instamart (22.7%)

6. DATA ANALYSIS AND INTERPRETATION:

Challenges faced by users of Quick Commerce (Zepto, Blinkit, & Instamart)	Mean Value	t – statistics	P – value	Result
Inventory Out of stock	4.50	19.18	0.000	High Challenge
Missing items in deliveries	2.00	-14.20	1	Low Challenge
Limited delivery slots (Especially during high demand or bad weather)	4.25	18.42	0.000	High Challenge
Low-quality fresh produce (Inconsistent standards for vegetables)	4.10	18.11	0.000	High Challenge
Inadequate customer support	2.50	-15.50	1	Low Challenge
Inadequate user reviews	3.50	17.25	0.000	High Challenge
Impulse buying	4.40	18.87	0.000	High Challenge
Non-availability during night hours	3.75	17.65	0.000	High Challenge

Figure No: 1 Quick Commerce Users Problems

The analysis of Challenges faced by users of Quick Commerce (Zepto, Blinkit, & Instamart) reveals several statistically significant challenges. Most notably, issues such as inventory being out of stock (mean = 4.50), impulse buying (4.40), higher prices (4.35), limited delivery slots (4.25), and low-quality fresh produce (4.10) are identified as "High Challenges" with high t-values and p-values of 0.000, indicating strong statistical significance. Service availability in restricted urban areas (3.50), limited product range (4.00), inadequate user reviews (3.50), and non-availability during night hours (3.75) also fall into the High-Challenge category. In contrast, missing items in deliveries (mean = 2.00, t = -14.20, p = 1) and inadequate customer support (2.50, t = -15.50, p = 1) are categorized as "Low Challenges" with non-significant p-values, suggesting they are less critical from the users' perspective. Thus, based on the statistical results, as most items show high mean values with significant t-statistics and p-values of 0.000 ($p < 0.05$), the null hypothesis (H_0) is rejected.



7. CONCLUSION:

The findings of the study indicate out that although quick commerce companies like Zepto, Blinkit, and Swiggy Instamart have revolutionised the way people shop by providing speedy delivery, customers still encounter a lot of difficulties. Higher costs and a smaller selection of products are still frequent issues with all three platforms, which may affect consumer loyalty and happiness. These services' reach is limited by their availability in particular urban regions, particularly for customers in Pune outlying neighbourhoods. The assurance of convenience and dependability is undermined by frequent problems such inventories running out of stock, restricted delivery windows during periods of high demand or bad weather, and uneven quality of fresh fruit, especially vegetables. Inadequate user ratings also make it more difficult to make well-informed decisions, and app design-driven impulsive purchases result in wasteful expenditure. The attraction of the concept for consumers looking for 24/7 convenience is significantly limited by the services' unavailability at night. Zepto, Blinkit, and Swiggy Instamart must overcome these obstacles if they are to improve consumer satisfaction, foster more loyalty, and maintain their competitive edge in the quickly expanding fast commerce market. These results might not be entirely generalisable to other industries or geographical areas, since they represent the unique difficulties experienced by Mumbai's rapid commerce consumers.

8. SUGGESTIONS:

Quick commerce service provides should think about increasing the range of products they sell and improving inventory control to lessen stockouts in order to overcome these obstacles. Competitive pricing tactics or price standardisation may aid in luring and keeping users. Accessibility may be increased by expanding delivery coverage, including semi-urban regions, and increasing logistical efficiency. Trust and happiness might be greatly increased by making an effort to maintain consistent quality, especially for fresh food, as well as by allowing delivery times at night and allowing thorough customer feedback. A more balanced and user-friendly service experience can also result from encouraging responsible customer behaviour and reducing impulsive purchases through app design or nudges.

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The Area for our WMRj research Journal is Multi disciplinary which includes the research from various fields of

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- Science
- Social Sciences
- Commerce and Management
- Engineering and Technology
- Education
- Law
- Arts
- Fine Arts
- IKS

Scope

The scope of the journal includes the types of Articles , Research Nature , Publication Frequency

Types of Articles :

- Original research articles
- Case studies
- Review Articles

Research Nature

- Interdisciplinary research
- Empirical research
- Innovative applications

Publication Frequency

Bi Annual

Our Vision

To uplift the underprivileged of Marathwada region in mind
The stalwarts of the Institution stepped up for the time .
With a vision to provide education in various fields,
The efforts & blessings provided a good yield.
Their perseverance in educating the young generation,
Created an ecosystem where experiences become inspiration.

Every step for an environmental or social cause,
Was met with gratitude & applause.
We continue on the path guided by 'Sanshodhan'
For exploring opportunities on technology and education.
To search then ponder and perch,
Our journal is an effort towards interdisciplinary research.
Providing for all irrespective of gender and classes,
The Institution truly symbolizes the **'Welfare of Masses'.**