"Tilak Samvida"

Pioneering Research, Transforming Perspectives

Editor-in-Chief
Dr. Shraddha M. Bhome
Principal,
J.K. College of Science and Commerce, Navi Mumbai, Maharashtra.

"Tilak Samvida"

Pioneering Research, Transforming Perspectives

Editor-in-Chief
Dr. Shraddha M. Bhome
Principal,
J.K. College of Science and Commerce, Navi Mumbai, Maharashtra.
Email: principal@jkc.ac.in

Board of Editors:

Dr. M. Gurusamy Professor and Chairperson – Marketing and Entrepreneurship, Adarsh Institute of Management and Information Technology, Chamarajpet, Bangalore, Karnataka. drmgurusamy@agieducation.org	**Dr. Hiren Dand** Head, Department of Information Technology Mulund College of Commerce (Autonomous), Mumbai hiren.dand@mccmulund.ac.in
Dr. (Mrs.) Sadhana Singh Assistant professor, Department of Commerce Vivekanand Education Society's College of Arts, Science and Commerce (Autonomous) sadhana.singh@ves.ac.in	**Dr. Mrunmayee Rajendra Thatte** Coordinator, Department of Banking and Insurance and Department of Financial Markets, VPM's K.G.Joshi College of Arts and N.G.Bedekar College of Commerce (Autonomous) Thane. mrthatte@vpmthane.org

FROM THE DESK OF HON. DIRECTOR

Dear Faculty Members, Researchers, and Students,

I am thrilled to introduce the inaugural volume of our College Research Journal, "Tilak Samvida". This journal represents a significant milestone in our institution's journey towards fostering a culture of research and scholarly inquiry, deeply rooted in the rich traditions of the Indian knowledge system.

"Tilak Samvida" exemplifies our commitment to nurturing academic excellence and innovation in alignment with the principles outlined in the National Education Policy 2020 of India. It serves as a dynamic platform for sharing insightful research contributions from our esteemed faculty members and talented students across diverse disciplines, including the revolutionary fields of Large Language Models, AI, and Robotics.

In today's transformative times, characterized by rapid advancements in technology and artificial intelligence, the relevance of research cannot be overstated. "Tilak Samvida" not only showcases our institution's intellectual prowess but also underscores our dedication to contributing meaningfully to the global academic discourse on these cutting-edge topics.

I encourage our students to leverage "Tilak Samvida" as a source of inspiration and a platform to hone their research skills, exploring innovative ideas and fresh perspectives crucial for shaping the future of academic research in the era of AI and robotics.

To our esteemed contributors, your rigorous research and scholarly contributions are instrumental in enhancing the reputation of our college as a center of academic excellence. Your work contributes significantly to our understanding and application of emerging technologies, aligning with the transformative goals set forth by the National Education Policy 2020.

Let us celebrate this momentous occasion with pride and optimism, looking forward to many more volumes of "Tilak Samvida" that will undoubtedly enrich our academic community and influence scholarly discussions worldwide.

My heartfelt congratulations to the editorial team and all contributors for their invaluable contributions to this inaugural volume. May "Tilak Samvida" continue to evolve as a beacon of scholarly excellence and a repository of transformative ideas in the years to come.

Thank you for your dedication and commitment to advancing knowledge and scholarship within our college community and beyond.

Warm regards,

Dr. Arun Janardhan

From the Desk of Editor-in-Chief

Warm Greetings!!!

I am delighted and honoured to announce the launch of the inaugural edition of our College Research Journal, "Tilak Samvida". This journal is a testament to our commitment to nurturing a research-centric environment that encourages intellectual curiosity and academic excellence.

"Tilak Samvida" represents a culmination of rigorous scholarship, innovative thinking, and collaborative efforts from our esteemed contributors. It showcases a diverse array of research papers and articles that demonstrate the depth and breadth of intellectual engagement within our college community. By integrating ancient knowledge with modern methodologies, we also aim to foster a holistic understanding of various disciplines and contribute to the preservation of India's intellectual heritage in a rapidly evolving world. "Tilak Samvida" encourages collaboration among faculty and students, aligning with the NEP's objectives to enhance research culture and uphold excellence in higher education, with dedication and playing a significant role in advancing the Nation's intellectual and societal progress.

As the Editor-in-Chief, I commend the dedication and scholarly rigour exhibited by our contributors. Your contributions have enriched this journal and underscored our institution's role in advancing knowledge across various disciplines.

I extend my heartfelt gratitude to the editorial team for their tireless efforts in ensuring the quality and coherence of this inaugural volume. Your commitment to excellence has been instrumental in bringing "Tilak Samvida" to fruition.

I encourage all readers to explore the pages of "Tilak Samvida" with curiosity and enthusiasm. May this journal inspire further research endeavours and also cultivate innovative solutions and insights that harness the potential of AI and robotics for the betterment of society.

Congratulations to everyone involved in this milestone achievement. Let us continue to strive for academic excellence and innovation in the pursuit of knowledge.

Warm regards,

Dr. Shraddha M. Bhome
Principal, J. K. College of Science and Commerce

CONTENT

1. A Comprehensive Study on Stress and its Management among Industrial Employees

Mubina Shaikh, Revathi Krishnan

Assistant Professor,
J. K. College of Science and Commerce,
Ghansoli.

ABSTRACT:

This study examines stress management among manufacturing employees, with the goal of aiding them by identifying the elements that contribute to work-related stress and understanding how it affects their well-being. It also discusses how corporations handle employee stress and makes ideas for corrective measures. The study applies a descriptive research design, drawing on both primary and secondary data sources. A questionnaire was presented to a sample of 60 employees to collect primary data. Pie charts are used in order to represent the data when analyzing and interpreting the results.

KEYWORDS:

Stress management, employees, manufacturing industry.

1. Introduction:

In an organization, stress is one of the common problems. One of the most important things to take care of is work stress, which is a big problem that has a big impact on a lot of people. For this reason, as more businesses begin to take the issue seriously in the workplace, it is becoming more and more important every day.

Promptly identify work-related stress accurately and take appropriate action to help people manage it. Because work stress is so important, it would be beneficial to research work stress among manufacturing industry employees in order to grow these sectors and make significant progress in workplace forecasts in the future.

2. Review of Literature:

Yan, H. & Xie, S. (2016) stress define as a series of physiological, psychological and behavioural responses due to the continuing effects of one or more stressors on individuals in an organization.

Latif, et al. (2016) highlighted that muscle tension, increased heart rates associated with high blood pressure, are all due to the stress leading in the working organization to gastrointestinal, cardiovascular, respiratory, musculoskeletal, skin, immune, and psychological disorders.

Dr. P. Kannan & Suma. U (2015) in order to manage stress the organization has to encourage employee development and embark on training interventions for employees.

Training specifically related to policies and policy implementation is a key priority to succeed. Stress in banking industries is mostly due to excess of over work pressure and work life imbalance in the organization should support and encourage taking up the roles that help them to balance work and family.

Karthik R. (2013) Employee's performance at work is influenced by stress that can be either positive or negative work stress. The employees perform better if they face low to moderate 54 amount of stress. Hence, it aims at reducing the level of stress rather than eliminating stress completely we have to conduct some program to the employees in working organization to reduce work stress

Y. Tatheer (2013) Majority of the bankers of Pakistan claim that they are highly stressed because of their jobs that not only affect their performance in banks but also equally affect their health and personal life of the employee. They also declare that the organizational politics and bureaucracy are the main reasons of stress in their banks.

3. Research Methodology:

Research Design	Descriptive research.
Types of data collected	Primary data - Systematic Questionnaire
	Secondary data - books, journals, and papers.
Sample Size	60 employees
Tools for Analysis	Tabulation method

4. Objectives of the Study:

1. To study the impact of stress on workers in the industrial sector
2. To find out the causes of employee stress
3. To identify the best strategy for reducing the impact on employee stress.

5. Results and Discussion:

5.1 Data Analysis and Findings:

AGE GROUP OF RESPONDENTS

Below 30 — 24.2%
30-40 — 2.1%
40-50 — 26.3%
50-60 — 47.4%
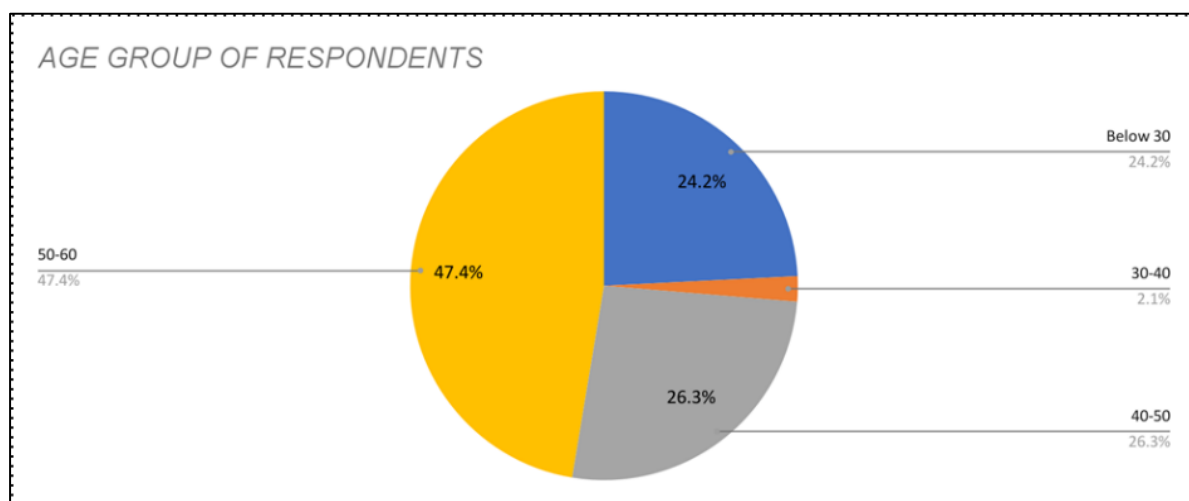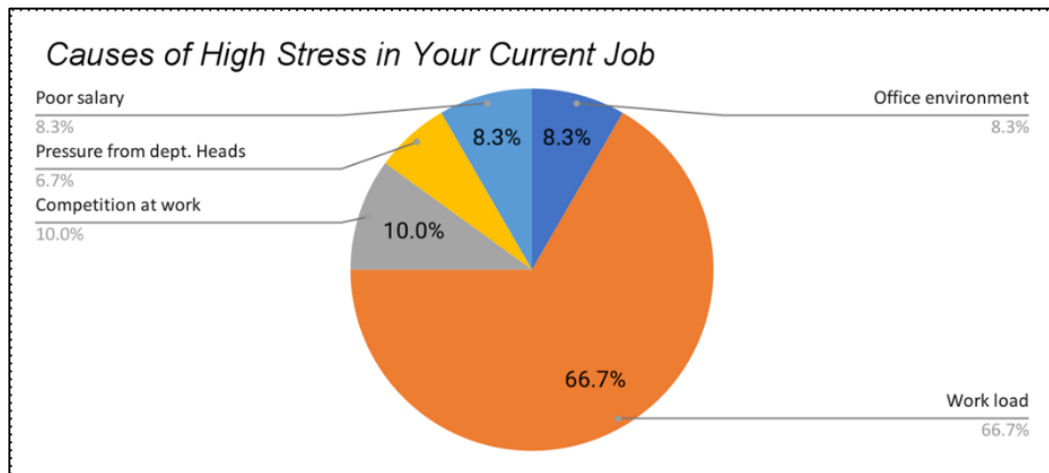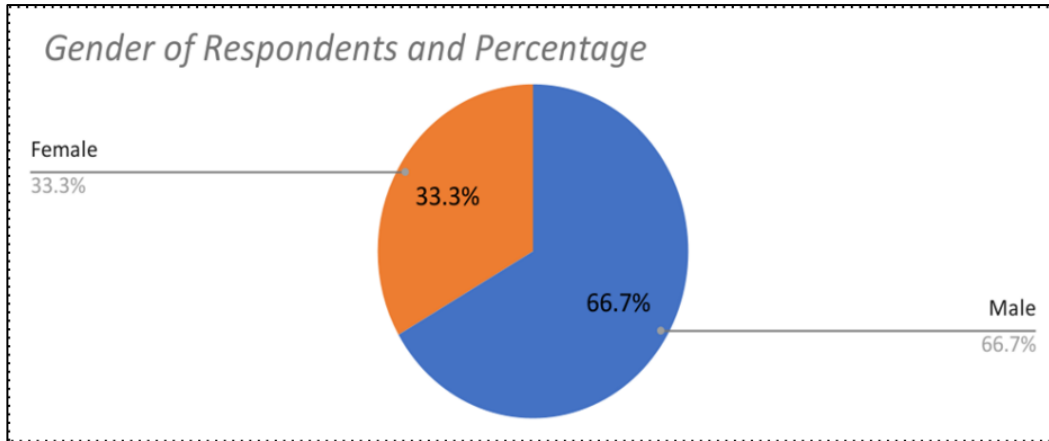
Interpretation:

The above table and diagram shows that 8% of employees face stress due to the office environment, 7% of employees saw that it's because of pressure from the department. Heads, 10% of employees saw that because of competition at work, 8% of employees say that it's because of a poor salary and 67% of employees say it's because of workload.
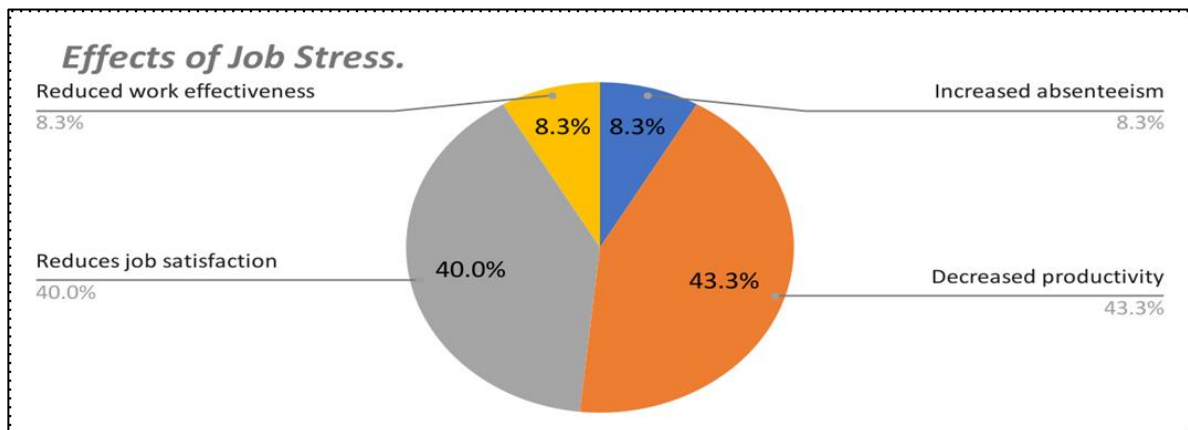
Interpretation:

The above table and diagram show that 43% decrease in productivity and 40% reduce job satisfaction are the major effects of job stress.

5.2 Hypothesis Testing:

5.2.1 Age of respondents and their opinion about the present organizational environment:

H0 (Null Hypothesis) = There is no significant relationship between the age of respondents and their opinion about the present organizational environment.

H1 (Alternate Hypothesis) = There is a significance relationship between age of respondents and their opinion about present organizational environment.

HO > H1: H0 is accepted.

Interpretation:

Hence there is no relationship between the age of respondents and their opinion about the present organizational environment.

5.2.2 Gender of the respondents and feel about the monitor and non-monitor compensation of the work in the company:

H0 (Null Hypothesis) = There is no significant relationship between gender of the respondents and feel about the monitor and non- monitor compensation of the work in the company.

H1 (Alternate Hypothesis) = There is a significant relationship between the gender of the respondents and their feelings about the monitor and non-monitor compensation of the work in the company.

HO > H1: H0 is accepted.

Interpretation:

Hence there is a significant influence between the gender of the employees and their relationship with feel about the monitor and non-monitor compensation of the work in the company.

5.3 Findings:

- Work stress significantly impacts employee performance.
- Decreased productivity and job satisfaction are indicators of work stress.
- Job-induced stress is common among employees.
- Primary causes of work stress include heavy workloads and pressure from department heads.
- Main stressors are the lack of recreational facilities and insufficient breaks during work hours.
- Employees face various mental and physical problems due to work stress.
- These issues negatively affect employees' routine work progress.

5.4 Suggestions & Recommendations:

- The top management should consider providing additional breaks during working hours to help alleviate stress.
- Enhancing recreational facilities for employees can further reduce stress levels.
- Improving the work environment by ensuring better lighting and ventilation can contribute to employee well-being.
- Redesigning jobs to make them less stressful is another effective strategy.

- Implementing health promotion programs within the firm can help monitor and improve employees' overall health.
- Employees experiencing high levels of stress should be offered individual counselling sessions.

6 Conclusion:

The project titled "A Study on Stress Management Among Employees" examines the critical relationship between stressors and employee performance in manufacturing industries. As the importance of managing work-related stress continues to grow, this study was undertaken to address this pressing issue.

Human resources are the most valuable asset of any organization and require dedicated attention and care. Employees, being the cornerstone of the firm, must have the factors causing their stress identified and mitigated to ensure they can perform their duties effectively. By addressing these stressors, organizations can enhance employee well-being, boost productivity, and achieve long-term success.

7 References:

1. A P Singh and Sadhana Singh, Effects of Stress and Work Culture on Job Satisfaction, Vol. VIII, No. 2, 2009, The Irfan University Journal of Organisational Behaviour.
2. J.E. Agolla, Police Officers: The Case of Botswana Police Service, (2009).
3. Khalid A, Role of Supportive Leadership as a Moderator between Job Stress and Job Performance (2012)
4. Latif, et al (2016). Occupational stress and psychological problems among workers.
5. P.S. Swaminath, Dr. S. Rajkumar, Stress levels in Organizations and their Impact on Employees' Behaviour, BVIMR Management Edge, Vol.6, No. 1 (2013).
6. Tatheer, stress management in private banks of Pakistan, Journal of emerging trends in economics and management sciences (2013).
7. Yan H & Xie, S. (2016), the effect of psychological stress on depression.

2. A Paradigm to Machine Learning in Education System: Challenges and Opportunities

Ms. Tejali Dattatray Mhatre,
Ms. Siddhi Shrikant Malpekar

Assistant Professor,
Department of IT,
J. K College of Science and Commerce,
Ghansoli, Navi-Mumbai.

ABSTRACT:

Machine learning is rapidly gaining in the education system like automated grading, assignments, tests, research, etc. Nowadays the Education System is the most important thing in human life. Machine learning offers various opportunities to transform the education system by adapting the technology to make effective teaching and learning experiences and optimizing administrative processes. Machine learning (ML) applications in the education system are making significant and fundamental changes or innovations in teaching, learning, administrative tasks, and educational research.

KEYWORDS:

Machine learning, Education System, Natural language processing.

1. Introduction:

ML algorithms analyze student performance data for learning materials to identify individual students' needs to improve their learning process. Machine learning provides facilities by assessing student responses and adapting real-time content and feedback. Predictive algorithms use student data to predict future academic performance, helping educators customize instructional strategies and resources. ML techniques can automate grading processes for objective assessments, saving educators time and providing instant feedback to students. ML helps optimize resource allocation, such as scheduling classes and allocating teaching staff based on predicted demand and availability. Machine learning models can analyze attendance and grade data to predict which students are at risk of dropping out. ML algorithms can recommend courses, learning modules, and educational resources adapted to students' academic strengths, weaknesses, and interests. ML uses Natural Language Processing (NLP) techniques in learning materials, assessments, and quizzes. Machine learning helps educators analyze large volumes of educational data and can design curriculum, teaching strategies, and resource allocation decisions. This process supports continuous improvement in teaching and learning practices.

ML in education holds significant promise for improving educational outcomes, enhancing teaching effectiveness, and optimizing administrative processes. Machine learning is the use of data as the primary source of information for training algorithms.

Data can be structured or unstructured, directly impacting the performance of machine learning models. Data includes tabular data, text, and images. Machine learning algorithms are used to learn patterns and relationships from data. There are various types of algorithms: supervised, unsupervised, and reinforcement learning. Algorithms learn from labeled data, such as classification and regression. Classification predicts discrete labels, and regression predicts continuous values, which is known as supervised learning. Algorithms have hidden patterns and structures in unlabeled data, which is known as unsupervised learning. Algorithms learn through interaction with an environment, receiving feedback in the form of rewards or penalties based on their actions, which is known as reinforcement learning.

2. Literature Review:

Enrico Barbierato and Alice Gatti, January 2024 describe the challenges of machine learning. The paper describes the continuous evolution of the ML field has yielded the introduction of additional standalone paradigms and methodologies. The paper analyzed the relationship between AI, ML, and the main advanced ML paradigms.

Anjali Jagwani, May 2019 stated machine learning types, applications, and benefits or limitations. The paper stated how intelligence and new machine technologies get invented in the education system.

Tom M. Mitchell described the field of machine learning, as the study of algorithms that allow computer programs to automatically improve through experience and key algorithms and theory that form the core of machine learning

Ibtehal Talal Nafea, July 2017 described the basic perspectives of machine learning in education and concluded that future learning environments are likely to be highly personalized, with the ability to help learners realize their utmost potential in the most fulfilling way.

3. Objective:

1. To study and understand machine learning in the education industry.
2. To evaluate its applications and importance in education.
3. To understand the opportunities and challenges of machine learning in the education system.

4. Applications of Machine Learning:

- **Natural Language Processing (NLP):** Sentiment Analysis is to determine sentiment (positive, negative, neutral) from text data. Language Translation is translating text from one language to another. Speech Recognition converts spoken language into text which focuses on the interaction between humans and computers.
- **Computer Vision:** Image Classification is to identify objects, scenes, or people within images. Object Detection locating instances of objects and classifying pictures or video frames. Facial Recognition is identifying a face in a photo and confirming individuals based on facial features.
- **Healthcare:** Using ML models in diagnostics assistance to assist in medical diagnostics based on patient data. Drug Discovery is the process of identifying new medications based on knowledge. Personalized Medicine: Patients receive treatments designed specifically for critical disease.
- **Finance:** The financial risk process is to identify fraud detection based on transaction data. I am using Algorithms in trading to make decisions based on market data and trends. It identifies groups of customers with similar behaviors or preferences.
- **Education:** Personalized learning is to gain educational content and pace to individual student needs. Predictive Analytics predicts the risk of dropping out students. Administrative work is automated such as grading and resource allocation.

5. Importance of ML in the Education Industry:

- **Natural Language Processing (NLP) Application:** NLP models are used to easily score/grade.ML provides learning platforms that can personalize language instruction and offer real-time feedback.
- **Analytics:** ML analyzes student behavior patterns within digital learning environments to understand learning habits, engagement levels, and areas needing improvement. ML algorithms recommend courses and learning materials based on a student's academic history, preferences, and career goals.
- **Educational Research and Decision Support:** ML enables large-scale analysis of educational data, providing insights into teaching methods, curriculum effectiveness, and factors influencing student success.
- **Paradigm Shift:** data-driven decision-making transforms educational institutions to operate and cater to student needs use ensuring that machine learning in education respects student privacy, promotes fairness, and enhances learning outcomes equitably. Machine learning solutions drive collaboration between educators, and technologists in designing effective education.

6. Opportunities:

- **Personalized Learning:** Machine learning enables personalized learning experiences for adapting learning styles. Predictive analytics can identify at-risk students early.
- **Enhanced Teaching and Administration**: Administrative tasks automated such as grading and scheduling. AI-powered tools are used by teachers for recommendations to optimize teaching strategies.
- **Data-Driven Insights:** Machine learning facilitates large-scale analysis of educational data for educational research. Also leads to insights that inform policy-making and educational reforms.
- **Predictive Modeling:** Forecasting educational trends and outcomes helps institutions make proactive decisions to improve student success rates.
- **Identifying learning difficulties:** Machine learning uses adaptive learning to identify difficulties students may be experiencing. Machine learning can help to flag learning issues and enable a tutor or program to alter teaching methods in response.
- **Personalizing teaching and learning processes:** ML algorithms allow educational software to personalize content, schedules, and learning goals to students' needs and capabilities, thereby improving the efficiency and quality of teaching and learning. This lets tutors shift their focus to processes that benefit from a human perspective.
- **Predictive analytics:** Educators use ML to predict future learning outcomes and change teaching methods based on these outcomes. Predictive analytics detect patterns in student behavior and determine the probability of each student passing a course or pursuing extracurricular activities.
- **Covering applications in higher education:** ML can predict enrollment levels and help higher education institutions find potential applicants. There are also research applications, as machine learning algorithms can quickly and accurately analyze large, growing datasets.

7. Challenges:

Implementing machine learning in the education system presents several challenges that need careful consideration and mitigation strategies:

- **Data Variety and Integration:** Educational data comes from diverse sources such as student records, assessments, and learning management systems. Integrating and standardizing these data sources can be challenging due to varying formats and quality.
- **Data Privacy and Security:** Educational data often contains sensitive information about students and faculty.

- **Resistance to Change**: Educational institutions may face cultural or institutional resistance to adopting new technologies like ML. Educators may require training and support to effectively integrate ML tools into their teaching practices.
- **Compatibility with Curriculum:** Integrating ML-driven tools and methodologies into existing curricula and educational frameworks requires alignment with learning objectives and pedagogical approaches.
- **Model Interpretability:** Understanding how ML models make decisions is crucial for educators and administrators to trust and validate their outputs. Complex models like deep neural networks may lack transparency.
- **Explain ability in Educational Contexts:** ML models used in education must provide explanations and insights that educators can understand and interpret to inform instructional strategies and interventions.
- **Technical Infrastructure:** Implementing ML requires adequate computational resources and infrastructure. Many educational institutions may face limitations in these areas.
- **Costs and Budgetary Considerations:** ML initiatives in education can incur significant costs related to data collection, model development, infrastructure setup, and ongoing maintenance. Budget constraints may hinder widespread adoption.
- **Student Privacy:** Safeguarding student privacy while collecting and analyzing data for ML applications is a critical ethical concern. Ensuring informed consent and secure data handling practices is essential.
- **Iterative Development:** ML models and algorithms in education need continuous evaluation and refinement based on real-world feedback and outcomes. This requires ongoing monitoring and adaptation to ensure effectiveness and relevance.
- **Evidence-Based Practices:** Validating the efficacy and impact of ML applications in education through rigorous research and evaluation is crucial to inform evidence-based decision-making and policy development.

8. Conclusion:

Machine learning offers various algorithms and techniques to enhance educational outcomes and administrative efficiency. ML Addressing challenges related to data quality, bias, adoption, interpretability, resources, ethics, and continuous improvement is essential for successful implementation in the education system. Efforts among educators, researchers, and technologists are crucial to navigating these challenges and realizing the full benefits of ML in education responsibly. Machine learning in education faces challenges such as data quality issues and algorithmic bias, but it also presents immense opportunities for personalized learning, administrative efficiency, and data-driven insights. Embracing these opportunities while addressing challenges is crucial for leveraging machine learning effectively and transforming the education system. Machine learning in the education system holds immense potential to enhance personalized learning experiences, improve educational outcomes, and streamline administrative processes. Addressing challenges related to data privacy, bias, and integration will be crucial to realizing these benefits responsibly. Machine learning continues to evolve rapidly, driving innovations across various industries and posing opportunities and challenges as its applications expand. Machine learning (ML) offers several applications and benefits in the education industry, transforming multiple aspects of teaching, learning, and administration.

9. References:

1. Nafea, I. T. (2018). Machine learning in educational technology. In *Machine Learning - Advanced Techniques and Emerging Applications*.
   doi:10.5772/intechopen.72906
2. Tuomi, I., Punie, Y., & Vuorikari, R. (2018). *The impact of artificial intelligence on learning, teaching, and education: Policies for the future* (Y. Punie, R. Vuorikari, & M. Cabrera, Eds.). Publications Office of the European Union.
   https://doi.org/10.2760/12297

3. Lynch, M. (2018, May 17). The benefits and limitations of machine learning in education. https://dev.thetechedvocate.org/the-benefits-and-limitations-of-machine-learning-in-education/

4. Barbierato, E., & Gatti, A. (2024). The challenges of machine learning: A critical review. *Electronics*, 13(2), 416. doi:10.3390/electronics13020416

5. Jagwani, A. (2019). A review of machine learning in education. *Journal of Emerging Technologies and Innovative Research (JETIR), 6*(5), 384-386

6. Mitchell, T. (1997). *Machine Learning*. New York, NY: McGraw-Hill Professional.

3. A Study of Customer's Opinion About Online Banking V/S Mobile Banking W.R.T. Trust, Security and Precautions

Dr. Shraddha Mayuresh Bhome

Principal,
Tilak Education Society's J. K. College of Science and Commerce,
Ghansoli.

ABSTRACT:

The banking sector is an example in which information-technology infrastructures have had implications on the economic development of many nations in the developing world. It is important to note that the banking industry was one of the very first to utilize information technology back in the 1960s, and has thus a record of influencing the development process through the technology. Online banking makes everything we do with our finances a bit easier. We can access the information anywhere that we have access to the Internet. In recent time Mobile banking is most often performed via SMS or the Mobile Internet but can also use special programs called clients downloaded to the mobile device. Here, the researcher has taken three aspects i.e. trust, opinion and precautions to be taken w.r.t. online banking and mobile banking. The researcher has tried to analyze the same with the help of standard deviation and t-test. 250 respondents are surveyed through pre-structured questionnaire.

KEYWORDS:

Online banking, mobile banking, Standard deviation and t-test.

1. Introduction:

The banking sector is an example in which information-technology infrastructures have had implications on the economic development of many nations in the developing world. It is important to note that the banking industry was one of the very first to utilize information technology back in the 1960s, and has thus a record of influencing the development process through the technology. There are many examples of information-technology applications in the banking sector that have helped build new markets and fuel the economy. For example, ATM, Internet banking and mobile banking etc.

Online banking is becoming much more common. We can pay our bills online and access a record of our checking account transactions online. Online banking makes everything we do with our finances a bit easier.

We can access the information anywhere that we have access to the Internet. It makes our financial life much easier to manage. In short, online bank provides the financial service for the individual client by means of internet.

Mobile Banking (MB) means a financial transaction conducted by logging on to a bank's website using a cell phone, such as viewing account balances, making transfers between accounts, or paying bills. It is a term used for performing balance checks, account transactions, payments etc. via a mobile device such as a mobile phone. In recent time Mobile banking is most often performed via SMS or the Mobile Internet but can also use special programs called clients downloaded to the mobile device.

2. Review of Literature:

Rangan, V. Kasturi and Lee, Katharine L., (2012), "Mobile Banking for the Unbanked ",

The case describes in detail the workings of two mobile banking operators in Africa-WIZZIT in South Africa and M-PESA in Kenya. It explores the dimensions of strategy that make for success in the market for the unbanked. It raises questions regarding the portability of the model to other countries and settings.

Safeena R., Date H., Kammani A. (2011), "Internet Banking Adoption in an Emerging Economy: Indian Consumer's Perspective", revealed that Information Technology Services is considered as the key driver for the changes taking place around the world. Internet banking (IB) is the latest and most innovative service and is the new trend among the consumers. The shift from the formal banking to e-banking has been a 'leap' change. This study determines the factors influencing the consumer's adoption of internet banking in India and hence investigates the influence of perceived usefulness, perceived ease of use and perceived risk on use of IB. It is an essential part of a bank's strategy formulation process in an emerging economy like India. Survey based questionnaire design with empirical test was carried out. The results have supported the hypothesis

Datta S. K. (2010), "Acceptance of E-banking among Adult Customers: An Empirical Investigation in India", revealed that Internet banking is a form of self-service technology. The numbers of Internet users have increased dramatically, but most of them are reluctant to provide sensitive personal information to websites because they do not trust e-commerce security. This paper investigates the factors which are affecting the acceptance of e-banking services among adult customers and also indicates level of concern regarding security and privacy issues in Indian context. Primary data was collected from 200 respondents, above the age of 35, through a structured questionnaire. Statistical analysis, descriptive statistics was used to explain demographic profile of respondents and also Factor and Regression analyses were used to know trend of internet use and factors affecting e-banking services among adult customer in India.

Khan M. S., Mahapatra S. S., (2009), "Service quality evaluation in internet banking: an empirical study in India" Demographic analysis of data reveals that gender is hardly a bias for use and evaluation of service quality of i-banking in most of the cases across various categories of customers.

A valid mathematical model is proposed to assess the overall service quality using regression analysis. The results show that customers are satisfied with quality of service on four dimensions such as reliability, accessibility, privacy/security, responsiveness and fulfillment, but least satisfied with the 'user-friendliness' dimension.

The empirical findings not only priorities different parameters but also provide guidelines to bankers to focus on the parameters on which they need to improve. The analysis showed that three variables (relative benefits, propensity to trust and structural assurances) had a significant effect on initial trust in mobile banking.

3. Objectives of The Study:

1. To study the opinion of the customer about Online Banking and Mobile banking w.r.t. trust, security and precautions.
2. To compare the opinion of the customer about Online Banking and Mobile banking w.r.t. trust, security and precautions.

4. Research Methodology:

Research universe: Commercial Banks in Thane city

Sample Size: 250

Sampling Method: Simple random sampling

Data Collection Method: Primary Data

Data Collection Tool: Questionnaire

Data Analysis tool: Standard deviation, Mean and t-Test

Hypothesis of Study:

H1: The opinion of the customer about Online Banking and Mobile banking w.r.t. trust, security and precautions are independent of each other.

5. Analysis and Interpretation of Data:

1. Customer's Trust On Their Bank While Using MB:

In questionnaire five questions were related to customer's trust on their bank. The maximum score for each question was 4, thus the total maximum score was 28. The following table shows the mean score of the customer's trust on their bank (out of the total score i.e. 20), standard deviation and higher limit, moderate limit and lower limit.

Table 1: Customer's Trust On Their Bank

	Mean Score (Out of 20)	S.D.	Higher Limit	Moderate	Lower Limit
	15.18	3.89	19.07	15.18	11.29
No. of Customer	250		22	199	29
Percentage of Customers	100 %		8.8 %	79.6 %	11.6 %

The above table shows that the mean score of the customer's trust on their bank was 15.18. The standard deviation was 3.89. 8.8% customers were having full trust on their banks while using MB. 79.6% customers were having moderate trust on their banks while using MB. 15.2% customers were having less trust or no trust on their bank while using MB.

2. Customer's Opinion About Security Provided by The Bank to MB Users:

In questionnaire three questions were related to customer's opinion about the security provided by the bank. The maximum score for each question was 4, thus the total maximum score was 12. The following table shows the mean score of the customer's opinion about the security provided by the bank (out of the total score i.e. 12), standard deviation and higher limit, moderate limit and lower limit.

Table 2: Customer's Opinion About the Security Provided by The Bank

	Mean Score (Out of 12)	S.D.	Higher Limit	Moderate	Lower Limit
	1.78	1.24	3.01	1.78	0.54
No. of Customer	250		56	69	125
Percentage of Customers	100 %		22.4 %	27.6 %	50 %

The above table shows that the mean score of the customer's opinion about the security provided by the bank was 1.78. The standard deviation was 1.24.

22.4 % customers believed that there are high chances of misuse their accounts if they use MB due to weak security provided by the banks. 27.6% customers believed that there are moderate chances of misuse their accounts if they use MB. 50% customers believed that there is less chance or no chance of misusing their accounts by other persons if they use MB. The study clearly shows that approximately 50% customers were satisfied with the security measures taken by the banks for MB users.

3. Precautions Taken by The Customers:

In questionnaire five questions were related to the precautions taken by the customers. The maximum score for each question was 4, thus the total maximum score was 20. The following table shows the mean score of the precautions taken by the customers (out of the total score i.e. 20), standard deviation and higher limit, moderate limit and lower limit.

Table 3: Precautions Taken by The Customers

	Mean Score (Out of 20)	S.D.	Higher Limit	Moderate	Lower Limit
	11.97	2.11	14.08	11.97	9.86
No. of Customer	250		33	191	26
Percentage of Customers	100 %		13.2 %	76.4 %	10.4 %

The above table shows that the mean score of the precautions taken by the customer was 11.97. The standard deviation was 2.11.

13.2% customers were taken high precautions, 76.4 % customers taken moderate precaution while 10.4% had not taken precautions or were taken less precautions.

4. Customer's Trust On Their Bank While Using OB:

In questionnaire seven questions were related to customer's trust on their bank. The maximum score for each question was 4, thus the total maximum score was 28. The following table shows the mean score of the customer's trust on their bank (out of the total score i.e. 28), standard deviation and higher limit, moderate limit and lower limit.

Table 4: Customer's Trust On Their Bank

	Mean Score (Out of 28)	S.D.	Higher Limit	Moderate	Lower Limit
	21.20	3.66	24.86	21.20	17.53
No. of Customer	250		31	181	38
Percentage of Customers	100 %		12.4 %	72.4 %	15.2 %

The above table shows that the mean score of the customer's trust on their bank was 21.20. The standard deviation was 3.66.

12.4% customers were having full trust on their banks. 72.4% customers were having moderate trust on their banks while 15.2% customers were having less trust or no trust on their bank.

5. Customer's Opinion About Security Provided by The Bank to OB Users:

In questionnaire three questions were related to customer's opinion about the security provided by the bank. The maximum score for each question was 4, thus the total maximum score was 12. The following table shows the mean score of the customer's opinion about the security provided by the bank (out of the total score i.e. 12), standard deviation and higher limit, moderate limit and lower limit.

Table 5: Customer's Opinion About the Security Provided by The Bank

	Mean Score (Out of 12)	S.D.	Higher Limit	Moderate	Lower Limit
	3.32	0.70	4.02	3.32	2.62
No. of Customer	250		59	189	02
Percentage of Customers	100 %		23.6 %	75.6 %	0.8 %

The above table shows that the mean score of the customer's opinion about the security provided by the bank was 3.32. The standard deviation was 0.70.

23.6 % customers believed that there are high chances of misuse their accounts if they use OB due to weak security provided by the banks. 75.6% customers believed that there are moderate chances of misuse their accounts if they use OB. 0.8% customers believed that there is less chance or no chance of misusing their accounts by other persons if they use OB. The study clearly shows that customers are not satisfied with the security provided by the banks to their OB users as they felt that somebody may misuse their accounts.

6. Precautions Taken by The Customers While Using OB:

In questionnaire five questions were related to the precautions taken by the customers. The maximum score for each question was 4, thus the total maximum score was 20. The following table shows the mean score of the precautions taken by the customers (out of the total score i.e. 20), standard deviation and higher limit, moderate limit and lower limit.

Table 6: Precautions Taken by The Customers

	Mean Score (Out of 20)	S.D.	Higher Limit	Moderate	Lower Limit
	11.83	1.03	12.86	11.83	10.80
No. of Customer	250		32	169	49
Percentage of Customers	100 %		12.8 %	67.6 %	19.6 %

The above table shows that the mean score of the precautions taken by the customer was 11.83. The standard deviation was 1.03. 32% customers were taken high precautions, 67.6 % customers taken moderate precaution while 19.6% had not taken precautions or were taken less precautions.

Comparison of the MB and OB users' trust on the banks:

Table 7: Comparison of MB and OB users' trust on the banks

	Sample Size	Mean	S.D.	t
OB users' trust on the bank	250	21.20	3.66	0.15
MB users' trust on the bank	250	21.26 *	5.45 *	
df	498			

Seven questions were asked to know the OB users' trust o their banks and five questions were asked to know the MB users' trust on their banks. To calculate t ratio, first researcher converted the score of MB users by dividing each score by 5 and multiply by 7 and then calculated the mean and standard deviation and t ratio was obtaining.

From table D, for df =498

Tabulated t = 1.96 at 0.05 level

        = 2.58 at 0.01 level

From the preceding table it is seen that:

The t ratio is 0.15. The obtained t ratio is smaller than 1.96 and hence is not significant at 0.01 level or 0.05 level. Hence, the null hypothesis was accepted. Thus, there is no significant difference in the OB users' and MB users' trust on their banks. The mean score of MB and OB users' trust on their bank was more than 21 out of 28. Therefore, the researcher concluded that MB and OB users' have more than 75% trust on their banks.

Comparison of the customers' opinion about security provided by the banks to MB and OB users: The next table shows the customers' opinion about security provided by the banks to MB and OB users.

Table 8: Customers' opinion about security provided by the banks to MB and OB users

	Sample Size	Mean	S.D.	t
Security provided by the bank to OB users	250	3.32	0.70	17.12
Security provided by the bank to MB users	250	1.78	1.24	
df	498			

From table D, for df =498

Tabulated t = 1.96 at 0.05 level

      = 2.58 at 0.01 level

From the preceding table it is seen that:

The t ratio is 17.12. The obtained t ratio is greater than 2.58 and hence is significant at 0.01 level. Hence, the null hypothesis was rejected. Thus, there is significant difference in the opinion of the customers about the security provided by the banks to MB and OB users.

The mean score of the customers' opinion about security provided by the bank to OB users was 3.32 and the mean score of the customers' opinion about security provided by the bank to MB users was 1.78. It indicates that the customers feel that bank provides more security to OB users as compared to MB users.

Comparison of the Precautions taken by the customers while using MB and OB:

Table 9: Comparison of precautions taken by the customers while using MB and OB

	Sample Size	Mean	S.D.	t
Precautions taken by the customer while using OB	250	11.83	1.03	0.97
Precautions taken by the customer while using MB	250	11.97	2.11	
df	498			

From table D, for df =498

Tabulated t = 1.96 at 0.05 level

      = 2.58 at 0.01 level

From the preceding table it is seen that:

The t ratio is 0.97. The obtained t ratio is smaller than 1.96 and hence is not significant at 0.01 level or 0.05 level. Hence, the null hypothesis was accepted. Thus, there is no significant difference in the precautions taken by the customers while using MB and OB. The mean score of precautions taken by the customers while using MB and OB was more than 11 out of 20. It indicates that MB and OB users took more than 55% security measures while using MB and OB.

6. Conclusion:

- The customers felt that OB is more useful than MB. MB is much easier to operate as compared to OB.
- The bank, bank officials and friends / colleagues encouraged the customers to adopt OB and MB, but they encouraged more to adopt OB as compared to MB.
- The study also revealed that some individual / groups have negative concept of OB and MB, thus they discouraged the customers for adopting MB and OB.
- There is no significant difference in the discouragement of the customer by individual / groups for adopting OB and MB.
- The customers using MB and OB have almost equal trust on their banks.
- The study showed that both customers i.e. MB users and OB users have more than 75% trust on their banks.
- Customers felt that banks provide more security to OB as compared to MB because of a high chance of misuse the accounts of the customer in OB.
- Both MB users and OB users took approx. 55% precautionary measures while using these services.

7. Scope for Further Research:

The researcher can further study the same aspects with respect to income pattern of consumers with further analysis of gender and educational background.

8. References:

1. Datta S. K. (2010), "Acceptance of E-banking among Adult Customers: An Empirical Investigation in India", Journal of Internet Banking and Commerce, Vol. 15 (2).
2. Khan M. S., Mahapatra S. S., (2009), "Service quality evaluation in internet banking: an empirical study in India", International Journal of Indian Culture and Business Management, Vol. 2 (1), pp. 30 - 46.
3. Rangan, V. Kasturi and Lee, Katharine L., (2012), "Mobile Banking for the Unbanked ", Harvard Business School, Marketing Unit, Case No. 511-649.
4. Safeena R., Date H., Kammani A. (2011), "Internet Banking Adoption in an Emerging Economy: Indian Consumer's Perspective", International Arab Journal of e-Technology, Vol. 2 (1).
5. Sylvie L., Xiaoyan L., (2005) "Consumers' attitudes towards online and mobile banking in China", International Journal of Bank Marketing, Vol. 23 (5), pp.362 - 380.
6. Yousafzai S. Y., Pallister J. G., Foxall G. R., (2003), "A proposed model of e-trust for electronic banking", Technovation, Vol. 23(11), pp. 847 - 860.

4. A Study On Uses of Artificial Intelligence in Online Shopping

Mrs. Trupti Deshmukh

Assistant Professor,
Tilak Education Society's,
J. K. College of Science and Commerce.

ABSTRACT:

Artificial Intelligence plays an important role in enhancing online shopping experience for the customers and retailers. Many retailers like amazon, flip kart, etc. Uses AI technology to detect the address and location of customers for better and on time product delivery. Research based on customer awareness about AI tools and techniques used while shopping online for finding products easily, customers feels secure or feel risky while doing online shopping. I used data from Navi-Mumbai and my native place Amravati district people to find the awareness of AI and their behavior about online shopping. The findings indicate that the customers like to buy online or not and the reasons behind it.

KEYWORDS:

Artificial Intelligence, Online Shopping, Customer, Retailer.

1. Introduction:

Artificial intelligence (AI) is revolutionizing online shopping, enhancing the overall experience for customers and retailers alike. It used to predict and analyze customer behavior and preferences, helping retailers optimize inventory, pricing, and promotions. This research shows the users are benefiting from online buying and selling with AI technologies, although this research benefits in customer experience, conventions and sales, operational efficiency, product discoverability, customer insights and analytics.

Many types of retailers are involved in business like Amazon, eBay, Alibaba, Walmart, Target, etc. and are able to enhance customer experiences, optimize operations and drive business growth. Generative AI technology gives responses to many questions like "What should I wear on a particular festival or on a Birthday Parties", also the new trending fashions recommendation. "This is big," said Arit Mondal, director of product management at Myntra. Customers can filter their choices and budget products online. AI can monitor the user's purchase to recommend their choices in future. Through emails, the customers can get reminders of left items in a cart to complete their purchases.

The integration of AI in online shopping has transformed the industry, enabling retailers to provide a more personalized, efficient, and secure shopping experience for customers. Online shopping experiences become more efficient, personalized, and secure, driving customer satisfaction and retailer success. Therefore, it is more important to monitor the consumer behavior data for online shopping and predict market changes in a timely manner.

For social development, the number of Internet users will continue to expand in the future, creating a very favorable market for the development of online shopping. A knowledge-based online shopping customer behavior analysis and prediction system is proposed to address the above situation. The real-time prediction of online shopping customer behavior is accomplished based on the real-time browsing behavior data and personal data of customers, as well as the existing knowledge in the machine knowledge database.

2. Objectives:

- To identify and track customer demographics, emotions and behavior
- To find out the reasons behind if customers refrain from doing online shopping or using AI technologies.
- To suggest how to overcome fear of customers.

3. Review of Literature:

- Ashish Mehta-(2021) CHANGING TREND IN ONLINE SHOPPING - A STUDY OF MUMBAI SUBURBS states in his paper that AI and Machine learning models gives more benefits to customers in terms of security and more discounts rate due to increase rate of companies and new brands in markets.
- Kothari P. Pritam, Maindargi S. Shivganga-(2016), A Study on Customers Attitude towards Online Shopping in India and its Impact: With Special Reference to Solapur City states that majority of users rely on online shopping but some are still want to do shopping manually, the reason behind this is users want to see the product before purchase and in online shopping these things never happen.

4. Methodology:

Data Collection:

Primary Data:

In order to fulfill my objectives, a sample study was taken using the well-formed questionnaires. This data has been generated only from Maharashtra's two region population i. Navi Mumbai ii. My town Amravati district. Respondents were selected based on the important aspects such as their Gender, Age, Annual income, Occupation, Frequency of shopping and so forth.

5. Limitations of Study:

- Sample size for statistical measurements is low as per the requirement
- Time constraints.

6. Analysis and Interpretation of Data:

1. Age of the maximum respondents are in the range 20 to 45 years, people from this group are very keen to shop online.
2. Frequency of online shopping in Respondents are: Maximum user's statistics are monthly basis (57.5%)
3. Analysis said that maximum 60% users are not using AI application, 30% are using AI applications and 10% users are neutral

Have you ever used AI applications (Chatbots, Voice Assistant (Google Assistant, Siri, and Alexa), etc. during online shopping?

40 responses

- Yes
- No
- Maybe

60% No
30% Yes
10% Maybe
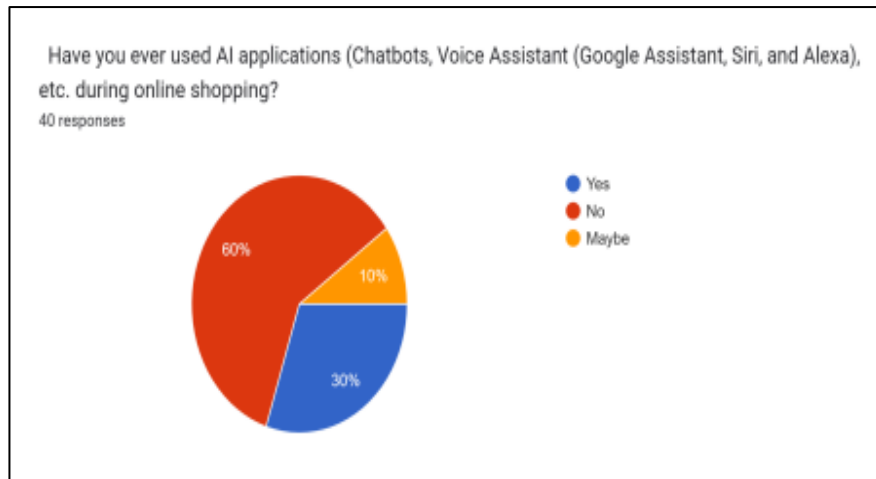
4. Respondents prefer online shopping because it saves time, various offers on online products and open 24/7, wide range of choices or big range of products/brands available.

Why do you prefer online shopping Online?(Choose as many as applicable)

39 responses

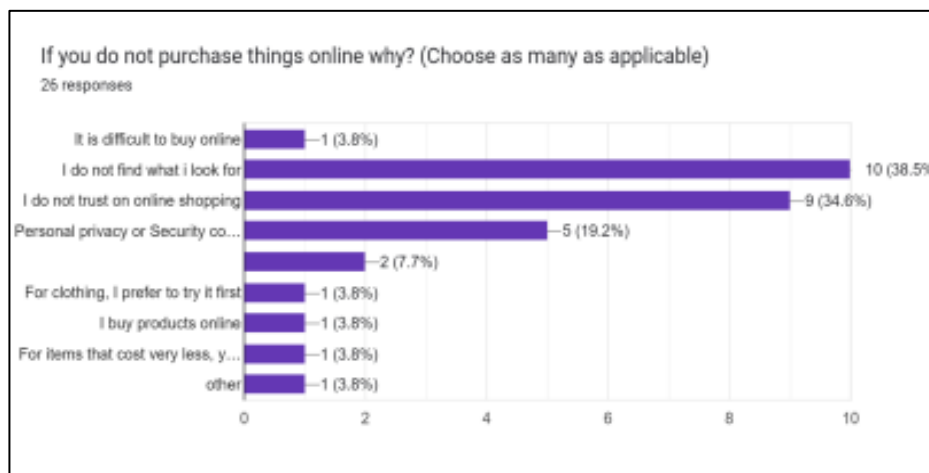| Category	Value
Security	8 (20.5%)
Saves Time	31 (79.5%)
Information accessibility	14 (35.9%)
open 24/7	23 (59%)
Big Selection of products/brands	21 (53.8%)
Fair Prices	16 (41%)
Wide range of choices	19 (48.7%)
Various offers for online products	24 (61.5%)
Easy ordering method	20 (51.3%)
Fun Doing Shopping on web	5 (12.8%)

5. Respondents do not prefer online shopping because they do not find whatever they looking for, some days they do not trust online shopping,

If you do not purchase things online why? (Choose as many as applicable)

26 responses

Category	Value
It is difficult to buy online	1 (3.8%)
I do not find what i look for	10 (38.5%)
I do not trust on online shopping	9 (34.6%)
Personal privacy or Security co...	5 (19.2%)
	2 (7.7%)
For clothing, I prefer to try it first	1 (3.8%)
I buy products online	1 (3.8%)
For items that cost very less, y...	1 (3.8%)
other	1 (3.8%)

6. Maximum of respondents feel safe while using different AI applications for online shopping, some are neutral and very few says they are not feeling safe.

I feel safe while using AI applications in online shopping
38 responses

7. Many of the respondents (i.e. 36%) say they are afraid of data leakage and 30% say they don't feel the risk, while 23% are neutral or indefinite about this.

I feel risk of private data leakage while using AI in online shopping
39 responses
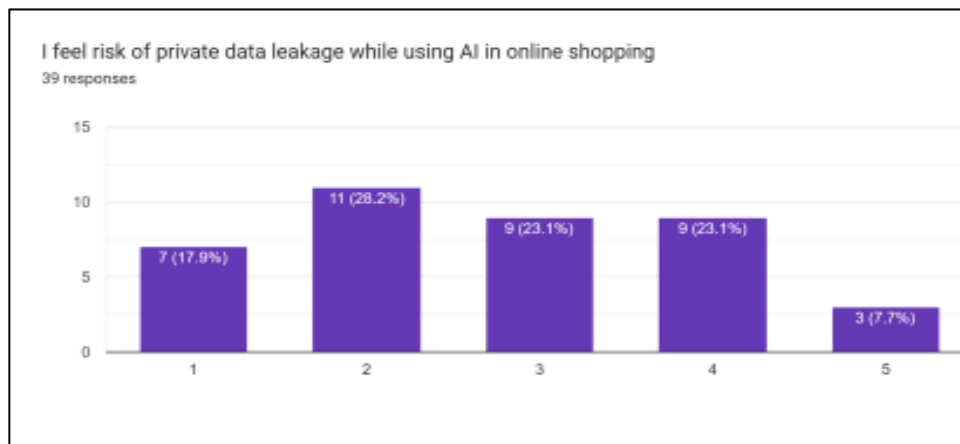
8. 57.8% of the respondents are aware of AI tools used in online applications. 29% respondents don't have knowledge about AI tools, while 13.2% respondents are neutral.

I am aware of AI tools used for online retail
38 responses

9. Analysis for the percent of respondents who feel that infrastructure has been developed or not developed is given in below graph.

I feel infrastructure of AI in Online shopping in India is well developed
37 responses

7. Findings and Conclusion:

In this research, findings were how the view of customers changes from time to time about online changes. The customers who were afraid of online shopping have a lack of awareness about AI applications and uses of AI tools and techniques in their daily life as if they were using it.

Suggestions:

Customers must have knowledge about AI tools and techniques in a positive way which will reduce their risk and confusion data leakage. Customers should be aware of techniques like AI using security features like face detection techniques to secure their data.

Scope for Further Research:

Need to do surveys about individual tools like chat bot, voice assistance, Micro AI, Prisync, etc. used by merchants to improve productivity and sales.

8. References:

1. Artificial Intelligence (AI) applications in on-line shopping in India Ayse Begum Ersoy Shannon School of Business, Cape Breton University, Nova Scotia, Canada
2. Ashish Mehta-(2021) CHANGING TREND IN ONLINE SHOPPING - A STUDY OF MUMBAI SUBURBS, INTERNATIONAL JOURNAL OF RESEARCH CULTURE SOCIETY ISSN: 2456-6683
3. Kothari P. Pritam, Maindargi S. Shivganga, International Journal of Advance research , Ideas and Innovations in Technology. ISSN: 2454-132X Impact factor: 4.295 (Volume2, Issue6), A Study on Customers Attitude towards Online Shopping in India and its Impact: With Special Reference to Solapur City.
   https://www.ijariit.com/manuscripts/v2i6/V2I6-1180.pdf
4. www.google.com
5. https://writing.wisc.edu/handbook/assignments/writing-an-abstract-for-your-research-paper/
   https://www.scribbr.com/methodology/literature-review/

5. A Study On Evaluating the Feasibility of Implementing Rental E-Scooters in The University of Mumbai, Kalina Campus

Milind Saraf

Assistant Professor,
Department of Accounting and Finance,
S. K. Somaiya College, Somaiya Vidyavihar University.

Abdul Rasheed

Assistant Professor,
Head of Department (Accounting and Finance),
Maharashtra College of Arts, Science and Commerce.

Meenakshi Sambamoorthy

Assistant Professor,
Department of Accounting and Finance,
J. K. College of Science and Commerce.

Siddhi Parab, Varsha Jeevanram

Assistant Professor,
Department of Information Technology,
J. K. College of Science and Commerce.

ABSTRACT:

This study investigates the feasibility of introducing rental e-scooters as a sustainable transportation option on a university campus. It examines the interest and readiness of students, faculty, and staff to adopt e-scooters, considering their transportation needs and preferences. The research identifies a strong inclination among stakeholders to use e-scooters, driven by dissatisfaction with current transportation options and their affordability within specified price points. The study evaluates financial viability and regulatory considerations, highlighting potential benefits such as improved campus mobility and reduced environmental impact. Recommendations include piloting the e-scooter program to assess user adoption and operational logistics, alongside infrastructure improvements and safety measures to ensure successful integration into campus life. Overall, the findings indicate that introducing rental e-scooters can effectively address diverse transportation needs within the university community while promoting sustainability and convenience.

KEYWORDS:

E-Scooter, University Campus, Micro-mobility.

1. Introduction:

Micro-mobility encompasses compact, human-powered or electric vehicles tailored for short urban trips. Examples of micro-mobility vehicles include electric scooters, electric bicycles, pedal bicycles and aim to offer convenient, efficient transport for activities like navigating university campuses and city centers.

The implementation of rental e-Scooters in the Kalina Campus of University of Mumbai (henceforth referred to University Campus) is a forward-thinking initiative that could potentially offer numerous benefits to the university community. This feasibility study aims to assess the practicality and viability of introducing e-Scooters as a sustainable and convenient mode of transportation within the campus.

With the increasing emphasis on sustainability and eco-friendly transportation solutions, the adoption of e-Scooters has gained significant traction worldwide. These electric vehicles offer a clean, efficient, and cost-effective alternative to traditional petrol-powered vehicles.

2. Objectives:

1. To understand the satisfaction levels of commuters towards current transportation infrastructure and facilities within the University Campus.
2. To assess the potential demand for rental e-Scooters among students, faculty and staff
3. To evaluate the feasibility of implementing rental e-Scooters in the University Campus

3. Review of Literature:

1. Moosavi, S. M. H. et al., 2022, investigates attitudes towards Shared Free-Floating Electric Scooters among university students and staff, identifying key factors like daily travel habits and age influencing its usage.
2. Chicco, A., & Diana, M. (2022) examine the usage patterns of bike sharing and e-scooter services, highlighting the distinct spatial and temporal dynamics of micro-mobility services in urban settings.

4. Research Methodology:

The feasibility study involves a combination of quantitative and qualitative research methods. Surveys will be conducted to gather data on transportation needs and preferences of commuters travelling to the University of Mumbai, Kalina Campus. Cost analysis will be conducted based on specific price points.

Expected Outcomes: The feasibility study is expected to provide valuable insights into the viability of introducing rental e-Scooters in the University Campus. It will help university authorities make informed decisions regarding the implementation of rental e-Scooters as a sustainable transportation solution.

Significance of the Study: The successful implementation of rental e-Scooters in the University Campus could serve as a model for other campuses and institutions looking to adopt sustainable transportation solutions. It could also contribute to reducing carbon emissions and promoting a greener campus environment.

Methods of Data Collection: Questionnaire method

Sample Size - 22 Respondents

Sample Profile:

- Gender
- Age group
- Occupation / Roles
- Purpose of visit to campus
- Primary mode of transportation
- Satisfaction levels with present mode of transportation within campus
- How much is the current cost of transportation?
- Feasibility of rented e-Scooter

5. Limitations of Study:

1. Since the data collection is confined to commuters travelling exclusively to the University of Mumbai, Kalina Campus, the findings may be specific to this particular campus.
2. The availability and reliability of data related to transportation patterns, user preferences, and infrastructure may vary across campuses.

6. Analysis and Interpretation of Data:

1. To understand the satisfaction towards current transportation infrastructure and facilities within the University Campus.

(H_0): There is no significant difference in satisfaction levels among different age groups regarding the current transportation infrastructure and facilities within the University Campus.

(H_1): There is a significant difference in satisfaction levels among different age groups regarding the current transportation infrastructure and facilities within the University Campus.

ANOVA					
Satisfaction levels with mode of transport within University Campus					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.576	4	2.144	2.247	.079
Within Groups	42.944	45	.954		
Total	51.520	49			

Interpretation: Null hypothesis is accepted .079 level of significance. There is no significant difference between all age groups. Commuters are of the opinion that they are not satisfied with the current mode of transport within the University Campus.

2. To assess the potential demand for rental e-Scooters among students, faculty, staff and commuters.

H_0: There is no significant difference in the willingness to use rental e-scooters among faculties, students and staff.

H_1: There is a significant difference in the willingness to use rental e-scooters among faculties, students and staff.

Roles in Mumbai University * Would you like to commute in University campus using rental e-scooters * Cross tabulation						
			Would you like to commute in University campus using rental e-Scooters			Total
			Yes	No	May be	
Roles in Mumbai University	Faculty	Count	20	1	2	23
		Expected Count	18.9	3.2	.9	23.0
	Student	Count	13	2	0	15
		Expected Count	12.3	2.1	.6	15.0
	Staff	Count	8	4	0	12
		Expected Count	9.8	1.7	.5	12.0
Total		Count	41	7	2	50
		Expected Count	41.0	7.0	2.0	50.0

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.540[a]	4	.110
Likelihood Ratio	7.987	4	.092
Linear-by-Linear Association	.241	1	.623
N of Valid Cases	50		
a. 6 cells (66.7%) have expected count less than Rs. 5. The minimum expected count is .48.			

Interpretation: Since P Value is greater than 0.05 we accept the null hypothesis. Faculties, students and staff are willing to use rented e-Scooters within the University Campus.

3. To evaluate the feasibility of implementing rental e-Scooters in the University Campus

(H₀): There is no significant difference in the willingness to use rental e-scooters among students, faculty, and staff at different cost levels.

(H₁): There is a significant difference in the willingness to use rental e-scooters among students, faculty, and staff at different cost levels.

Role in Mumbai university * Would you consider rented e-scooter to and from University campus? * How much are you willing to spend on rented e-Scooter? Cross tabulation								
How much are you willing to spend on rented E-Scooter				Would you consider rented e-scooter to and from MU campus				Total
				Yes definitely	Yes may be	No probably not	No definitely not	
less than Rs. 5	Role in Mumbai University	Faculty	Count		2			2
			Expected Count		2.0			2.0

Role in Mumbai university * Would you consider rented e-scooter to and from University campus? * How much are you willing to spend on rented e-Scooter? Cross tabulation							
How much are you willing to spend on rented E-Scooter			Would you consider rented e-scooter to and from MU campus				Total
			Yes definitely	Yes may be	No probably not	No definitely not	
	Total	Count		2			2
		Expected Count		2.0			2.0
Rs. 5 - 10	Role in Mumbai University	Faculty	Count	1	4			5
			Expected Count	1.7	3.3			5.0
		Staff	Count	2	2			4
			Expected Count	1.3	2.7			4.0
	Total	Count	3	6			9
		Expected Count	3.0	6.0			9.0
Rs 10-15	Role in Mumbai University	Faculty	Count	2	0	2		4
			Expected Count	2.2	.9	.9		4.0
		student	Count	6	3	2		11
			Expected Count	6.1	2.4	2.4		11.0
		staff	Count	2	1	0		3
			Expected Count	1.7	.7	.7		3.0
	Total	Count	10	4	4		18
		Expected Count	10.0	4.0	4.0		18.0
Rs. 15-20	Role in Mumbai University	Faculty	Count	2	2			4
			Expected Count	2.2	1.8			4.0
		student	Count	2	2			4
			Expected Count	2.2	1.8			4.0
		staff	Count	1	0			1
			Expected Count	.6	.4			1.0
	Total	Count	5	4			9
		Expected Count	5.0	4.0			9.0
Rs. 20-25	Role in Mumbai University	Faculty	Count	6			2	8
			Expected Count	6.0			2.0	8.0
	Total	Count	6			2	8

Role in Mumbai university * Would you consider rented e-scooter to and from University campus? * How much are you willing to spend on rented e-Scooter? Cross tabulation							
How much are you willing to spend on rented E-Scooter				Would you consider rented e-scooter to and from MU campus			Total
				Yes definitely	Yes may be	No probably not	No definitely not	
			Expected Count	6.0			2.0	8.0
Rs. 25 above	Role in Mumbai University	staff	Count	2		2		4
			Expected Count	2.0		2.0		4.0
	Total		Count	2		2		4
			Expected Count	2.0		2.0		4.0
Total	Role in Mumbai University	Faculty	Count	11	8	2	2	23
			Expected Count	12.0	7.4	2.8	.9	23.0
		Student	Count	8	5	2	0	15
			Expected Count	7.8	4.8	1.8	.6	15.0
		Staff	Count	7	3	2	0	12
			Expected Count	6.2	3.8	1.4	.5	12.0
	Total		Count	26	16	6	2	50
			Expected Count	26.0	16.0	6.0	2.0	50.0

Chi-Square Tests						
How much are you willing to spend on rented e-scooter		Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
less than Rs. 5	Pearson Chi-Square	.[b]				
	N of Valid Cases	2				
Rs. 5 - 10	Pearson Chi-Square	.900[c]	1	.343		
	Continuity Correction[d]	.056	1	.813		
	Likelihood Ratio	.908	1	.341		
	Fisher's Exact Test				.524	.405
	Linear-by-Linear Association	.800	1	.371		
	Pearson Chi-Square	9				
Rs 10-15	Pearson Chi-Square	3.409[e]	4	.492		
	Likelihood Ratio	4.568	4	.335		
	Linear-by-Linear Association	1.111	1	.292		
	N of Valid Cases	18				

Chi-Square Tests						
How much are you willing to spend on rented e-scooter		Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Rs. 15-20	Pearson Chi-Square	.900f	2	.638		
	Likelihood Ratio	1.275	2	.529		
	Linear-by-Linear Association	.400	1	.527		
	N of Valid Cases	9				
Rs. 20-25	Pearson Chi-Square	.g				
	N of Valid Cases	8				
Rs. 25 above	Pearson Chi-Square	.g				
	N of Valid Cases	4				
Total	Pearson Chi-Square	3.220a	6	.781		
	Likelihood Ratio	3.988	6	.678		
	Linear-by-Linear Association	.534	1	.465		
	N of Valid Cases	50				

Willingness and Cost affordability

Classification Table[a,b]					
			Predicted		
			Would you like to commute in University campus using e-scooter		Percentage Correct
	Observed		Yes	No	
Step 0	would you like to commute in University campus using e-scooter	Yes	41	0	100.0
		No	9	0	.0
	Overall Percentage				82.0
a. Constant is included in the model.					
b. The cut value is .500					

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.516	.368	16.969	1	.000	.220

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	.038	1	.846
	Block	.038	1	.846
	Model	.038	1	.846

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	How much are you willing to spend on rented e-scooter?	.056	.285	.038	1	.846	1.057
	Constant	-1.711	1.074	2.540	1	.111	.181
a. Variable(s) entered on step 1: How much willing to spend on rented e-scooter.							

Interpretation: Willingness to use rented e-scooters in campus of Mumbai university and it is affordable considering the willingness of commuters.

☐ Exp**(B)** = 1.057

☐ This indicates that the odds of willingness to use e-scooters are approximately 1.057 times higher for certain groups compared to the reference group.

☐ Exp**(B)** = 0.181

☐ This indicates that for each unit increase in cost level, the odds of willingness to use e-scooters decrease by approximately 81.9% (since 1 - 0.181 = 0.819).

Above table shows higher willingness of commuters if cost is Rs. 5-10 and it will decrease by 81.90% for next level increase in cost.

7. Findings and Conclusion:

1. The findings indicate that commuters are not satisfied with the current transportation options available within the University Campus.
2. There is substantial interest among students, faculty and staff at the University of Mumbai, Kalina Campus for implementing rental e-scooters as a convenient mode of intra-campus transportation.

3. Based on the findings, introducing rental e-scooters on the university campus is a viable option due to the expressed willingness of students, faculty and staff, as well as the affordability related to specified cost levels, effectively meeting their transportation needs.

Suggestions:

1. Rental e-scooters can provide a cost-effective, environmentally friendly, and convenient transportation option that enhances mobility across University campuses.
2. Pilot programs can be implemented to test user adoption, operational logistics and infrastructure readiness.
3. Collaborations can be initiated with local authorities, campus stakeholders and e-scooter rental companies to establish partnerships and regulatory frameworks.

Scope for Further Research:

1. The detailed financial feasibility of implementing and maintaining the e-Scooter fleet can be explored.
2. Identification of potential challenges and risks associated with the implementation of e-Scooters can be analysed.

3. A comprehensive plan for the successful integration of e-Scooters into the campus environment can be developed.

8. References:

1. Moosavi, S. M. H., Ma, Z., Armaghani, D. J., Aghaabbasi, M., Ganggayah, M. D., Wah, Y. C., & Ulrikh, D. V. (2022). Understanding and predicting the usage of shared electric scooter services on university campuses. Applied Sciences. 2022; 12(18):9392.
2. Chicco, A., & Diana, M. (2022). Understanding micro-mobility usage patterns: A preliminary comparison between dockless bike sharing and e-scooters in the city of Turin (Italy). Transportation Research Procedia, 62, 459-466.
3. https://www.itdp.in/wp-content/uploads/2022/10/Status-of-e-Micromobility-in-India.pdf
4. https://bolt.earth/blog/future-electric-vehicles-india

9. Annexure:

Questionnaire:

Sr. no	Questions	Options	Options
1	Age	Below 18 to 64	65 and above
2	Gender	Male, Female	Prefer not to say
3	Role in University of Mumbai, Kalina campus or affiliated colleges	Students, Faculty, Staff	Other
4	Please indicate the purpose of your visit to University of Mumbai, Kalina campus	Admission, Examinations, Lectures,	Research training, administration, support staff
5	What is your primary mode of transportation within the University campus?	Walking , Cycling, Public transport (bus)	Personal fleet, Taxi, Auto
6	How satisfied are you with the frequency of transportation modes within the Mumbai University campus?	1-very satisfied	5-Very dissatisfied
7	How satisfied are you with your current mode of transportation?	1-very satisfied	5-Very dissatisfied
8	How much do you spend on transportation to and from the campus per day visit? (in INR)	Rs. 0-5	Rs. 25 and above
9	Would you consider using Rented e-scooters as a mode of transportation to and from the campus?	Yes definitely	No definitely not
10	What factors would influence your decision to use rented e-scooters on campus? (Check all that apply)	Cost effectiveness, Availability,	Convenience ,Safety
11	On a scale of 1 to 5, where 1 is "Not at all affordable" and 5 is "Very affordable," how would you rate the affordability of transportation to and from the University of Mumbai Kalina campus using existing modes?	1 is "Not at all affordable"	5 is "Very affordable,"

Sr. no	Questions	Options	Options
12	Would you prefer commuting within the university campus using rented e-scooters for mobility?	Yes	No, may be
13	How much are you willing to spend per trip for mobility within the University campus? (in INR)	Rs. 0-5	Rs. 25 and above
14	Do you have any concerns or reservations about implementing rented e-scooters on the University campus? If yes, please specify.	—	—
15	Please share any additional comments or suggestions regarding the implementation of rented e-scooters on the University campus.	—	—

6. University of Mumbai: Improving Undergraduate Education by Integrating Research

Mrs. Bhavana Mulani

Assistant Professor,
Commerce Department,
J. K. College of Science & Commerce.

Saba Ansari

Assistant Professor,
B. Sc (CS) Department,
J. K. College of Science & Commerce.

ABSTRACT:

This paper explores the significance of incorporating research activities into University of Mumbai undergraduate (UG) programs. Integrating research into the UG curriculum fosters critical thinking, problem-solving skills, and a deeper understanding of student's field of study. The study examines current practices, identifies challenges, and proposes strategies for embedding research within the UG framework. This research was based on secondary data from the e-resources available. A lot of studies have been done in medical science covering student's perceptions and teacher's perception of research as a part of the curriculum in undergraduate study. The study highlights the importance of research in curriculum and disclosed that through research projects students develop interpersonal skills, critical & analytical thinking ability, and ability to explore and express their knowledge. The study also looked at the challenges that students encounter, including inadequate facilities, lack of training and motivation, lack of proper guidance, rigid curriculum, etc. The findings suggest the strategies that institutional & faculty support can greatly enhance the research environment among students and enrich the educational experience by preparing students for advanced studies and professional careers.

KEYWORDS:

Curriculum, integration, educational experience, challenges, strategies.

Introduction:

The University of Mumbai, originally known as the University of Bombay, is one of the oldest and most esteemed universities in India.

In 1857, it was established as one of the three initial universities in India, following the publication of "Wood's Education Dispatch." Bombay changed its name to Mumbai, and as a result, the University of Bombay became the University of Mumbai. On September 4, 1996, the Maharashtra government published a notification in the Government Gazette, officially bringing about this alteration.

The institution received five stars in 2001 and an "A" grade from the National Assessment and Accreditation Council (NAAC) in April 2012. Mumbai University being one of the premier institutions, provides a wide range of undergraduate programs in several academic fields

Graduate education and research initiatives have always been tightly related. However, integrating research into undergraduate programs has attracted interest from all over the world since it can enhance student learning and foster academic curiosity.

Integration of research means inclusion or incorporating research as a subject in the normal curriculum of Self-Financing Courses designed by the University of Mumbai for affiliated colleges. These courses were introduced by the University of Mumbai in the year 2000 with an aim of serving students better and making them prepare for future employment and achieving professional goals.

Why Research?

The key to increasing our knowledge is research. It provides solutions to challenging issues and opens doors to new opportunities. Research serves as a compass that guides us through the maze of uncertainty, whether we are making educated judgments, addressing societal concerns, or improving technology.

Research as a part of the curriculum not only provides credit to undergraduate students but also enhances their ability to find a solution to the existing problem through deep investigation and analysis of information on a particular topic more critically. Through research collecting information, synthesizing, analyzing, and arriving at conclusions helps the students to attain new knowledge and skills. It also expands their learning horizon enhancing their wisdom to explore and grow in various fields. Research motivates students to examine the situation from a different perspective. It helps the students to understand the different perspectives of all those who have already contributed to a particular topic. Thus, research helps the students to shape their personality and to contribute innovations and solutions to society and to policy makers.

Review of Literature:

1. Development of Critical Thinking and Analytical Skills:

Research experiences at the undergraduate level are pivotal in developing critical thinking and analytical skills. Research activities encourage students to question assumptions, evaluate evidence, and develop reasoned arguments, fostering intellectual autonomy and robust problem-solving abilities (Kuh, 2008).

2. Enhancement of Learning and Understanding:

Research integration facilitates a deeper understanding of academic content. Students engaged in research often report a better grasp of their field of study, moving beyond passive learning to actively constructing knowledge, leading to a more profound and retained understanding of their subject matter (Lopatto, 2004).

3. Preparation for Advanced Studies and Professional Careers:

Research experience is often seen as a prerequisite for advanced studies. Undergraduates who participate in research are more likely to pursue graduate studies and careers in research-intensive fields (Kardash, 2000). The skills gained through research, such as project management, data analysis, and scientific writing, are highly valued in the job market, making graduates more competitive.

Case Studies of Successful Integration:

Numerous institutions have successfully integrated research into their UG programs. The Massachusetts Institute of Technology (MIT) provides undergraduates with opportunities to engage in research through its Undergraduate Research Opportunities Program (UROP), allowing students to collaborate with faculty on research projects, often resulting in coauthored publications and conference presentations.

Similarly, the University of Sydney has implemented the Research-Enhanced Learning and Teaching (RELT) initiative, embedding research experiences in the curriculum from the first year. This approach has been shown to increase student engagement and academic performance.

Objectives of the Study:

1. To highlight the importance of research in undergraduate education.
2. To assess the current status of research integration in Mumbai University's UG programs.
3. To propose strategies for effectively incorporating research activities into the UG curriculum.

Research Methodology:

Data Collection was done through secondary sources. Secondary data was collected through online journals, e-books, and e-resources.

1. Benefits of Undergraduate Research:

- Enhanced Academic Performance

Students who participate in undergraduate research tend to have higher academic performance.

Research participation positively correlates with higher GPAs and improved retention rates (Bauer & Bennett, 2003). The engagement and motivation derived from research activities contribute to a more committed and successful academic journey.

- Development of Soft Skills

Undergraduate research fosters the development of essential soft skills, such as communication, teamwork, and time management. Research projects require students to work collaboratively, present their findings, and manage their time effectively, which are crucial for personal and professional success (Lopatto, 2010).

- Contribution to Institutional Reputation

Universities that prioritize undergraduate research often see an enhancement in their institutional reputation. Research-active faculty members bring cutting-edge knowledge to their teaching, benefiting students and enhancing the institution's academic standing. Additionally, student research outputs, such as publications and conference presentations, contribute to the university's academic profile (Hattie & Marsh, 1996).

Benefits of Integrating Research into UG Programs:

The development of autonomous critical thinking abilities as well as oral and written communication skills can be achieved through the integration of research methodology and the hypothesis-driven scientific process.

Undergraduate students who practice independent thinking will develop the self-assurance to draw their conclusions from the information at hand. Undergraduate students who attended classes in the same department as the research projects reported feeling more autonomous in their thinking, more intrinsically motivated to learn, and more engaged in the educational process. As a result, as undergraduates get ready for their respective careers, the research process has a very positive influence on important learning objectives.

Additional advantages for students have been documented and shared by the SURE (Survey of Undergraduate Research Experiences) (Lopatto, 2007) study. After completing a mentored research program, undergraduate students identified several areas in which they gained knowledge and experience. The following were mentioned as being favorably impacted by the research experience, and they piqued our interest as advisors for an undergraduate research curriculum. (for a complete list, see Figure 1 of Ref. 11):

- Understanding the research process
- Understanding how scientists work on problems
- Learning lab techniques
- Developing skills in the interpretation of results
- The ability to analyze data
- The ability to integrate theory and practice

However, participation in an undergraduate research experience also benefited students in areas that can reach beyond academia.

- Having tolerance for obstacles
- Learning to work independently
- Understanding how knowledge is constructed
- Self-confidence
- Understanding that assertions require supporting evidence
- Clarification of a career path

Current status of research integration in the University of Mumbai's UG program:

- Research Output

According to the UGC's annual report (2020), the University of Mumbai reported a total of 1,200 research publications in 2019-20, with a significant increase from the previous year. However, the report also noted that only 20% of these publications were in the field of science and technology, indicating a need for more research emphasis in these areas.

- Research Infrastructure

The University of Mumbai's annual report (2020) highlighted the establishment of new research centers and laboratories, including a Center for Excellence in Nanotechnology and a Biotechnology Research Laboratory. However, the report also mentioned that some departments lack adequate research infrastructure, such as updated equipment and software.

- Research Awareness and Attitudes

 A study by Shah (2020) found that only 40% of UG students at the University of Mumbai were aware of the research opportunities available to them, indicating a need for better communication and promotion of research programs. The study also found that faculty members perceived research as essential for their career growth, but only 20% of them involved UG students in their research projects.

- Research Integration in Curriculum

The University of Mumbai's curriculum document (2020) shows that research components are integrated into some UG programs, such as the Bachelor of Science (Research) program. However, the document also reveals that some programs need clearer research goals and outcomes, indicating a need for curriculum revision and alignment with research objectives.

Challenges of Integrating Research into UG Programs:

- Resource Constraints

One of the primary challenges of integrating research into UG programs is the availability of resources. Research requires access to laboratories, libraries, and funding, which can be limited. Institutions must balance the allocation of resources between teaching and research to ensure the successful implementation of undergraduate research initiatives (Brew, 2006).

- Faculty Workload

High teaching loads and administrative responsibilities can limit faculty member's ability to mentor undergraduate research projects. Institutions should consider adjusting faculty workloads to provide dedicated time for research supervision. This may involve hiring additional teaching staff or providing incentives for faculty involvement in undergraduate research (Jenkins & Healey, 2005).

- Curriculum Rigidity

The structured nature of many undergraduate programs can hinder the incorporation of research activities. Developing flexible curricula that allow for research components, such as independent study projects and research-oriented courses, is essential. Incorporating research skills training early in the curriculum prepares students for research experiences later in their programs (Healey et al., 2014).

3. Strategies for Effective Integration:

- Curriculum Design

Incorporating research methodology courses and flexible research credits into the curriculum can provide students with the necessary skills and opportunities for research. Embedding research experiences throughout the undergraduate program, rather than limiting them to final year projects, can be beneficial (Healey & Jenkins, 2009).

- Faculty Development

Providing professional development opportunities for faculty to enhance their mentoring skills is crucial. Institutions should offer workshops and training sessions to help faculty integrate research into their teaching and effectively supervise undergraduate research projects (Brew & Boud, 1995).

- Institutional Support

Universities must invest in research infrastructure and provide funding opportunities for undergraduate research. Establishing research grants and scholarships specifically for undergraduate students can encourage participation. Additionally, partnerships with industry and research institutions can offer practical research experiences and internships (Zimbardi & Myatt, 2014).

Findings:

- **Limited Research Opportunities**: Most UG programs at Mumbai University do not mandate research projects, and research exposure is often limited to final-year projects or elective courses.
- **Lack of Infrastructure**: Insufficient access to research facilities, funding, and resources hampers the ability to conduct meaningful research.
- **Faculty Workload**: High teaching loads and administrative responsibilities leave little time for faculty to mentor UG research projects.
- **Curriculum Rigidity**: The structured nature of UG programs leaves little room for flexible research components.
- **Awareness and Motivation**: Many students are unaware of the benefits of research or lack the motivation to engage in research activities.
- **Skill Gaps**: Students often lack the necessary research skills and training, which deters them from undertaking research projects.

Recommendations:

- Curriculum Reform

1. Incorporate Research Methodology Courses: Introduce mandatory research methodology courses early in the UG programs to equip students with essential research skills.
2. Flexible Research Credits: Allow students to earn credits through research projects, independent studies, or internships.

- Faculty Support

1. Reduce Teaching Load: Adjust faculty teaching loads to allocate time for mentoring UG research projects.
2. Research Grants: Establish grants and funding opportunities specifically for UG research initiatives.

- Infrastructure and Resources

1. Enhance Facilities: Invest in research laboratories, libraries, and online databases to provide adequate resources for UG research.
2. Collaboration with Industry: Partner with industry and research institutions to offer practical research opportunities and internships.

- Student Engagement

1. Workshops and Seminars: Organize regular workshops and seminars to raise awareness about the importance of research and available opportunities.
2. Research Clubs and Societies: Encourage the formation of student-led research clubs to foster a research culture on campus.

Conclusion:

Integrating research into undergraduate programs at the University of Mumbai holds significant potential for enhancing the quality of education and preparing students for future challenges.

- ✓ The University of Mumbai has shown an increase in research output, but there is still a need to emphasize research in science and technology fields.

- ✓ While research infrastructure has improved, some departments still lack adequate facilities.
- ✓ Research awareness and attitudes among faculty and students need improvement, with a focus on involving UG students in research projects.
- ✓ Research integration in the curriculum is present but needs to be strengthened and aligned with research objectives.
- ✓ The findings suggest that the University of Mumbai has made progress in research integration, but there are still areas that require attention and improvement to enhance research integration in the UG program.
- ✓ By addressing the identified challenges and implementing the proposed strategies, Mumbai University can create a more research-oriented academic environment that benefits students, faculty, and the broader academic community.

References:

1. https://mu.ac.in/about-us
2. https://edutinker.com/glossary/why-is-research-important-forstudents/#:~:text=Simply%20put%2C%20research%20can%20enhance,learning%20new%20knowledge%20and%20skills.
3. https://www.asianage.com/metros/mumbai/160218/aided-colleges-taking-selffinanced-route.html
4. Brew, A., & Boud, D. (1995). Teaching and Research: Establishing the Vital Link with Learning. Higher Education, 29(3), 261-273.
5. Hattie, J., & Marsh, H. W. (1996). The Relationship Between Research and Teaching: A Meta-Analysis. Review of Educational Research, 66(4), 507-542.
6. Kardash, C. M. (2000). Evaluation of undergraduate research experience: Perceptions of undergraduate interns and their faculty mentors. *Journal of Educational Psychology, 92*(1), 191–201. https://doi.org/10.1037/0022-0663.92.1.191
7. Bauer, K. W., & Bennett, J. S. (2003). Alumni Perceptions Used to Assess Undergraduate Research Experience. The Journal of Higher Education, 74(2), 210-230.
8. Bauer, K. W., & Bennett, J. S. (2003). Alumni perceptions used to assess undergraduate research experience. The Journal of Higher Education, 74, 210-230. doi:10.1353/jhe.2003.0011
9. Jenkins, A., & Healey, M. (2005). Institutional Strategies to Link Teaching and Research. Higher Education Academy.
10. Brew, A. (2006). Research and Teaching: Beyond the Divide. Palgrave Macmillan.
11. Lopatto, D. (2006). Undergraduate Research Experiences Support Science Career Decisions and Active Learning. *CBE Life Sciences Education*, 6(4), 297-306. https://doi.org/10.1187/cbe.07-06-0039
12. Petrella JK, Jung AP. (2008). Undergraduate Research: Importance, Benefits, and Challenges. *International Journal of Exercise Science*, 1(3), 91-95. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4739295/
13. Healey, M., & Jenkins, A. (2009). Developing Undergraduate Research and Inquiry. Higher Education Academy.
14. D Lopatto (2010)Undergraduate research as a high-impact student experience.Tucson, Science in solution AZ: Research Corporation for Science Advancement,12(2)
15. Zimbardi, K., & Myatt, P. (2012). Embedding undergraduate research experiences within the curriculum: a cross-disciplinary study of the key characteristics guiding implementation. *Studies in Higher Education*, 39(2), 233–250. https://doi.org/10.1080/03075079.2011.651448
16. Healey, M., Jenkins, A., & Lea, J. (2014). Developing Research-Based Curricula in College-Based Higher Education. Higher Education Academy.
17. Imafuku, R., Saiki, T., Kawakami, C., & Suzuki, Y. (2015). How do students' perceptions of research and approaches to learning change in undergraduate research? *International Journal of Medical Education 6*, 47-55.

https://doi.org/10.5116/ijme.5523.2b9e

18. Christopher Harvey, Emilia Bertolo and Lee Byrne (2017).Global Voices in Higher Education (1) https://www.intechopen.com/profiles/198175

19. (2024, April 4). In *Wikipedia*. https://en.wikipedia.org/wiki/Undergraduate_education

7. The Impact of ChatGPT on Undergraduate Students

Pranita Talekar

Assistant Professor,
Department of Information Technology,
J. K. College of Science and Commerce.

Reetu Gupta

Assistant Professor,
Department of Banking and Insurance,
J. K. College of Science and Commerce.

ABSTRACT:

Surfaces can be machined with the help of a shaping machine. Cuts curves, angles, and the rise of artificial intelligence has brought forth a new wave of digital tools designed for educational purposes, such as chatbots and virtual assistants. Among these, ChatGPT, an advanced language model, has garnered attention as a valuable educational resource. Yet, questions have arisen about its possible adverse effects on student learning behaviors. This experimental research aims to explore how ChatGPT influences student learning behaviors and provides insights into its potential drawbacks.

KEYWORDS:

ChatGPT, Student, Impact; AI.

Introduction:

Artificial intelligence (AI) has increasingly found its place in education, with chatbots and virtual assistants serving as valuable aids in learning, providing real-time support and personalized assistance to students. ChatGPT, utilizing the GPT-3.5 architecture, has gained recognition for its robust natural language capabilities.

However, as these AI tools become more integral to education, it becomes crucial to examine potential drawbacks. This study explores the adverse effects of ChatGPT on student learning behavior, focusing on concerns such as overreliance, diminished critical thinking, and reduced engagement.

Literature Review:

- Sarin Sok and Kimkong Heng, in "ChatGPT for Education and Research: A Review of Benefits and Risks", The article argues that ChatGPT has at least five main benefits, such as creating learning assessment,enhancing pedagogical practice, offering virtual personal tutoring, creating an essay or research article outline,and brainstorming ideas [1].

- Enkelejda kasneci (Kathrin Sessler, Stefan kuchemann, Maria Bannert, Daryna Dementieva, Frank Fischer,Urs Gasser, Georg Grah), "ChatGPT for good? On opportunities and challenges of large language models for education" This commentary presents the potential benefits and challenges of educational applications of large language models, from student and teacher perspectives [2].
- Sukhpal Singh Gill (Minxian Xu, Panos Patros, Huaming Wu, Rupinder Kaur), "Transformative effects of ChatGPT on modern education: Emerging Era of AI Chatbots", in this article, leading academics,scientists, distinguish researchers and engineers discuss the transformative effects of ChatGPT on modern education [3].
- Marta Montenegro-Rueda (José Fernández-Cerero, José María Fernández-Batanero, Eloy López Meneses), "Impact of the Implementation of ChatGPT in Education: A Systematic Review", This paper is based on a systematic review of the literature, an analysis of the impact of the application of the ChatGPT tool in education [4].

Research Objectives:

1. Evaluate the extent of student overreliance on ChatGPT as a learning tool in academic settings.
2. Investigate how ChatGPT influences students' critical thinking abilities, particularly their inclination to verify information provided by the AI.
3. Measure the impact of ChatGPT usage on student engagement with course materials and academic performance.
4. Compare the learning behaviors of students using ChatGPT versus those who do not, focusing on differences in study habits, independent research, and problem-solving approaches.
5. Offer insights into the potential drawbacks of ChatGPT in education and recommend strategies to balance its use with traditional learning methods for optimal learning outcomes.

By addressing these objectives, this study aims to deepen understanding of how ChatGPT may negatively affect student learning behavior, aiding educators and institutions in making informed decisions about integrating AI tools into the educational process.

Hypothesis:

The use of ChatGPT as an educational tool impacts undergraduate students, leading to increased dependence on the AI system, decreased critical thinking, and diminished engagement with course materials.

Limitations of Study:

1. **Narrow Focus:** This research specifically focuses on how it affects Undergraduate students.
2. **Small Sample Sizes:** Small Sample Size Due to Time Constraints
3. **Lack of Prior Research:** Since ChatGPT is a new technology, there is limited previous research to build upon. More empirical studies are needed to establish a stronger base of evidence.
4. **Limited Researcher Perspectives:** The research so far has been conducted by a relatively small group of researchers, which may limit the diversity of viewpoints and analyses. Expanding the pool of researchers could lead to more comprehensive insights.

Research Methodology:

1. **Participants:** This study recruited 71 undergraduate students from various academic disciplines.
2. **Procedure:** The study spanned Two weeks.

3. **Data Collection:** Data was collected through the Survey method. A standardized survey questionnaire for the research on the impact of ChatGPT on Students educational behavior involves a range of questions to gather data. Following are the set of questions used in the survey:
4. **Sampling Design:** A Sample of 71 Students (respondents) were selected from our colleges and other college institutes. All respondents attempted to complete the survey using Google Forms.

Analysis and Interpretation of Data:

- **Demographic Information**
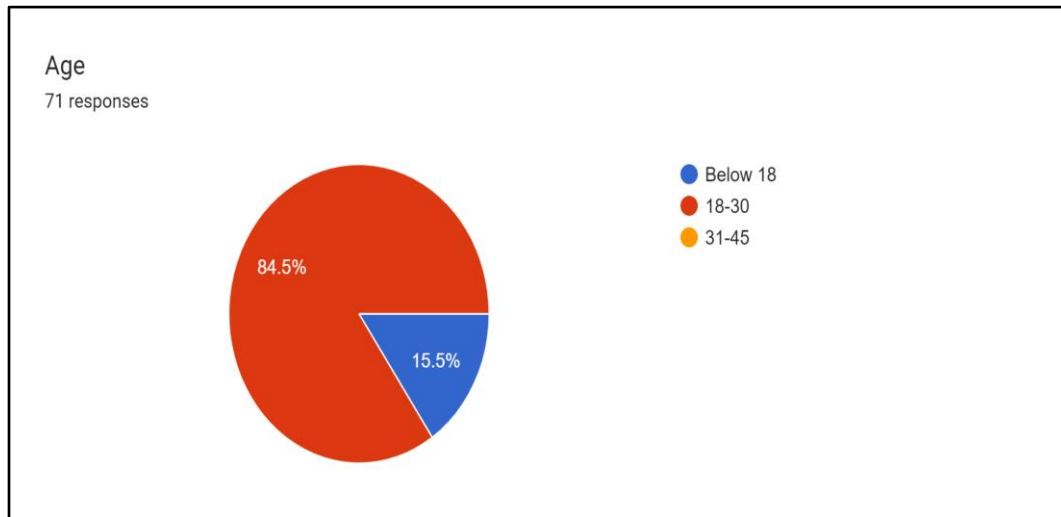
Figure 1

Explanation- Figure 1 indicates that the majority of ChatGPT users are in the 18-30 age group, accounting for 84.5%. In contrast, 15.5% of users are below 18 years old, and there are no users above 30 years old in the data.
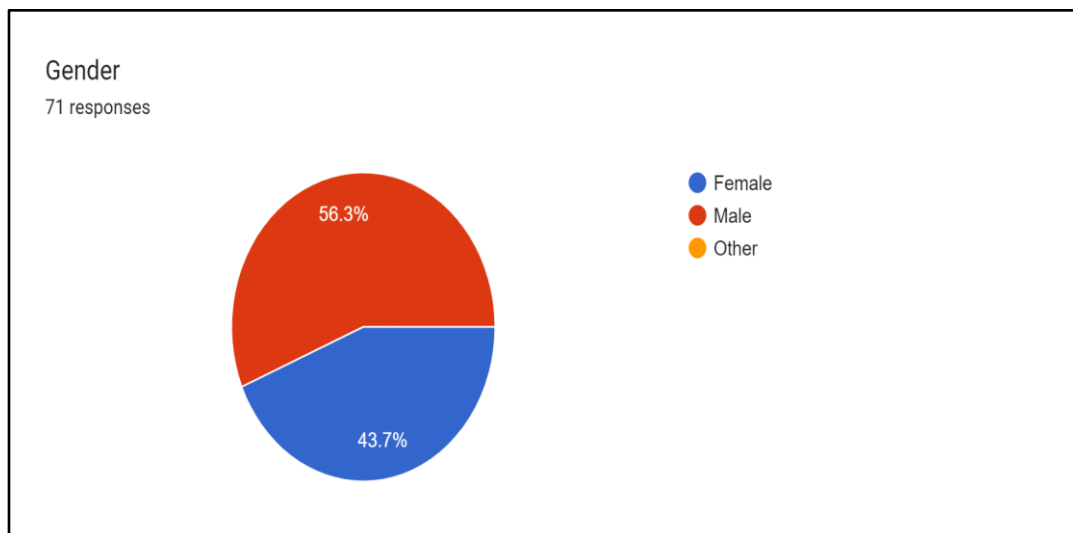
Figure-2

Explanation- Figure-2 shows that most ChatGPT users are male, making up 56.3% of the total. Conversely, 43.7% of users are female, with no users from other genders represented in the data.
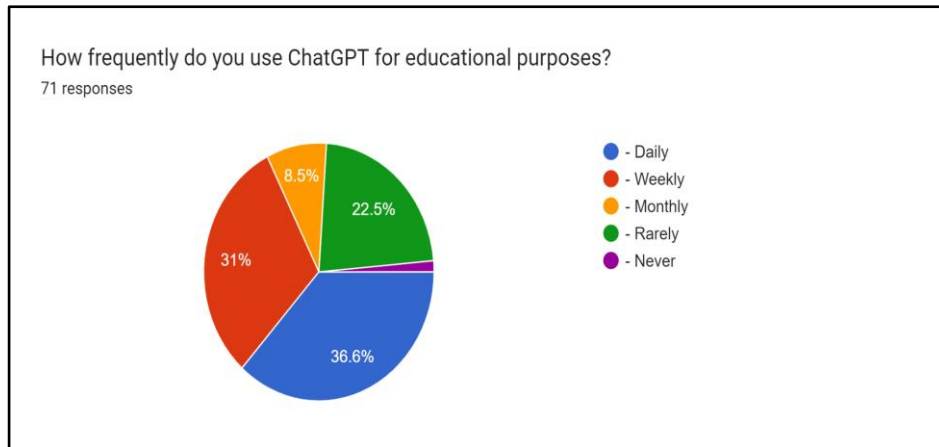
Figure-3

Explanation- Figure-3 illustrates that 36.6% of students use ChatGPT daily, 31% use it weekly, 22.5% use it rarely, 8.5% use it monthly, and 1.4% never use it.
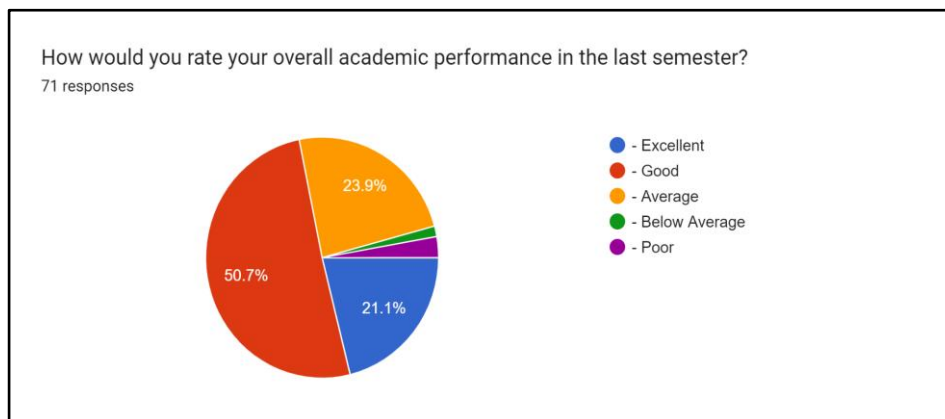
Figure-4

Explanation- Figure-4 reveals that 50.7% of students rated ChatGPT as good, 21.1% rated it as excellent, 23.9% rated it as average, and 3.3% rated it as poor.

- **Over-dependence on ChatGPT**
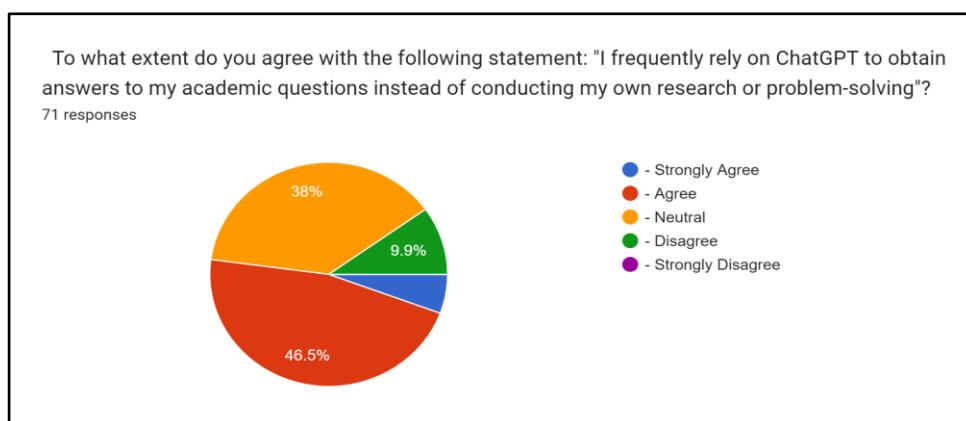
Figure-5

Explanation- Figure-5 illustrates that 46.5% of students agree with the statement, 38% are neutral, 9.9% disagree, and the remaining strongly agree.
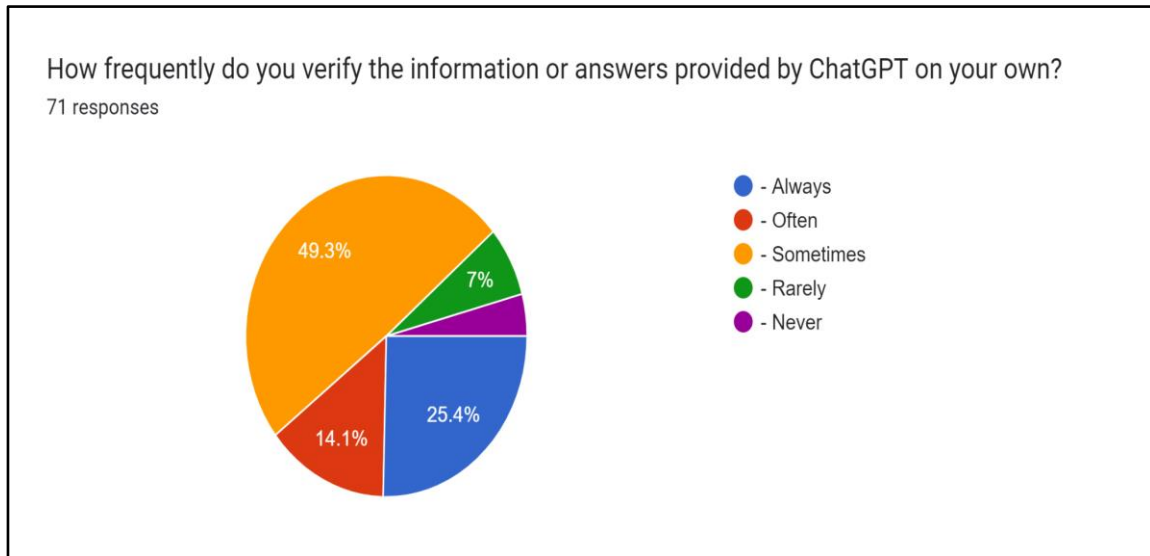
Figure-6

Explanation- Figure-6 It shows that 49.3% of students sometimes verify the information, 25.4% always verify it, and 7% rarely verify the information provided by ChatGPT.

- **Reduced Critical Thinking-**
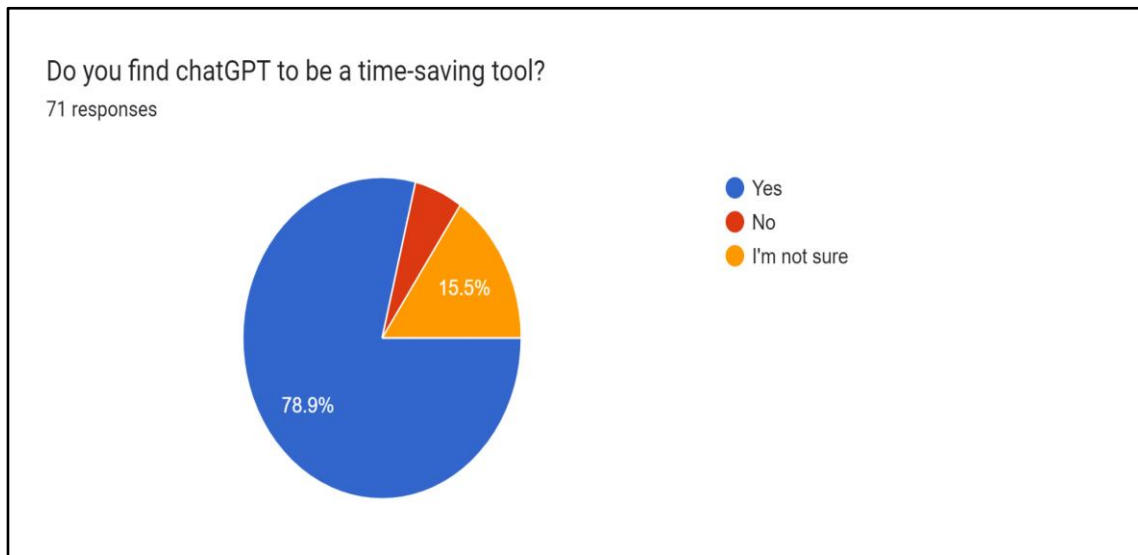
Figure-7

Explanation- Figure 7 illustrates that 78.9% of students agree that ChatGPT is a time-saving tool, while 15.5% disagree, and 8.6% are undecided.
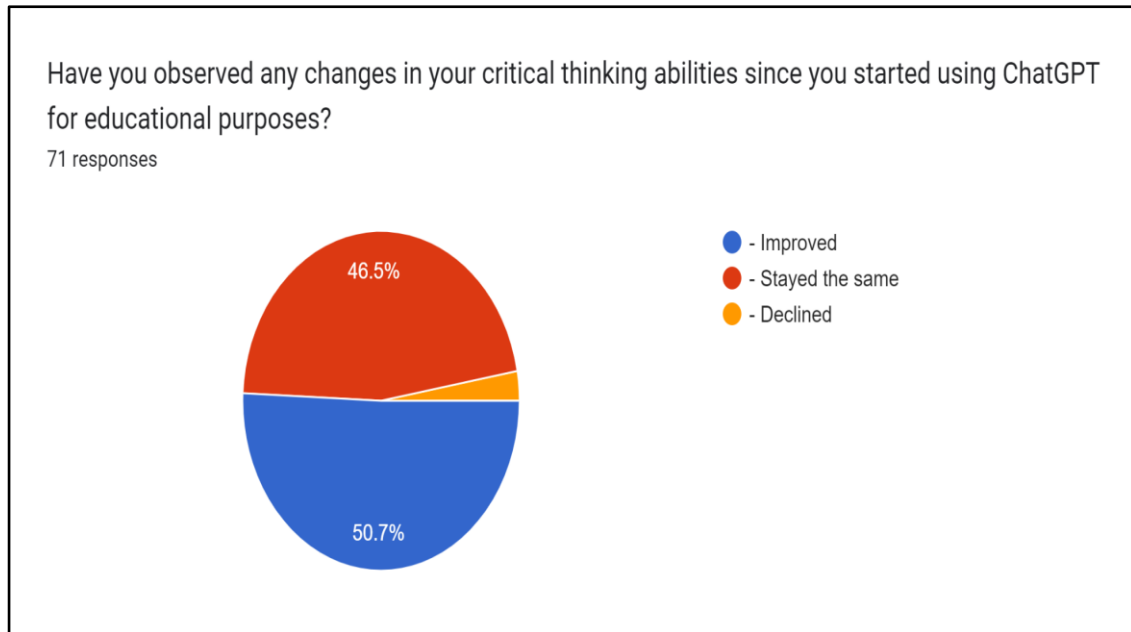
Figure-8

Explanation- Figure 8 illustrates that 50.7% students observed improvement in their critical thinking abilities since they started using chatGPT for educational purpose, 46.5% students observed no changes and 2% students observed declination in critical thinking abilities.
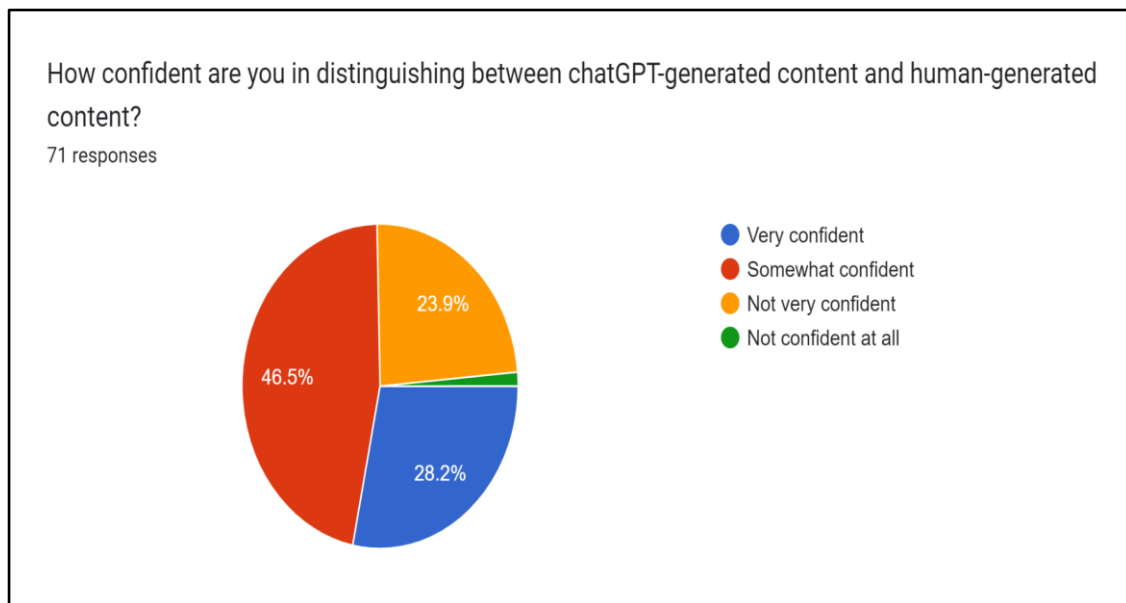

Figure-9

Explanation- Figure-9 shows that 28.2% students are very confident in distinguishing between chatGPT generated content and human generated content, 46.5% students are somewhat confident and 23.9% students are not confident at all.
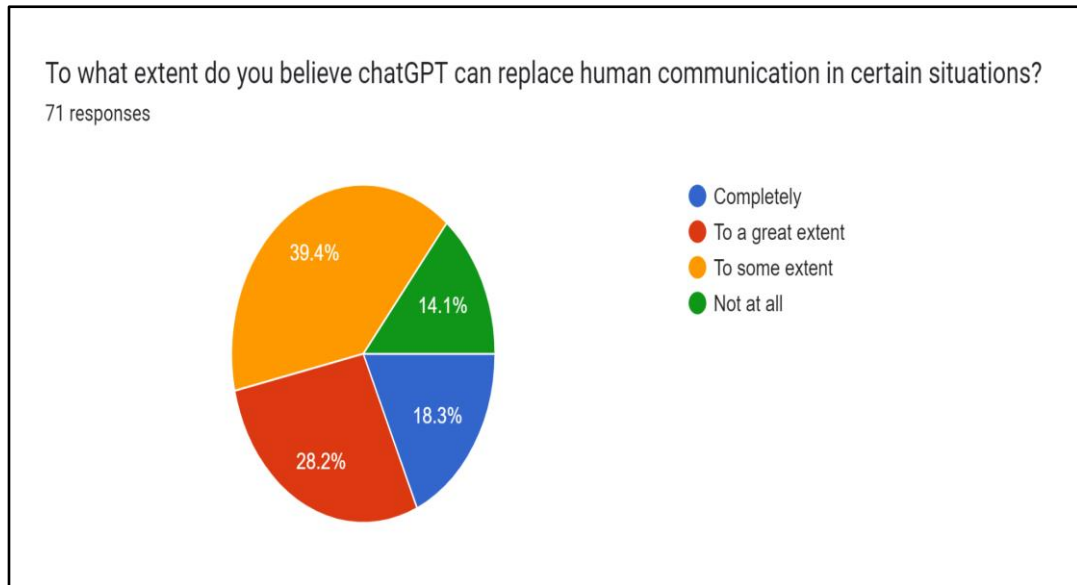
Figure-10

Explanation- Figure-10 shows that 18.3% students feel that ChatGPT can replace human communication in certain situation ,28.2% feel to a great extent,39.4 % feel to some extent, and 14.1 % feel not at all.

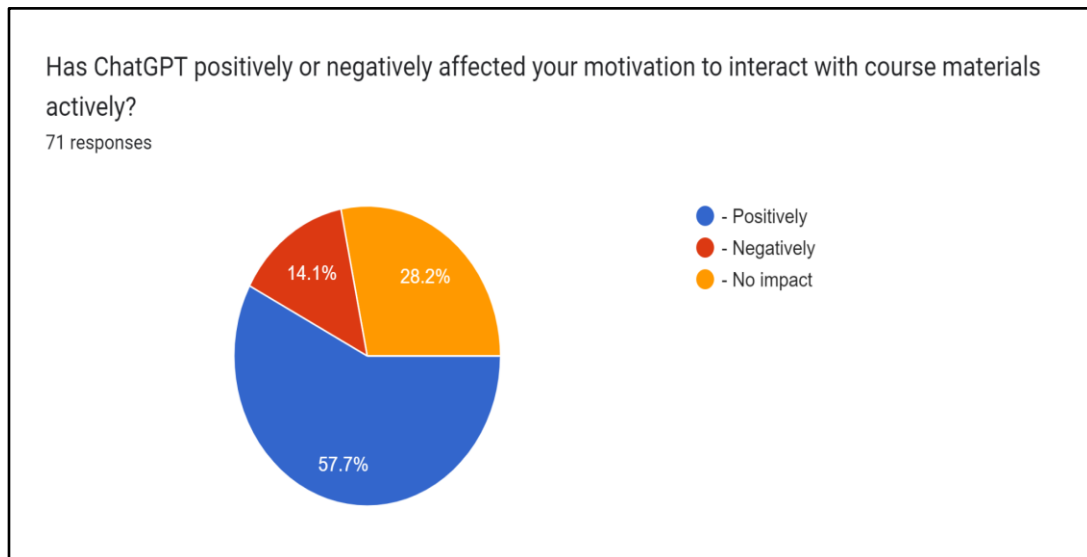- **Decreased course material-**

Figure-11

Explanation- Figure-11 shows that 57.7% students feel it has been positively affected, 14.1% feel no impact and 28.2% feel negatively impacted.
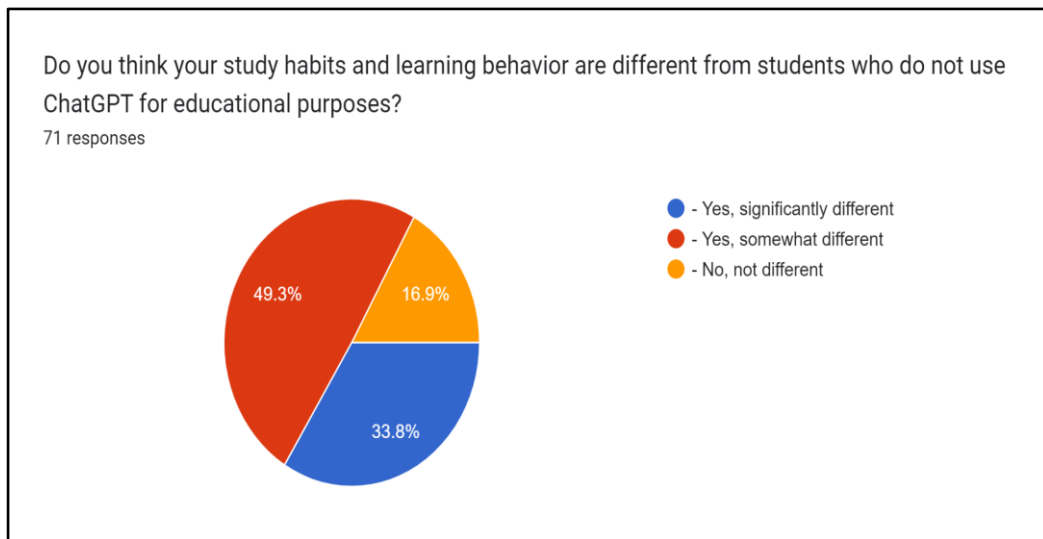
- **Effectiveness of ChatGPT-**

Figure-12

Explanation- Figure-12 shows that 33.6% students think that there is a difference, 49.3% think its maybe while 16.9% think there isn't.
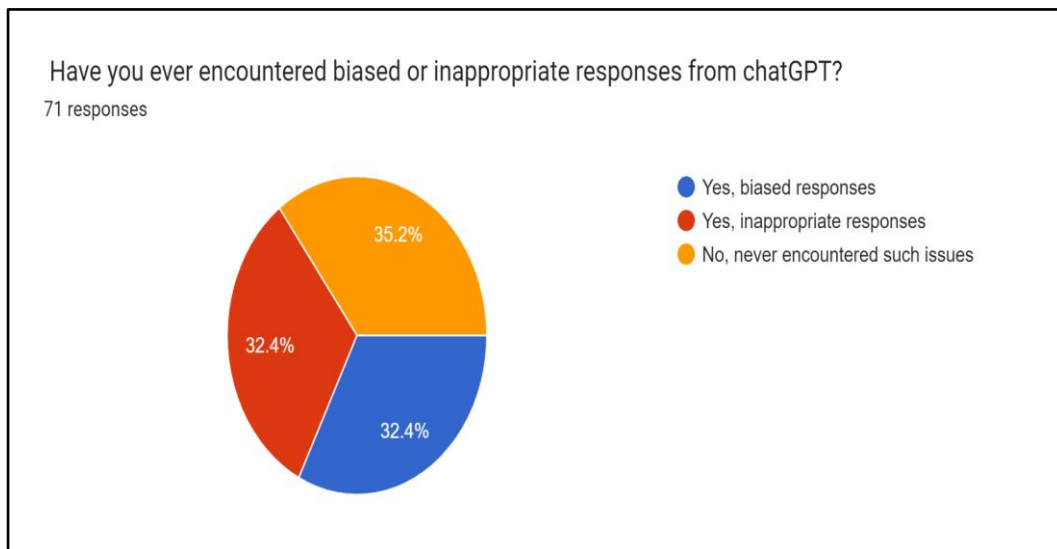

Figure-13

Explanation- Figure-13 shows that 32.4% students feel ChatGPT has encountered biased response, 32.4% feel inappropriate response and 35.2% feel no.

Result and Conclusion:

In summary, this research has provided valuable insights into how ChatGPT affects students' education. Many students use ChatGPT for help with homework and studying for exams, which has often led to improved academic performance. Even without verifying ChatGPT's answers, students frequently rely on it instead of conducting their own research. However, students have mixed feelings about how ChatGPT influences their critical thinking skills.

The study found significant change in the use of traditional study materials despite the availability of ChatGPT. Additionally, many students believe their study habits and learning behaviors differ from those who do not use ChatGPT. When comparing ChatGPT with YouTube, most students prefer YouTube because videos are easier to understand and provide visual information, unlike ChatGPT, which cannot generate images or illustrations. Consequently, the research concludes that ChatGPT has both positive and negative impacts on students' learning experiences.

Scope for Further Research:

1. The study can be undertaken with a larger sample size and across research scholars of different disciples
2. Many undergraduate students have expressed concerns about potentially becoming dependent on ChatGPT for language learning. They are interested in ensuring that using ChatGPT to learn English does not hinder their personal thinking and independent thinking skills. Furthermore, there is apprehension that unethical use of ChatGPT by students could lead to intellectual regression and unlearning. This raises significant considerations for future educational efforts, prompting the need for relevant research in this area. Additionally, ChatGPT and other AI tools hold promise as supportive resources for educational and research endeavors. Concerns among undergraduate students also include the ongoing development of ChatGPT towards greater intelligence and human-like capabilities.

References:

1. Sarin Sok and Kimkong Heng, The University of Huddersfield, United Kingdom; Paññāsāstra University of Cambodia,Phnom Penh, Cambodia;"ChatGPT for Education and Research: A Review of Benefits and Risks";Cambodian Journal of Educational Research (2023); Volume 3, Issue1,SSRN Electronic Journal; Pages: 110-121; DOI:10.2139/ssrn.4378735
2. Enkelejda kasneci(Kathrin Sessler, Stefan kuchemann, Maria Bannert, Daryna Dementieva, Frank Fischer, Urs Gasser, Georg Grah and more);"ChatGPT for good? on opportunities and challenges of large language models for education"; Elsevier; January 2023; Volume 103, April 2023, 102274; DOI:10.1016/j.lindif.2023.102274
3. Sukhpal Singh Gill, (Minxian Xu, Panos Patros, Huaming Wu, Rupinder Kaur, Kamalpreet Kaur, Stephanie Fuller, Manmeet Singh, Priyansh Arora, Ajith Kumar Parlikad, Vlado Stankovski, Ajith Abraham, Soumya K. Ghosh, Hanan Lutfiyya, Salil S. Kanhere, Rami Bahsoon, Omer Rana, Schahram Dustdar, Rizos Sakellariou, Steve Uhlig, Rajkumar Buyya);
4. "Transformative effects of ChatGPT on modern education: Emerging Era of AI Chatbots"; Journal reference: Internet of Things and Cyber-Physical Systems (Elsevier), Volume 4, 2024, Pages 19-23, DOI: 10.1016/j.iotcps.2023.06.002.

ABOUT J. K. COLLEGE OF SCIENCE & COMMERCE

J. K. College of Science & Commerce was established in 2009 under the banner of Tilak Education Society with four full-time graduate programmes. Currently, we have seven undergraduate programmes. Owning state-of-the-art infrastructure, the college is committed to quality and excellence. Further, the institution strives for its students to be highly competitive at the global level and thereby, make them proud citizens of the country. The institution imparts education in the field of Business Management, Commerce, Mass Media, Computer Science and Information Technology.

The college started with four courses:

Bachelor of Science in Computer Science (B.Sc. CS), Bachelor of Science in Information Technology (B.Sc. IT), Bachelor of Commerce (B.Com), Bachelor of Management Studies (BMS). Later on, approvals for four new courses were granted by the University of Mumbai which are Bachelor of Accounting and Finance (BAF), Bachelor of Banking and Insurance (BBI), Bachelor of Financial Market (BFM) and Bachelor of Arts in Multimedia and Mass Communication (BAMMC).

The college is fully equipped with the latest infrastructure and provides a library with reading room, computer labs, canteen, indoor gymkhana, sports room, playground with basketball court, incubation center, media lab, student council room, National Service Scheme (N.S.S.) room, Math and Robotics lab, audio visual room and all other required infrastructure facilities to support curricular and extracurricular activities.

ABOUT THE JOURNAL

"Tilak Samvida" is a bi-annual International Research Journal dedicated to advancing knowledge across diverse fields. It offers a platform for scholars, lecturers and researchers to publish peer-reviewed papers. The journal explores multidisciplinary topics from emerging technologies ranging from artificial intelligence and robotics, significant societal issues to cutting-edge contemporary research and practices. The journal also publishes special issues for academic conferences promoting innovative and interdisciplinary research.

J.K COLLEGE OF SCIENCE AND COMMERCE, GHANSOLI

Plot no 22, Opposite Ghansoli Railway Station Sector 5, Savoli Ghansoli, Navi Mumbai 400701