



A Comprehensive Study on Sentiment Analysis and Its Application in Intelligent Add-On Course Recommendation Systems

Kalokhe Anil Sopan¹, Chandgude Divya Satish², Wagh Riya Sachin³,

Gunjawate Poonam Umesh⁴, Pawar Mahesh Dattatray⁵,

Kumbhar Vijaykumar Shambhajirao⁶

Research Scholar, Department of Computer Science, Shivaji University, Kolhapur(MH), India¹

Research Student, Department of BBA(CA), Vidya Pratishthan's, Arts, Science and Commerce College, Baramati, Pune (MH), India^{2,3}

Assistant Professor, Department of BBA(CA), Vidya Pratishthan's, Arts, Science and Commerce College, Baramati, Pune (MH), India^{4,5}

Research Guide, Department of Computer Science, Shivaji University, Kolhapur(MH), India⁶

Abstract: In the modern digital era, social media platforms have become a dominant medium for communication, self-expression, and information exchange. This study explores user behavior, awareness, and perceptions related to sentiment analysis and privacy concerns in social media usage. A structured online survey was conducted to collect responses from participants across different backgrounds, focusing on their level of engagement, familiarity with sentiment analysis, and trust in AI-based emotional interpretation. The analysis reveals that while users are highly active on social platforms and aware of sentiment analysis to some extent, concerns regarding data privacy and ethical implications remain prevalent. Participants expressed mixed views on the accuracy and reliability of AI in detecting emotions, emphasizing the need for transparency and secure data handling. The findings further highlight how sentiment analysis can enhance AI-driven add-on course recommendation systems, enabling more personalized learning based on student sentiments and preferences. The study concludes that balancing innovation with ethical responsibility is essential for the sustainable use of sentiment analysis in both digital and educational environments.

Keywords: Artificial Intelligence, Course Recommendation System, Data Privacy, Sentiment Analysis, Social Media Usage, User Awareness

I. INTRODUCTION

In today's interconnected digital landscape, social media platforms have become essential tools for communication, self-expression, and information sharing. Emotions are psychological responses that emerge from how humans react to different situations or experiences[1]. The increasing amount of user-created content on social media platforms has turned sentiment analysis into an essential field of research [2]. Social media refers to platforms that enable people to interact by creating, sharing, exchanging, and commenting on content within virtual communities and networks[3]. Social media platforms have become powerful mediums where users can express their opinions, share experiences, and interact with brands[4]. With the swift progress of artificial intelligence and computer science, many advanced AI technologies are now widely applied across various engineering systems[5].

Social media serves as a platform for expressing emotions, sharing opinions and participating in conversations with people from diverse backgrounds and locations[6]. As a subfield of NLP, sentiment analysis focuses on identifying, extracting, and interpreting opinions, emotions, and attitudes conveyed through textual data [7]. Platforms such as Twitter, Facebook, and YouTube provide meaningful spaces where students can share their experiences, express their feelings and stress, and seek emotional or social support [8]. The dynamic nature of these platforms allows individuals to engage in discussions, express emotions, and exchange opinions with global audiences. To adopt a more data-driven approach, sentiment analysis offers valuable insights to digital marketers about consumer opinions, brand reputation, and overall market trends [9]. This shift from traditional communication to digital interaction has given rise to an enormous amount of data that captures not only user behavior but also their emotional and psychological patterns.



Sentiment analysis, often referred to as opinion mining, is a challenging task because of the intricate nature of human language. Human communication is filled with subtle meanings, shaped by context, and frequently influenced by sarcasm, irony, and cultural nuances [10]. Consequently, understanding this data through computational methods has emerged as a critical area of research in recent years. Education serves as the cornerstone of personal development and societal advancement. In India, it has long been a key force driving cultural enrichment and intellectual growth [11]. Individuals are devoting more time to the online world and becoming increasingly dependent on digital technologies for their professional and personal needs [12]. Applying effective noise reduction techniques and robust preprocessing methods is essential to remove irrelevant data and enhance the precision of sentiment analysis [13].

Sentiment analysis, a branch of artificial intelligence (AI) and natural language processing (NLP), plays a pivotal role in decoding emotions and opinions embedded within user-generated content. Machine learning is a field of computer science that involves various techniques used to analyze data, uncover hidden structures, and understand underlying patterns [14]. Sentiment analysis is a subfield derived from machine learning (ML), data mining (DM), natural language processing (NLP), and computational linguistics, incorporating elements of both sociology and psychology [15]. It enables the identification of positive, negative, or neutral sentiments from textual data, offering valuable insights into public opinion, customer satisfaction, and behavioral trends. Beyond commercial and social applications, sentiment analysis has promising potential in the education sector particularly in designing AI-driven add-on course recommendation systems that respond to students' interests, emotional engagement, and learning preferences.

The integration of sentiment analysis into add-on course recommendation systems presents a transformative approach to personalized learning. An effectively developed Add-On Course Recommendation System utilizes modern technologies, data analytics, and machine learning techniques to deliver customized course suggestions for learners [16]. By analyzing students' feedback, interests, and emotional engagement reflected in their digital activities, AI algorithms can identify patterns that reveal individual learning preferences and motivational factors. This enables the recommendation of supplementary or skill-based courses that align with each student's academic strengths, career aspirations, and emotional inclinations. Unlike traditional recommendation models that rely solely on grades or demographics, sentiment-based systems incorporate psychological and behavioral insights to provide more human-centric academic guidance. Such systems not only enhance the learning experience but also support informed decision-making for both students and educators, promoting continuous learning, self-improvement, and academic satisfaction.

In contemporary India, education serves as a means to facilitate learning and promote the development of knowledge, skills, values, beliefs, and habits [17]. The integration of AI in education through sentiment-based analytics bridges the gap between technology and learner psychology. It allows institutions to understand students' needs more effectively and deliver recommendations aligned with their academic and emotional states. However, while these systems offer immense opportunities for adaptive learning and academic improvement, they also raise valid concerns related to privacy, data ownership, and ethical use of personal information. Ensuring transparency and informed consent becomes crucial when analyzing student-generated content for recommendation purposes.

Deep learning models play a fundamental role in multimodal sentiment analysis, as they can automatically derive complex, high-level features directly from raw data [18]. Security involves safeguarding data and systems against unauthorized access, modification, or damage, whereas privacy emphasizes the responsible collection, use, and sharing of an individual's personal information [19]. Sentiments can be divided into various levels based on the strength or direction of the expressed emotion. One common approach is binary sentiment analysis, which classifies emotions into two categories positive and negative [20].

Therefore, this research explores the broader implications of sentiment analysis by examining user awareness, engagement, and trust in AI systems, while also reflecting on its educational significance. The findings can contribute to the development of privacy-aware, sentiment-based recommendation models that support personalized academic growth without compromising user data security. This approach aligns with the growing emphasis on integrating AI technologies into education to enhance student experience, decision-making, and academic performance.

II. LITERATURE REVIEW

Dr. Suwarna Gothane, Dr. G. Vinoda Reddy, Dr. K. Praveen Kumar, Dr. D. Baswaraj, Gumma Parvathi Devi, Sruthi Thanugundala, Ravindra Changala [1], stated that To extract meaningful insights from the vast amount of user-generated content on social media, deep learning-based sentiment analysis plays a crucial role. Ongoing advancements in deep learning architectures have significantly enhanced the precision and robustness of sentiment analysis models,



despite existing challenges. In the digital era, sentiment analysis will remain a vital approach for understanding consumer behavior, public attitudes, and social trends as research and innovation continue to evolve.

Srishti Sudhir Patil, Vaishali Pankaj Suryawanshi, Sudhir Madhav Patil, Sheetal Pravin Girase, Dhananjay Abhilash Bhagat [2] presented a comprehensive examination of sentiment analysis on social media through the lens of big data, highlighting key principles, methods, and technological progress. Both traditional machine learning and advanced deep learning techniques, supported by big data frameworks such as Hadoop and Spark, have played a crucial role in deriving valuable sentiment insights. However, persistent challenges remain, including issues related to data quality, real-time analysis, handling multiple languages, and addressing ethical implications.

III. RESEARCH METHODOLOGY

The study employed a quantitative research methodology using a structured questionnaire to collect primary data from respondents regarding their social media usage, awareness of sentiment analysis, and privacy perceptions. The survey responses were gathered through online forms to ensure accessibility and wider participation. Once the data was collected, preprocessing and data cleaning techniques were applied to enhance accuracy and reliability. In this phase, incomplete, duplicate, or inconsistent responses were identified and removed, while textual data were standardized for uniformity. The dataset was then organized and coded for analysis, ensuring that only valid and relevant entries were retained. This systematic approach to data collection and preparation provided a clean and consistent dataset, forming a strong foundation for accurate interpretation and analysis in the subsequent stages of the research.

IV. OBJECTIVES OF THE STUDY

1. To identify the most preferred social media platforms and analyze user engagement patterns based on content type and frequency of usage.
2. To determine the level of awareness and familiarity among users regarding the concept and functioning of sentiment analysis.
3. To study user perceptions of comfort and trust toward the analysis of their social media posts and comments by AI-based sentiment tools.
4. To evaluate user opinions on the accuracy and reliability of technology in detecting emotions and sentiments from textual data.
5. To explore the potential use of sentiment analysis in designing add-on course recommendation systems that personalize learning based on student feedback and preferences.

V. RESULT AND DISCUSSIONS

RESULT: The study reveals that social media plays a vital role in the daily activities of respondents, primarily serving as a platform for entertainment, communication, and information sharing. The findings highlight that most users prefer visual and interactive content, reflecting the increasing dominance of multimedia engagement. User participation patterns show that while some individuals actively express opinions, a larger segment tends to engage passively by viewing or reading posts. The responses also indicate a fair level of awareness about sentiment analysis, with many participants showing confidence in its potential applications across business, education, and social contexts. However, the results also point to underlying privacy concerns, as several respondents expressed apprehension about the misuse of their personal data when analyzed through AI systems.

DISCUSSION: The overall findings suggest that while sentiment analysis is recognized as a valuable and innovative tool, its adoption is shaped by users' trust and perceptions of data privacy. The tendency of users to consume rather than create content indicates that online opinion data may not always represent the entire user community, emphasizing the need for cautious interpretation in AI-based sentiment models. Furthermore, the concerns regarding privacy underscore the importance of transparent and ethical data-handling practices. Building user confidence requires clear communication about how emotional data is collected, analyzed, and protected. In an educational context, these insights can be leveraged to design intelligent add-on course recommendation systems that not only interpret student feedback and sentiment accurately but also operate under strict privacy-preserving protocols. Thus, the study underlines that the sustainable growth of sentiment analysis depends not only on technological accuracy but also on maintaining ethical standards and ensuring user awareness and consent in both social and academic analytics.

Question 1: The first question from questionnaires is that which social media platforms do you use regularly with option instagram, facebook, twitter, youtube, whatsApp, Twitter, etc.



1. Which social media platforms do you use regularly?

155 responses

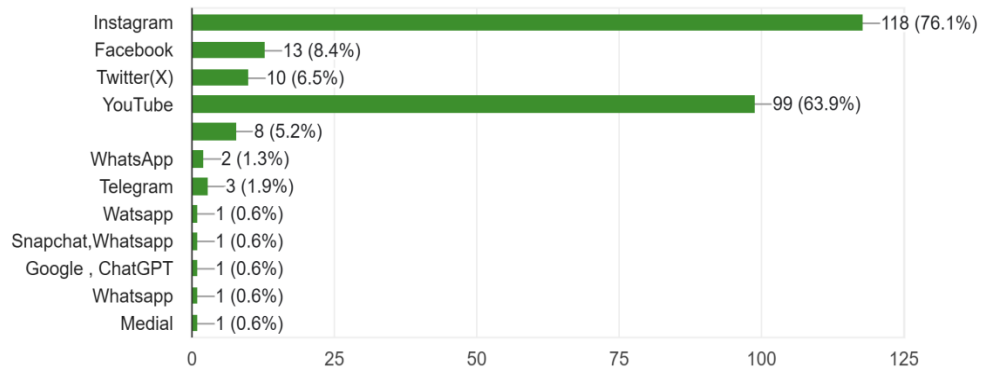


Fig 1: The result about use of social media platforms

The survey results presented in the chart indicate that Instagram is the most widely used social media platform, with 76.1% (118 out of 155) respondents reporting regular usage. YouTube follows closely, being used regularly by 63.9% (99 respondents). In contrast, Facebook (8.4%) and Twitter(X) (6.5%) show significantly lower engagement levels. Other platforms such as WhatsApp, Telegram, and Snapchat are used minimally, each accounting for less than 2% of responses. This data highlights a clear preference for visually driven and entertainment-based platforms among participants.

Question 2: The next question is that how many hours per day do you spend on social media with multiple options given.

2. How many hours per day do you spend on social media?

155 responses

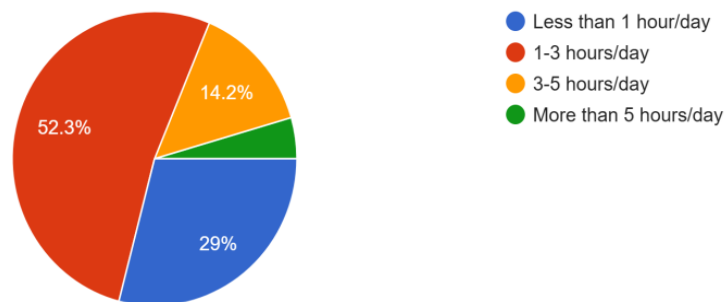


Fig 2: The result about hours per day spend on social media

The data presented in the chart reveals that a majority of respondents, 52.3%, spend 1–3 hours per day on social media, indicating moderate daily engagement. Around 29% of participants use social media for less than 1 hour per day, suggesting a relatively controlled usage pattern. Meanwhile, 14.2% reported spending 3–5 hours daily, and a small portion, approximately 4%, spend more than 5 hours per day on social platforms. Overall, the findings suggest that most individuals maintain a balanced social media routine, with only a minority exhibiting extended daily usage.

Question 3: The next question is that what type pf content do you mostly engage with multiple options given.



3.What type of content do you mostly engage with ?

155 responses

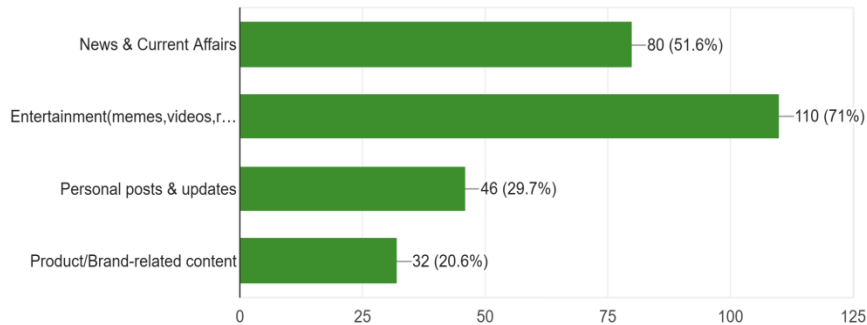


Fig 3: The result about type of content do you mostly engage

The chart shows that entertainment-related content such as memes, videos, and reels is the most popular among respondents, with 71% (110 out of 155) engaging with it regularly. News and current affairs follow, attracting 51.6% (80 respondents), indicating a strong interest in staying informed. Personal posts and updates engage 29.7% (46 respondents), while product or brand-related content has the least engagement at 20.6% (32 respondents). Overall, the data suggests that users primarily use social media for entertainment and information rather than for personal or commercial content.

Question 4: The next question is that how often do you post your own thoughts or opinions on social media with options daily, weekly, monthly and rarely or never.

4.How often do you post your own thoughts or opinions on social media ?

155 responses

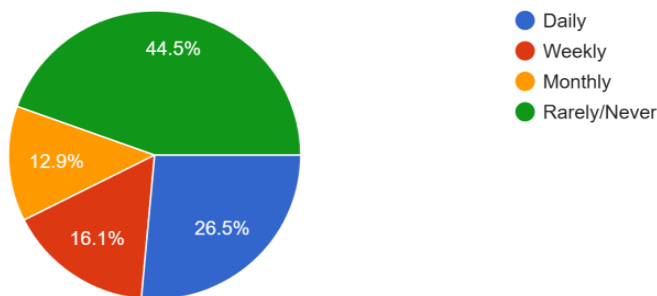


Fig 4: The result about post your own thoughts or opinions on social media

The chart indicates that a large portion of respondents, 44.5%, rarely or never post their own thoughts or opinions on social media, showing a preference for passive engagement. Meanwhile, 26.5% of participants share content daily, suggesting a consistent level of online activity. Around 16.1% post weekly, and 12.9% post monthly, representing moderate engagement levels. Overall, the data suggests that while a segment of users actively shares opinions, the majority prefer to observe or interact with existing content rather than create their own.

Question 5: The next question is that how often do you read other peoples posts or comments expressing opinions with options daily, weekly, monthly and rarely or never.



5. How often do you read other people's posts or comments expressing opinions ?

155 responses

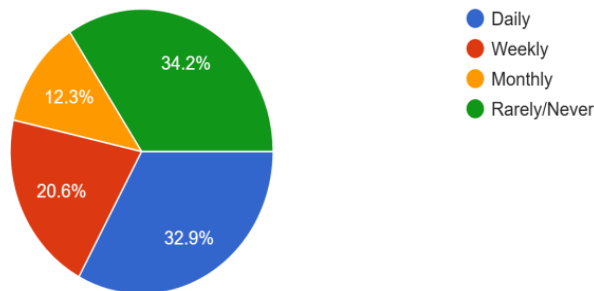


Fig 5: The result about peoples posts or comments expressing opinions

The chart reveals that 32.9% of respondents daily read other people's posts or comments expressing opinions, indicating active observation of social media discussions. Meanwhile, 20.6% do so on a weekly basis, and 12.3% engage monthly. A notable 34.2% of participants rarely or never read such opinion-based content. Overall, the findings suggest that while a substantial portion of users regularly consume opinion-oriented posts, a significant group remains less engaged with such interactions, possibly preferring other types of social media content.

Question 6: The next question is that have you heard of sentiment analysis before this survey with options yes or no.

6. Have you heard of sentiment analysis before this survey ?

155 responses

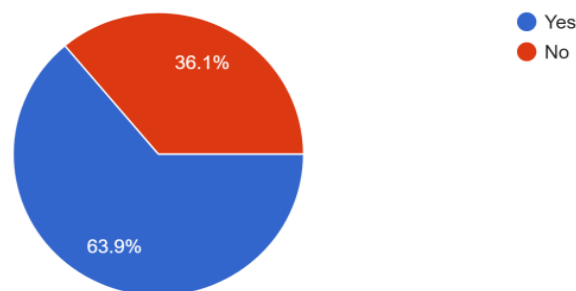


Fig 6: The result about heard of sentiment analysis before this survey

The chart indicates that a majority of respondents, 63.9%, had heard of sentiment analysis prior to the survey, demonstrating a relatively good level of awareness about the concept. In contrast, 36.1% of participants reported that they had no prior knowledge of sentiment analysis. This suggests that while most respondents are somewhat familiar with analytical tools used in understanding opinions or emotions in data, there remains a significant portion who are still unfamiliar with such computational techniques.

Question 7: The next question is that how comfortable are you with companies or researchers analysing your social media posts to understand your sentiment with multiple options.



7. How comfortable are you with companies or researchers analyzing your social media posts to understand your sentiments ?

155 responses

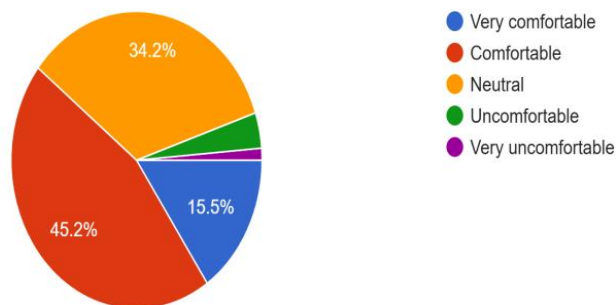


Fig 7: The result about comfortable about companies or researchers

The chart shows that 45.2% of respondents feel comfortable with companies or researchers analysing their social media posts to understand their sentiments, while 15.5% are very comfortable with such analysis. Meanwhile, 34.2% of participants expressed a neutral stance, indicating mixed feelings or uncertainty about data privacy. A small fraction of respondents reported being uncomfortable or very uncomfortable with this practice. Overall, the findings suggest that while most individuals show a positive or neutral attitude toward sentiment analysis, a minority remain cautious about privacy and data usage concerns.

Question 8: The next question is that in your opinion how accurately technology can detect emotions from text with multiple options.

8. In your opinion, how accurately can technology detect emotions from text (e.g., tweets, comments, reviews)?

155 responses

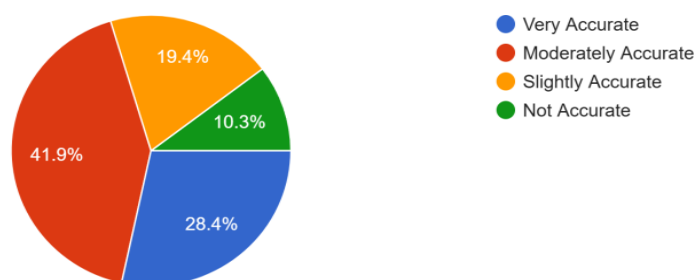


Fig 8: The result about opinion about can accurately technology detects emotions

The chart reveals that 41.9% of respondents believe technology is moderately accurate in detecting emotions from text, indicating a general confidence in its capability. Meanwhile, 28.4% view it as very accurate, reflecting strong trust in emotion recognition systems. However, 19.4% consider it only slightly accurate, and 10.3% believe it is not accurate at all. Overall, the results suggest that while most participants have a positive perception of technology's emotional detection accuracy, a notable minority remain skeptical about its precision and reliability.

Question 9: The next question is that do you feel privacy is at risk when your posts/comments are analysed by AI for sentiment with option yes, no and not sure.



9. Do you feel your Privacy is at risk when your posts/comments are analyzed by AI for sentiment?

155 responses

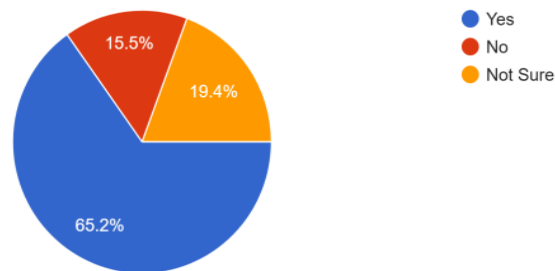


Fig 9: The result about privacy risk

The chart shows that a majority of respondents, 65.2%, feel their privacy is at risk when their posts or comments are analyzed by AI for sentiment, indicating significant concern about data security and personal privacy. Meanwhile, 19.4% of participants are not sure, reflecting uncertainty or limited awareness of AI data handling practices. Only 15.5% believe their privacy is not at risk, suggesting that trust in AI-driven sentiment analysis remains relatively low among users. Overall, the findings highlight a strong perception of privacy vulnerability in AI-based content analysis.

Question10: The next question is that would you support the use of sentiment analysis in the following areas with multiple options.

10. Would you support the use of sentiment analysis in the following areas?

155 responses

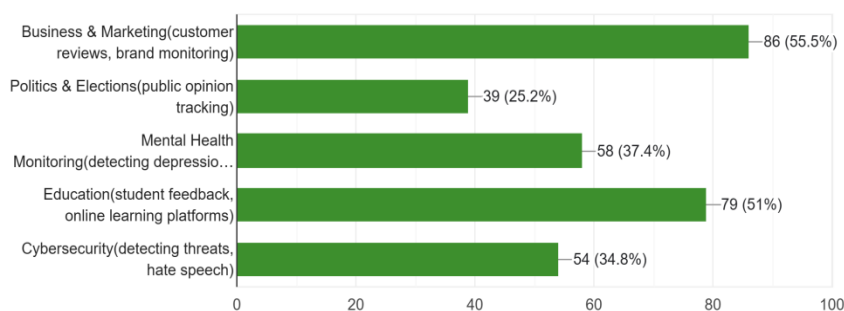


Fig 10: The result about support the use of sentiment analysis

The chart indicates that 55.5% of respondents support the use of sentiment analysis in business and marketing, making it the most favored application area, particularly for customer reviews and brand monitoring. Education-related uses such as analyzing student feedback also received strong support at 51%. Meanwhile, mental health monitoring was supported by 37.4%, reflecting moderate acceptance for health-related applications. Cybersecurity applications, such as detecting threats and hate speech, gained 34.8% support, while politics and elections had the lowest approval at 25.2%. Overall, respondents favor sentiment analysis in commercial and educational contexts more than in political or surveillance-related areas.

VI. CONCLUSION

The study concludes that sentiment analysis is a valuable technological approach for understanding user behavior, emotional expression, and opinion trends across digital platforms. While it offers significant advantages in fields such as business, education, and digital marketing, its responsible implementation is essential to address privacy and ethical concerns. The insights derived from this study can be effectively utilized in developing AI-driven add-on course recommendation systems that analyze students' sentiments, preferences, and feedback to suggest suitable learning opportunities. Such systems can help educators tailor course offerings based on learners' emotional engagement and academic needs. However, the ethical collection and handling of educational data remain paramount. Ensuring data transparency, privacy preservation, and student consent is vital to fostering trust in AI-assisted educational systems.



Ultimately, integrating sentiment analysis with recommendation algorithms can create a more adaptive and student-centric learning environment, balancing innovation with accountability in the evolving landscape of digital education.

ACKNOWLEDGEMENT

The authors express their sincere gratitude to all participants who contributed valuable responses to the survey conducted during this study. Their insights and perspectives were instrumental in understanding user awareness, privacy perceptions, and the broader implications of sentiment analysis. The authors also extend heartfelt thanks to their mentors, peers, and colleagues for their continuous guidance, constructive feedback, and encouragement throughout the research process. Appreciation is due to the institutions that provided the necessary academic resources and technical support for the successful completion of this work. Finally, the authors acknowledge the collective efforts that made this study possible and hope it contributes meaningfully to the growing body of research in sentiment analysis and AI-driven educational systems.

REFERENCES

- [1]. Dr. Suwarna Gothane, Dr. G. Vinoda Reddy, Dr. K. Praveen Kumar, Dr. D. Baswaraj, Gumma Parvathi Devi, Sruthi Thanugundala, Ravindra Changala, "Sentiment Analysis in Social Media Using Deep Learning Techniques," *International Journal of Intelligent Systems And Applications In Engineering*, 12(30), pp. 1588-1597, 2024.
- [2]. Srishti Sudhir Patil, Vaishali Pankaj Suryawanshi, Sudhir Madhav Patil, Sheetal Pravin Girase, Dhananjay Abhilash Bhagat, "Review of sentiment analysis in social media using big data: techniques, tools, and frameworks," *International Journal of Basic and Applied Sciences*, 14(2), pp. 34-48, 2025.
- [3]. Kalokhe Anil Sopan, Pawar Mahesh Dattatray, "Data Mining in Social Media Data: A Review," *International Research Journal of Multidisciplinary Studies*, Volume 4, Issue 8, pp. 1-7, February 2018.
- [4]. Md Abdullah Al Montaser, Bishnu Padh Ghosh, Ayan Barua, Fazle Karim, Bimol, Chandra Das, Reza E Rabbi Shawon, Muhammad Shoyaibur Rahman Chowdhury, "Sentiment analysis of social media data: Business insights and consumer behavior trends in the USA," *Edelweiss Applied Science and Technology*, Volume 9, Issue 1, pp. 545-565, 9 January 2025.
- [5]. Kalokhe Anil Sopan, Kharade Vaishnavi santosh, Shinde gauri Krushnath, Kumbhar Vijaykumar Sambhajirao, "Enhancing Student Performance Prediction and Course Recommendation Using Machine Learning," *International Journal of Advance and Applied Research*, Volume 6, Issue 2, pp. 183-190, March- April 2025.
- [6]. Amna Faisal1, NZ Jhanjhi, Farzeen Ashfaq, Husham M. Ahmed, Azeem Khan, "AI-Driven Framework for Location-Aware Sentiment Analysis and Topic Classification of Public Social Media Data in West Malaysia," *International Journal of Engineering, Science and Information Technology*, Volume 5, Issue 4, pp. 114-123, 2025.
- [7]. Srinivasa Kalyan Vangibhurathachchi, "Big Data and Mental Health: Social Media Sentiment Analysis," *Journal of Advances in Developmental Research*, Volume 16, Issue 2, pp. 1-9, July- December 2025.
- [8]. Kalokhe Anil Sopan, Phadtare Siddhi Dyaneshwar, Kale Samiksha Santaram, Pawar Mahesh Dattatray, "Exploring the Role Social media in Education thorough Web Mining: Insights into student engament and Behavioral trends," *International Journal of Advance and Applied Research*, Volume 6, Issue 2, pp. 183-190, March- April 2025.
- [9]. Dr. Shrabani Mallick, Mrs. Parul Awasthi, Dr. Anil Kumar Yadav, Bhagya Sri G, Dr. Rabins Porwal, Nidhi Bhatia, Jyoti Kataria, "Deep Hybrid CNN-LSTM Framework For Advanced Social Media Sentiment Analysis In Data-Driven Marketing Analytic," *International Journal of Environmental Sciences*, Volume 11, Issue 6, pp. 169-180, 2025.
- [10]. Dinkar Kumar, Kundan Kumar, Kritim Prasad Kafle, Vishal Kumar, Jivesh Kumar, A. Periyasamy, "Sentiment Analysis of Social Media Presence", *International Journal of Research Publication and Reviews*, Volume 5, Issue 3, pp 2181-2184, March 2024.
- [11]. Kalokhe Anil Sopan, Kumbhar Vijaykumar Sambhajirao, "Comparative Analysis of the Evolution and Integration of Traditional and Modern Education Systems in India," *International Journal of Advanced Research in Science, Communication and Technology*, Volume 5, Issue 2, pp 46-52, May 2025.
- [12]. Kalokhe Anil Sopan, Shinde gauri Krushnath, Kharade Vaishnavi santosh, Kumbhar Vijaykumar Sambhajirao, "An Empirical Study on Mobile Security Awareness and Its Implications for Course Recommendation Systems in Education," *International Journal for Research in Applied Science & Engineering Technology*, Volume 13, Issue 10, pp 507-514, October 2025.



- [13]. Nabaa Muhammad Diaa, Saba Sabah Ahmed, Hayder Mahmood Salman, Wafaa Adnan Sajid, "Statistical Challenges in Social media Data Analysis Sntiment Tracking and Beyond," Journal of Ecohumanism, Volume 3, Issue 5, pp 365-384, 2024.
- [14]. Anil Sopan Kalokhe, Vijaykumar Sambhajirao Kumbhar, "A Review on Course Recommendation System in Higher Education using Machine Learning," International Research Journal of Humanities and Interdisciplinary Studies, Volume 3, Issue 5, pp 47-55, 13 January 2024.
- [15]. Jyoti Yadav, "Sentiment Analysis on Social Media," Qeios, pp 1-10, 9 January 2023, <https://doi.org/10.32388/YF9X04>.
- [16]. Kalokhe Anil Sopan, Kumbhar Vijaykumar Sambhajirao, "A Personalized Course ecommendation System for Students Using Machine Learning Techniques," Journal of Technology, Volume 12 , Issue 2, pp 903-912, 2024.
- [17]. Kalokhe Anil Sopan, Kumbhar Vijaykumar Sambhajirao, "Comprehensive Evolution and Impact of the Indian Education System: From Ancient Wisdom to Modern Innovation," Journal of Nonlinear Analysis and Optimization, Volume 16 , Issue 1, pp 144-151, 2025.
- [18]. Ms.S.Prathi, "Multimodal Sentiment Analysis," International Journal of Scientific Research & Engineering Trends, Volume 11 , Issue 3, pp 1-6, May–June 2025.
- [19]. Kalokhe Anil Sopan, Phadtare Siddhi Dnyaneshwar, Kale Samiksha Santaram, Gunjawate Poonam Umesh,Kumbhar Vijaykumar Shambhajirao, "Balancing Security and Privacy in the Digital Era: A Study on Public Awareness and Technological Ethics," Journal of Emerging Technologies and Innovative Research, Volume 12 , Issue 10, pp e275-e281, October 2025.
- [20]. Ravi Lourdusamy, Prabakaran Thangavel, Johnbosco S, "Sentiments Unleashed : Pioneering the Frontier of Sentiment Analysis through Cutting-Edge Applications and Methodologies," International Journal of Scientific Research in Computer Science, Engineering and Information Technology, Volume 10 , Issue 5, pp 205-220, Septmber- October 2024.