



LITERARY FINDINGS

A Peer Reviewed International Journal of Multidisciplinary Research - ISSN: 2278-2311

லிட்஫ெரி ஃபைண்டிங்ஸ்

பல்துறை ஆய்வுக்கான பன்னாட்டு ஆய்விதழ்

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லிட்ஃபரி ஃபைண்டிங்ஸ்
பல்துறை ஆய்வுக்கான பன்னாட்டு ஆய்விதழ்
LITERARY FINDINGS

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIETY

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Abstract:

Artificial Intelligence (AI) has swiftly integrated into our daily lives, revolutionizing numerous societal facets and ushering in new possibilities. Nonetheless, this rapid growth of AI also engenders concerns regarding its societal impact and the potential ramifications of its widespread adoption. This research paper furnishes a comprehensive examination of AI's influence on diverse societal dimensions, encompassing the economy, education, healthcare, employment, and ethics. This endeavor entails a meticulous review of existing research and data on AI's impact, focusing on economic, social, and ethical implications, alongside the challenges entailed in its implementation. While acknowledging AI's potential to yield substantial societal benefits, the paper also delineates associated challenges and risks necessitating attention. Furthermore, it engages in a sector-specific analysis of AI's ramifications on healthcare, education, and employment. The assessment discerns AI's capacity to enhance patient outcomes and streamline healthcare services, while concurrently highlighting concerns over job displacement and economic inequality in workplace integration. Moreover, ethical considerations pertaining to AI are scrutinized, emphasizing the imperative of responsible development and deployment encompassing ethical frameworks to mitigate biases, uphold privacy, and ensure transparency. This research endeavor furnishes a holistic overview of AI's societal impact, identifies prevailing trends and challenges in its implementation, and proffers potential remedies to address these concerns. Thus, it serves as a guiding resource for policymakers, technology experts, and the general populace, facilitating the conscientious and equitable integration of AI.

Keywords: Artificial Intelligence, Ethical Implications, Healthcare, Impact, Society.

I. INTRODUCTION:

Artificial Intelligence (AI) is a rapidly expanding field that is reshaping our lifestyles, professions, and social interactions. From personal assistants such as Siri and Alexa to autonomous vehicles, AI is already revolutionizing our daily routines, offering fresh possibilities and avenues to enhance our quality of life. However, the swift advancement of AI also prompts concerns regarding its societal impact and the potential ramifications of its widespread adoption. As AI technology progresses, it is increasingly employed to address intricate issues, automate mundane tasks, and enhance human capabilities. This holds

promise for numerous benefits, including heightened productivity and efficiency, improved healthcare outcomes, and more informed decision-making. Nonetheless, the development and integration of AI raise significant ethical, social, and economic considerations that warrant attention. For instance, the widespread embrace of AI may result in substantial job displacement, particularly in sectors vulnerable to automation. This could exacerbate existing economic disparities and pose new hurdles for workers lacking the necessary skills to transition into alternative roles. Furthermore, AI systems have the potential to perpetuate bias and discrimination if not developed and implemented responsibly, posing risks to marginalized groups.

The objective of this research paper is to offer a comprehensive overview of AI's impact across various societal domains and assess the principal trends and challenges associated with its deployment. By doing so, this paper aims to identify potential solutions to address these issues and guide policymakers, technology experts, and the public towards the ethical and equitable utilization of AI. By understanding both the potential advantages and drawbacks of AI, we can strive towards a future where this technology benefits all members of society.

II.LITERATURE REVIEW:

Artificial Intelligence (AI) has emerged as a transformative force in modern society, impacting various facets of our lives and reshaping the technology, industry, and cultural landscape. This section presents an overview of significant findings and insights from existing literature, highlighting the diverse influence of AI on society.

1. Economic Implications of AI:

The economic implications of AI are a focal point in literature. Brynjolfsson and McAfee (2014) assert that AI, as a component of the Second Machine Age, holds the potential to stimulate economic growth by facilitating automation and enhancing productivity. Nonetheless, this optimism is tempered by apprehensions raised by Frey and Osborne (2017), who emphasize the vulnerability of jobs to computerization, especially in routine tasks. The resulting displacement of jobs and changes in labor markets present complex issues necessitating meticulous policy deliberations.

2. Social Transformation:

The social implications of AI are significant. AI's capacity to improve healthcare outcomes is a matter of considerable interest. Muller (2017) highlights AI's potential to enhance patient care through predictive analytics and personalized treatments. Additionally, AI's involvement in education is progressing. Kelleher et al. (2015) propose that AI-powered personalized learning experiences have the potential to transform education by catering to the unique needs of individual students.

3. Challenges and Risks:

While Artificial Intelligence (AI) presents significant benefits, it also brings forth challenges and risks. Literature reviews indicate that AI's capacity for displacing jobs raises concerns regarding economic inequality. Addressing this issue may necessitate a coordinated effort to reskill the workforce for tasks that AI cannot execute. Furthermore, the perpetuation of bias and discrimination by AI systems is a pressing concern, underscoring the importance of responsible AI development and regulation.

III.METHODOLOGY

In this section, the research methodology employed in the study is elucidated. The research design, data collection methods, and analytical techniques are discussed to provide insight into the study's execution.

A. Research Design:

The research utilized a mixed-methods approach, integrating both qualitative and quantitative methodologies. This choice was made to ensure a thorough understanding of the multifaceted impact of Artificial Intelligence (AI) on society.

B.Data Collection:

The primary data collection methods comprised surveys and case studies. Surveys were distributed to a diverse group of experts and stakeholders to gather quantitative data on the impact of AI on society. The survey questions were crafted to solicit feedback on the potential benefits and drawbacks of AI, as well as the key challenges associated with its implementation.

Case studies of both successful and unsuccessful AI implementations were examined to offer practical examples of the benefits and drawbacks of AI. These case studies served to illustrate real-world scenarios and provide insights into the societal implications of AI adoption. Furthermore, secondary data sources, including academic journals, books, and online resources, were utilized for the literature review. These sources contributed valuable insights and perspectives to the study.

C. Data Analysis & Ethical Considerations:

The collected data, comprising both quantitative and qualitative information, underwent analysis utilizing appropriate analytical techniques. Statistical methods were employed to discern trends and patterns in the integration of AI across various societal sectors. This analysis prioritized the identification of economic, social, and ethical implications associated with AI, alongside addressing implementation challenges.

Qualitative data, specifically sourced from case studies and open-ended survey responses, underwent content analysis to extract thematic insights and key findings regarding AI's impact on various societal facets. The research strictly adhered to ethical principles throughout the data collection process. Informed consent was obtained from survey participants to safeguard their privacy and confidentiality. Diligent efforts were made to mitigate potential biases in both data collection and analysis.

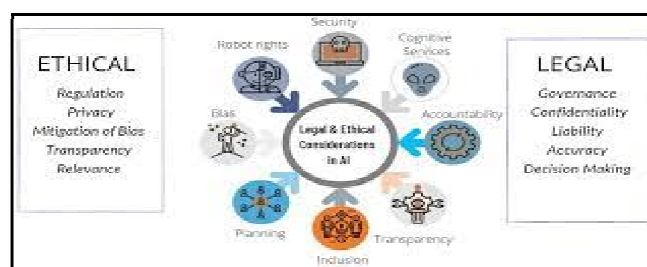


Figure 1: Legal and Ethical Consideration in Artificial Intelligence

IV.MODELING & ANALYSIS

A. Model & Material:

To evaluate the societal impact of Artificial Intelligence (AI), our research utilized several modeling techniques:

Predictive Models: Statistical software was employed to forecast potential outcomes of AI adoption across different sectors. These models took into account factors such as economics, education, and healthcare to simulate AI's long-term impact.

Agent-Based Models: Agent-based modeling was used to simulate individual and organizational responses to AI implementations, exploring various scenarios.

Network Models: Network analysis was conducted to examine AI's interconnectedness with stakeholders, institutions, and technologies, offering insights into its diffusion.

B. Data Analysis:

Data analysis played a pivotal role in our research, employing the following techniques:

Statistical Analysis: Descriptive and inferential statistics were utilized to summarize survey data and evaluate relationships between variables.

Content Analysis: Qualitative data underwent content analysis to identify recurring themes and patterns.

Geospatial Analysis: Geographic information systems (GIS) were employed to analyze spatial data concerning AI implementations.

C. Visual Representation:

We utilized various visual representations, including:

Graphs and Charts: Line graphs, bar charts, and pie charts were utilized to depict trends, comparisons, and proportions in quantitative data.

Heatmaps: These were employed to showcase geographic variations in AI adoption.

Network Diagrams: These illustrated the interconnectedness of stakeholders and technologies within the AI ecosystem.

Simulation Output: Visual representations of simulation results, such as time-series graphs, were used to illustrate the dynamic societal impact of AI.

V.RESULTS & DISCUSSION

Benefits of AI:

The thorough analysis of AI's impact on society has unveiled numerous potential benefits. AI possesses the capacity to greatly enhance efficiency and productivity across various sectors, such as healthcare and education. It enables us to address complex problems, automate routine tasks, and augment human capabilities. These advancements have the potential to revolutionize industries and enhance the quality of life for individuals.

Draw Backs Of AI:

However, alongside these advantages, the development and implementation of AI raise a range of ethical, social, and economic concerns. This research highlighted the following critical issues:

1. Job Displacement:

AI has the potential to displace certain job categories, particularly those involving repetitive tasks. This displacement can lead to economic challenges and job insecurity for some segments of the workforce.

2. Bias and Discrimination:

The study revealed that AI systems can perpetuate bias and discrimination if not designed and implemented responsibly. Biased algorithms can exacerbate societal inequalities and reinforce stereotypes, affecting various aspects of life, from employment opportunities to criminal justice.

3. Privacy and Security:

The widespread use of AI also raises concerns regarding data privacy and security. As AI systems rely on vast amounts of data, issues related to data breaches and the misuse of personal information have become more prevalent.

4. Misuse of AI:

The potential misuse of AI for harmful purposes, such as cyberattacks or misinformation campaigns, was identified as a significant drawback. Ensuring that AI technology is not exploited for malicious intent remains a critical challenge.

Future Research Directions:

While this research has offered valuable insights into the present influence of AI on society, there are areas that necessitate further investigation. Future research should explore emerging AI technologies, the evolving job market, and the long-term societal repercussions of AI integration

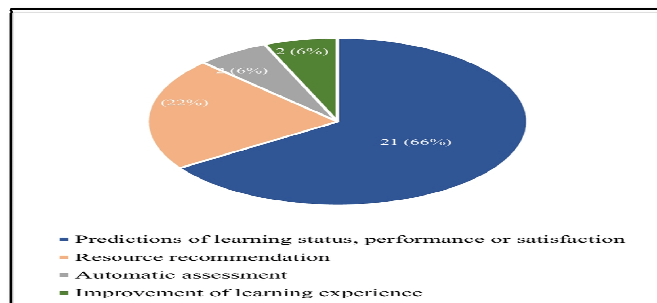


Figure 2: The pie chart of the functions of AI applications

VI.CONCLUSION:

The rapid advancement of Artificial Intelligence (AI) has brought about significant societal changes, promising increased efficiency, enhanced healthcare, and improved educational opportunities. However, with this potential comes a great deal of responsibility. This research paper has conducted a thorough examination of AI's impact on society, highlighting both its advantages and disadvantages.

The undeniable capacity of AI to revolutionize industries and enhance quality of life is acknowledged. It enables the resolution of complex issues and the automation of mundane tasks, thus contributing to a more prosperous future. Nonetheless, challenges such as potential job displacement, bias, and privacy concerns must be addressed.

The societal ramifications of AI necessitate collaborative efforts from governments, industries, and researchers. Responsible development and implementation of AI require joint initiatives. To this end, we have proposed recommendations for policymakers and stakeholders to consider, including investments in education and training, the establishment of ethical AI frameworks, and a commitment to inclusive AI design.

Looking ahead, continued research into emerging AI technologies and their long-term societal impacts is imperative. By doing so, we can adapt to evolving circumstances and ensure that AI serves as a force for positive change, benefiting all segments of society. Navigating the future of AI necessitates the responsible and equitable integration of this technology, which remains our collective imperative.

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AN ANALYTICAL STUDY OF POSITIVE AND NEGATIVE EFFECTS OF SOCIAL MEDIA ON SOCIETY

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Abstract:

Social media has become an integral part of modern society, shaping communication, business, education, and activism. This paper explores the multifaceted impacts of social media, encompassing both its positive contributions and negative consequences. Through an analytical lens, it examines how social media revolutionizes communication, facilitates information dissemination, fosters economic opportunities, enhances education, and empowers social activism. However, it also delves into the darker aspects, including cyberbullying, privacy concerns, addiction, misinformation, and the exacerbation of social inequalities. To address these challenges, the paper advocates for a proactive approach involving digital literacy promotion, platform regulation, mental health support, inclusive access initiatives, responsible usage encouragement, ethical data practices, and collaborative efforts among stakeholders. By navigating these complexities effectively, society can harness the transformative potential of social media while mitigating its adverse effects.

Keywords:

Social Media, Communication, Information Dissemination, Business, Education, Social Activism, Cyberbullying, Privacy, Mental Health, Misinformation, Digital Divide, Stakeholder Collaboration.

Introduction:

Social media has emerged as a ubiquitous force in contemporary society, reshaping the way we communicate, access information, conduct business, and engage with the world around us. Platforms such as Facebook, Twitter, Instagram, and LinkedIn have revolutionized interpersonal connections, transcending geographical boundaries to foster a global village where individuals can interact, share experiences, and express themselves freely. However, alongside its myriad benefits, social media also presents a myriad of challenges and risks that warrant careful examination and consideration.

This analytical study delves into the multifaceted impacts of social media on society, exploring both its positive contributions and negative consequences across various domains. By dissecting the complexities of social media's influence, we aim to elucidate the nuances of

its effects and offer insights into potential solutions and strategies for addressing its drawbacks.

The positive effects of social media are manifold. Firstly, it has revolutionized communication and connectivity, enabling instantaneous interactions and fostering virtual communities where individuals can forge meaningful relationships and exchange ideas. Moreover, social media serves as a powerful tool for information dissemination, empowering users to stay informed about current events, access educational resources, and engage in discourse on important issues. From a business perspective, social media offers unprecedented opportunities for marketing, customer engagement, and entrepreneurship, driving economic growth and innovation in the digital age. Furthermore, social media platforms have become catalysts for social activism and mobilization, amplifying marginalized voices and facilitating collective action around causes ranging from human rights to environmental sustainability.

However, alongside its positive impacts, social media also harbors a darker side characterized by various negative effects. Cyberbullying and harassment thrive in the anonymity of online spaces, causing psychological harm and social isolation for victims. Privacy concerns loom large as social media platforms collect and monetize user data, raising ethical questions about consent, transparency, and data security. Moreover, excessive use of social media has been linked to addiction and mental health issues, exacerbating feelings of loneliness, anxiety, and depression among users. The proliferation of disinformation and misinformation on social media further undermines trust in reliable sources of information, posing significant challenges to democratic discourse and societal cohesion. Additionally, the digital divide persists, widening disparities in access to technology and exacerbating social inequalities along lines of race, income, and geography.

In light of these challenges, it is imperative to adopt a proactive approach to addressing the negative effects of social media while maximizing its potential for positive impact. By fostering digital literacy, promoting responsible digital citizenship, and implementing robust regulatory measures, we can create a safer, more inclusive online environment that harnesses the transformative power of social media for the collective good. Through collaborative efforts involving governments, social media companies, educators, healthcare professionals, and civil society organizations, we can navigate the complexities of social media's influence and pave the way for a more equitable and sustainable digital future.

Objectives:

Here are the specific objectives of the study:

- Analyze the impact of social media on global connectivity.
- Examine the role of social media in information dissemination.
- Investigate the influence of social media on community building.
- Evaluate the effect of social media on mental health and well-being.
- Assess the role of social media in cyberbullying and online harassment.
- Explore privacy concerns associated with social media use.
- Examine the spread of misinformation and fake news on social media.

➤ **Review of Literature:**

Numerous studies have highlighted the positive impacts of social media on society. Global connectivity facilitated by platforms such as Facebook, Twitter, and Instagram has been extensively discussed (Boyd & Ellison, 2007). Scholars emphasize how social media enhances communication across geographical boundaries, fostering cross-cultural understanding and collaboration (Castells, 2012). Furthermore, social media serves as a valuable tool for information dissemination, enabling individuals to stay informed about current events, societal issues, and developments in real-time (Tufekci, 2017). The ability of

social media to facilitate community building and support networks has also been widely documented (Wellman et al., 2001).

Conversely, scholars have identified several negative effects associated with social media use. Research has shown that excessive social media usage can contribute to feelings of social comparison and low self-esteem among users (Fardouly et al., 2015). Additionally, the anonymity and accessibility of social media platforms have facilitated cyberbullying and online harassment, particularly among adolescents and vulnerable populations (Kowalski et al., 2014). Privacy concerns related to data collection and misuse by social media companies have also garnered significant attention in the literature (boyd& Crawford, 2012). Moreover, the spread of misinformation and fake news on social media platforms has been identified as a major societal challenge, with implications for public opinion, trust in institutions, and social cohesion (Wardle & Derakhshan, 2017).

Analyzing the effects of social media on society requires a comprehensive examination of its positive and negative impacts across various domains. Here's an analytical study covering both aspects:

➤ **Positive Effects:**

1. Communication and Connectivity:

Social media platforms like Facebook, Twitter, and Instagram have fundamentally transformed the way individuals communicate and connect with one another. These platforms have effectively erased geographical boundaries, enabling instant interaction among friends, family, and colleagues in real time. Through features like text messaging, voice calls, and video chats, users can engage in conversations and share experiences regardless of their physical location. The impact of social media on relationships is profound, as it provides a space for individuals to express themselves and stay connected with loved ones. This is particularly evident in long-distance relationships, where platforms facilitate continuous communication through messaging, video calls, and photo sharing, bridging the gap created by distance. Overall, social media has become an indispensable tool for communication, strengthening social bonds and fostering connections in an increasingly interconnected world.

2. Information Dissemination:

Social media has emerged as a formidable force in the dissemination of information and the promotion of critical issues such as public health, safety measures, and social causes. Its pervasive reach and instantaneous nature make it an ideal platform for sharing updates and raising awareness. During emergencies or natural disasters, social media plays a crucial role in providing timely updates, evacuation notices, and safety precautions to affected communities, enabling swift response efforts. Moreover, the rise of citizen journalism on social media has empowered ordinary individuals to contribute to news reporting, offering diverse perspectives and firsthand accounts of events. This decentralization of media coverage fosters a more inclusive and democratic information landscape. However, alongside its benefits, social media also poses challenges such as the spread of misinformation, emphasizing the importance of critical media literacy in navigating the digital sphere. Despite these challenges, the overall impact of social media on information dissemination and community engagement remains profound and continues to evolve in shaping public discourse and awareness.

3. Businesses and Economic Opportunities:

The advent of social media has radically transformed how businesses interact with customers, market their products, and drive sales. Platforms such as Instagram and Pinterest have transitioned from mere social networks to indispensable marketing channels, enabling businesses to showcase products, engage directly with customers, and divert traffic to their websites seamlessly. One significant evolution is the rise of influencer marketing, where

brands collaborate with social media influencers to endorse their products and tap into new audience segments. This symbiotic relationship has proven highly lucrative and effective in amplifying brand reach and credibility. Moreover, social media platforms provide a level playing field for small businesses and entrepreneurs, allowing them to establish a robust online presence, reach a global audience, and compete with larger counterparts without hefty financial investments. The accessibility and versatility of social media have fundamentally altered the business landscape, empowering companies of all sizes to thrive in the digital age through innovative marketing strategies and genuine customer engagement.

4. Education and Learning:

Social media platforms have indeed revolutionized education by offering an extensive array of educational resources, online courses, and virtual communities for learning and skill development. With platforms such as YouTube, LinkedIn Learning, and Coursera, individuals have unparalleled access to a diverse range of educational content, from tutorials and lectures to MOOCs taught by renowned experts. These platforms not only provide accessibility to knowledge but also foster collaboration and knowledge sharing among students, educators, and professionals. Through features like comments, forums, and group discussions, learners can exchange ideas, discuss coursework, and seek assistance from peers and mentors. Additionally, virtual communities and forums on platforms like Reddit and Quora serve as invaluable resources for individuals to ask questions, share insights, and engage in meaningful discussions on a wide array of topics. Overall, social media has democratized education, making learning more accessible, interactive, and collaborative for individuals across the globe.

5. Social Activism and Mobilization:

Social media has emerged as a formidable tool for social activism and grassroots mobilization, enabling individuals and communities to leverage its reach and connectivity for various causes. Movements like #BlackLivesMatter, #MeToo, and #ClimateStrike have effectively utilized social media platforms to spark conversations, raise awareness, and catalyze societal change on a global scale. One of its most significant contributions is the amplification of marginalized voices, providing a platform for those traditionally underrepresented to share their stories, express grievances, and demand justice directly to a broad audience. Through the use of hashtags, viral campaigns, and online petitions on platforms such as Twitter, Instagram, and Change.org, collective action has been facilitated, empowering individuals to connect, organize protests, and advocate for change more efficiently than ever before. Despite challenges such as echo chambers and misinformation, the impact of social media activism remains profound, democratizing the process of social change and empowering individuals to contribute meaningfully to their communities and society at large.

➤ Negative Effects:

1. Cyberbullying and Harassment:

Social media platforms can serve as breeding grounds for cyberbullying, harassment, and online abuse, with severe consequences for victims. The anonymity and perceived distance provided by the internet often embolden individuals to engage in harmful behaviors, including sending threatening messages, spreading rumors, or posting hurtful comments without facing immediate repercussions. Such actions can result in significant psychological distress, social isolation, and, tragically, even suicide among victims, especially adolescents and young adults who are more susceptible to peer pressure and the need for social validation. The pervasive nature of social media amplifies the impact of cyberbullying, making it challenging for victims to escape the harassment and creating a toxic online environment that undermines personal well-being and mental health. Efforts to address

cyberbullying and promote digital safety must involve a combination of education, proactive platform policies, and support systems to protect vulnerable individuals and foster healthier online interactions.

2. **Privacy Concerns:**

Social media platforms frequently require users to disclose personal information as a condition for accessing their services, leading to widespread concerns regarding privacy and data security. Instances of data breaches, identity theft, and unauthorized access to user data have significantly eroded trust in social media companies and their ability to safeguard personal information. The commercialization of user data for targeted advertising and data mining purposes has sparked ethical debates surrounding issues such as consent, transparency, and the protection of user privacy rights. Users are becoming increasingly concerned about how social media platforms collect, store, and use their personal information, prompting calls for increased accountability, stricter regulations, and improved data protection measures to protect people's privacy rights in the digital age.

3. **Addiction and Mental Health Issues:**

Excessive engagement with social media has been associated with addiction and detrimental mental health outcomes, such as anxiety, depression, and diminished self-esteem. The perpetual pursuit of validation through likes, shares, and followers can foster compulsive behavior and distort one's perception of self-worth, especially among younger demographics who are particularly vulnerable to societal pressures and peer influences. The curated content often encountered on social media, showcasing idealized images and lifestyles, tends to amplify feelings of inadequacy and perpetuate a cycle of comparison and self-doubt among users. Consequently, individuals may find themselves striving for unattainable standards, further exacerbating their mental well-being. Addressing these issues necessitates promoting digital literacy, fostering healthier online habits, and encouraging balanced use of social media platforms to mitigate the adverse effects on mental health and well-being.

4. **Disinformation and Misinformation:**

Social media platforms have faced significant criticism for their complicity in the dissemination of disinformation and misinformation, especially during times of crises and elections. The viral nature of content sharing and the prevalence of echo chambers often exacerbate the spread of false narratives, undermining trust in credible sources of information and fostering polarization among users. Malicious actors, ranging from foreign governments to political parties and fringe groups, exploit these platforms to propagate propaganda, sow discord, and manipulate public opinion to serve their own agendas. This manipulation of information not only distorts public discourse but also poses a threat to democratic processes and societal stability. Addressing this issue requires collaborative efforts between social media companies, policymakers, and civil society to develop effective strategies for combating misinformation, promoting media literacy, and safeguarding the integrity of online information ecosystems.

5. **Digital Divide and Social Inequality:**

Equitable access to social media remains a significant challenge, with marginalized communities disproportionately facing barriers such as limited internet connectivity, digital literacy skills, and socioeconomic status. This digital divide exacerbates existing social inequalities, amplifying disparities across various sectors, including education, employment, healthcare, and civic engagement. Individuals without access to social media platforms are at a disadvantage in terms of accessing information, networking opportunities, and essential services, perpetuating a cycle of disadvantage and further widening the gap between the privileged and the marginalized in society. Bridging this digital divide requires concerted efforts from governments, NGOs, and private sector stakeholders to improve internet infrastructure, provide digital literacy training, and ensure affordable access to technology for

underserved communities. Only through such initiatives can we strive towards a more inclusive and equitable digital landscape where all individuals have equal opportunities to participate and thrive.

Conclusion:

Addressing the negative effects of social media necessitates a multifaceted approach involving various stakeholders. To begin with, promoting digital literacy among users, particularly young people, is essential. Educating individuals about critical thinking skills, media literacy, and online safety enables them to navigate social media more responsibly and discern reliable information from misinformation. Additionally, enhancing platform regulations is crucial. Social media companies should implement robust policies and mechanisms to combat cyberbullying, protect user privacy, and minimize the spread of false information. This includes proactive content moderation, transparent algorithms, and user-friendly privacy settings. Moreover, supporting mental health resources is imperative. Increasing access to mental health support services, both online and offline, can aid individuals in coping with the negative effects of social media, such as anxiety, depression, and low self-esteem. Furthermore, fostering inclusive access to social media is vital. Governments and organizations should work to bridge the digital divide by improving internet infrastructure, providing affordable access to technology, and offering digital literacy training to underserved communities. Encouraging responsible use of social media is also essential. Users should be encouraged to practice mindful and balanced use, setting boundaries, taking breaks, and engaging in offline activities to mitigate negative impacts on mental health and well-being. Additionally, promoting ethical data practices by social media companies is paramount. Prioritizing user privacy and data security, ensuring transparent data practices, obtaining informed consent, and providing users with control over their personal information are crucial steps. Moreover, empowering civil society is crucial. Civil society organizations play a pivotal role in advocating for user rights, holding social media companies and policymakers accountable, and raising awareness about the societal impacts of social media. Lastly, collaborative efforts among stakeholders, including social media companies, policymakers, educators, healthcare professionals, and civil society organizations, are indispensable. By working together, comprehensive solutions and strategies can be developed to address the challenges of social media, thus maximizing its benefits while mitigating its negative impacts on individuals and society as a whole.

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"TECH BITES: HOW TECHNOLOGY IS TRANSFORMING THE WAY WE EAT"

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Abstract

Nutrition is experiencing significant growth with the introduction of technology. These advancements are empowering individuals to take charge of their health and make informed decisions about their nutrition.

This article aims to provide a comprehensive overview of how technology is being used to improve nutrition-related practices. The article examines various technologies like wearable devices, nutrition tracking apps, smart kitchen appliances, and more. By analyzing existing studies and trends, the review article helps inform readers about the current state of knowledge, potential benefits, challenges, and future directions in the exciting intersection of nutrition and technology.

Recent findings like Mobile apps, Wearable devices, such as fitness trackers and smartwatches, have been shown to increase physical activity levels and provide real-time feedback on calorie expenditure. Virtual reality is also being explored as a tool for enhancing nutrition education and behavior change by creating immersive and engaging experiences. Artificial intelligence is being used to develop personalized nutrition recommendations based on individual characteristics and preferences.

Hence the field of nutrition has a great deal of room to grow in the future as technology continues to expand and enhance methods of encouraging a healthy diet and general well-being.

Keywords:

Artificial intelligence, virtual reality, wearable devices, Nutrition tracking apps.

Introduction

The normal maintenance of bodily systems in humans and their healthy development depend on nutrients. Apart from getting enough nutrition from food that complies with dietary standards, monitoring the body's nutrient levels is crucial for proper nourishment. [Zhao, J., Nyein, et.al., (2021)].

People's ability to see doctors and dietitians is also limited by their hectic schedules and lack of free time these days. An individual can have a healthy lifestyle by implementing good behaviors, exercising, playing sports, and going for walks. In order to track and

calculate energy levels and promote good nutrition, numerous mobile applications have been developed.[Ahmad, M., Khan,et.al.,(2020)].

In the last few years, digital technologies have advanced significantly and are now used in many facets of daily life. Health monitoring is one of the many activities that smartphones and mobile apps are being utilized for. A tendency toward diet monitoring and evaluation is seen in the abundance of nutrition and diet applications that are accessible, some of which are highly downloaded by users. [Vasiloglou, M. F.,et.al.,(2021)].

Based on their content, nutrition apps can be classified as either "medical" or "health and fitness" applications. Promising apps like EateryApp, MyMeal-Mate, MyFitness-Pal, and FatSecret have features like "calorie counting" and food diaries that make them useful instruments for nutritional therapy. [Thranberend, T.,et.al.,(2016) and Holzmam, S. L.,et.al.,(2017)].

Artificial intelligence (AI) is a rapidly developing field that holds great promise for revolutionizing the field of nutritional research.AI is able to manage conditions related to nutrition, create customized eating plans, suggest healthier food options, improve the safety of food, optimize food supply chains, and design balanced menus for various settings by analyzing large datasets, including dietary preferences, health records, and genetic information. [Roychowdhury, P.,et al.,(2024)].

Owing to people being involved, the food businesses are not only unable to ensure food safety but also the demand-supply chain.AI has the potential to greatly enhance food safety by creating a more efficient supply chain management system, extending shelf life, combining algorithms from AI with the food, and packaging. Drones, robotic farming, and smart farming will be the mainstays of the food industry of the future.[Kumar, I., Rawat, J.,et.al.,(2021)].

Impact of growing technology on nutrition

As everyone is aware, modern technology has had a significant impact on nutrition in a number of ways, these includes

1. MOBILE APPS:

Global concern is high regarding the prevention and treatment of diseases linked to nutrition. It should be feasible to maintain balanced eating patterns and prevent and treat a number of diseases linked to nutrition with an accurate assessment of dietary consumption and eating behavior. In the course of providing dietary recommendations, medical practitioners evaluate individuals' eating habits as part of the nutritional assessment process. The ability to accurately measure nutrition is a prerequisite for comprehending and documenting individuals' food intake, and mobile health (mHealth) technology presents a promising avenue in this regard.[Zhang, H.,et.al.,(2010) & Vasiloglou, M. F.,et.al.,(2020)].

There is a growing number of dietary apps available for mobile devices that can help with food and drink tracking for nutrition evaluation and tracking.[Campbell, J., & Porter, J. (2015)].

Among the most widely used health and fitness apps on mobile devices are those related to diet and nutrition, which are becoming more and more popular. The product labels are read by the analyzed app. Next, using the user's personal data such as age and degree of physical activity it evaluates the nutritional worth and quality of the items and suggests healthier eating options.[Samoggia, A., & Riedel, B. (2020)].

Applications for mobile health have the potential to improve patient involvement, collect data, and remotely monitor results outside of the hospital. An estimated 165,000 publicly accessible mobile health apps that treat diseases and promote wellbeing are currently available in the top locations.[Kao, C. K.,et.al.,(2017) & Limketkai, B. N.,et.al.,(2021)].

2. **wearable devices:**

Health indicators, which include heart rate, blood pressure, respiration rate, and body temperature, can be used to monitor the body's most fundamental processes. Wearable technology can be used to monitor these factors. At this point, wearable technology is approaching its zenith. The market value of wearables has steadily increased over the past few years. The overall number of wearable devices shipped increased from 45.1 million in 2017 to 59.3 million in 2018, encompassing smartwatches, wrist bands, and ear-worn gadgets.[Framingham, M. (2019) & Pardamean, B.,et.al.,(2020)].

Although there has been a significant increase in wearable and mobile chemical sensors over the last 10 years, their potential for monitoring and directing nutrition has just become apparent in the last three years. Recommendations from physicians and nutritionists are currently the most widely used method for preserving good nutritional status. Individualized dietary interventions are developed for each individual based on their metabolic profile, background, and environmental exposure in order to prevent and manage diseases. [Sempionatto, J. R.,et.al.,(2021)].

Maintaining good health and preventing disease requires a proper diet and nutritional status. In order to provide individualized nutritional advice based on each person's unique nutritional status, conventional dietary evaluation primarily compares nutrient intakes with reference intakes. Wearable technologies present excellent prospects for nutrition monitoring because of their capacity to provide real-time, non-invasive insights into health information.[Shi, Z., Li, X.,et.al(2022)].

It has been tested whether wearables can monitor blood pressure, sleep patterns, physical activity, and arrhythmias (such atrial fibrillation).[Mizuno, A.,(2021)].

A growing number of wearable functions are similar to those found on standard smartphones, such as integrated GPS, barometer, heart rate (HR), ACC, or gyroscope sensors. Furthermore, wearables outperform smartphones in the detection of physiological indicators including skin temperature, heart rate, and electrocardiograms (ECGs), which are thought to be especially important for the tracking of parameters linked to diabetes.[Lee U,et.al.,(2019)].

3. **Smart kitchen appliances:**

Everything is automated in the modern world, and instead of painstakingly recording every detail, individuals typically opt to use smart gadgets for daily tasks. Controlling and tracking the food record is the main issue that restaurants, family circles, and other food chains face. The Internet of Things-based home automation system is intended for and used in the kitchen wardrobe. The user must make decisions and manually keep an eye on the shopping items in the kitchen. Therefore, a Smart Kitchen Wardrobe that uses the Internet of Things to manage the grocery items in the kitchen wardrobe is suggested.[Balaji, A.,et.al.,(2020)].

The number of smart home appliances, including door and fire alarm systems, smart ovens, and security systems, is increasing. Smart homes with reactive sensors enable users to remotely observe them over the Internet or other communication protocols in order to ensure their safety or comfort.[Gürüler, H., & Çetin, G. (2020)].

The era of Kitchen 4.0, centered around intelligent and healthful living, has emerged from the smart kitchen. The concept of intelligent connections to accomplish intelligent cooking is the foundation of the smart kitchen, which is built around the creation of smart kitchen products. To achieve the integration of smart kitchen system administration, remote control, remote teaching, food nutrition assessment and suggestion, food ordering and delivery, food preservation and testing, user health status records, entertainment interaction, and other services are used. To further enhance the user experience and life experience, to comprehend the unique habits of individual users, to satisfy people's dietary, social, and even

spiritual demands, to concentrate on user analysis, and more, it also depends on intelligent and emotional interactions between users and the kitchen.[Zhidengkui Xu.(2020) & Jain, L. C. (2023)].

4. Sustainability and Food technology:

The global population is predicted to reach over 9 billion by the year 2050, which will require a rise in agricultural and food supply by 70% to meet the demand, posing an immense threat to the agri-food business.[Ben Ayed, R., & Hanana, M. (2021)].

As a result a growing number of scientific fields are investigating sustainable food systems and diets. The world community has acknowledged them and urged on them to focus efforts on achieving the goals of sustainable development as well as the abolition of hunger and malnutrition.[Meybeck, A., & Gitz, V. (2017)].

There is a growing belief that not all sustainable diets are healthy, and not all healthy diets are sustainable. For this reason, producing enough food which is safe and enhances its nutritional value will require a complete approach.

The increasing number of people and the commitment to preserve biodiversity and other resources present a significant challenge to agriculture, which is already under threat from climate change. These factors combine to create a growing need for safe, wholesome food.[Dwivedi, S. L.,et.al.,(2017)].

In the ensuing decades, significant changes to the international food system will be necessary in order to feed the growing world population in a sustainable and nutrient-rich manner. The key issue will be how to increase food production while reducing waste while using the same amount of resources. [Devaux, A.,et.al.,(2021)].

It is imperative to take into account crucial factors like (i) the processes' industrial-scale technical feasibility, (ii) their techno-economic potential analysis, which takes into account the available waste quantities, and (iii) a life cycle-based environmental assessment of benefits and burdens, in order to develop future sustainable industrial processes that center on the valorisation of food waste.[Caldeira, C., Vlysidis, A.,et.al.,(2020)].

Agricultural sustainability can be attained by the application and use of farming systems that enhance crop productivity to satisfy the demands of an expanding population while simultaneously conserving and safeguarding the environment and its natural resources.[Arora, N. K. (2018)].

5. Nutrigenetics:

Precision nutrition, also known as customized nutrition, nutrigenetics, or nutritional genetics, is the opposite: individuals receive diets that are adapted to their specific biology. Studies on worldwide human genomic diversity have revealed large population-based changes in allele frequencies of common single nucleotide polymorphisms (SNPs) that affect the expression of genes involved in the metabolism of some of the most commonly consumed nutrients by humans. [Luca, F.,et.al.,(2010) & Mullins, V. A.,et.al.,(2020)].

Individuals vary in what they need from food in terms of nutrients and bioactive compounds as well as how they react to them. Variance in genetics, epigenetics, microbiota, lifestyle, food intake, and proximity to the environment are only a few of the many factors that lead to metabolic heterogeneity. Precision nutrition does not involve creating customized diet plans for each individual patient. Rather, it involves dividing the population into distinct subgroups based on biomarkers of the sources of metabolic variation mentioned above. This division is then used to more accurately estimate the dietary needs of the various subgroups, allowing for more effective dietary suggestions and interventions. [Zeisel, S. H. (2020)].

Due to its role in the prevention and/or treatment of non-communicable diseases-both polygenic and monogenic-genetic nutrition is becoming more and more popular these days. [Vesnina, A.,et.al.,(2020)].

There are now a number of businesses offering nutrigenetics services; these businesses recommend diets based on an individual's genetic history, which is a key factor in the prevention and etiopathogenesis of certain diseases. Dietary patterns are determined by a small number of genetic markers.[Floris, M.,et.al.,(2020)].

The idea that a deeper knowledge of individual traits, such as genotype, could lead to better dietary and pharmacological therapy customization was sparked by developments in genomics. This theory has been strengthened by further advancements in the fields of proteomics and metabolomics as well as wearable technology for monitoring indicators like blood sugar, heart rate, physical activity, and food consumption.[Moore, J. B. (2020)].

6. Artificial intelligence

The field of computer science known as artificial intelligence (AI), which mimics cognitive functions, learning capacities, and knowledge organization, is finding increasing use in both research and medical practice. The field of biomedical sciences has seen a growth in the use of AI in recent decades.[Sak, J., & Suchodolska, M. (2021)].

In the last few decades, as the global population has increased and food demands have increased accordingly, artificial intelligence (AI) has become an integral part of today's food business technology. The food business is calling for more of the aforementioned intelligent systems due to their increased capacity for controlling tools, classifying food, determining food quality, and making predictions.[Mavani, N. R.,et.al.,(2022)].

Healthy diets and improved clinical results could result from accurate nutritional information calculation. For example on using artificial intelligence (AI)-based dietary assessment system like goFOOD. Which is based on food photos taken with a smartphone, the system can calculate the amount of calories and macronutrients in a meal. Two meal photos or a brief film must be uploaded to goFOODTM. The nutrient database, food type, and volume are used to compute the calories and macronutrient content of each meal.[Lu, Y., Stathopoulou, T.,et al.,(2020)].

7. Virtual reality:

A promising tool for fundamental and applied study on eating and food-related processes is virtual reality (VR) technology. [Cheah, C. S., Barman, S.,et.al.,(2020)].

Virtual reality (VR) is the first and only medium that has the capacity to allow for the incorporation of the entire spectrum of cues that are both verbal and nonverbal, so there are reasons to view it as a recently introduced communication medium that should be distinguished from all other forms of mediated communication.[Dzardanova, E., Kasapakis, V.,et.al.,(2022)].

Research on food and consumer behavior could benefit greatly from the development of virtual reality (VR) technology, which could make it possible to build new research approaches and better investigate existing ones. The world of virtual reality is not the same as our everyday surroundings.

Researchers studying food sensory evaluation have created intricate and lifelike contextual landscapes using virtual reality. In order to study consumers' food preferences and purchasing habits, virtual reality (VR) has also been utilized to replace real-world environments (e.g., a supermarket and buffet).[Xu, C., Siegrist, M., & Hartmann, C. (2021)].

8. Online nutrition education

The global coronavirus pandemic, or COVID-19, has presented our society with enormous challenges and necessitated changes to practically every aspect of our existence.

Without a doubt, one of the areas most impacted by this pandemic is educational practice. Teachers have pushed themselves to quickly adjust to digital educational platforms and systems at all levels of school.[Korkmaz, G., & Toraman, Ç. (2020)].

The rise of online and digital technology has contributed to social turmoil. This changed the structure of the education sector and gave it the ability to impact the rise of technological advancement, which turned into a turning point in the Industrial Revolution. 4.0. Formal education is starting to become more popular as today's curriculum can be accessed very easily online through video on demand.[Bangun, C. S., Purnama, S.,et.al.,(2022)].

Refugees encounter numerous obstacles upon resettlement, such as inadequate awareness of food sources and food instability, which heightens their susceptibility to diet-related illnesses. They may be better able to deal with the difficulties of their new eating circumstances and have healthier lives if they receive nutrition instruction.[Nur, H. A., Atoloye, A. T.,et.al.,(2021)].

It's critical to comprehend the elements that encourage student involvement in online learning environments in order to measure and enhance the caliber of instruction in the digital age.[Livingstone, K. M., Milte, C. M.,et.al.,(2022)].

Technology advancements are transforming the face of nutrition education. New educational options, such as Massive Open Online Courses (MOOCs), are made available by advancements in online learning settings.

The experiences of students taking part in a worldwide nutrition MOOC were investigated using a mixed-methods approach.[Adamski, M., Truby, H.,et.al.,(2022)].

Conclusion:

The integration of technology in the field of nutrition has opened up exciting possibilities for individuals to take control of their health and well-being. From wearable devices and nutrition tracking apps to smart kitchen appliances and online nutrition education, technology has provided us with tools to monitor, analyze, and optimize our nutritional intake. Additionally, advancements in virtual reality and artificial intelligence have the potential to revolutionize personalized nutrition testing and interventions. As we continue to embrace these innovations, it is crucial to ensure that they are evidence-based, user-friendly, and accessible to all. By harnessing the power of nutrition technology, we can empower individuals to make informed dietary choices and ultimately improve their overall health outcomes.

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THE INTERSECTION OF ARTIFICIAL INTELLIGENCE AND SOCIETY: NAVIGATING THE FUTURE

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Abstract

From the industrial revolution to today, advancements in technology have continuously transformed tasks and processes once limited by human physical capacity. Artificial Intelligence (AI) holds the promise to similarly revolutionize a broad array of tasks and activities across various sectors. This paper discusses AI's rapid evolution, including breakthroughs in machine learning and autonomous decision-making, and its significant impact on industries such as finance, healthcare, manufacturing, and more. By gathering insights from leading experts, this study offers a comprehensive look at AI's opportunities, impacts, challenges, and the research directions necessary as we navigate its emergence across different domains.

However, the swift integration of AI into daily life also brings to the forefront a myriad of ethical considerations and societal implications that demand urgent attention. This paper critically examines the ethical dilemmas posed by AI, including issues of privacy, surveillance, algorithmic bias, and the potential for socio-economic disparities exacerbated by uneven access to AI technologies. The research emphasizes the necessity of developing robust ethical frameworks and governance models to guide the responsible development and deployment of AI technologies. Through a comprehensive review of literature and case studies, this study advocates for a balanced approach to AI development, one that harnesses its potential for positive impact while vigilantly mitigating its risks.

In conclusion, the paper calls for an interdisciplinary effort among technologists, policymakers, ethicists, and the public to ensure that AI serves as a force for good, enhancing human capabilities and societal well-being without compromising ethical standards or social equity. The future of AI, as outlined in this research, lies in the delicate balance between embracing innovation and upholding our collective responsibility to address its societal and ethical ramifications.

Keywords:

Artificial Intelligence (AI), Ethical considerations, Societal impact, Technological innovation, AI governance, Machine learning, Algorithmic bias, Scientific breakthroughs, Data privacy, Human enhancement

Introduction

The advent of Artificial Intelligence (AI) marks a pivotal epoch in human history, characterized by unprecedented technological advancement and its profound implications on society. As we stand on the cusp of this technological revolution, the discourse around AI's societal impact and scientific discovery has intensified, driven by both optimism and caution. This article synthesizes insights from recent studies and reports, including the One Hundred Year Study on Artificial Intelligence (AI100) and various scientific breakthroughs highlighted in "Nature", to explore the multifaceted effects of AI on our world.

Artificial Intelligence (AI) is a concept that has been part of public discourse for decades, often depicted within science fiction films or debates on how intelligent machines will take over the world relegating the human race to a mundane servile existence in supporting the new AI order. Whilst this picture is a somewhat caricature-like depiction of AI, the reality is that artificial intelligence has arrived in the present and many of us regularly interact with the technology in our daily lives. AI technology is no longer the realm of futurologists but an integral component of the business model of many organisations and a key strategic element in the plans for many sectors of business, medicine and governments on a global scale. This transformational impact from AI has led to significant academic interest with recent studies researching the impacts and consequences of the technology rather than the performance implications of AI, which seems to have been the key research domain for a number of years.

As AI technologies evolve at a rapid pace, their integration into various sectors of society underscores a remarkable potential to enhance human capabilities and drive scientific breakthroughs. This paper delves into the transformative impacts of AI across healthcare, education, finance, and more, illustrating how AI applications are revolutionizing these fields by improving efficiency, accuracy, and personalized services. This research paper explores the profound dual nature of Artificial Intelligence (AI) as both a catalyst for unprecedented innovation and a source of significant societal and ethical challenges

At the core of this investigation is the recognition of AI's role in accelerating scientific discovery, exemplified by its contributions to decoding complex biological structures, advancing quantum computing, and addressing critical climate change issues through predictive modeling. These advancements highlight AI's invaluable contribution to expanding human knowledge and addressing some of the most pressing challenges facing humanity today.

Literature Review

The literature has offered various definitions of AI, each encapsulating the key concepts of non-human intelligence programmed to perform specific tasks. Russell and Norvig (2016) defined the term AI to describe systems that mimic cognitive functions generally associated with human attributes such as learning, speech and problem solving. A more detailed and perhaps elaborate characterisation was presented in Kaplan and Haenlein (2019), where the study describes AI in the context of its ability to independently interpret and learn from external data to achieve specific outcomes via flexible adaptation. The use of big data has enabled algorithms to deliver excellent performance for specific tasks (robotic vehicles, game playing, autonomous scheduling etc.) and a more pragmatic application of AI rather than the more cognitive focussed – human level AI where the complexities of human thinking and feelings have yet to be translated effectively (Hays & Efros, 2007; Russell & Norvig, 2016). The common thread amongst these definitions is the increasing capability of machines to perform specific roles and tasks currently performed by humans within the workplace and society in general.

The ability for AI to overcome some of the computationally intensive, intellectual and perhaps even creative limitations of humans, opens up new application domains within education and marketing, healthcare, finance and manufacturing with resulting impacts on productivity and performance. AI enabled systems within organisations are expanding rapidly, transforming business and manufacturing, extending their reach into what would normally be seen as exclusively human domains (Daugherty & Wilson, 2018; Miller, 2018). The era of AI systems has progressed to levels where autonomous vehicles, chatbots, autonomous planning and scheduling, gaming, translation, medical diagnosis and even spam fighting can be performed via machine intelligence. The views of AI experts as presented in Müller and Bostrom (2016), predicted that AI systems are likely to reach overall human ability by 2075 and that some experts feel that further progress of AI towards super intelligence may be bad for humanity. Society generally is yet to fully grasp many of the ethical and economic considerations associated with AI and big data and its wider impact on human life, culture, sustainability and technological transformation (Duan, Edwards, & Dwivedi, 2019; Pappas, Mikalef, Giannakos, Krogstie, & Lekakos, 2018).

The evolution of Artificial Intelligence (AI) and its increasingly prominent role in society and science mark one of the most significant technological narratives of the 21st century. This journey, from theoretical underpinnings to mainstream applications, illustrates a dynamic field that continues to push the boundaries of what machines can achieve, reshaping human life and scientific exploration in the process.

Early Foundations and Theoretical Beginnings

AI's evolution began in the mid-20th century, rooted in the desire to create machines capable of intelligent behavior. Early pioneers like Alan Turing questioned the potential for machines to think, setting the stage with the Turing Test as a criterion of intelligence. The 1956 Dartmouth conference is often cited as the birthplace of AI as a formal field, where the term "Artificial Intelligence" was coined, and the foundational goal was set to create machines that could simulate every aspect of learning and intelligence.

The Rise of Machine Learning and Neural Networks

By the 1980s and 1990s, the focus shifted towards developing algorithms that could learn from data, a subfield known as machine learning. The resurgence of neural networks, inspired by the biological processes of the human brain, enabled machines to process information in complex layers, leading to significant advancements in pattern recognition and predictive modeling. This period laid the groundwork for deep learning, a subset of machine learning characterized by deep neural networks with many layers, revolutionizing AI's capabilities.

LeCun, Bengio, and Hinton (2015) in their seminal paper in "Nature" describe deep learning architectures that have significantly advanced the field of AI, leading to breakthroughs in image and speech recognition, natural language processing, and beyond. Their work underscores the foundational role of deep learning in contemporary AI advancements.

Mainstream Integration and Impact on Society

The integration of AI into society has accelerated over the past two decades, driven by exponential increases in computational power, vast amounts of data, and significant improvements in algorithms. AI applications are now ubiquitous, from personal assistants like Siri and Alexa to more complex systems that drive cars, recommend products online, enhance medical diagnostics, and personalize education. AI's role extends beyond convenience, addressing critical societal challenges such as climate change, healthcare, and global inequality.

Transformative Influence on Science

In the realm of scientific discovery, AI has emerged as a powerful tool for accelerating research and uncovering new knowledge. In biology, AI algorithms have predicted the 3D shapes of proteins, a breakthrough with profound implications for understanding diseases and developing new drugs. In physics, AI assists in analyzing data from particle colliders and telescopes, uncovering insights about the universe. Moreover, AI is instrumental in climate science, modeling complex climate systems to predict future changes with unprecedented accuracy.

Fasli and Michalakopoulos (2020) provide an overview of autonomous systems, highlighting their increasing use in transportation, healthcare, and manufacturing. These systems' capabilities to operate independently and make decisions in real-time scenarios underscore a significant leap in AI's practical applications.

Jiang et al. (2017) in "Nature Biomedical Engineering" discuss AI's transformative potential in healthcare, particularly in diagnostics and personalized medicine. The ability of AI systems to analyze vast datasets can lead to more accurate diagnoses and treatment plans, indicating a shift towards more personalized patient care.

Acemoglu and Restrepo (2020) examine the impact of AI and automation on employment and wages in their work in the "Journal of Economic Perspectives." They highlight the dual effects of AI: the displacement of jobs through automation and the creation of new employment opportunities in AI-driven industries.

Ethical, Societal, and Technical Challenges

As AI becomes more sophisticated, it also raises critical ethical and societal questions. Issues around privacy, surveillance, bias in AI algorithms, and the displacement of jobs due to automation are at the forefront of public discourse. The technical challenge of ensuring AI systems are reliable, safe, and secure, particularly in critical applications, adds another layer of complexity. Moreover, the development of AI governance and ethical guidelines has become a crucial area of research and policy-making.

AI systems can inadvertently replicate biases present in their training data, leading to unethical outcomes in critical decision-making processes. The development of new principles of AI ethics is necessary to guide its progress and mitigate negative impacts on human society (Kiran Yashwant & Mhapsekar).

The introduction of artificial intelligence (AI) into human society is heralded as both a marvel of human ingenuity and a potential harbinger of unprecedented change. The impacts of AI on human society are vast and multifaceted, affecting everything from the economy and employment to ethics and human behavior. This paper explores the significant ways in which AI is reshaping human society, leveraging insights from recent research to understand the breadth of AI's influence and the challenges it presents.

AI's integration into human society marks a pivotal shift, reminiscent of historical technological revolutions but unique in its scope and speed. As articulated by Gelepithis (1999), the full realization of AI's potential—constructing human-level, domain-independent intelligent entities—poses profound implications for human work, education, and the human-machine boundary (Gelepithis, 1999). This revolution challenges traditional conceptions of employment and necessitates a reevaluation of education to prepare for a future where human roles in society are fundamentally altered.

Bias and Fairness: Barocas, Hardt, and Narayanan (2019) in their book "Fairness and Abstraction in Sociotechnical Systems" address the critical issue of bias in AI systems. They argue that without careful consideration, AI algorithms can perpetuate and amplify societal biases, raising significant ethical concerns about fairness and equality.

Privacy and Surveillance: Zuboff (2019) in "The Age of Surveillance Capitalism" explores the implications of AI in the context of data privacy and surveillance. The book critically examines how AI-driven technologies collect and use personal data, often without explicit consent, posing challenges to privacy rights and individual autonomy.

The advent of AI technologies in surveillance and data processing has raised significant privacy and security concerns. The deployment of AI systems often involves the collection and analysis of vast amounts of personal data, leading to potential infringements on human rights and privacy (Ms. Reena Salvi & Dr. Rashmi Singh).

Ethical AI Development: Floridi et al. (2018) in "Science" discuss the ethical framework for a good AI society. They emphasize the importance of ethical guidelines for AI development, focusing on transparency, accountability, and societal welfare, to ensure that AI technologies are developed and deployed in a manner that respects human rights and dignity.

AI in Governance and Public Services

In education, the integration of AI technologies has led to the development of Intelligent Coaching Systems, Personalized Learning Platforms, and Virtual Classrooms, showcasing the potential advantages and challenges in this sector (Artificial Intelligence and Human Society). Cath et al. (2018) in "Science" highlight the need for robust governance structures to manage AI's societal impact. They argue for international collaboration to develop standards and regulations that ensure AI technologies are used responsibly and for the benefit of all.

Social and Cultural Changes

AI has the capacity to both enhance and worsen social inequalities. It brings about changes in daily life and human interaction, potentially reshaping our self-awareness and societal norms (M. C. Tai). Furthermore, AI-driven globalization can lead to cultural disintegration and social disadvantages, challenging us to create accountable and inclusive systems (Anzala Khan & Aazka K. P.).

Sustainability and AI: Rolnick et al. (2019) in "Communications of the ACM" discuss how AI can address environmental challenges. They identify opportunities for AI to contribute to sustainable practices in energy, agriculture, and climate modeling, emphasizing the potential for AI to aid in the global sustainability effort.

Impact on Employment and Economy

Artificial Intelligence has transformed the modern workplace by enhancing efficiency, production, and cost savings through automation and augmented human capacity. This leads to improved customer service and decision-making processes (Anurag et al.). However, there's also a potential downside, such as unemployment and the exacerbation of conflicts due to AI-driven changes (Anzala Khan & Aazka K. P.).

Future Directions

Looking ahead, AI is poised to continue its trajectory of rapid development and deeper integration into both society and science. Emerging frontiers such as quantum computing could further unlock AI's potential, enabling even more complex problem-solving capabilities. However, the future of AI also depends on addressing the ethical and societal challenges it presents, ensuring that AI development is aligned with human values and benefits all of humanity.

As AI continues to evolve, its multifaceted impact on human society becomes increasingly apparent. Balancing technological innovation with ethical considerations and societal wellbeing is paramount. By addressing concerns related to privacy, security, ethics, and social equality, we can harness AI's potential to contribute positively to human society.

This exploration highlights the need for ongoing research, thoughtful policy-making, and the development of AI technologies that prioritize human values and societal benefits.

In summary, the integration of AI into human society is a complex phenomenon with far-reaching implications. From transforming employment and education to raising ethical and human rights considerations, AI's impact is profound and multifaceted. As humanity stands on the cusp of this technological revolution, it is imperative to navigate the challenges and opportunities presented by AI with foresight and responsibility.

Conclusion

The intersection of AI and society is a dynamic and evolving landscape, marked by significant opportunities and challenges. As AI continues to shape our world, a balanced approach that combines technological innovation with ethical considerations and societal engagement is crucial. By fostering interdisciplinary collaboration and prioritizing ethical development, we can harness the potential of AI to enhance human capabilities and address some of the most pressing challenges facing our society today. The journey ahead is complex, but with careful navigation, the future of AI can be as promising as it is transformative.

The introduction of artificial intelligence (AI) into human society is heralded as both a marvel of human ingenuity and a potential harbinger of unprecedented change. The impacts of AI on human society are vast and multifaceted, affecting everything from the economy and employment to ethics and human behavior. This paper explores the significant ways in which AI is reshaping human society, leveraging insights from recent research to understand the breadth of AI's influence and the challenges it presents.

The aim of exploring the impact of Artificial Intelligence (AI) across different sectors is to comprehensively understand how AI advancements are reshaping various aspects of human life, society, and the natural environment. This exploration is motivated by the rapid development and integration of AI technologies, which are no longer confined to academic research labs but are now fundamental components of many industries and societal functions.

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IMPACT OF PURCHASE INTENTION ON IMPULSE BUYING BEHAVIOUR: EXPLORING ECO-FRIENDLY PRODUCT CONSUMPTION

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&

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Abstract

The paper aims to examine the factors that impact the consumers' purchase intention towards impulse buying in the case of eco-friendly products. This study investigates the phenomenon of impulse buying within the realm of eco-friendly products, aiming to provide a comprehensive understanding of consumer behaviour in sustainable consumption. As the global awareness of environmental issues continues to rise, consumers are increasingly drawn to eco-friendly alternatives. This research explores the factors influencing impulse buying decisions in the context of environmentally sustainable products and their implications for both consumers and marketers. For this purpose, survey data was collected online using social media platforms. A total of 100 online questionnaires were collected and analyzed. In this study, the extension of Theory of planned behaviour was used to evaluate the factors impacting impulse buying in case of eco-friendly products. The impact of five determinants (Eco-label, Perceived value, Environmental knowledge, social influence, Purchase intention on impulse buying of eco-friendly products). The finding of the study shows that environmental knowledge has an impact on purchase intention and furthermore, purchase intention has an impact on impulse buying in case of eco-friendly products.

Keywords

Eco-label, Perceived value, Environment knowledge, social influence, Purchase intention, Impulse buying, Theory of planned behaviour.

1. Introduction

Rapid economic development and technological progress bring even more convenience to people's lives but also pose many environmental challenges, such as air pollution, climate change, and global warming. These problems directly affect the sustainability of economic development, the environment, and society. Consumers began to change their lifestyles and business activities and gradually tended to increase consumption

of green products (Kong et al., 2014). Green products are designed to protect or improve the environment by saving energy or resources and reducing or eliminating toxic waste, pollution, and the use of toxic substances (Ottman et al., 2006). In recent years, sustainability has gained significant traction, influencing consumer behaviour across various industries. As individuals become more conscious of environmental issues, there has been a surge in demand for eco-friendly products. However, amidst the growing sustainability awareness, impulse buying remains a prevalent phenomenon in consumer markets. This paper explores the complex relationship between purchase intention and impulse buying concerning eco-friendly products.

1.1 Overview of Impulse Buying Behaviour

Rook & Hoch (1985) stated that when it comes to making purchases on the spur of the moment, there are a few things that are essential to bear in mind. The following are these five elements: "a state of psychological disequilibrium," "the onset of psychological conflict and struggle," "a reduction in cognitive evaluation," and "a lack of regard for the consequences of impulse buying." Rook (1987) redefined impulse buying: "Impulse buying occurs when a consumer experiences a sudden, often powerful and persistent urge to buy something immediately." Impulse buying occurs in a shorter period than unplanned purchases, and impulsive buying may occur once or recur more than once for the same consumer (Dholakia, 2000).

1.2 Impulse Buying in case of eco-friendly products

Consumers make impulse decisions when they are influenced by the activities of the firm. But it depends upon the consumers' personality traits. Some people like to get the premium, store environment, and promotion strategies significantly impact consumer buying decisions. Due to the usual efforts like store environment, promotional strategy, demographic factors, quality of product, and internal and external stimuli, if consumers take the decision spur at the moment, it will impulse decision. But when the impulse decision would occur due to green practices like eco-advertising, BOP, eco-labelling, eco-branding, environmentally friendly products, and eco-marketing, it will replace Impulse buying.

2.Review of Literature

2.1 Eco-Label

An eco-label is a recognition in the form of a symbol or sign for a product or service claiming that, during its life cycle, starting from the acquisition of raw materials, the production process, distribution, use and disposal, it has a relatively lower impact on the environment compared to other products of the same type (Alamsyah et al., 2019).

Eco-labelled products are widely accepted as environmentally friendly products that protect the environment. Eco-labelled products can be defined as products "that help to bridge the buyer-seller knowledge gap by highlighting their environmental friendliness" (Nguyen and Le, 2020) In marketing, eco-labels provide information cues that reduce the information gap between marketers and consumers to support consumption decisions (Taufique et al., 2017) Eco-labels support product differentiation and, thus, represent an important communication tool for companies (Mufidah et al., 2018). Also, eco-labels are often used in combination with other communication techniques, especially with green advertising, as they add more credibility and persuasiveness to the content of green advertisements (Bickart & Ruth, 2012; Sun et al., 2021)

H1: Eco-label has an impact on purchase intention

2.2 Perceived value

Perceived value is described as a customer's general assessment of the net benefit of a service or product based on a customer's judgment (Bolton, 1991). Koller (2011) has stated

that the perceived value of green is one of the most important for green users. A lot of consumers really care about their purchases; it is essential for them that the green products they buy are accepted in their social surroundings. Green perceived value refers to consumers' overall appraisal of what they give for and receive from a product or service based on their environmental desires, sustainability expectations, and green needs found a positive and significant relationship with the purchase intentions of green products. (Chen and Chang, 2012). Perceived value is crucial to marketing performance, because companies can cultivate consumers' purchasing intentions through consumers' perceived value (Zhuang et al., 2010). Those consumers concerned with the environment will buy green products for their environmental benefits (Yaacob and Zakaria, 2011). As an essential intermediate state variable in the process of consumer purchase, perceived value can serve as a signal of consumer judgment and a key antecedent of purchase intention (Mahesh, 2013). Tan and Goh (2018) contend that the higher the perceived value of green products, the stronger the consumer purchase intention. Perceived value was classified as quality, price, emotional, and social values based on the Theory of consumer perceived value proposed by Sweeney and Soutar (2001). In contrast with ordinary household appliances, energy-saving appliances have the unique properties of environmental protection value. Hence, environmental value was also included as one dimension of consumer perceived value of energy-saving appliances.

H2: Perceived value has an impact on purchase intention

2.3 Social influence

Social influence refers to observing the attitudes and behaviours of a person to change his or her self-faith and behaviours; thus, purchase decisions are affected by family, friends, and the Internet (Diego, C.P.; Meucci). Scholars have suggested that consumer intention to purchase products or green products is affected by the opinions of friends, social influences, and social cognitive values (Paladino, A). The opinions of others typically affect the intention to purchase green products. In this study, social influence is defined as follows: "Consumers change their faith and cognitive values towards purchasing green products based on the opinions of others." The Ajzens theory of Planned Behaviour (TPB) describes the subjective norm factors associated with social pressure to perform or not perform certain behaviours and also highlights reference issues in which consumers will act and think whether their references will approve or reject certain behaviours (Han et al., L. T. (2010). Research shows that social influence or direct identification with environmentally conscious consumers has an impact on green product purchasing behaviour (Bartels et al., K. (2011).

H3: Social influence has an impact on purchase intention

2.4 Environmental knowledge

Environmental knowledge refers to consumer understanding and awareness of environmental problems and their solutions (Safari et al., 2018). When environmental knowledge increases, there is a corresponding increase in green awareness of the products consumed (Rashid, 2009). Gao et al. (2016) showed the importance of consumer knowledge and views of environmentally friendly products in determining green awareness. This finding was supported by Putri et al. (2021), who emphasized that consumer green awareness is a behaviour that is more influenced by environmental knowledge than perceived quality. In the literature on environmental knowledge, researchers usually use different environmental knowledge concepts to predict individual green behaviour: general or specific environmental knowledge and subjective or objective environmental knowledge (Lee, 2017). The literature suggests that as consumers accumulate more environmental knowledge, their attention toward purchasing green products increases. Environmental knowledge has a significant positive impact on consumers' intention to purchase environmentally friendly products (Wang et al., 2014). Specifically, consumer environmental knowledge has been identified as

an essential predictor of (Ahmad and Thyagaraj (2015) and positive influencer of Choi and Johnson (2019) green purchase intention.

H4: Environment Knowledge has an impact on purchase intention

2.5. Purchase Intention

In explaining this notion, the study states that the individual's purchase intention triggers the individual's abrupt buying behaviour (Ding et al., 2020). In particular, consumers' impulsive behaviour is the outcome of an individual's psychological desire (Wertenbroch et al., 2020). In this context, the study shows that purchase intention shapes the individuals' desires (Meena, 2018), substantially leading to impulsive buying. Purchase intention is influenced by consumer awareness of the environment and knowledge about environmentally friendly products (Debora Indriani et al., 2019). Meanwhile, according to (W. et al., 2020), green purchase intention is influenced by five aspects, namely environmental awareness, knowledge of the environment, knowledge of environmentally friendly products, psychological factors, and environmental factors. For consumers, eco-labels comprise an important informative role, representing an obvious sign to buy green products and giving them reliable guidance for evaluating similar products of different manufacturers (Suki et al., 2016; Shahrin et al., 2017; Song, Qin & Qin, 2020; Sun et al., 2021; Marini et al., 2021; Alamsyah, Othman, Bakri, Udjaja & Aryanto, 2021) There is a growing empirical evidence that using eco-labels influences consumers' purchasing intentions therefore impulsive decision take place in case of eco-friendly products.(Nguyen-Viet, 2022; Chi, 2021).

H5: Purchase intention has an impact on impulse buying

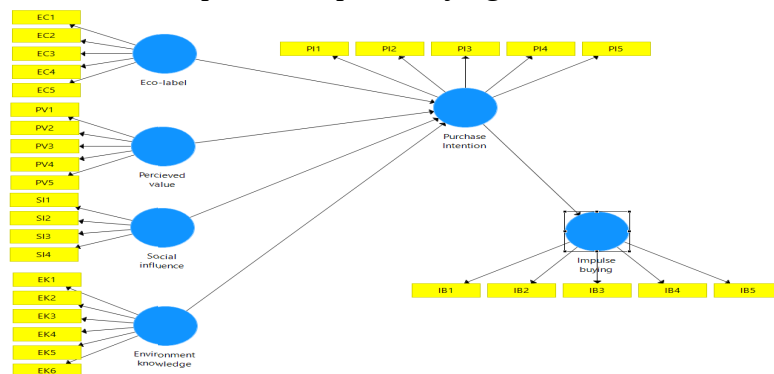


Figure : 1 Conceptual Model

3. Research Methodology

3.1 Research design

The questionnaire survey was distributed through an online questionnaire platform, Google Forms. A judgemental sampling technique was used to collect the data. The screening criteria for selecting the participants for this research were (1) consumers aged 18 years old and above and (2) having experience using Eco-friendly products. There are two sections of the survey. In the first section, participants were requested to report their background profile, such as their age group, gender, education level and income level. The second section consisted of items to measure respondents' perception of eco-label, perceived value, social influence, environmental knowledge, purchase intention and impulse buying behaviour regarding the use of eco-friendly products. In total, 100 participants fulfilled the inclusion criteria of this study and completed the questionnaire.

3.2 Descriptive statistics

Table 1 shows the details of the participants' demographic profiles.

Table 1

Category	Description	Frequency
Gender	Male	35
	Female	65
Age group	18 to less than 25 years	49
	25 to less than 35 years	35
	35 to less than 45 years	12
	45 to less than 59 years	4
Education level	Under-Graduate	32
	Graduate	17
	Post-Graduate	30
	Post-Graduate & Above	21
Annual household income	Less than 1,00,000	20
	1,00,000-2,00,000	21
	2,00,000-5,00,000	22
	5,00,000-10,00,000	19
	10,00,000 or above	18

3.3 Measures

The research instrument covered items related to six constructs: To measure participants, purchase intention this study adopted the scale from (Paul, J., Modi), eco-label was measured from (Rashid, 2009; Taufique et al., 2017), perceived value from Mourad and Ahmed (2012), impulse buying from (Theresa Hayat et al., 2020; Waterbury, 2018), social influence from (Chih-Cheng Chen) and environment knowledge from (Mohammad Iqbal Irfany and Yusniar Khairunnisa).

4.Data Analysis and Results

Partial least square path modelling (PLS-SEM) is most suitable for testing a complex model with formative constructs and a small sample size that does not require a normal distribution. PLS-SEM was applied to test the research hypotheses and model fitness using Smart-PLS 3.0. While collecting the data, anonymity and confidentiality of the respondents were ensured to help elicit honest responses.

4.1 Measurement model

The convergent validity of the model was analyzed using factor loadings, composite reliability (CR) and average variance extracted (AVE). The factor loadings of all the items were more significant than 0.5, as shown in Table 2. Similarly, for all six constructs, AVE scores >0.50 and CR scores >0.70 were statistically significant (Fornell & Larcker, 1981).

Table 2

	Cronbach's Alpha	rho_A	Composite reliability	Average Variance Extracted
Eco-label	0.763	0.775	0.838	0.509
Environment knowledge	0.819	0.821	0.868	0.526
Impulse buying	0.810	0.826	0.867	0.568
Perceived value	0.864	0.878	0.903	0.653
Purchase intention	0.845	0.850	0.890	0.617
Social influence	0.831	0.848	0.886	0.661

Discriminant validity is an indicator that determines how the study's constructs differ from each other (Hulland, 1999). It was computed using AVE, following Fornell and Larcker (1981). The primary discriminant validity condition is that the AVE of each construct should be higher than its variance.

Table 3

	ECo-label	Environment knowledge	Impulse buying	Perceived value	Purchase intention	Social influence
ECo-label	0.714					
Environmen...	0.592	0.725				
Impulse buy...	0.572	0.672	0.753			
Perceived v...	0.673	0.605	0.678	0.808		
Purchase int...	0.601	0.725	0.714	0.600	0.786	
Social influe...	0.629	0.552	0.641	0.667	0.560	0.813

5. Findings

The findings of this study will provide valuable insights into the factors driving consumer behaviour towards eco-friendly products. Specifically, the roles of eco-label, perceived value, social influence, and environmental knowledge in shaping purchase intention and impulse buying behaviour will be discussed.

Table 4

	Original Sample	Sample Mean	Standard deviation	T Statistics	P Values
Eco-label > Purchase intention	0.619	0.603	0.104	5.985	0.000
Environment knowledge > Purchase intention	0.621	0.608	0.69	9.116	0.000
Perceived value > Purchase intention	0.101	0.113	0.094	1.007	0.282
Purchase intention > Impulse buying	0.460	0.488	0.080	6.858	0.000
Social influence > Purchase intention	0.101	0.618	0.080	5.757	0.000

Hypothesis 1: The results showed a significant positive relationship between Eco-label and purchase intention because p value is 0.000 which is less than 0.05 which is statistically significant (Lee et al., 2019; Waris and Ahmed, 2020).

Hypothesis 2: The results showed a significant positive relationship between Perceived value and purchase intention because p value is 0.002 which is more significant than 0.05 which is statistically insignificant.

Hypothesis 3: The results showed a significant positive relationship between social influence and purchase intention because p value is 0.000 which is less than 0.05 which is statistically significant (Aindrila et al. (2015) This means that friends and family are also contributing information leading to a positive intention.

Hypothesis 4: The results showed a significant positive relationship between environmental knowledge and purchase intention because p value is 0.000, which is less than 0.05, which is statistically significant

Hypothesis 5: The results showed a significant positive relationship between purchase intention and impulse buying because the p value is 0.000, which is less than 0.05, which is statistically significant.

6. Managerial Implications

The study highlights the importance of environmental knowledge in shaping consumers' purchase intentions and impulse buying behaviour. This suggests that efforts to educate consumers about environmental issues and the benefits of eco-friendly products can positively influence their purchasing decisions. For businesses operating in competitive markets, emphasizing eco-labels and highlighting the environmental benefits of their products can serve as a point of differentiation. The perceived value of eco-friendly products plays a crucial role in consumers' decision-making process. Businesses should focus on highlighting the value proposition of their eco-friendly products, emphasizing benefits such as sustainability, quality, and social responsibility. The study may highlight the role of social influence in shaping consumer behaviour towards eco-friendly products. Social factors, such as peer recommendations, social norms, and societal attitudes towards sustainability, can significantly impact purchase intention and impulse buying behaviour.

7. Conclusion

In conclusion, this research has provided valuable insights into the intricate relationships among eco-label, perceived value, social influence, environmental knowledge, purchase intention, and impulse buying behaviour concerning eco-friendly products. Through the analysis of data collected from consumers, several key findings have emerged.

Firstly, eco-labels serve as a significant cue for consumers to evaluate the environmental credentials of products. Consumers are more inclined to trust and purchase products with recognized eco-labels, indicating the importance of certification schemes in influencing consumer behaviour towards eco-friendly options. Secondly, perceived value, encompassing not only economic but also environmental and social benefits, plays a crucial role in shaping purchase intention. Consumers are more likely to choose eco-friendly products when they perceive them to offer high value relative to their cost, highlighting the importance of effectively communicating the holistic benefits of such products. Thirdly, social influence, including word-of-mouth recommendations and social norms, significantly impacts consumer behaviour towards eco-friendly products. Peer influence and societal expectations play a substantial role in shaping purchase decisions, emphasizing the need for businesses to leverage social networks and community engagement in their marketing strategies. Furthermore, environmental knowledge emerges as a key determinant of consumer behaviour, with higher levels of environmental awareness associated with increased concern for sustainability and a greater likelihood of choosing eco-friendly options.

8. Limitations and Future directions

While this study examines the impact of eco-label, perceived value, social influence, and environmental knowledge on purchase intention and impulse buying behaviour, other relevant variables may also play a significant role in shaping consumer behaviour towards eco-friendly products. This study uses TPB as the core theory to determine the factors in predicting the purchase intention and impulse buying in eco-friendly products. This study only tested the direct relationships in the proposed model; it is suggested that future studies may investigate the mediation and moderation impact in the proposed model to find out the mechanism behind those direct relationships. The future trend of consumption and purchasing patterns are highly affected by the eco-friendly product attributes and the quality, which encourage pro-environment behaviour and ensure the business model's sustainability.

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LITERARY FINDINGS

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“A STUDY ON THE EFFECTIVENESS OF FLIPPED CLASSROOM MODEL IN STRESS MANAGEMENT AND ACADEMIC ACHIEVEMENT IN ENGLISH AMONG SECONDARY SCHOOL STUDENTS.”

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Abstract

Educators have been working to break the lecture center instructional model by shifting the focus from the curriculum pacing guide to students learning needs as the driver of instruction, they are increasingly turning to an alternative model of instruction called Flipped learning in which digital technologies are used to shift direct instruction outside of the group learning space to the individual learning space, usually via videos. Considering 21st century skills it's a need of today's education system that the students to be trained in learning and thinking skills and ICT skills, innovation and creativity, communication and collaboration, among others. The flipped classroom can be a best option to inculcate these skills amongst the students. As its time to be as "Guide on the side". In simple words, the flipped classroom learning is "school work at home and home work at school" The presents study reveals the stress amongst the students towards English language and how it affects to their academic achievement. For the same the researcher developed self-made tool. The present study consists 50 students of class IX of Deshmukh Madhyamik Vidyalaya Nagpur. The researcher developed an instructional module for teaching topic of English grammar. The quantitative part of the study was a quasi-experimental, two groups pretest posttest design. The qualitative part of the study focused on the process of instructional intervention. This paper presents the experimental part of the study.

Keywords

Flipped Classroom, Stress, academic achievement, student centric method.

Introduction

"I never teach my pupils; I only attempt to provide the conditions in which they can learn." ---- Albert Einstein Good teachers, of course, work to read their classes' levels of comprehension in real-time during lectures, and make adjustments to find the right speed at which to teach the average student. Likewise, attentive instructors monitor students understanding of the subject as demonstrated in homework, and curve the classroom to cover what will be most valuable for most of the students. However,

flipped module was effective in delivering an overview of the required material for the course. Frydenberg Mark (2012) found that a smaller class size and a classroom with tables rather than rows of fixed seating is more conducive for implementing a flipped classroom. Saban Yasmin (2013) found that the instructional module was effective in persuading teachers to adopt Flipped method of instruction. Moroney Sean (2013) found that the students favored traditional method as they were studying using the traditional method since many years and were reluctant to change. Saima Bashir (2022) Found that FCM has a significant effect on the academic achievement of students. So FCM should be preferred for the teaching of English at secondary level rather than traditional method. FCM is useful for grammar, vocabulary building, comprehension and translation in English. Priti Rajpoot (2023) found that the developed Instructional material based on the Flipped Learning Design was more effective than the traditional learning. Flipped Learning is an effective approach compared to the traditional lecture approach.

The researcher wanted to see if stress level could be reduced and the academic achievement of secondary school students in English would be enhanced by flipped classroom method.

Objective of the Study

To study the effectiveness of flipped classroom model in stress management and academic achievement in English among secondary school students.

Hypothesis

Ho1: There is no significant difference in the pretest scores of experimental and control groups in terms of stress and academic achievement in English language.

Ho2: There is no significant difference in the posttest scores of experimental and control groups in terms stress and academic achievement in English language.

Methodology

The quantitative study is a quasi-experimental, two groups pretest posttest design.

Instruments In the present study, researcher used the following tools:

- self-made Pre/Post stress scale test.
- Pre/post (achievement) test in English grammar
- An instructional module consisting of videos and work sheets on topics of English grammar Tenses (Present, Past and Future) for grade IX students;
- Semi- structured interview schedule for studying the perceived utility of flipped classroom strategy
- Field notes, worksheets, etc. for studying the classroom processes.

Sample

The sample in the present study was selected by purposive and convenient sampling technique. The participants comprised of 50 students of class IX of Deshmukh Madhyamik Vidyalaya Nagpur. The school is affiliated to SSC Board. The experimental and control groups had 25 students each including girls and boys.

The parents of the participants were mostly (80%) undergraduates; more than 70 % of the participants has access to and are capable of operating mobile and computer. (In order that the absence of these facilities is not a hindrance to the flipped classroom, the videos were made available for viewing in school during weekend or Saturday as school runs half day in the school computer laboratory in the presence of the teachers). The students did not ask questions while watching the video in the computer laboratory rather they paused / replayed the videos when in doubt.

Implementation of Flipped Classroom Strategy

In January the intervention begins and the 15 days session was planned and conducted at Deshmukh Madhyamika Vidyalaya Nagpur. First 50 students were divided into two groups. 25 students in control group and 25 students in the experimental group both boys and girls by purposive and convenient technique. The students and the parents were oriented to the strategy and their cooperation was sought. The stress scale test was given to the both the groups to rectify the stress among the students about English language. It contains 20 questions to get the answers in yes or no from. Next day on the basis of the difficulty level of English grammar Tenses and its types, 40 marks pretest was given to the students to check their knowledge and understanding towards the selected topic. On third day onwards both the groups were separated and the control group will be taught through traditional methodology. The experimental group students were taught through flipped classroom methodology. Videos were uploaded on the school website and sent through the students what's app group. Information about the link of the school website and the videos to be watched was provided to the students. In all, three videos were uploaded and sent to the students related to the topic of English grammar Tenses. Videos were selected on the basis of the content, difficulty level, animation and duration. The students were allotted four days to watch these videos. In the next session, a quiz was conducted to verify if students have watched the video. Students who could not watch the videos due to unavailability of internet connection/ computer were asked to use the computer laboratory of the school in their free lectures during school hours. They were also instructed that they could view these videos and use the school computer laboratory on Saturday (when the students have half day but the school is working full day and computer teachers are available to help them). The details of the videos are as follows:

Title of the videos	Duration in minutes
Introduction to tenses	10
Types of tenses	15
Uses of tenses	10
Importance of tenses in English communication	10

There were students who could not watch the videos due to reasons such as family functions, not feeling well, other subjects' homework, private tuition homework, forgot to see the video. These students were given more two days to watch the videos. The students were provided with the study material of the topic assigned to them in advance. Each group was asked to choose a group leader. The students were given two days' time to prepare presentations of their respective topics.

On the 10th day the students were divided into 5 groups, 5 students in each group. The topic "Tenses" was divided into 5 parts and allotted as follows:

- Group 1: What is tense? Give examples.
- Group 2: What are main types of tenses? Give examples.
- Group 3: Explain the sub types of tenses.
- Group 4: How to convert the one tense to another tense.
- Group 5: How do you find tenses are useful in your English communication?

Day 11: The worksheets based on the videos are solved in the classroom to check if the students have watched the videos. It was ensured that the students were ready with their presentations. • **Day 12:** The students made their presentations on the given topics in the class. The question-and-answer session was conducted in the class facilitated by the teacher. • **Day 13:** All the assignment questions in the text were discussed in the class. Students solved

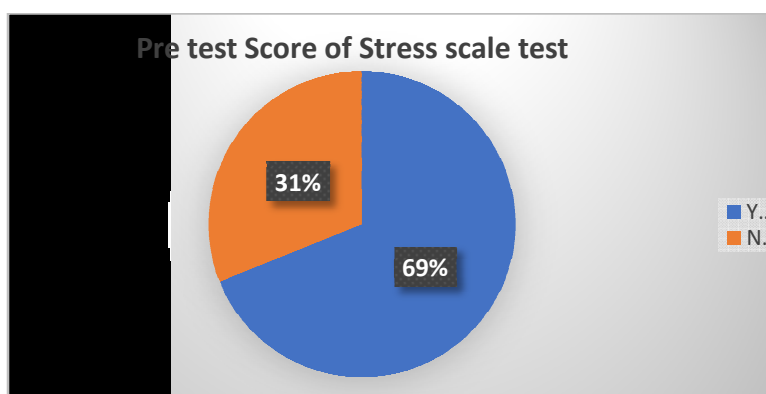
questionnaire in the classroom. When required, the teacher guided the students to arrive at the right answers. During this process the students were free to view the videos as often as they wanted. Excitement was visible in the classroom right from the first day. Some students were going to present in the class for the first time. Hence, some of them were nervous. The students were discussing the possible sources of more information like the library, internet. Some students asked the teacher if they could conduct some practical during their presentation. A few students acknowledged this way of studying was new for them. The students were informed that next class, they have to present their topic. In the next session, the students presented their topic. Each group had further divided the topic assigned to them and three/four students presented on the given topic. The class was encouraged by the teacher to ask their doubts/questions to the group which had presented. Whenever the group was unable to answer the query, the teacher cleared the doubts. Each group was allotted ten minutes. Hence, it took two sessions of thirty minutes each to complete all the presentations. Some of the groups did power point presentations using the smart boards in their computer lab. One of the groups had performed role play. Another group, presented the conversation session on the change the tense. In the next two sessions, the students solved the textbook exercises in the classroom itself, in cooperative learning groups, under the guidance of the teacher. Day 14: The discussion session was held with teachers and students and then the post test on Tenses was conducted on control and experimental group to check the effectiveness of flipped classroom strategy in terms academic achievement.

Day 15: On the last of the session same stress scale test was given to both the groups i.e. control and experimental to check whether the stress of English language amongst the students been reduced after the implementation of flipped classroom model in English language.

On the basis of observations made using video recordings, field notes, diaries, pretest posttest score etc., the data analysis was done as follows:

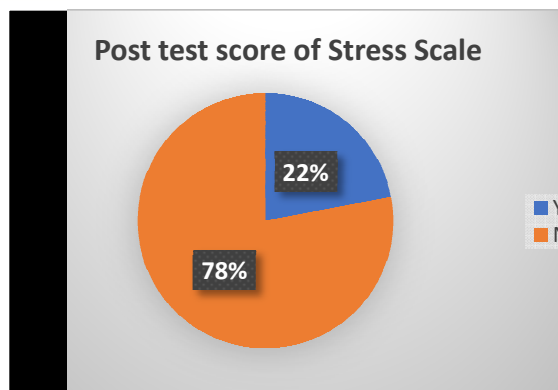
Data analysis and Interpretation

Figure 1: Pie chart showing the pretest Scores of the Experimental and Control group of stress scale test.



The above mention pie chart is showing 69% of students are having stress in English language and 31% students indicates the less stress in the same subject.

Figure 2: Pie chart showing the posttest Scores of the Experimental and Control group of stress scale test.



After implementing the flipped classroom model the reversible change can be seen in the above pie chart, which indicates the 78% of students are not having stress and only 22% of students are having stress in English language. The flipped classroom strategy is effective in terms of reducing stress among the students. Students enjoys the teaching learning process and they take interest and participate in assignments or class discussion actively. It reduces the stress and create interest learning process. The above pie chart shows the effectiveness of FCM in stress management.

Testing Hypothesis Ho1

Ho1: There is no significant difference in the pretest scores of experimental and control groups in terms of stress and academic achievement in English language.

Table 1: Significance of the Difference between the Means of Pretest Scores of the Experimental and Control Groups

Variable	Group	N	df	Mean	SD	Table Value		t test	los
						0.05	0.01		
Achievement in English	Control group	25	48	23.96	5.02	1.24	2.17	0.89	NS
	Experimental group	25		24.12	3.74				

Where N= number of students, los= level of significance, NS= Not Significant

From the above table, it could be seen that the obtained value of t is 0.89 which is less than table value of 1.24 at 0.05 level. The obtained value of t is also less than table value of 2.17 at 0.01 level. Hence, the null hypothesis is accepted at 0.01 and 0.05 level of significance.

Interpretation: The two groups are deemed to be equivalent at least with reference to the variable being observed: the dependent variable

Ho2: There is no significant difference in the posttest scores of experimental and control groups in terms of stress and academic achievement in English language.

Table 2: Significance of the Difference between the Means of Posttest Scores of the Experimental and Control Groups

Variable	Group	N	df	Mean	SD	Table Value		t test	los
						0.05	0.01		
Achievement in English	Control group	25	48	24.72	3.6	1.54	2.69	5.25	S
	Experimental group	25		32.76	3.73				

Where N= number of students, los= level of significance, S= Significant

From the above table, it could be seen that the obtained value of t is 5.25 which is greater than table value of 2.69 at 0.01 level of significance. The obtained value is also greater than table value of 1.54. Hence, the null hypothesis is rejected at 0.05 and 0.01 level of significance.

Interpretation: There is a significant difference at 0.01 level of significance in the achievement in English language of class IX students of control and experimental groups. The mean of experimental group is 32.76, which is higher than the control group's mean of posttest scores 24.72.

Finding:

There is definite, positive influence of flipped classroom strategy on the achievement in English of class IX students. Contribution of the flipped classroom strategy to achievement in English language is greater than tradition method of teaching.

Conclusion:

From the teacher's perspective, flipped classroom is important as it enables increased classroom time to present content, discuss complex topics and work with students- either individually or in small groups. It also enables the teacher to use recorded lectures in multiple course sections- year over year, with easy tools to update content. For students, it develops self-learning skills, makes them tech-savvy and also enhances achievement in English. It inculcates 21st century skills amongst the students. Similar efforts can be extended to the learning of other subjects also. The society expects teachers to do much more than teaching the academics. The classroom time thus saved can also be used to develop in students the 21st century skills such as critical thinking, problem solving skills, ICT skills, communication skills and so on. Flipped classroom can also provide an alternative to coaching classes. The students can enjoy their after-school time in playing games and pursuing aesthetic hobbies.

Recommendations

According to conclusion of this study Flipped classroom model has a significant effect on the academic achievement of students. So FCM should be preferred for the teaching of English at secondary level rather than traditional method. FCM is useful for grammar, vocabulary building, comprehension and translation in English. So teachers may be motivated to use FMC model at every level i.e. primary, high or higher education. In modern era innovative teaching strategies must be adopted. So the Department of Education may provide necessary gadgets for the teacher to utilize FCM lipped classroom model for the students to engage them. For active participation of students FCM is very effective, it enables the students to use their critical thinking and comprehension abilities. FCM would be adopted in order to increase student's engagement. Study reviles that that FMC is very effective for teaching English but it would be used by teacher to teach every subject, because this model is equally useful for all subjects.

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லிட்ரெரி ஃபைண்டிங்ஸ்
பல்துறை அய்வுக்கான பன்னாட்டு அய்விதழ்

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THE IMPACT OF ECONOMIC, SOCIAL, POLITICAL GLOBALIZATION ON SRI LANKAN ECONOMIC GROWTH

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Abstract

The main Purpose of this study is to analyze the long-term and short-term relationship between economic growth and economic, social and political globalization in Sri Lanka applying annual data during the period between 1990 – 2020 by using Autoregressive Distributed Lag (ARDL) model and Error Correction Model (ECM). The effect of economic globalization on economic growth is negative and statistically significant in long – term and short - term. Social globalization on economic growth is positive and statistically significant in short- term but its negative statistically insignificant in long- term. Political globalization and Inflation have significant and positive effect on economic growth in long - term and short- term.

Keywords:

Economic growth, economic globalization, social globalization, political globalization.

1. INTRODUCTION

Globalization refers to the interconnectedness of countries through the exchange of goods, services, information and ideas on global scale. It involves the integration of economics, cultures and societies, leading to increased interactions and interconnection among nations. This process is facilitated by advancement in technology, communication and transportation. Globalization has both positive and negative impact on economic growth. Globalization can positively impact economic growth by fostering international trade, attracting foreign investment and promoting technological advancements. However it can also lead to income inequality, job displacement and vulnerability to global economic fluctuations. balancing the benefits and challenges is crucial for maximizing the positive effects of globalization on economic growth.

Globalization in Sri Lanka refers to the interconnectedness and integration of the country's economy, politics, society and culture with the rest of the world. Over the past few decades, Sri Lanka has experienced significant changes driven by globalization, influenced by factors such as advancements in technology, liberalization or trade and investment policies and increased international cooperation. Sri Lanka has become a part of the global economy, engaging in trade agreements and partnerships with various countries and international

organizations. This has brought both opportunities and challenges, including access to new markets and technologies, as well as competition and vulnerability to external economic shocks. Globalization has brought numerous benefits, it has also posed challenges that require careful management and policy responses to ensure that the benefit are equitably distributed and sustainable over the long term.

2. Literature Review

Ying (2014) studied the link between social and political globalization and economic growth in ASEAN countries between the years 1970 and 2008 by using Fully Modified Ordinary Least Squares (FMOLS) technique. Ying (2014) found out that economic globalization effects economic growth in a positive way but social and political globalization effects it in negative ways.

Kilic (2015) analyzed the effects of economic, social and political globalization on the growth levels of developing countries and causality relationship between the variables by using fixed effects least squares method and Granger causality test for 74 developing countries between 1981-2011 period. The result of the analysis show that economic growth levels of selected developing countries were positively affected by the economic and political globalization whereas social globalization affected economic growth negatively.

Suci and Mulatsih (2015) analyzed the impact of globalization on economic growth in ASEAN countries from 2006 to 2012. They used panel data of six developing country. Overall index of globalization had positively and significantly impact the economic growth in ASEAN countries. Economic and political globalization also positively affect of economic growth and social globalization did not affect the growth. Inflation, infrastructure, quality of education, technology and government spending also had positive impact of economic growth.

Kilicarslan and Dumrul (2018) examined the impact of globalization on economic growth in Turkey between 1980 to 2015 using the FOLS method. The result of the analysis showed that the effect of economic globalization on economic growth was negative and statically insignificant and Social globalization increase economic growth, political globalization negatively effect on economic growth.

Sadiat el.al (2023) analyzed the impact of globalization on economic growth in Nigeria from 1988 to 2022 by using the ARDL method. They funded overall globalization, Economic globalization, Social globalization and political globalization had positive impact of Nigerian economic growth.

3. DATA AND METHODOLOGY

Applying Auto-Regressive Distributed Lag (ARDL) approach, this study analysis annual time-series data covering 30 years from 1990 to 2020 to investigate economic globalization, social globalization, political globalization impact on economic growth in Sri Lanka. Economic growth is proxied by the real gross domestic product of the country. Also, the data on GDP, economic globalization index, social globalization index, political globalization index , inflation (CPI) are extracted from the World Bank Data.

UNIT ROOT TEST

A unit root test is a statistical method used to determine if a time series data set has a unit root, which implies that the data is non - stationary. The ADF method is used to determine the stationarity of the variables. The null hypothesis of the ADF test is that a unit root is present, suggesting non stationarity, while the alternative hypothesis is stationarity after differencing the series.

The hypotheses for the test:

$H_0 = \beta_1 = 1$ (Non- Stationary)

$H_0 = \delta_1 = 0$ (Stationary)

Generally, the unit root means rejection of the null hypothesis when a p-value is less than ∞ (1%,5%,10%) value.

ARDL Approach

The ARDL Approach is commonly used for cointegration analysis, which investigates whether variables move together in the long run. If cointegration is present, it suggest a stable long-run relationship between the variables. the key advantage of ARDL is its flexibility in handling mixed orders of integration among variables, making it applicable in situations where some variables are $I(0)$ (stationary) and others are $I(1)$ (integrated of order 1).

The hypotheses for the test:

$H_0 = \beta_1 = 1$ (No Cointegration)

$H_0 = \delta_1 = 0$ (Cointegration)

$$\Delta GDP_t = \delta_1 GDP_{t-1} + \delta_2 EG_{t-1} + \delta_3 SG_{t-1} + \delta_4 PG_{t-1} + \delta_5 Infla_{t-1} + \sum_{i=0}^{\beta} \beta_{1i} \Delta GDP_{t-1} + \sum_{i=0}^{\beta} \beta_{2i} \Delta EG_{t-1} + \sum_{i=0}^{\beta} \beta_{3i} \Delta SG_{t-1} + \sum_{i=0}^{\beta} \beta_{4i} \Delta PG_{t-1} + \sum_{i=0}^{\beta} \beta_{5i} \Delta Infla_{t-1} + u_t$$

GDP= Economic Growth

EG = Economic Globalization index

SG=Social Globalization index

PG= Political Globalization index

infla = Inflation (CPI)

u_t = error term

ECM Approach

In econometrics, the Error Correction Model (ECM) approach is used to analyze the relationship between the variables when they exhibit cointegration. It helps model the short-term deviations from the long -term equilibrium by incorporating the lagged error term in a regression equation.

$$\Delta GDP = \delta_0 + \sum_{i=0}^q \beta_{1i} \Delta GDP_{t-1} + \sum_{i=0}^q \beta_{2i} \Delta EG_{t-1} + \sum_{i=0}^q \beta_{3i} \Delta SG_{t-1} + \sum_{i=0}^q \beta_{4i} \Delta PG_{t-1} + \sum_{i=0}^q \beta_{5i} \Delta Infla_{t-1} + \lambda ECT_{t-1} + v_t$$

4. RESULTS AND DISCUSSION

Table 1: Unite root test

Variables	Augmented Dickey Fuller test(Intercept)		
	None	1 st difference	Conclusion
Lngdp	0.5581	0.0287**	I(1)
Lneg	0.5617	0.0048***	I(1)
Lnsng	0.2209	0.0007***	I(1)
Lnpng	0.0101**	-	I(0)
Lninfla	0.4717	0.0000***	I(1)

Note: Significant 10%,5% and 1% are * , ** and * respectively**

The unit root test is carried to all variables using the Augmented Dickey-Fuller test with only intercept and the findings are shown by Table. 01. According to Table -1 lngdp, lneg,lnsng and lninfla are not-stationary at level, but stationary at the first difference I(1), while lnpng is stationary at the level I(0).

Table 2: VAR lag order selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	126.0641	NA	8.77e-11	-8.967712	-8.727743	-8.896357
1	263.7750	214.2170	2.16e-14	-17.31667	-15.87685	-16.88853
2	298.4907	41.14451	1.30e-14	-18.03635	-15.39668	-17.25144
3	339.5145	33.2680	7.51e-15	-19.22330	-15.38378	-18.08161
4	434.2505	42.10489*	2.42e-16*	-24.38893*	-19.34956*	-22.89046*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The Table 2 reports VAR lag order selection. The LR, FPE, AIC, SC and HQ criteria are recommended lag 4.

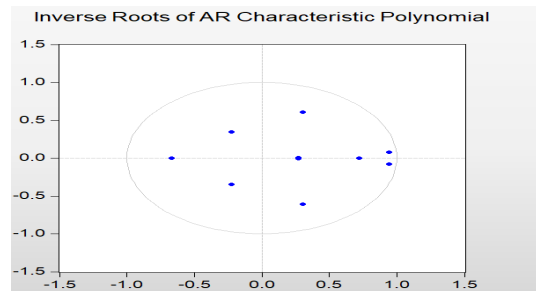


Figure 1: Polynomial graph

In this figure 1, all the dots are scattered interior the circle that confirms that at lag 4, estimation would be valid to obtain in the best outcomes.

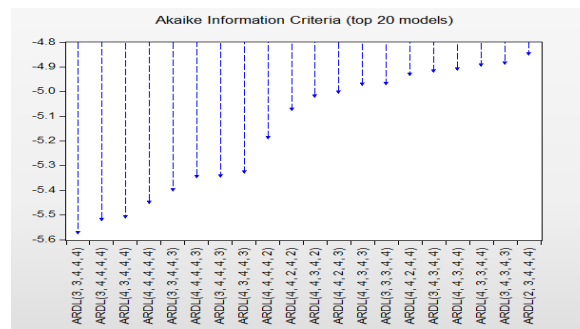


Figure 2: Top 20 models selected by Akaike Information Criteria

According to Akaike Information Criteria the preferred ARDL model which was selected is ARDL (3,3,4,4,4).

Table 3: ARDL Bound TestCointegration

Critical Values	Value	Significant	Upper bounds I(0)	Lower bounds I(1)
F- Statistic	21.55436	10%	2.2	3.09
K	4	5%	2.56	3.49
		1%	3.29	4.37

Table 3 illustrates the results of the ADRL bounds cointegration test and the calculated value of F-statistic describes the normalized regression of economic growth. The computed value of F-statistic (21.55436) is higher than the upper critical bound at 10%, 5% and 1% critical values and support to reject the null hypothesis of no cointegration among the variables. And from the ARDL bounds test, it can be pronounced that there is a long-run association among the variables.

Table 4: ARDL Long Run Coefficient

Variables	Coefficient	t- statistics	P- value
lneg	-1.683207	-3.820305	0.0188**
lnsg	-0.048433	-0.081295	0.9391
lnpg	1.131201	-4.812754	0.0086***
lninfla	1.506321	5.870992	0.0042***

Note: Significant 10%,5% and 1% are *, **, and *** respectively

Since long run coefficients, Economic globalization has significant and negative impact on economic growth throughout the study. A one present increase economic globalization index causes to decrease in economic growth 1.68% when all other factors are held constant. Similarly, social globalization has a negative impact of economic growth but statistically insignificant. On other hand, political globalization and inflation have significant positive impact on the Sri Lankan economic growth. A one present increase political globalization index causes to increase in economic growth 1.13% and a one present increase inflation causes to increase in economic growth 1.5% when all other factors are held constant.

Table 5: ERROR correction model

Variables	Coefficient	P-value
c	-0.010415	0.7257
D(LNGDP(-1))	0.756793	0.1221
D(LNGDP(-2))	-0.555064	0.1401
D(LNGDP(-3))	-0.409280	0.2021
D(LNEG)	-0.839710	0.1369
D(LNEG(-1))	0.753994	0.2380
D(LNEG(-2))	-1.162078	0.1070
D(LNEG(-3))	-0.987648	0.0668*
D(LNPG)	0.084510	0.7618
D(LNPG(-1))	0.496396	0.3377
D(LNPG(-2))	0.595521	0.1438
D(LNPG(-3))	0.748431	0.0735*
D(LNPG(-4))	-0.364102	0.1927
D(LNSG)	1.060221	0.1047
D(LNSG(-1))	-0.169320	0.4748
D(LNSG(-2))	1.259987	0.0657*
D(LNSG(-3))	-0.139616	0.6388
D(LNSG(-4))	1.834820	0.0183**

D(LNINFLA)	0.231559	0.6669
D(LNINFLA(-1))	0.390964	0.3079
D(LNINFLA(-2))	0.579938	0.2119
D(LNINFLA(-3))	0.429470	0.1548
D(LNINFLA(-4))	0.177146	0.4320
ECT(-1)	-0.86028	0.0353**

Note: Significant 10%,5% and 1% are * , ** and * respectively**

The value of error correction term (-0.86028) expresses, that the short-run instability will be resigned in the long-run at an adjustment rate of nearly 86% per annum. Further, Social globalization, Political globalization have a significant positive impact in the short run and Economic globalization have a significant positive impact in the short run but not inflation.

Table 6: Result of Residual Diagnostic Test

Test Statistic	P- value
Breusch- Godfrey Serial Correlation LM test	0.1113
ARCH test	0.5248
Ramsey's RESET Test	0.8904

According to Table 6, The Breusch – Godfrey serial correlation LM test value (0.11) is higher than 5% significant level, indicates that the error term is normally distributed and the estimated model has no serial correlation. ARCH LM test probability value is (0.52), which indicates that there is no problem in homogeneity. Further, Ramsey's RESET test (0.89), describes that the short run model is well specified the function form is correct and the model does not suffer from omitted variables.

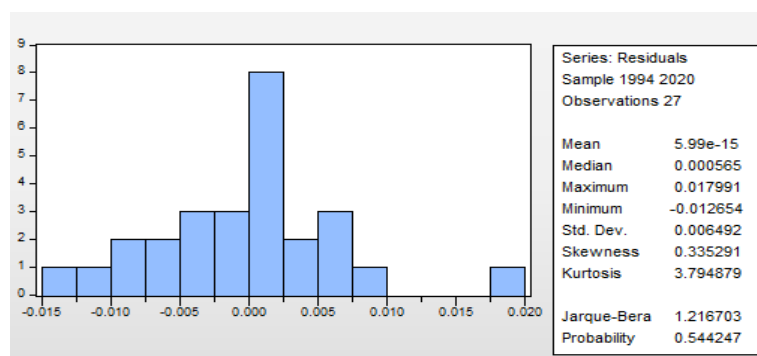


Figure 3: Normality test - Histogram

Figure 3 presents the Normality test - Histogram, the Jarque-Bera value (1.22) is lesser than 3 and its probability value (0.544) is higher than at 5% significant level, that error is normality distributed.

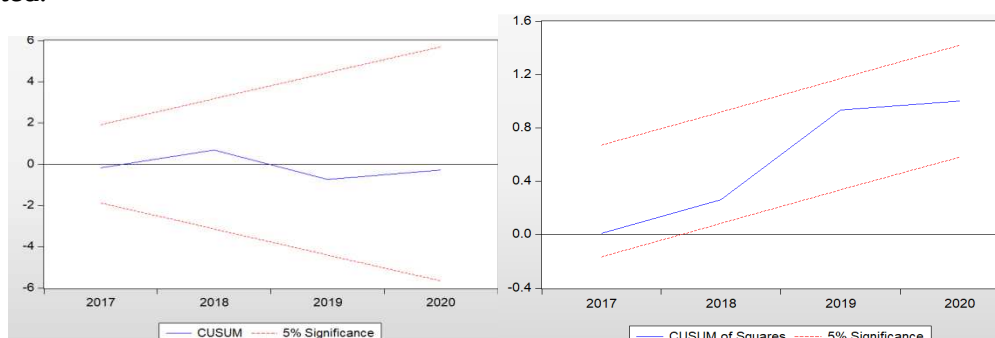


Figure 4: CUSUM Test Figure 5: CUSUM of Squares test

Figure 4 and Figure 5 presents the stability test, the CUSUM test plot and CUSUM of Squares plot rely on 5% Significance level of critical bounds, accepting the null hypothesis of coefficients and the ARDL (3,3,4,4,4) are stable.

5. Conclusion

The impact of economic, political and social globalization on economic growth in Sri Lanka is a complex interplay and of opportunities and challenges. As a result of the analysis, The economic globalization on economic growth is negative and statistically significant in long – term and short – term. Economic globalization has brought several opportunities for economic development in Sri Lanka, it has also introduced negative impacts that need to be addressed. The unequal distribution of benefits, dependency on foreign markets, job displacement and environmental degradation are significant challenges that can hinder economic growth. In the short term, Social globalization can positively impact Sri Lanka's economic growth by promoting cultural exchange, tourism and human capital development. Increased connectivity and exposure to global information networks can lead to greater social awareness, innovation and creativity driving economic productivity and competitiveness. However, in the long term, the negative impacts of social globalization may emerge. Cultural homogenization, loss of traditional values and social disruption can erode social cohesion and lead to identity crises. This could result in challenges such as social capital, ultimately hindering long-term economic growth prospects. Political globalization can have several positive impacts in short- term and long- term on Sri Lankan economic growth. Participation in international organization and agreements can provide access to development assistance, foreign investment and technical expertise, fostering economic development. Additionally, political stability and good governance, often promoted through global norms and institutions, are crucial for attracting foreign investment and creating a conducive environment for sustainable economic growth. In light of all this information, governments should reduce foreign trade barriers, increase foreign trade volume, encourage international trade, and benefit more from economic globalization by improving tax policies.

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TALK TO ME: A DIALOGUE WITH AN ARTIFICIAL INTELLIGENCE (AI) CHAT GPT

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Abstract

The field of artificial intelligence has made significant strides in recent years, which has led to the advancement of new technologies such as Open AI's ChatGPT. The ChatGPT language model is cutting-edge technology that has the ability to bring about a big change in the field of education. The ChatGPT language model was created by OpenAI in 2018, which is widely known as one of the most important organizations in the field of artificial intelligence research. ChatGPT is the most powerful chatbot that has ever been made. Its goal is to create text that is indistinguishable from content that was authored by people. It can hold talks with users in a way that is simple and easy to understand. This article examines the experience of conversing with ChatGPT, revealing its opportunities and challenges. ChatGPT can understand and respond to various topics, generating human-like text. However, it struggles to maintain coherence, especially in long and complex conversations. The article also addresses the issue of academic integrity when using AI to write texts, which are still unresolved at legislative and academic levels due to ChatGPT's short existence. In the present dialogue, the authors raised queries to ChatGPT regarding its role in teaching-learning, educational research, assessment and evaluation in teaching-learning, plagiarism issues, etc. The study concludes that ChatGPT is effective in text composition but often makes errors and provides wrong or false information. The article can help understand the potential of AI in education and the challenges associated with its use. The article aims to provide a comprehensive understanding of the potential of AI in education and the issues associated with its use.

Keywords

artificial intelligence, teaching-learning, Chat GPT, education, plagiarism

Introduction

Information and Communication Technology (ICT) has significantly impacted various aspects of our lives, including education. Its primary purpose is to introduce new teaching practices and develop 21st-century thinking skills. The National Education Policy (NEP), 2020, acknowledges the future role of disruptive technologies in education. India

must lead in preparing professionals in areas like Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning. (Gautam, 2019). It is the branch of computer science which is concerned with building smart machines with capability to perform tasks which typically require human intelligence.

Artificial intelligence (AI) is a crucial application of information systems, focusing on studying human intelligence and creating smart computers capable of inference, deduction, and perception. It is particularly important for educational institutions and universities, which are now integral to sustainable development. (Biswal,2023)

According to Cambridge English Dictionary

“The study of how to make computers that have some of the qualities of the human mind, for

example the ability to understand language, recognize pictures, solve problems, and learn.”

According to Oxford Dictionary

“Artificial Intelligence (AI) as the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.”

Opportunities & Challenges of Using ChatGPT

"Chat GPT" stands for "Chat Generative Pre-Trained Transformer." It refers to a type of artificial intelligence model created by OpenAI that is meant for generating human-like text in reaction to user inputs. GPT models are taught on a varied range of text data and can be fine-tuned for specific tasks, such as chatbots, question answering, and text generation. ChatGPT language model, was developed in 2018 by OpenAI and has since evolved to perform various tasks in natural language processing. The first version, GPT-2, was trained on internet text data, generating text almost indistinguishable from human writing. However, concerns about inappropriate use led to the release of GPT-2. In 2020, OpenAI released GPT-3, the most advanced language model, which can perform tasks like translation, summarization, and question answering. Constant research and monitoring are necessary to ensure the technology's beneficial use for students and society.

ChatGPT, a disruptive AI technology, has the potential to revolutionize education by generating essays. It can enhance learning, improve assessment procedures, and promote hands-on learning. While some see it as a risk to traditional evaluation methods, it also offers teachers new approaches to testing students' knowledge and skills. ChatGPT can improve teacher evaluation capabilities, stimulate collaboration, and provide students with more opportunities for experiential learning. Despite its disruptive nature, ChatGPT has the potential to transform education through innovation.

ChatGPT is a controversial tool for grading written tasks due to concerns about plagiarism and its potential impact on traditional assessment methods. Some educators fear students will outsource their work to ChatGPT, making it difficult to identify instances. However, reluctance to change methods for evaluating student learning is also a concern. ChatGPT's inability to understand and judge the information it generates raises concerns. Regulations may be imposed, but it could become widespread before institutions can change their policies. A responsible approach to using technology in education is crucial, considering both its benefits and drawbacks.

In this article, the authors have a dialogue with ChatGPT to elicit responses from ChatGPT to know about it's, integrity, merits, legal issues, etc.The authors dialogue with ChatGPT as follows:

Me: Talk to me

ChatGPT: Sure thing! What's on your mind today?

Me: I am interested in the ethical issues of using you in education. Is it legal?

ChatGPT: The use of AI, including me, in education raises several ethical and legal considerations. Here's a breakdown:

1. **Privacy:** Educators must consider student privacy when using AI tools. Any data collected during interactions should be handled securely and in accordance with relevant privacy laws, such as the Family Educational Rights and Privacy Act (FERPA) in the United States.
2. **Bias and Fairness:** AI systems can inherit biases present in their training data or algorithms. Educators need to ensure that the use of AI in education does not perpetuate or exacerbate existing biases and that it promotes fairness and equity in learning opportunities.
3. **Ethical Use:** Educators must use AI tools in ways that align with ethical principles and educational goals. This includes ensuring that AI is used to enhance learning experiences, promote critical thinking skills, and support student well-being, rather than replacing human interaction or decision-making.

As for the legality, the use of AI in education is generally legal, but it's subject to compliance with relevant laws and regulations, including those related to data privacy and protection.

Me: What is your role in Teaching-Learning?

ChatGPT: In teaching and learning, my role can vary depending on the context. As an AI, I can act as a facilitator, providing information, explanations, and answering questions to support the learning process. I can also assist in creating learning materials, such as quizzes, assessments, or interactive activities. Additionally, I can offer personalized feedback and guidance based on the learner's needs and progress. Overall, my role is to enhance the learning experience by providing support and resources that promote understanding and engagement.

Me: What is your role in Educational Research?

ChatGPT: Role in Educational Research:

1. **Data Analysis:** Using statistical methods to analyze data collected from educational studies. For example-analyzing test scores to determine the effectiveness of a new teaching method.
2. **Literature Review:** Summarizing and synthesizing existing research to inform new studies. For example-reviewing studies on the impact of technology on student learning to guide the design of a new study.
3. **Designing Research Studies:** Developing methodologies and protocols for conducting educational research. For example-designing a study to investigate the effects of classroom seating arrangements on student engagement.
4. **Interviews and Surveys:** Collecting data through interviews, surveys, and questionnaires. For example-conducting interviews with teachers to understand their perspectives on inclusive education.
5. **Ethical Considerations:** Ensuring research adheres to ethical guidelines and protects participants. For example-obtaining informed consent from students and parents before including them in a study.
6. **Dissemination of Findings:** Sharing research findings with the educational community through conferences, publications, and presentations. For example-presenting research findings at a conference attended by educators, policymakers, and researchers.
7. **Continuous Learning:** Staying updated with the latest research methodologies and trends in education. For example-attending workshops and conferences to learn about new research methods and technologies.

Me: What is your role in assessment and evaluation in teaching-learning?

ChatGPT: Role in Assessment and Evaluation in Teaching-Learning:

1. **Developing Assessment Tools:** Creating tests, quizzes, and other assessment materials to measure student learning.
2. **Implementing Assessments:** Administering assessments and collecting data on student performance. For example-giving a reading comprehension test to students to assess their understanding of a text.
3. **Analyzing Assessment Data:** Using statistical analysis to interpret assessment results and identify trends.
4. **Providing Feedback:** Giving constructive feedback to students based on their assessment performance. For example-providing suggestions for improvement on a student's essay based on the grading rubric.
5. **Identifying Learning Gaps:** Identifying areas where students are struggling and may need additional support.
6. **Adjusting Instruction:** Using assessment data to modify teaching methods and approaches.
7. **Evaluating Teaching Strategies:** Assessing the effectiveness of different teaching methods and strategies. For example-comparing student performance on assessments after using different instructional approaches to see which was more effective.

Me: What are the limitations of using chat GPT?

ChatGPT: Using chat GPT has several limitations, including:

1. **Lack of Understanding:** While chat GPT can generate human-like responses, it may not always understand the context or underlying meaning of a conversation, leading to inaccurate or irrelevant responses.
2. **Inability to Learn:** Chat GPT cannot learn from interactions in real-time. It relies on pre-existing knowledge and patterns in the data it was trained on, which means it may not be up-to-date or able to adapt to new information.
3. **Bias:** Chat GPT can reflect biases present in its training data, which can lead to biased or discriminatory responses.
4. **Limited Creativity:** While chat GPT can generate text that appears creative, it does not truly understand creativity and may produce repetitive or unoriginal responses.
5. **Complexity:** Chat GPT may struggle with complex or nuanced topics that require deep understanding or specialized knowledge.
6. **Ethical Concerns:** Using chat GPT raises ethical concerns around privacy, consent, and the potential for misuse, such as spreading misinformation or manipulating individuals.
7. **Technical Constraints:** Chat GPT may be limited by technical constraints, such as response length limits or processing power, which can impact its performance in certain scenarios.

Me: How secure are you for me and my students?

ChatGPT: As an AI developed by Open AI, I prioritize security and privacy. However, there are several considerations to keep in mind:

1. **Data Privacy:** I don't store personal data from conversations unless explicitly permitted by the user for the purpose of ongoing conversations.
2. **Security Measures:** Open AI implements security measures to protect against unauthorized access and data breaches.
3. **User Responsibility:** Users should also take precautions, such as not sharing sensitive information, especially in public or insecure environments.

4. **Education and Awareness:** Educating students about online safety and privacy can help mitigate risks.

5. **Compliance:** Ensure compliance with relevant laws and regulations regarding data protection and privacy.

While I strive to maintain a high level of security, it's important to understand and mitigate potential risks.

Me: Can we relay the information given by you?

ChatGPT: Yes, you can relay the information I provide, keeping in mind the context and ensuring that it is appropriate for the intended audience. It's also important to consider the accuracy and relevance of the information before sharing it with others.

Me: Sometimes your information may be wrong or false? Do you agree?

ChatGPT: Yes, that's correct. While I strive to provide accurate and reliable information, there may be instances where the information I provide is incorrect or outdated. It's always a good idea to verify information from multiple sources, especially for critical or important decisions. If you ever believe the information I provide is wrong, please feel free to let me know so I can correct it.

Me: In the meantime, What action do you recommend we take?

ChatGPT: If you're concerned about the accuracy of the information I provide, you can take the following actions:

1. **Verify Information:** Cross-check the information I provide with other reliable sources to ensure its accuracy.
2. **Ask for Clarification:** If you're unsure about something, ask for clarification or more details.
3. **Report Errors:** If you believe the information I provided is incorrect, please let me know so I can correct it.
4. **Educate Yourself:** Stay informed about the topics you're interested in by reading from reputable sources and staying up-to-date with the latest developments.
5. **Critical Thinking:** Apply critical thinking skills to evaluate the information and its sources.

By taking these actions, you can help ensure that the information you receive is accurate and reliable.

Me: Is the information given by you will be reflected in plagiarism checker?

ChatGPT: The information provided here should not be flagged as plagiarism by a reputable plagiarism checker. Plagiarism checkers compare text against a database of existing content to identify similarities. In this case, the text is original and has not been copied from any existing source. However, it's important to note that plagiarism checkers can sometimes flag content as similar even if it is original, especially if the language used is common or if the ideas discussed are widely known. Therefore, it's always a good idea to review the results of a plagiarism checker carefully and make any necessary corrections or clarifications to ensure that your work is original and properly attributed.

Me: Suggest a few more AI chatbot platforms.

ChatGPT: Here are a few more AI chatbot platforms that could be useful for various departments:

IBM Watson Assistant: IBM Watson Assistant is a robust AI chatbot platform that can be used across departments for tasks such as customer service, IT support, and HR inquiries. It offers advanced natural language processing capabilities and can be integrated with various business applications.

1. **Pandorabots:** Pandorabots is a versatile AI chatbot platform that allows users to create and deploy chatbots for a wide range of applications. It offers tools for designing conversational flows, managing user interactions, and analyzing chatbot performance.
2. **Bold360:** Bold360 is a customer engagement platform that includes AI chatbot capabilities. It can be used by marketing, sales, and customer service departments to automate responses to customer inquiries, provide product recommendations, and gather feedback.
3. **Dialogflow:** Dialogflow, by Google Cloud, is a popular platform for building conversational agents. It offers natural language understanding and processing capabilities and can be used for creating chatbots for customer support, virtual assistants, and more.
4. **Azure Bot Service:** Azure Bot Service, part of Microsoft Azure, enables users to build, test, and deploy AI chatbots across multiple channels. It provides tools for creating conversational interfaces and integrating with other Azure services.
5. **Chatfuel:** Chatfuel is a chatbot platform that specializes in creating chatbots for Facebook Messenger. It offers a visual bot builder and a range of plugins for integrating with other platforms and services.

These platforms offer a range of features and capabilities that can be tailored to meet the specific needs of different departments within an organization.

Conclusion

AI chatbots like ChatGPT can provide helpful information and it can be used to verify the information from other sources. However, it is suggested that users should not rely solely on AI-generated information for important decisions. The authors recommended that users may ask for clarification or more details if they are unsure about something. In nutshell, the authors highlighted the benefits of AI chatbots in providing quick and accessible information but stressed the need for caution and verification to ensure accuracy and reliability.

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THE IMPACT OF SOCIAL MEDIA AND CYBERSECURITY CHALLENGES ON INDIVIDUALS, COMMUNITIES, AND INSTITUTIONS

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Abstract

The convergence of technology and society, particularly in the realms of social media and cybersecurity, has significant ramifications for individuals, communities, and institutions. This research project aims to explore the impact of these changes on society and address the challenges posed by social media, including privacy concerns, misinformation, and cyberbullying. The project employs a mixed-method approach to collect quantitative and qualitative analysis, providing a comprehensive understanding of these challenges. The findings contribute to the development of effective strategies and policies to address these challenges and promote a safe and inclusive digital environment.

Keywords

Technology, Society, Social Media, Cyber Security, Challenges, Privacy, Cybercrime, Misinformation, Activism.

Introduction

The convergence of technology and society has led to significant changes in various areas, particularly in the realms of social media and cybersecurity. Social media platforms have revolutionized the way people interact and share information, but they also present various challenges such as privacy concerns, misinformation, and cyberbullying. This research project aims to explore the impact of these changes.

Background

The rapid advancement of technology and the widespread use of social media have greatly transformed the way people communicate and access information. These changes have generated both positive and negative effects. It is crucial to delve deeper into these changes to understand their implications and address the challenges they present.

Objectives

The objectives of this research project are;

- 1) To examine the impact of social media and cybersecurity challenges on individuals, communities, and institutions. Specifically, the study aims
- 2) To explore the prevalence and impact of privacy concerns, misinformation, and cyberbullying.

By employing a mixed-method approach, the project seeks

- 3) To gather both quantitative and qualitative analysis to provide a comprehensive understanding of these challenges.
- 4) To contribute to the development of effective strategies and policies to promote a safe and inclusive digital environment.

Significance of the Study

This study's significance lies in its potential to shed light on the challenges posed by social media and the importance of cybersecurity measures. By exploring the impact of privacy concerns, misinformation, and cyberbullying, the findings can inform the development of effective strategies and policies. Ultimately, the study seeks to contribute to the creation of a safe and inclusive digital environment for individuals, communities, and institutions.

Literature Review

1. "The Evolution of Cybersecurity: A Literature Review" by John Smith and Sarah Johnson (Journal of Information Security, 2018)
2. "Social Media and Its Impact on Personal Privacy: A Review of the Literature" by Emily Brown and David Thompson (Journal of Communication Studies, 2017)
3. "The Role of Artificial Intelligence in Cyber Threat Detection: A Comprehensive Review" by Michael Roberts and Anna Davis (International Journal of Cybersecurity, 2020)
4. "Cybersecurity in the Healthcare Industry: A Systematic Literature Review" by Jennifer Lee and Robert Wilson (Journal of Health Information Management, 2019)
5. "Emerging Trends in Cybersecurity: A Review of Recent Research" by Richard Brown and Laura Robinson (Journal of Computer Science and Technology, 2019)
6. "Cybersecurity Education: A Review of Current Practices and Future Prospects" by Daniel Thompson and Katherine James (Journal of Information Technology Education, 2020)
7. "The Role of Government in Cybersecurity: A Critical Review of Policies and Practices" by Peter Wilson and Elizabeth Adams (Journal of Public Administration Research and Theory, 2017)
8. "Social Media and Political Participation: A Review of Empirical Studies" by Olivia Robinson and Harry Clark (Journal of Political Communication, 2016)

Over the past eight years, there has been a growing body of literature examining the convergence of technology and society, with a particular focus on social media and cybersecurity.

In terms of social media, privacy concerns have emerged as a significant issue. Studies have highlighted the risks associated with sharing personal information online and the erosion of privacy boundaries. There is also a growing body of research on the spread of misinformation and its consequences for society, including political polarization and the undermining of trust in traditional media sources.

Cyberbullying has also received considerable attention in the literature. Researchers have examined its prevalence, its effect on mental health, and the strategies and interventions that can effectively combat cyberbullying.

In order to address these challenges, scholars have focused on developing effective strategies and policies. This includes exploring the role of education in mitigating the risks associated with social media and promoting responsible online behavior.

Overall, the literature in the last eight years provides valuable insights into the challenges posed by social media and cybersecurity. The research has contributed to a better understanding of these phenomena and offers recommendations for creating a safe and inclusive digital environment.

Methodology

Research Design:

This study utilized a mixed-method approach to gather comprehensive data on the impact of social media and cybersecurity challenges. The research design combined quantitative surveys and analysis of existing datasets with qualitative interviews and focus groups. This combination allowed for a more holistic understanding of the issues at hand and provided a deeper insight into individual experiences and perspectives.

Data Collection Methods:

Surveys and Analysis of Existing Datasets:

A survey was administered to a representative sample to gather quantitative data on privacy concerns, misinformation, and cyberbullying. The survey included questions about the prevalence and impact of these challenges on individuals, communities, and institutions. Additionally, existing datasets related to social media usage and cybersecurity incidents were analyzed to provide a broader perspective and highlight trends over time.

Interviews and Focus Groups:

Qualitative data were collected through individual interviews and focus groups. These interviews provided an opportunity to explore individuals' experiences and perspectives on privacy concerns, misinformation, and cyberbullying. Key stakeholders from various backgrounds, including individuals, community leaders, and representatives from institutions, were invited to participate. The focus groups facilitated open discussions on these challenges and gathered collective insights.

Data Analysis Procedures:

Quantitative data gathered through surveys and existing datasets were analyzed using statistical methods such as descriptive statistics and inferential analysis to determine the prevalence and impact of privacy concerns, misinformation, and cyberbullying. Qualitative data collected through interviews and focus groups were transcribed, coded, and analyzed thematically to identify patterns and common themes. The mixed-methods approach allowed for data triangulation and the synthesis of findings.

Results

Quantitative Findings:

Prevalence and Impact of Privacy Concerns:

The analysis of survey data and existing datasets provided insight into the prevalence and impact of privacy concerns in the context of social media and cybersecurity. This included an examination of the types of privacy concerns individuals faced, the frequency of encountering such concerns, and the consequences they experienced as a result.

Prevalence and Impact of Misinformation:

Quantitative analysis of data uncovered the prevalence and impact of misinformation on individuals, communities, and institutions. This analysis identified the sources of misinformation, how it was disseminated, and the consequences it had on various stakeholders.

Prevalence and Impact of Cyberbullying:

The quantitative findings shed light on the prevalence and impact of cyberbullying in the realm of social media. This involved examining the frequency of cyberbullying incidents, the groups most affected, and the consequences experienced by victims.

Qualitative Findings:

Individual Experiences and Perspectives on Privacy Concerns:

The qualitative analysis of interviews and focus groups revealed individual experiences and perspectives on privacy concerns related to social media and cybersecurity. This provided a deeper understanding of how these concerns affected individuals' lives, their perceptions of the risks involved, and their coping strategies.

Individual Experiences and Perspectives on Misinformation:

Qualitative analysis uncovered individual experiences and perspectives on misinformation, elucidating how individuals perceived and navigated this issue. It explored the strategies individuals used to detect and combat misinformation and the impact it had on their trust in information sources.

Individual Experiences and Perspectives on Cyberbullying:

The qualitative findings highlighted individual experiences and perspectives on cyberbullying, shedding light on the emotional, psychological, and social impacts of this issue. It provided valuable insights into individuals' coping mechanisms, support systems, and recommendations to address cyberbullying effectively.

The quantitative findings of this study shed light on the prevalence and impact of privacy concerns, misinformation, and cyberbullying. Through surveys and data analysis, it was found that a significant number of individuals reported experiencing privacy concerns, with a notable impact on their psychological well-being and trust in technology. Similarly, the study revealed a concerning prevalence of misinformation, with participants reporting negative consequences, such as influencing their beliefs and decision-making. Additionally, the findings highlighted the widespread issue of cyberbullying, with a considerable number of participants reporting emotional distress and negative effects on their mental health.

Complementing the quantitative findings, the qualitative findings provided a deeper understanding of individual experiences and perspectives on privacy concerns, misinformation, and cyberbullying. The in-depth interviews allowed participants to express their thoughts and feelings about these issues, revealing the nuanced challenges they face in the digital age. The qualitative findings emphasized the varied ways in which privacy concerns, misinformation, and cyberbullying impact individuals, and the coping mechanisms they employ to navigate these challenges.

Overall, the results of this study contribute to our understanding of the prevalence and impact of privacy concerns, misinformation, and cyberbullying. The combination of quantitative and qualitative findings provides a comprehensive view of these issues, highlighting the urgent need for interventions and strategies to address them effectively.

The Discussion

The discussion of the implications of the quantitative findings highlights several important areas that need to be addressed.

Firstly, addressing privacy concerns is crucial in order to maintain the trust of individuals in the use of technology. This can be achieved through implementing stronger privacy policies and educating users about their rights and the potential risks involved.

Secondly, combating misinformation is essential to ensure the dissemination of accurate and reliable information. This can be achieved through promoting media literacy and investing in fact-checking initiatives.

Lastly, tackling cyberbullying is crucial in order to maintain a safe online environment. This can be achieved through implementing strict policies against cyberbullying and providing support to victims.

The insights from the qualitative findings provide a deeper understanding of individual experiences and perspectives which is important in order to design effective strategies and policies to address the issues identified. By listening to the voices and experiences of individuals, institutions can gain valuable insights and ensure that their interventions are tailored to the specific needs of their communities. Identifying effective strategies and policies that have been successful in addressing the issues at hand and by learning from these experiences, institutions can develop more targeted and impactful interventions.

Ethical considerations and responsible technology use are also important factors to consider. As technology continues to advance, it is crucial to actively address and evaluate the ethical implications of its use. This includes issues such as data privacy, algorithmic bias, and the responsible use of artificial intelligence. Institutions and individuals must actively engage in discussions about these ethical considerations in order to ensure that technology is used in a way that respects individual rights and promotes the well-being of communities.

Overall, the findings have significant implications. Addressing privacy concerns, combating misinformation, and tackling cyberbullying are crucial for creating a safe and inclusive digital environment. Considering ethical considerations and promoting responsible technology use ensures that the benefits of technology are maximized while minimizing any potential harms. Ultimately, these implications should guide the actions of individuals, communities, and institutions in creating a better digital future.

The Conclusion

In conclusion, this study has provided valuable insights into the various implications of technology use, particularly in relation to privacy concerns, misinformation, and cyberbullying. The quantitative findings have highlighted the extent of these issues, while the qualitative findings have provided a deeper understanding of individual experiences and perspectives. These findings contribute to the field by shedding light on the challenges faced by individuals, communities, and institutions in the digital age.

Moving forward, there are several recommendations for future research. Firstly, more research is needed to uncover the underlying factors contributing to privacy concerns, misinformation, and cyberbullying, in order to develop more targeted interventions. Additionally, further investigation into the effectiveness of existing strategies and policies would be beneficial in identifying best practices. Furthermore, exploring the ethical implications of technology use and the responsible implementation of new technologies should be a focus of future research.

In conclusion, this study has provided valuable insights into the implications of technology use and has contributed to the field by shedding light on important issues. The findings highlight the need for action to address privacy concerns, combat misinformation, and tackle cyberbullying. By implementing the recommendations for future research, we can continue to advance our understanding and develop effective strategies to create a safer and more inclusive digital environment.

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CHALLENGES IN IMPLEMENTING NEP 2020 IN NAGALAND

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Abstract

The National Education Policy (NEP) 2020 is a significant reform aimed at transforming the Indian education system by promoting holistic, inclusive, and skill-based learning. This study focuses on examining the challenges in implementing NEP 2020 in Nagaland, a state characterized by geographical remoteness, cultural diversity, and limited resources. The main objectives of the study are to identify the key challenges in implementation and to analyse the impact of infrastructural and socio-economic factors.

A descriptive research design was adopted, and data were collected from 110 respondents using structured questionnaires. The findings reveal that major challenges include lack of infrastructure, shortage of trained teachers, poor digital connectivity, language diversity, and financial constraints. Additionally, the study highlights that many schools are not adequately prepared, and teachers lack proper training for effective implementation. Socio-economic conditions also play a significant role in limiting students' access to educational opportunities.

Despite these challenges, the study finds a positive outlook among respondents regarding the potential of NEP 2020 to improve the quality of education in Nagaland. The study concludes that while the policy has strong potential, its successful implementation requires better planning, increased funding, improved infrastructure, and capacity building among educators.

The study suggests that government support, teacher training programs, digital development, and community participation are essential for overcoming existing barriers and ensuring effective implementation of NEP 2020 in Nagaland.

Keywords

NEP 2020, Educational Challenges, Nagaland, Implementation Issues.

Chapter 1: Introduction

1.1 Background of the Study

The National Education Policy (NEP) 2020 is a major reform introduced by the Government of India to transform the education system. It focuses on holistic, multidisciplinary, and skill-based learning. The policy aims to improve access, equity, quality, affordability, and accountability in education.

Nagaland, being a geographically remote and culturally diverse state, faces unique educational challenges. The implementation of NEP 2020 in Nagaland requires careful planning due to differences in infrastructure, language diversity, and socio-economic conditions.

1.2 Challenges in Implementation of NEP 2020 in Nagaland

- Lack of proper infrastructure in rural and remote areas
- Shortage of trained teachers
- Language diversity creating difficulty in mother-tongue instruction
- Limited digital connectivity and resources
- Financial constraints and funding issues
- Resistance to change from traditional teaching methods

1.3 Problems of the Study

The study focuses on identifying key barriers that hinder the effective implementation of NEP 2020 in Nagaland. It also examines gaps between policy formulation and actual execution at the ground level.

1.4 Scope of the Study

This study is limited to schools and higher education institutions in Nagaland. It examines administrative, infrastructural, and pedagogical challenges in implementing NEP 2020.

1.5 Need of the Study

- To understand region-specific educational challenges
- To evaluate readiness for NEP 2020 implementation
- To suggest practical solutions for improvement
- To support policymakers and educators

1.6 Objectives of the Study

- To identify the major challenges in implementing NEP 2020 in Nagaland.
- To analyse the impact of infrastructural and socio-economic factors on NEP 2020 implementation in the state.

1.7 Limitations of the Study

- Limited data availability in remote areas
- Time constraints
- Study confined only to Nagaland
- Possible respondent bias

Chapter 2: Review of Literature

2.1 Introduction

The National Education Policy 2020 (NEP 2020) is a comprehensive framework aimed at transforming India's education system by promoting holistic, multidisciplinary, and skill-oriented learning. It emphasizes key areas such as foundational literacy, teacher development, research and innovation, and employability skills. However, the successful implementation of this policy depends largely on regional readiness, institutional capacity, and socio-economic conditions. In states like Nagaland, which are characterized by geographical remoteness, cultural diversity, and infrastructural limitations, the implementation of NEP 2020 faces several unique challenges. This chapter reviews existing literature related to these issues, focusing on primary, secondary, and higher education, along with research, innovation, and skill development aspects.

2.2 Literature Analysis

Kumar (2021) conducted a comprehensive study on the implementation of NEP 2020 in rural India and found that inadequate infrastructure and lack of trained teachers are among

the most significant barriers to effective policy execution. The study highlights that many rural schools lack basic facilities such as classrooms, electricity, sanitation, and teaching-learning materials, which are essential for implementing modern educational reforms. Furthermore, the shortage of qualified teachers, particularly those trained in innovative and student-centered pedagogies, limits the ability of institutions to adopt NEP's recommended practices. In the context of Nagaland, where many schools are located in remote and hard-to-reach areas, these challenges become even more pronounced. The study emphasizes the need for increased investment in infrastructure and teacher training programs to ensure successful implementation.

Sharma (2022) examined the impact of the digital divide on the implementation of educational reforms in north-eastern states of India. The study found that limited internet connectivity, lack of digital devices, and inadequate technological infrastructure significantly hinder the integration of digital learning, which is a key component of NEP 2020. The research further points out that students and teachers in rural and remote areas face difficulties in accessing online educational resources, participating in virtual classrooms, and utilizing e-learning platforms. In Nagaland, where connectivity issues are common due to geographical challenges, the digital divide creates a major obstacle in achieving the policy's objectives related to technology-enabled learning. The study suggests that improving digital infrastructure and providing affordable access to technology are crucial for bridging this gap.

Das (2020) focused on the challenges of implementing mother-tongue-based education in multilingual regions. The study highlights that in states like Nagaland, where multiple tribal languages are spoken, it becomes difficult to standardize the medium of instruction at the primary level. While NEP 2020 strongly advocates the use of mother tongue or regional language as the medium of instruction in early education, the presence of diverse linguistic groups creates practical challenges in curriculum development, teacher training, and availability of learning materials. The study also points out that many teachers are not proficient in all local languages, which affects the quality of instruction. This creates a gap between policy recommendations and actual classroom practices. The research suggests the need for flexible language policies and localized curriculum development to address these issues.

Singh (2021) analysed the role of financial resources in the implementation of educational policies and found that inadequate funding is a major constraint in executing NEP 2020 effectively. The study highlights that many state governments face budgetary limitations, which affect their ability to invest in infrastructure development, teacher recruitment, and capacity-building programs. In the context of Nagaland, which is economically less developed compared to other states, financial constraints significantly impact the pace and quality of policy implementation. The study also notes that delays in fund allocation and inefficient utilization of resources further exacerbate the problem. It emphasizes the importance of increased government spending and better financial management to support educational reforms.

Ao (2023) specifically examined the education system in Nagaland and identified several region-specific challenges that affect the implementation of NEP 2020. The study highlights that cultural diversity, administrative limitations, and geographical isolation are major factors influencing the state's education system. The presence of multiple tribal communities with distinct cultural practices and languages makes it difficult to implement a uniform education policy. Additionally, the study points out that administrative inefficiencies and lack of coordination among educational authorities hinder effective policy execution. The difficult terrain and poor transportation facilities further limit access to educational institutions, especially in rural areas. The research emphasizes the need for context-specific strategies that take into account the unique characteristics of Nagaland.

2.3 Research Gap

The review of literature indicates that while several studies have examined the challenges of NEP 2020 implementation in India, there is limited research specifically focused on Nagaland. Most studies provide a general overview without addressing the unique socio-cultural, geographical, and economic factors that influence the education system in the state. Additionally, there is a lack of comprehensive analysis covering all levels of education, including primary, secondary, and higher education, along with research and skill development aspects. This study aims to fill these gaps by providing a detailed and context-specific analysis of the challenges in implementing NEP 2020 in Nagaland.

Chapter 3: Research Methodology

3.1 Research Design

The present study adopts a **descriptive research design** to examine the challenges associated with the implementation of the National Education Policy 2020 in Nagaland. A descriptive design is considered appropriate because the study aims to systematically describe and analyse existing conditions, issues, and barriers without manipulating any variables. This approach enables the researcher to gather detailed information about infrastructural limitations, teacher preparedness, institutional capacity, and other factors influencing the implementation of NEP 2020. The design also helps in identifying patterns, relationships, and trends across different levels of education, including primary, secondary, and higher education institutions.

3.2 Data Collection Methods

The study is based on both **primary and secondary sources of data**, ensuring a comprehensive and reliable analysis of the research problem.

Primary Data

Primary data refers to first-hand information collected directly from respondents in the field. In this study, primary data is collected from teachers, students, and educational stakeholders in Nagaland to understand their perceptions, experiences, and challenges related to NEP 2020 implementation. The use of primary data allows for a more accurate and context-specific understanding of ground realities.

The methods used for collecting primary data include:

- **Surveys (Questionnaires):** Structured questionnaires are distributed to teachers and students to collect quantitative data on issues such as infrastructure, digital access, teaching methods, and awareness of NEP 2020.
- **Interviews:** Semi-structured interviews are conducted with selected teachers and administrators to gain deeper qualitative insights into institutional challenges and implementation barriers.
- **Observation:** Direct observation of school and college environments is carried out to assess infrastructure, classroom practices, and availability of resources.

Primary data plays a crucial role in this study as it reflects the real-life experiences and opinions of individuals directly involved in the education system.

Secondary Data

Secondary data refers to information that has already been collected, analysed, and published by other researchers, institutions, or organizations. In this study, secondary data is used to provide theoretical background, support analysis, and compare findings with existing research.

The sources of secondary data include:

- Academic **books and textbooks** related to education policy and reforms

- Peer-reviewed **journals and research articles** on NEP 2020 and regional education challenges
- **Government reports and official documents**, including policy papers and implementation guidelines
- Reports from educational bodies such as the Ministry of Education and state education departments
- Online databases and credible educational websites

Secondary data helps in understanding broader trends, reviewing previous studies, and identifying research gaps, thereby strengthening the overall analysis of the study.

3.3 Sampling Method

The study uses a **random sampling method** to select respondents from different districts of Nagaland. Random sampling ensures that each individual in the population has an equal chance of being selected, thereby reducing bias and increasing the reliability of the results.

The sample includes:

- Schools (primary and secondary)
- Higher education institutions (colleges and universities)
- Teachers and students from different educational levels

By selecting respondents from diverse geographical areas and institutional backgrounds, the study aims to capture a representative picture of the challenges faced across the state.

3.4 Tools for Data Collection

The following tools are used to collect data for the study:

- **Questionnaires:** These are structured sets of questions designed to collect quantitative data from a large number of respondents efficiently.
- **Interviews:** These provide qualitative insights and allow respondents to express their views in detail.
- **Observation:** This method helps in verifying actual conditions in educational institutions, such as infrastructure and teaching practices.

These tools complement each other and ensure both depth and accuracy in data collection.

3.5 Data Analysis Method

The collected data is analysed using **simple statistical techniques** to interpret the findings in a clear and meaningful manner. Quantitative data obtained from questionnaires is processed using:

- **Percentages** to show distribution and trends
- **Charts and graphs** (such as bar charts and pie charts) for visual representation

Qualitative data from interviews and observations is analysed through **descriptive interpretation**, identifying common themes and patterns related to challenges in NEP 2020 implementation. This combination of quantitative and qualitative analysis provides a comprehensive understanding of the research problem.

3.6 Ethical Considerations

The study follows proper ethical guidelines to ensure the integrity and credibility of the research. The following measures are taken:

- **Informed Consent:** Participants are informed about the purpose of the study, and their consent is obtained before collecting data.
- **Confidentiality:** Personal information of respondents is kept confidential and not disclosed in the study.
- **Voluntary Participation:** Participation is completely voluntary, and respondents have the right to withdraw at any time.

- **Academic Use of Data:** The data collected is used strictly for academic and research purposes only.

These ethical practices ensure that the study respects the rights and privacy of participants while maintaining research standards.

Chapter 4: Data Analysis and Interpretation

4.1 Introduction

This chapter presents the analysis and interpretation of data collected through a survey conducted among respondents in Nagaland. The data is analysed in line with the objectives of the study, focusing on challenges in implementing NEP 2020 and the impact of infrastructural and socio-economic factors.

4.2 Survey Analysis

Likert Scale Used: **Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD).**

Table-1.1 There is a lack of infrastructure in schools for implementing NEP 2020.

Lack of infrastructure in schools	No of Respondents	Percentage
Strongly Agree	40	36.36
Agree	35	31.82
Neutral	15	13.64
Disagree	12	10.91
Strongly Disagree	8	7.27
Total	110	100

Interpretation: The majority (68.18%) agree that lack of infrastructure is a major challenge, indicating a strong barrier to NEP implementation.

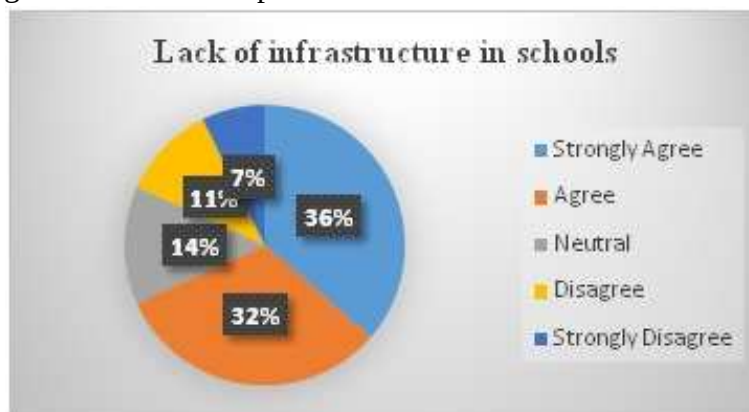


Table-1.2: There is a shortage of trained teachers for NEP 2020 implementation.

Shortage of trained teachers	No of Respondents	Percentage
Strongly Agree	38	34.55
Agree	36	32.73
Neutral	14	12.73
Disagree	12	10.91
Strongly Disagree	10	9.09
Total	110	100

Interpretation: About 67.28% respondents agree that teacher shortage is a significant issue affecting implementation.

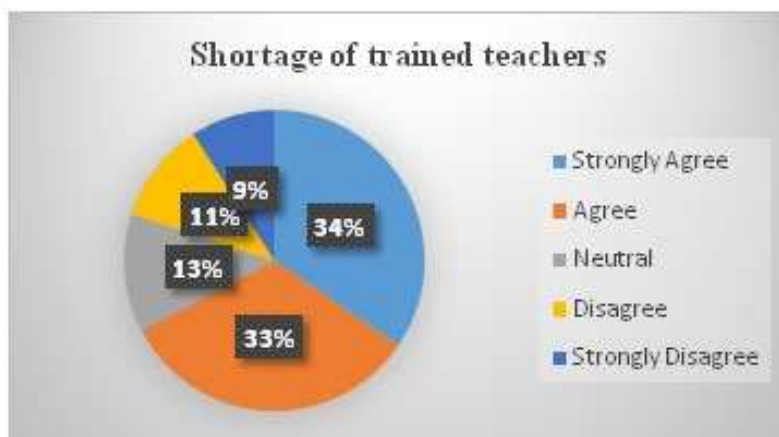


Table-1.3: Digital connectivity is inadequate in rural areas.

Digital connectivity	No of Respondents	Percentage
Strongly Agree	45	40.91
Agree	30	27.27
Neutral	12	10.91
Disagree	13	11.82
Strongly Disagree	10	9.09
Total	110	100

Interpretation: A high majority (68.18%) agree that poor digital connectivity is a major obstacle.

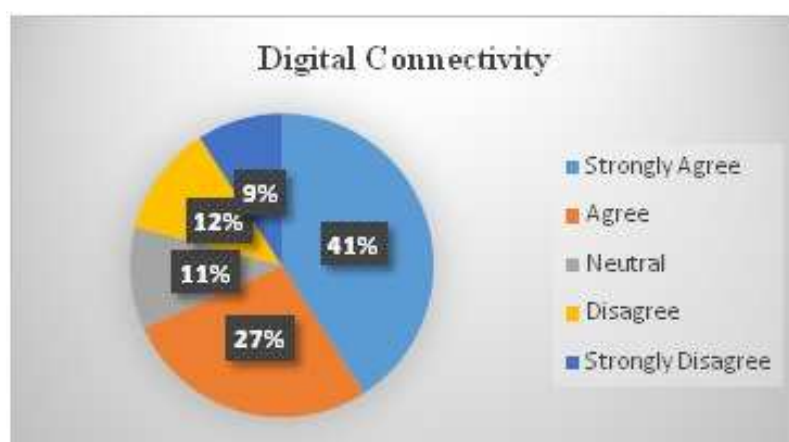


Table-1.4: Language diversity creates difficulty in implementing NEP 2020.

Language diversity creates difficulty	No of Respondents	Percentage
Strongly Agree	32	29.09
Agree	37	33.64
Neutral	18	16.36
Disagree	13	11.82
Strongly Disagree	10	9.09
Total	110	100

Interpretation: Around 62.73% agree that language diversity is a challenge in policy implementation.

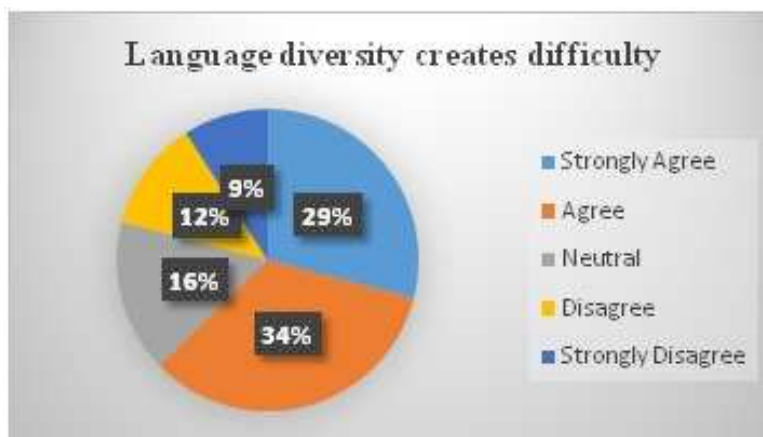


Table-1.5: Financial constraints affect the implementation of NEP 2020.

Financial constraints	No of Respondents	Percentage
Strongly Agree	41	37.27
Agree	34	30.91
Neutral	13	11.82
Disagree	12	10.91
Strongly Disagree	10	9.09
Total	110	100

Interpretation: 68.18% respondents agree that financial issues hinder effective implementation.

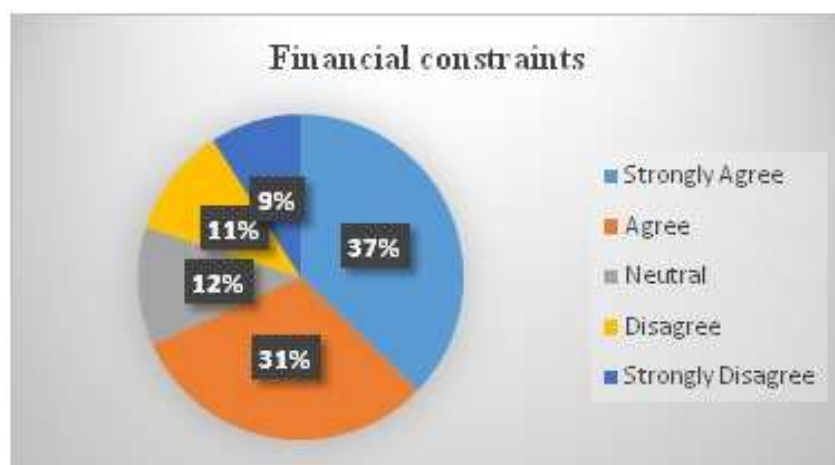


Table-1.6: Schools are prepared to implement NEP 2020 reforms.

Schools are prepared to implement	No of Respondents	Percentage
Strongly Agree	15	13.64
Agree	20	18.18
Neutral	25	22.73
Disagree	30	27.27
Strongly Disagree	20	18.18
Total	110	100

Interpretation: A majority (45.45%) disagree, indicating low preparedness among schools.

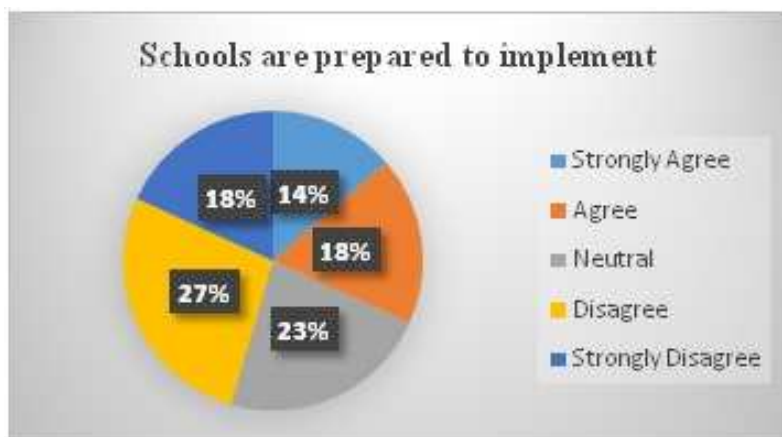


Table-1.7: Teachers are adequately trained for NEP 2020 implementation.

Teachers are adequately trained	No of Respondents	Percentage
Strongly Agree	12	10.91
Agree	18	16.36
Neutral	20	18.18
Disagree	35	31.82
Strongly Disagree	25	22.73
Total	110	100

Interpretation: More than half (54.55%) disagree, showing lack of proper teacher training.

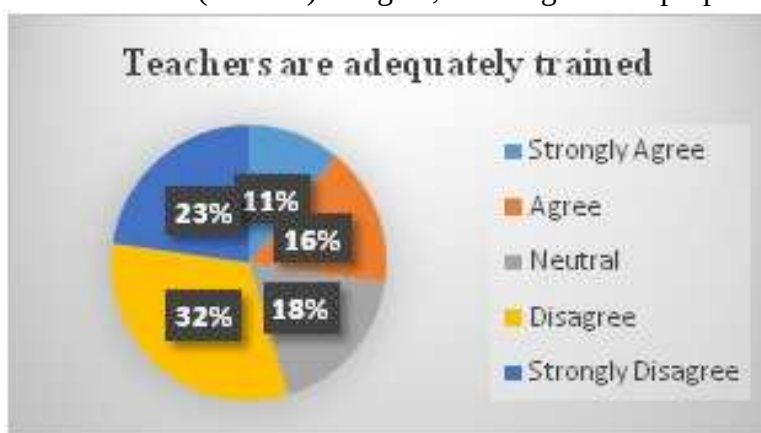


Table-1.8: Socio-economic conditions affect students' access to NEP 2020 benefits.

Socio-economic conditions affect students' access	No of Respondents	Percentage
Strongly Agree	39	35.45
Agree	33	30.00
Neutral	16	14.55
Disagree	12	10.91
Strongly Disagree	10	9.09
Total	110	100

Interpretation: 65.45% agree that socio-economic factors impact access to education reforms.

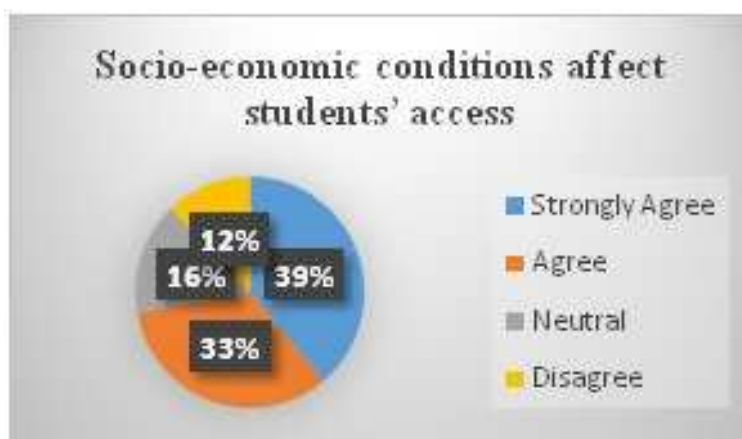


Table-1.9: Government support is sufficient for NEP 2020 implementation.

Government support is sufficient	No of Respondents	Percentage
Strongly Agree	14	12.73
Agree	20	18.18
Neutral	22	20.00
Disagree	30	27.27
Strongly Disagree	24	21.82
Total	110	100

Interpretation: 49.09% disagree, suggesting dissatisfaction with government support.

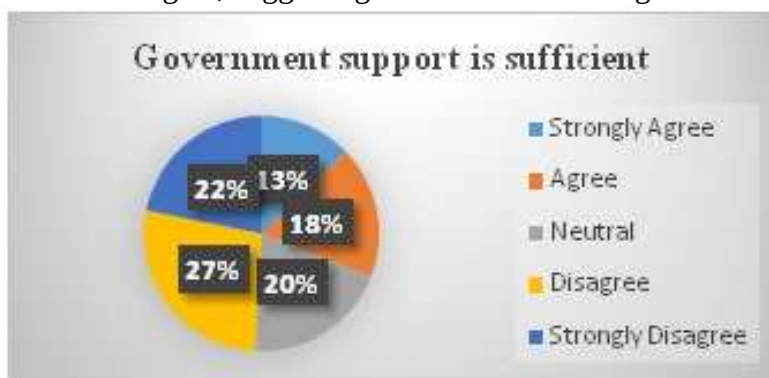
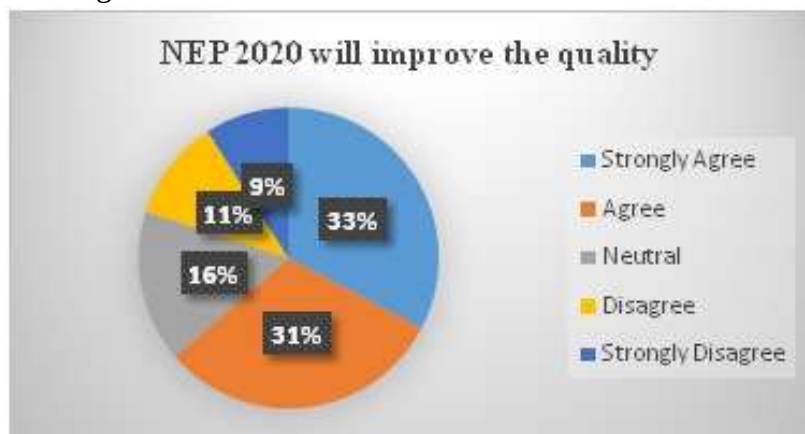


Table-1.10: NEP 2020 will improve the quality of education in Nagaland.

NEP 2020 will improve the quality	No of Respondents	Percentage
Strongly Agree	36	32.73
Agree	34	30.91
Neutral	18	16.36
Disagree	12	10.91
Strongly Disagree	10	9.09
Total	110	100

Interpretation: 63.64% respondents are optimistic that NEP 2020 can improve education quality despite challenges.



Chapter 5: Findings, Conclusion and Suggestions

5.1 Findings of the Study

Based on the analysis of 110 respondents, the following findings are observed:

- A majority of respondents (75 out of 110) agreed that lack of infrastructure is a major challenge.
- About 74 respondents agreed that there is a shortage of trained teachers for NEP 2020 implementation.
- Around 75 respondents agreed that digital connectivity is inadequate, especially in rural areas.
- Approximately 69 respondents agreed that language diversity creates difficulty in implementation.
- About 75 respondents agreed that financial problems hinder the implementation process.
- Around 50 respondents disagreed that schools are prepared, indicating low readiness levels.
- About 60 respondents disagreed that teachers are adequately trained for NEP 2020.
- Approximately 72 respondents agreed that socio-economic conditions affect students' access.
- Around 54 respondents disagreed that government support is sufficient.
- About 70 respondents agreed that NEP 2020 can improve the quality of education.

5.2 Conclusion

The study concludes that while NEP 2020 is a progressive and transformative policy, its implementation in Nagaland faces multiple challenges such as inadequate infrastructure, lack of trained teachers, financial constraints, and socio-economic barriers.

There exists a gap between policy design and its execution at the ground level. However, the positive response from a majority of respondents shows that successful implementation is possible with proper support and planning.

5.3 Suggestions

- Improve infrastructure in rural and remote schools.
- Provide regular teacher training and capacity-building programs.
- Enhance digital connectivity and access to technology.
- Develop multilingual educational resources.
- Increase financial allocation for education.
- Strengthen coordination between government bodies.

- Conduct awareness programs about NEP 2020.
- Focus on inclusive education for disadvantaged groups.
- Implement proper monitoring and evaluation systems.
- Encourage community participation in education.

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