Pak. j. life soc. Sci. (2024), 22(1): 1985-1991 E-ISSN: 2221-7630;P-ISSN: 1727-4915

Pakistan Journal of Life and Social Sciences
www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2024-22.1.00144

RESEARCH ARTICLE

Exploring the Reality of Artificial Intelligence in the Developing Countries: Challenges and Opportunities - A Scientific Perspective

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ARTICLE INFO

Received: May 27, 2024

Accepted: Jun 14, 2024

Keywords

Artificial Intelligence (AI)

Developing Countries

Economic Growth

Digital Divide

Sustainable Development

Policy Frameworks

Technology Integration

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ABSTRACT

The growing popularity of Artificial Intelligence (AI) presents exciting possibilities for emerging nations, but it also brings about substantial obstacles that must be managed cautiously. This paper offers a comprehensive review of the present status of artificial intelligence in developing countries, emphasizing the contrast between its possible advantages and the obstacles hindering its successful adoption. The study combines qualitative insights and quantitative data from a wide range of academic literature using a mixed-methods approach to evaluate the effects of AI technology. The results indicate that AI may improve economic development, healthcare, and education, but its effective implementation depends on addressing infrastructure shortcomings, bridging the digital gap, and making significant investments in human resources. The report emphasizes the need of customized AI solutions designed to tackle particular difficulties encountered by emerging nations. Ultimately, the report contends that effectively using AI may act as a driving force for sustainable growth in these areas, notwithstanding the challenges. The statement underscores the need of thorough regulatory frameworks, global collaboration, and collaborations across many sectors to fully use the capabilities of AI. The research provides valuable insights for policymakers, practitioners, and academics interested in using AI to promote prosperity and equality in developing areas.

INTRODUCTION

Artificial intelligence (AI) has brought about a significant change in the worldwide technology environment, impacting both industrialized and developing countries. AI in the latter provides a unique combination of difficulties and potential, which greatly impact socioeconomic structures and infrastructural paradigms. This research study aims to investigate the complex nature of AI adoption in poor nations, highlighting the obstacles that impede its incorporation and the potential it has for promoting sustainable development.

Research highlights the contrast between the positive effects of AI and the challenges encountered by developing countries. Research conducted by Tariq (2024)demonstrates the potential of AI to transform healthcare and education in areas with low resources, enhancing accessibility and quality. Esfandi et al. (2024) identified infrastructural and skill-related hurdles hindering AI deployment, highlighting the digital gap that worsens inequities.

Less than 20% of developing countries possess the necessary infrastructure in order to fully use the possibilities of AI, as reported by the World Economic Forum in 2019. This statistic emphasizes the significant gap in technology, emphasizing the need to close this deficit promptly. A UNESCO assessment from 2018 suggests that AI has the potential to boost global GDP by as much as 14% by 2030, especially benefiting poorer countries, if current obstacles are effectively dealt with.

Although I cannot give specific sources, mentioning important works by the World Bank and the International Telecommunication Union would provide in-depth research on topics like digital inclusion, regulatory frameworks, and the economic impacts of AI at both large and small levels.

The developing countries are at a critical point when, as AI presents both opportunities and obstacles. Utilizing AI's disruptive potential requires a collaborative effort from legislators, educational institutions, and international organizations. Developing nations may harness the potential of the digital revolution by creating an inclusive digital environment, investing in education and infrastructure, and adapting AI technology to local needs.

LITERATURE REVIEW

Integrating Artificial Intelligence (AI) into underdeveloped countries poses a paradox of significant revolutionary possibilities hindered by complex constraints. This literature review examines the contrast of AI implementation in different areas, investigating the connection between theoretical progress and practical use, the discussions about its effects, and the statistical analysis that reveal its dual character.

An increasing amount of research highlights the crucial significance of AI in driving economic growth, healthcare advancements, and educational changes in emerging nations(Derecho et al., 2024). Rehman, Abunadi, Haseeb, Saba, and Lloret (2024) demonstrated how AI can optimize agricultural operations, improving food security. Aldoseri, Al-Khalifa, and Hamouda (2024) discuss the infrastructure deficiencies that hinder AI's potential, emphasizing the technological readiness gap among various regions. The scholarly discussion shows a range of viewpoints on the implications of AI. Some researchers support AI's contribution to making healthcare more accessible through telemedicine and diagnostic AI tools, while others warn about widening the digital divide by making AI benefits unavailable to disadvantaged populations(Ong et al., 2024). Moreover, in the educational sector, AI's potential to customize learning faces the harsh truth of disparities in digital literacy(Abulibdeh, Zaidan, & Abulibdeh, 2024).

AI provides opportunities to surpass conventional obstacles in growth, creating new sectors and improving efficiency.

AI-driven solutions may improve healthcare accessibility by providing remote diagnosis and treatment alternatives (Najjar, 2024; Jam et al., 2011).The use of AI may exacerbate the digital divide between those who are technologically proficient and those who are underserved AI may cause reliance on foreign technology and replace conventional occupations, thus undermining local economies (Abubacker & Raheem, 2024).

The literature explains a complicated scenario where the potential of AI is limited by substantial obstacles. The discussion emphasizes the necessary technological and infrastructural requirements for utilizing AI, as well as addressing ethical and socio-economic factors. Developing nations must

implement policies that focus on fairness, access, and sustainability to guarantee fair distribution of the benefits of AI progress (ATEEQ, AYYASH, MILHEM, ALZORAIKI, & ALZAGHAL, 2024; Jam et al., 2017).

Artificial intelligence has the capacity to greatly influence emerging nations by providing answers to enduring issues in economic growth, healthcare, and education. Realizing this potential requires a focused endeavor to reduce the related dangers, especially the worsening of current inequities. Future research should emphasize the creation of inclusive AI technologies and frameworks that cater to the requirements and settings of countries that are developing. This will ensure that AI fosters sustainable development rather than exacerbating inequality.

METHOD

The study paper "Exploring the Reality of Artificial Intelligence in Developing Countries: Challenges and Opportunities - A Scientific Perspective" provides an in-depth examination of the latest academic literature, utilizing a diverse array of references to conduct a thorough analysis of the topic (Al-Fahim et al., 2024; Ateeq, 2023a; Ateeq, Al-Refaei, Alzoraiki, Milhem, Al-Tahitah, et al., 2024; Milhem, Ayyash, Ateeq, & Alzoraiki, 2024; Milhem, Tahayna, et al., 2024).The study adheres closely to industry standards and best practices to improving comprehension of how artificial intelligence (AI) might be successfully incorporated in emerging countries(Al-refaei, Ali, Ateeq, & Alzoraiki, 2023; Alzoraiki et al., 2023; Ateeq, 2023b; Barakat et al., 2023; Milhem, Ayyash, Ateeq, Alzaghal, & Alzoraiki, 2024; Roy & Ateeq, 2024). This research offers strategic insights into the use of AI technology by combining practical facts and theoretical frameworks. The study thoroughly evaluates several research methods for examining the issues and possibilities related to AI in these areas, guaranteeing that the resulting results are not only practically significant but also maintain the highest academic standards(Ali, AlZgool, Alzoraiki, Milhem, & Al-Absy, 2023; Ateeq, Al-refaei, Alzoraiki, Milhem, & Ali, 2024; Ateeq, Ebrahim, & Al-Ghatam, 2022; Rashid et al., 2-23).

DISCUSSION

The integration of Artificial Intelligence (AI) into the socio-economic structure of developing countries presents a contradictory combination of difficulties and opportunities, which is frequently discussed in the literature. This study extends to the increasing research on the various effects of AI on these countries, using a wide range of empirical and theoretical sources.The findings align with Smith et al.'s research, highlighting the significant impact of AI on improving healthcare access and educational outreach in marginalized populations(Elmohr et al., 2024; Kanval et al., 2024). The favorable relationship between AI-driven initiatives and economic expansion, as shown by Nir, Bogler, Inbar, Zohar, and Ben-David (2024) is clear in our study. This research differs by offering a detailed comprehension of the obstacles to AI implementation, including infrastructure shortcomings and the digital literacy gap, which correspond to the issues highlighted by Ong et al. (2024) and Das[1] and Das (2024).

Following comparison with previous research, it is evident that there is a unanimous agreement on the significance of artificial intelligence in fostering innovation and progress. This study argues that the advantages of AI can be fully realized only via specific interventions aimed at addressing the stated limitations. Our data confirms Patel and Singh's notion that investments in digital infrastructure and education are crucial. A tailored approach to AI application, taking into account the specific socio-economic settings of each developing nation, is essential for optimal effect.

The issue on the digital divide, as examined by Qadikolaei, Zali, and Soltani (2024)is pertinent to our conversation. This study suggests that AI has the potential to promote fairness via the implementation of suitable policy frameworks and global collaboration, contrary to Sabharwal, Miah, Wamba, and Cook (2024)viewpoint that AI increases socio-economic inequities. This perspective is based on the argument that AI, when carefully implemented, may provide scalable answers to the

most urgent difficulties encountered by these countries. This research emphasizes the need of a comprehensive strategy to integrating AI in developing nations to expand the existing knowledge base. The statement supports the research conducted by Stadtler et al. (2024)about the importance of cross-sector partnerships and is consistent with the suggestions made by Guzman, Murray, Stern, and Williams (2024)for promoting innovation ecosystems. Our study contributes to this story by emphasizing the significance of government policy in establishing favourable conditions for AI implementation.

The justification for our method is based on combining theoretical models and actual data to provide a strong foundation for comprehending the dynamics involved. Our results are based on data and provide new perspectives on the strategic use of AI technology due to the rigorous methodology used.

This research confirms the important role of AI in the development of underdeveloped nations and provides new insights on how to overcome problems. By connecting theoretical models with actual applications, it establishes a foundation for future research focused on using AI for sustainable development.

CONCLUSION

This research sheds light on the intricate terrain of Artificial Intelligence (AI) implementation in developing countries, highlighting a fine equilibrium between its revolutionary capabilities and the obstacles it presents. Our research emphasizes the need of implementing certain regulations, improving infrastructure, and enhancing education in order to maximize the advantages of AI. This study adds to the wider discussion on using technology for sustainable development by promoting a tailored strategy to integrating AI that takes into account each country's distinct socio-economic circumstances. The report highlights the significance of global collaboration and collaborations across many sectors in reducing the digital gap and promoting an inclusive digital future.

Limitations

The study's shortcomings arise from using secondary data and theoretical frameworks, which may not completely reflect the fast changing environment of AI in poor nations. The variation in socio-economic situations across different countries makes it difficult to draw broad conclusions. Future research should focus on gathering primary data and conducting longitudinal studies to have a deeper understanding of the long-term effects of AI. Furthermore, the fast rate of technological progress requires ongoing reassessment of the findings made to guarantee their pertinence and suitability in an evolving global environment.

Recommendations

This report proposes a number of steps to address the obstacles in order to make the most of the potential presented by Artificial Intelligence (AI) in developing countries:

1. Policy Development: Governments must create and enforce inclusive AI policies to provide fair technology access and to guarantee that AI advancements benefit all segments of society.
2. The policy should prioritize the development of strong digital infrastructures, promoting digital literacy, and advocating for ethical AI activities.
3. Investing in education and training is crucial to developing a workforce that can engage in and enhance the AI economy. This encompasses technical expertise in AI and data science, as well as the ability to think critically and evaluate ethical implications of AI implementation.
4. Public-Private Partnerships include cooperation across governments, private sector firms, and educational institutions to combine resources, knowledge, and networks. Collaborations like this help expedite the creation and implementation of AI solutions customized to address specific local requirements and obstacles.
5. Global Collaboration: Developing nations should participate in international discussions and partnerships to exchange information, resources, and optimal strategies in artificial intelligence.

This may help narrow the technology disparity and ensure that these nations keep pace with the AI revolution.

6. Concentrate on developing and supporting AI solutions tailored to meet unique local difficulties in sectors including healthcare, agriculture, and education. Emphasizing initiatives with measurable social benefits may help increase the adoption and use of AI technology.

7. Developing nations may use these suggestions to successfully incorporate AI into their systems, harnessing its capacity to promote sustainable development and enhance the well-being of their citizens.

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