

Original Research Article

A Study of AI in Education and Skill Development: Exploring Generative AI, NEP 2020, and Modern Museum Practices in MMR

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Abstract:

Artificial Intelligence (AI) has revolutionized the education sector with new teaching-learning models, customized learning spaces and enhanced skill development opportunities. Generative AI technologies such as ChatGPT, Gemini, and AI-assisted educational platforms are increasingly being adopted by students, teachers, and educational institutions. At the same time, the focus on the implementation of the National Education Policy (NEP) 2020 has been on technology integration, multidisciplinary learning, experiential learning, and development of digital skills. Additionally, the use of AI-powered interactive exhibits, virtual learning spaces, and digital heritage preservation methods for educational goals has transformed museum practices.

The present study explores the significance of AI in the field of education and skill development, particularly in the context of generative AI, the NEP 2020 and current museum practices in the Mumbai Metropolitan Region.

The study aims to gain insights into students' and teachers' awareness along with the effectiveness and challenges of using AI tools in education, as well as the awareness and challenges of using AI tools in museum work. A structured questionnaire was used to gather data from 200 respondents from the population, with stratified random sampling. Students (60%), teachers (25%) and museum professionals (15%) were among the respondents.

The results suggest that G.A.I. has made a huge contribution to the learning efficiency, research, creativity and skill acquisition of learners. The study also shows that the goals of NEP 2020 are positively facilitated with AI driven education practices. AI-enhanced digital exhibits were found to engage and enhance learning for visitors, according to museum professionals.

The research concludes that AI is a game-changer in the education and cultural learning landscape. To leverage the potential of AI in education and museum-based learning effectively, implementation strategies, digital literacy programs, and ethical guidelines are crucial. The research provides valuable guidance for policymakers, educators, museum administrators, and researchers in developing innovative, technology-enhanced learning environments that enrich educational experiences and promote greater engagement.

Keywords: Artificial Intelligence in Education, Generative AI, NEP 2020, Museum Innovation and Skill Development.

1. Introduction

AI is one of the most impactful technological innovations of the 21st century. AI-powered technologies are becoming more and more prevalent in educational institutions worldwide. AI-powered educational systems provide personalized learning experiences, automated assessments, and intelligent tutoring mechanisms. With the advent of Generative AI, the landscape of education has evolved even more, offering processes for creating educational content, helping us with research, language learning, and interactive problem-solving.

The NEP 2020 puts a strong focus on Digital transformation, Multidisciplinary learning, Innovation and Skill development. The policy encourages the integration of advanced technologies in education to improve learning outcomes and empower students with the knowledge and skills required for future success. AI technologies can help achieve these goals by creating personalized learning platforms and improving engagement.

The Mumbai Metropolitan Region is one of the most important education and culture hubs of India. Digital technologies are increasingly being embraced by schools, colleges, universities, museums, and cultural institutions in Mumbai for improving the delivery of education. Today, museums have become interactive learning environments that incorporate the use of artificial intelligence, augmented reality, virtual reality, and digital exhibits.

This is because generative AI tools like ChatGPT and other smart systems are becoming increasingly popular among students and teachers. These tools can assist with research, creating content, language translation, coding help, and tailoring learning experiences. AI in museums has also enhanced the educational experience by creating smart exhibits, virtual tours, and offering individualized content to each visitor.

Despite all the advances of AI technologies, ethical issues, privacy concerns, misinformation, and digital accessibility issues remain. Hence, it is crucial to have a clear grasp of the opportunities and challenges of

implementing AI. This study aims to understand the correlation of AI in education, skill development, NEP 2020 implementation and the modern practices in the museums of Mumbai Metropolitan Region.

2. Review of literature

- 1) **Holmes, Bialik, and Fadel (2019)** wrote about the use of AI in education and its implications for teaching and learning. The study, however, did not include the study of Generative AI tools, so there is scope for further research.
- 2) **Luckin, (2018)** looked into how AI has transformed education. The study emphasized the need for the incorporation of AI in educational institutions. However, there is limited exploitation of evidence from developing countries like India.
- 3) **UNESCO (2021)** explored the state of global trends towards the educational transformation with AI. The study however, did not specifically explore the use of AI in the museum learning space.
- 4) **Zawacki-Richter et al. (2019)** reviewed the use of AI in higher education. The review did not, however, cover museum learning spaces, or Generative AI technologies.
- 5) **Kumar & Sharma (2022)** conducted a study on the adoption of AI in the Indian educational institutions. But, there was no discussion about the use of AI in museums and cultural institutions.
- 6) **Dwivedi et al. (2023)** discussed the implications of Generative AI in education and society. But the potential of Generative AI for education in museums had yet to be explored.
- 7) **Bozkurt et al. (2023)** explored the educational implications of ChatGPT and Generative AI technologies. Academic integrity and misinformation were also areas of concern that were identified in the study. But, the Indian educational context and applications in museum learning were not explored.
- 8) **Parry (2020)** explored the concept of digital transformation in museums, along with its educational implications. AI specific education applications, however, were not explored in depth.
- 9) **Tallon and Walker (2019)** explored the use of digital technologies in museums. But, the use of Generative AI capabilities in museums was largely untapped.

Research Gap:

Previous research focused on Artificial Intelligence (AI), Generative AI (GAI) or digital technologies in education or museums individually. But very few studies are available on the use of Generative AI in museum-based situations, especially in India, which relates to classroom instruction. However, the integration of Generative AI in the instructional scenario of a museum is limitedly researched, especially in India. The field of AI and education, skill development, and neo-musealization is still much less explored and there is definitely a gap in research about the relationship between these three.

3. Significance of the Study:

This research is a vital addition to the field of understanding of how AI can be utilized in education, skill development and learning experiences in museums in the Mumbai Metropolitan Region. It aligns with NEP 2020, fosters experiential learning through the use of AI in museum practice, and offers recommendations for policy makers, teachers and museum leaders on issues of AI literacy, ethics, and digital inclusion.

4. Scope of the Study:

This study emphasizes on educational institutions and museums located in Mumbai Metropolitan Region. It explores awareness, adoption and effectiveness of Generative AI among students, teachers and museum professionals and how it impacts learning, innovation and skill development.

5. Statement of the Research Problem:

While AI is being increasingly adopted in educational and cultural institutions, there is a lack of empirical evidence on its effectiveness in improving learning outcomes and skills. Hence, this study aims to comprehend the role of AI in the field of education and skill development along with museum-based learning in the educational and cultural ecosystem of Mumbai.

6. Objectives of the study

1. To understand the awareness of the participants on Artificial Intelligence and Generative AI.
2. To evaluate the impact of Generative AI on learning and skills.
3. To analyze the role of AI in achieving the goals of NEP 2020.
4. To understand how contemporary museum work contributes to education.
5. To pinpoint the problems of using AI in schools.
6. To make suggestions on how to use AI in the field of education and museums.

7. Hypotheses of the study

Hypothesis 1

H⁰: There is no significant relationship between the perceived improvement in the education outcomes by the respondents and the use of Generative AI.

H¹: There is a significant relationship between the perceived improvement in the education outcomes by the respondents and the use of Generative AI.

Hypothesis 2

H⁰: There is no significant correlation between educational engagement and the respondents' use of AI in their museum practice.

H¹: There is a significant correlation between educational engagement and the respondents' use of AI in their museum practice.

8. Limitations of the study

The study is confined only to the Mumbai Metropolitan Region and hence might not be representative of the education institutes across India. The research is based on the responses of a representative subset of students, teachers, and museum professionals. The study had limitations in terms of both size and geographic scope due to the availability of time and resources. The information collected from respondents may not always accurately reflect their true perceptions and opinions, which can affect the reliability of the study's findings. The rapidly changing trend in AI technology could lead to new trends that are not addressed in this study. Therefore, the findings need to be interpreted within the context of the selected research area.

9. Research methodology

To explore the study of AI in the field of education and skill development in the Mumbai Metropolitan Region, a descriptive research design was used.

Research Design: Descriptive Research

Nature of Data: Primary Data

Area of Study: Mumbai Metropolitan Region

Population: Students, Teachers, and Museum Professionals

Sample Size: 200 Respondents

Sampling Technique: Stratified Random Sampling

Statistical Tools Used: Percentage Analysis, Frequency Distribution, Chi-Square Test and SPSS Analysis.

10. Data analysis and interpretation

Table 1 Level of AI Awareness

Awareness Level	Respondents	Percentage
Highly Aware	90	45%
Aware	70	35%
Moderately Aware	25	12.5%
Slightly Aware	10	5%
Not Aware	5	2.5%
Total	200	100%

Source: Data compiled by the researcher.

Interpretation This shows a high level of understanding of AI technologies among participants. The rise in AI literacy has been aided by educational institutions and digital platforms.

Table 2 Usage of Generative AI Tools

Response	Respondents	Percentage
Regularly	80	40%
Frequently	60	30%
Occasionally	35	17.5%
Rarely	15	7.5%
Never	10	5%
Total	200	100%

Source: The data was compiled by the researcher.

Interpretation This shows a broad range of applications of AI in educational practices. The results demonstrate positive acceptance of AI technologies.

Table 3 Perceived Impact of AI on Skill Development

Response	Respondents	Percentage
Strongly Agree	85	42.5%
Agree	70	35%
Neutral	25	12.5%
Disagree	15	7.5%
Strongly Disagree	5	2.5%
Total	200	100%

Source: Data compiled by researcher.

Interpretation AI facilitates creativity, digital skills, and problem-solving skills. The findings show there is a significant level of support for the usage of AI in learning.

Table 4 AI Support for NEP 2020 Objectives

Response	Respondents	Percentage
Strongly Agree	75	37.5%
Agree	80	40%
Neutral	25	12.5%
Disagree	15	7.5%
Strongly Disagree	5	2.5%
Total	200	100%

Source: The data was compiled by the researcher.

Interpretation AI is used for personalized learning and digital education. The results indicate that there is a connection between the use of AI and educational reform.

Table 5 Effectiveness of AI in Modern Museum Practices

Response	Respondents	Percentage
Highly Effective	70	35%
Effective	65	32.5%
Moderately Effective	35	17.5%
Less Effective	20	10%
Not Effective	10	5%
Total	200	100%

Source: Data Compiled by Researcher

Interpretation The use of interactive exhibits and virtual experiences enhances educational engagement. AI improves visitors' learning experiences.

Table 6 Major Challenges in AI Adoption

Challenge	Respondents	Percentage
Privacy Concerns	60	30%
Ethical Issues	50	25%
Lack of Training	40	20%
Cost Factors	30	15%
Infrastructure Issues	20	10%
Total	200	100%

Source: Data Compiled from the Source

Interpretation Ethics and privacy problems arose as significant issues. Limited training and infrastructure was also cited. The results underscore the importance of ethical use of AI.

Table 7 Overall Satisfaction with AI-Based Learning

Response	Respondents	Percentage
Highly Satisfied	80	40%
Satisfied	70	35%
Neutral	25	12.5%
Dissatisfied	15	7.5%
Highly Dissatisfied	10	5%
Total	200	100%

Source: Data Compiled by Researcher

Interpretation Most of the respondents reported that they were happy with the AI-based learning experiences. The findings show that the attitudes are positive towards the use of educational technology.

❖ Hypothesis Testing.

Hypothesis 1

This will examine the relationship between generative AI usage and educational outcomes.

Table 8. Chi-Square Test Results

Test Statistics	Value
Pearson Chi-Square	18.642
Degrees of Freedom (df)	4
Asymptotic Significance (2-sided)	0.001
Level of Significance (α)	0.05
Decision	Reject H_{01}
Result	Significant

Interpretation

The use of Generative AI was significantly related to the educational outcomes ($p = 0.001 < 0.05$) as revealed by the Chi-Square test. This means that using Generative AI positively improves the effectiveness of learning, academic performance, and development of skills for students.

Hypothesis 2

The relationship between AI-Enabled Museum Practices and Educational Engagement.

Table 9. Chi-Square Test Results

Test Statistics	Value
Pearson Chi-Square	15.318
Degrees of Freedom (df)	4
Asymptotic Significance (2-sided)	0.004
Level of Significance (α)	0.05
Decision	Reject H_{02}
Result	Significant

Interpretation

The Chi-Square test indicated significant association between the AI enabled practices in a museum and educational involvement ($p = 0.004 < 0.05$). This indicates that AI tools in museums enhance participation in education, learning experiences, and interaction with the museum.

11. Findings of the Study

The results of the study indicate that the awareness and acceptance of AI among the respondents is high. AI applications in the education, research, and skill development fields are plentiful and extensive. AI helps in enhancing classroom effectiveness, enhancing digital skills, and fulfilling NEP 2020 goals. AI-driven museum operations also enhance learning experiences.

12. Suggestions

AI literacy must be encouraged and trained in schools. There is a need for ethical guidelines for AI in policy-making and for museums to implement AI in interactive learning systems. Robust data security and collaboration among museums and educational institutions are also suggested.

13. Scope for Further Research

Larger and more diverse samples in various regions can be used in future studies. Research can be conducted on the difference between urban and rural institutions, in the long-term impact of AI on academic research, in ethical and legal issues raised by AI and in the advanced applications of AI in museums.

14. Conclusion

AI is an integral part of the future of education and skill development. It facilitates personalized learning, creativity and engagement in learning while is also contributing to the achievement of NEP 2020 objectives. While there are ethical and privacy concerns, the potential of responsible AI adoption for improving learning opportunities and fostering lifelong learning is significant.

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