



Impact Of Artificial Intelligence In Educational Assessments In Karnataka – A Study

¹ Capt. Dr. M.C. Shivakumar

¹ Associate professor in Commerce,

¹Department of Commerce,

¹GFGC, Kyathanahalli, PandavapuraTq, Mandya Dist., Karnataka, India

Abstract: The integration of Artificial Intelligence (AI) in education has emerged as a transformative approach to enhance assessment accuracy, efficiency, and student learning outcomes. This study investigates the impact of AI on educational assessments in Karnataka, addressing the growing need to understand its effectiveness, adoption, and associated challenges within local academic institutions. The research aims to examine students' and educators' perceptions of AI-driven assessment tools, identify regional and demographic variations in acceptance, and explore ethical considerations influencing implementation. A descriptive research design was adopted, with primary data collected through a structured questionnaire administered to 150 respondents from Mysore, Bangalore, and Hassan. Data were analyzed using descriptive statistics, ANOVA, and regression analysis to identify trends, differences, and relationships between demographic factors and AI perceptions. The findings indicate that AI significantly improves assessment accuracy, reduces evaluation time, and positively influences learning outcomes, while ethical concerns and regional disparities affect adoption levels. Income and city of residence were found to significantly shape respondents' perceptions, and the null hypothesis of no significant impact of AI was rejected. The study highlights the relevance of AI in contemporary education and provides insights for institutions to implement ethical, context-sensitive, and effective AI-based assessment practices.

Index Terms - Artificial Intelligence, Educational Assessment, Karnataka, Learning Outcomes, Ethical Challenges

I. INTRODUCTION

The rapid advancement of technology has brought Artificial Intelligence (AI) to the forefront of educational innovation, transforming traditional assessment practices worldwide. AI applications in education have expanded beyond automated grading to include personalized learning, predictive analytics, and adaptive evaluation, offering greater accuracy, efficiency, and insight into student performance. In the current educational scenario, especially in India, institutions are exploring AI-driven tools to manage increasing student populations, streamline assessment processes, and enhance learning outcomes. While global studies have highlighted the potential of AI in improving assessment fairness and effectiveness, its implementation in the Indian context, particularly in Karnataka, remains under-explored. Understanding how AI influences assessment practices, addresses challenges, and supports teaching and learning processes is crucial for maximizing its benefits while ensuring ethical and responsible usage.

Educational institutions in Karnataka are witnessing a gradual integration of AI in evaluation processes, influenced by emerging technologies, student expectations, and policy initiatives promoting digital education. The relevance of this research stems from the need to analyze both the opportunities and limitations of AI in local educational contexts, including ethical considerations, regional disparities, and demographic factors affecting adoption. By examining students' and educators' perceptions, this study aims to provide empirical evidence on the impact of AI on assessment accuracy, efficiency, and learning outcomes. The findings are

expected to inform institutional strategies, improve AI implementation, and guide policy-making to foster effective, equitable, and sustainable AI integration in educational assessments. Furthermore, the study opens avenues for future research on AI's long-term influence on academic performance, pedagogical practices, and regional educational development in India.

II. CONCEPTUAL BACKGROUND

Artificial Intelligence (AI) has emerged as a transformative force in education, reshaping the ways assessments are designed, conducted, and interpreted. Traditionally, evaluation systems have relied heavily on manual grading and standardized testing, which often fail to capture the diverse learning needs of students. AI technologies, including machine learning algorithms, natural language processing, and data analytics, offer the potential to create dynamic, adaptive, and personalized assessment environments. In the current educational landscape, characterized by rapid digitalization and increased student diversity, AI can support more efficient feedback mechanisms, monitor learning progress in real time, and reduce human errors in evaluation. Moreover, AI's ability to analyze large datasets allows educators to identify learning gaps, enhance curriculum planning, and foster evidence-based pedagogical decisions, making it a critical tool for improving the overall quality of education.

In India, the adoption of AI in education is gaining momentum due to initiatives promoting digital learning, smart classrooms, and technology-driven educational policies. However, challenges such as infrastructure limitations, lack of AI literacy among educators, and ethical concerns around data privacy and algorithmic bias continue to influence its effective integration. Studying AI's impact on educational assessments in Karnataka is particularly relevant, as it provides insights into how regional institutions are navigating these challenges while leveraging AI to enhance student learning and performance evaluation. By examining the effectiveness, acceptance, and contextual factors influencing AI adoption, this research contributes to a deeper understanding of AI's role in modern education. Additionally, the study highlights practical implications for policymakers and educators, offering guidance for sustainable, inclusive, and responsible AI integration in assessment practices across diverse educational settings.

III. REVIEW OF LITERATURE

Onyinye Maryqueen (2025)²¹ explores the application of AI in student assessment and evaluation within tertiary institutions in Anambra State, Nigeria and examines the benefits and challenges associated with AI-driven assessment tools, including personalized learning, efficiency, and data analysis. Adiyono et al. (2025)¹ aimed to analyze student reliance on AI in finding answers to midterm and final exams at the Ibnu Rusyd College of Tarbiyah (IRCT) Tanah Grogot, Indonesia. And employed a mixed-methods approach through a survey of 98 Islamic Education Study Program students and interviews with 5 lecturers and 20 students. Feigerlova et al. (2025)⁴ conducted a systematic literature search using electronic databases (CINAHL Plus, EMBASE, Proquest, Pubmed, Cochrane Library, and Web of Science) to identify studies published until October 1st 2024. Trang Ngoc & Thi Truong (2025)¹² aim to explore key trends, geographical distribution of research, and emerging themes in the educational use of GenAI, while addressing ethical challenges such as algorithmic bias, data privacy, and the digital divide. Iris Heung & Jiahong Su (2025)²⁵ aim to investigate pedagogical strategies, learning tools, assessment methods in AI literacy education in K-12 contexts, and students' learning outcomes by reviewing 46 studies in academic conferences and journals.

Ayush Kumar Singh et al. (2025)¹⁷ explores the multifaceted role of AI in enhancing education through personalized learning, intelligent tutoring, and data-driven insights, while also addressing the challenges and ethical considerations inherent in these technologies.

Sarah Chardonnens (2025)³ explores the specific educational needs of Generation Z, defined as individuals born between 1997 and 2012, and examines the role of metacognitive strategies and artificial intelligence (AI) in enhancing their learning experiences. Fahmi Zaidi Abdul Razak et al. (2025)¹⁵ aims to identify the factors that contribute to the adoption of AI among postgraduate students. And focuses on the postgraduate student population in Malaysia, employing convenience sampling techniques. Ahmed Tlili et al. (2025)²⁰ conducted a meta-analysis and research synthesis of the effects of AI application on students' learning achievement. And analyze the field of education, level of education, learning mode, intervention duration, and geographical distribution as moderating variables of the effect of AIED. Aniella Mihaela & Gabriel Petrea (2025)²² investigates the impact of AI technologies on students' learning processes and academic performance, with a focus on their perceptions and the challenges associated with AI adoption.

Mengke Wang et al. (2025)²³ found that teachers' trust in AI-based teaching analysis system positively predicted perceived usefulness and willingness to use the system and evaluation anxiety negatively affected perceived ease of use and teachers' willingness to use the system.

Oluwaseyi Aina (2025)¹³ provides a succinct overview of the pros and cons of integrating AI in mathematics education. And striking a balance between AI-driven developments and preserving core pedagogical principles is critical in the teaching and learning environment. Zouhaier Slimi (2025)¹⁸ explores the impact of artificial intelligence (AI) integration on students' educational experiences. And investigates student perceptions of AI across various academic aspects, such as module outlines, learning outcomes, curriculum design, instructional activities, assessments, and feedback mechanisms. Seema Yadav (2025)²⁴ explores the benefits of AI-driven immersive learning, including improved student motivation, engagement, and retention, while also discussing scalability and the potential for widespread adoption across diverse educational settings. Yunus Kökver (2025)⁶ aims to determine the misconceptions of teacher candidates about the greenhouse effect concept by using Artificial Intelligence (AI) algorithm instead of human experts. For this obtained the dataset from 402 teacher candidates and analysed by Natural Language Processing (NLP) methods.

Jin Mao (2024)⁹ aims to recapitulate the use of AI in education and examine potential opportunities and challenges of employing generative AI for educational assessment, with systems thinking in mind. Hande Tanberkan et al. (2024)¹⁹ discusses the benefits offered by AI technologies in education and the problems they cause in the context of measurement and evaluation. And highlighted that developing AI technologies in education with a participatory approach involving all educational stakeholders and continuously monitoring potential risks. Ashwini Jagannath et al. (2024)⁷ explores the integration of AI technologies into the assessment process, aiming to improve accuracy, fairness, and efficiency. And examine the current state of educational assessments, identifying key areas where AI can contribute significantly. Bahar Memarian & Tenzin Doleck (2024)¹⁰ conduct a review of the literature to examine the state of work on AFL and AI in the education literature. A review of articles in Web of Science, SCOPUS, and Google Scholar yielded 35 studies for review. Kershnee & Anne Potter (2024)¹⁶ explores the transformative impact of GenAI in distance learning and focuses on academic integrity and student voices. And uses the technology acceptance model to investigate how GenAI influences distance education. Okan Bulut et al. (2024)² examines the ethical implications of AI-powered tools in educational measurement, explores significant challenges such as automation bias and environmental impact, and proposes solutions to ensure AI's responsible and effective use in education. Haozhuo Lin & Qiu Chen (2024)⁷ aims to explore the effects of AI-integrated educational applications on college students' creativity and academic emotions from the perspectives of both students and teachers. Valentine Joseph Owan (2023)¹⁴ explores the various applications of AI tools in educational measurement and assessment. And presents strategies to address these challenges and enhance the effectiveness of AI in educational assessment. Doina Olivia & Mirona Ana (2023)¹¹ provide a comprehensive overview of latest research papers, offering diverse perspectives on the current role of AI in education. Spanning from 2018 to 2023, these studies collectively shed light on the far-reaching potential of AI in education. Salmiza Saleh (2021)⁵ outlines the application of AI in the field of education, such as adaptive learning, teaching evaluation, virtual classroom, etc. And then analyzes its impact on teaching and learning, which has a positive meaning for improving teachers' teaching level and students' learning quality.

IV. PROBLEM STATEMENT

Although extensive international research has highlighted the transformative potential of Artificial Intelligence in enhancing educational assessments through personalized learning, efficient evaluation, and data-driven insights, there is a notable paucity of region-specific studies in the Indian context, particularly in Karnataka. Existing literature predominantly focuses on global trends, pedagogical strategies, ethical considerations, and technological integration, leaving a gap in understanding the localized impact of AI adoption in educational assessments. This necessitates a systematic inquiry into the effectiveness, challenges, and acceptance of AI-driven assessment practices within Karnataka's educational institutions.

V. OBJECTIVE OF THE STUDY

To examine the impact of Artificial Intelligence on educational assessments within local educational institutions in Karnataka

VI. RESEARCH METHODOLOGY

6.1 Research Design

The study adopts a descriptive research design to investigate the impact of Artificial Intelligence on educational assessments in Karnataka. The descriptive method allows a detailed examination of current practices, perceptions, and challenges associated with AI adoption in local educational institutions, providing insights into effectiveness and acceptance among students and educators.

6.2 Sample Area and Population

The research focuses on three selected cities in Karnataka: Mysore, Bangalore, and Hassan, representing diverse educational environments. Respondents are selected based on their involvement in academic assessments where AI tools are used, ensuring the sample reflects the practical exposure to AI-driven evaluation systems.

6.3 Sample Size and Criteria

A total of 150 respondents has been considered as valid for this study, with 50 respondents from each selected city. The criteria for respondent selection include: participation in educational assessments, familiarity with AI-based tools, and willingness to provide informed responses.

Table 1 Sample Size

City	Sample Size
Mysore	50
Bangalore	150
Hassan	50
Total	250

6.4 Sample Classification (Demographics)

Respondents are classified based on age, gender, and income to ensure a representative analysis across socio-demographic groups.

6.5 Source of Data

Primary Data - Collected using a structured questionnaire based on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), designed to capture respondents' perceptions, experiences, and challenges regarding AI in educational assessments.

Secondary Data

Collected from published journals, articles, conference papers, institutional reports, and relevant online databases to provide context, background, and comparative insights into AI applications in education. This helps validate primary findings and enrich the discussion with global and national perspectives.

6.6 Tools and Techniques of Analysis

- **Descriptive Statistics:** To summarize respondents' demographic characteristics and overall responses regarding AI adoption in assessments.
- **ANOVA (Analysis of Variance):** To determine whether there are significant differences in perceptions across the three cities.
- **Regression Analysis:** To explore the relationship between demographic factors and perceptions of AI's effectiveness in educational assessments.

VII. DATA ANALYSIS AND INTERPRETATION

The collected data were systematically analyzed to examine the impact of Artificial Intelligence on educational assessments in Karnataka, focusing on effectiveness, adoption, and associated challenges. Descriptive statistics, ANOVA, and regression analysis were employed to interpret respondents' perceptions and identify significant patterns and relationships.

Table 2 Descriptive Statistics (Perception of AI in Educational Assessments)

Statement	Mean Score	Std. Deviation
AI improves the accuracy of assessments	4.2	0.65
AI reduces the time required for evaluation	4.0	0.72
AI provides personalized feedback to students	3.8	0.80
AI adoption faces ethical challenges (bias, privacy issues)	3.5	0.88
AI enhances students' learning outcomes Positive perception of AI effectiveness.	4.1	0.70

Source – Primary data - SPSS output

The descriptive statistics indicate that respondents perceive AI as beneficial for improving assessment accuracy, efficiency, and learning outcomes, although concerns about ethics and bias remain moderate.

Table 3 ANOVA (Differences in Perception across Cities)

Perception Factor	Source	Sum of Squares (SS)	df	Mean Square (MS)	F-Value	p-value
AI improves assessment accuracy	Between	1.23	2	0.615	4.12	0.019
AI reduces evaluation time	Between	0.78	2	0.39	2.35	0.101
AI provides personalized feedback	Between	0.92	2	0.46	3.05	0.052
AI faces ethical challenges	Between	1.15	2	0.575	3.88	0.024
AI enhances learning outcomes	Between	1.30	2	0.65	4.50	0.015

Source – Primary data - SPSS output

The ANOVA results show significant differences in perceptions regarding assessment accuracy, ethical challenges, and learning outcomes among respondents from Mysore, Bangalore, and Hassan, suggesting regional variations in AI adoption and acceptance.

Table 4 Regression Analysis (Effect of Demographics on Perception of AI Effectiveness)

Independent Variable	β Regression Coefficient	t-value	p-value
Age	0.12	1.95	0.053
Gender	0.08	1.32	0.188
Income	0.15	2.42	0.017
City (Mysore/Bangalore/Hassan)	0.20	3.05	.003

Source – Primary data - SPSS output

Regression results indicate that income level and city of residence significantly influence respondents' perception of AI's effectiveness, while age has a marginal effect and gender is not significant.

The study reveals that AI is perceived positively in enhancing assessment accuracy, efficiency, and learning outcomes among students and educators in Karnataka. However, ethical concerns and regional variations exist. Income level and city of residence significantly influence perceptions, confirming that AI adoption and its impact are context-dependent.

VIII. RESULTS AND DISCUSSIONS

- AI significantly improves the accuracy of educational assessments in Karnataka, as indicated by high mean scores (Mean = 4.2) and ANOVA results ($F = 4.12, p = 0.019$).
- Respondents perceive AI as an effective tool for reducing evaluation time, with consistent agreement across cities (Mean = 4.0, $F = 2.35, p = 0.101$).
- AI positively enhances students' learning outcomes, with significant differences observed across cities (Mean = 4.1, $F = 4.50, p = 0.015$).
- Ethical challenges such as algorithmic bias and data privacy are a concern among respondents, with significant variation across regions (Mean = 3.5, $F = 3.88, p = 0.024$).
- Income and city of residence significantly influence perceptions of AI effectiveness, while age shows marginal influence and gender is not significant.
- The null hypothesis stating that AI has no significant impact on educational assessments is rejected, confirming AI's positive impact on assessment effectiveness, efficiency, and learning outcomes.
- Based on the findings, institutions should enhance AI integration with ethical safeguards, conduct awareness programs for students and educators, and implement AI systems considering local demographic and regional factors.
- Educational institutions should adopt AI systems with safeguards to address bias, data privacy, and fairness, ensuring responsible and transparent assessment processes.
- Organize workshops and seminars for students and educators to enhance understanding and effective use of AI-based assessment tools.
- Design AI-driven assessment strategies considering regional and demographic factors such as city, income, and institutional readiness to maximize acceptance and effectiveness.

IX. CONCLUSION

The study on the impact of Artificial Intelligence in educational assessments in Karnataka highlights the growing relevance of AI in enhancing accuracy, efficiency, and learning outcomes in contemporary education. Findings reveal that respondents perceive AI positively, though ethical challenges such as bias and data privacy remain a concern. Significant differences were observed across cities, indicating regional variations in adoption and acceptance. Demographic factors, particularly income and city of residence, influence perceptions of AI effectiveness. The study confirms that AI can significantly improve assessment processes, validating the research hypothesis. Institutions are encouraged to implement ethical safeguards, provide training, and tailor AI adoption to local contexts. These steps can enhance both teaching and learning experiences. The research contributes to understanding the localized impact of AI in Indian education. Future research can explore longitudinal effects of AI adoption, investigate faculty perspectives in depth, and assess AI's influence across different levels of education and diverse regions. This study provides a foundation for evidence-based policy-making and strategic AI integration in educational assessments.

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