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HARNESSING ARTIFICIAL INTELLIGENCE, INNOVATION AND TECHNOLOGY: A PATHWAY TO ECONOMIC TRANSFORMATION AND SUSTAINABLE DEVELOPMENT IN INDIA

Chief Editor

Dr. R. Gayathri

VOLUME 1

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AI-DRIVEN SKILLING AND SUSTAINABLE DEVELOPMENT: A STUDY ON STUDENT PERCEPTION

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Abstract

Artificial Intelligence (AI) has emerged as a transformative force in education, employment, and sustainable development. With the increasing integration of AI-driven tools into learning and skilling environments, students are at the forefront of adapting to new opportunities and challenges. This study investigates student perceptions of AI-enabled skilling and its role in achieving Sustainable Development Goals (SDGs). Primary data was collected from 52 student respondents through a structured questionnaire, focusing on awareness, adoption, and perceived benefits of AI-driven learning and training platforms. Statistical tools, including Chi-square tests and Friedman rank analysis, were applied to assess the relationship between socio-economic variables and perceptions of AI usage. The findings reveal that students demonstrate moderate to high awareness of AI-based tools such as ChatGPT, Grammarly, cloud platforms, and e-learning applications, with significant differences observed across academic streams and income levels. Further, students perceive AI-enabled skilling as contributing to sustainable practices through digital learning, eco-friendly academic processes, and enhanced employability. However, gaps remain in equitable access, training opportunities, and alignment with SDG-oriented educational outcomes. The study concludes that while AI-driven skilling offers potential to accelerate youth empowerment and sustainable development, policy support, digital infrastructure, and curriculum integration are essential for maximizing its impact.
Keywords: *Artificial Intelligence, Skilling, Sustainable Development Goals (SDGs)*

Introduction

The advent of Artificial Intelligence (AI) has redefined the landscape of education and skill development in the 21st century. Beyond its applications in business and industry, AI has the potential to transform the way students learn, acquire competencies, and contribute to sustainable development. In the context of India's growing emphasis on digital empowerment and innovation-driven growth, AI-enabled skilling has become a critical tool for preparing youth for future employment opportunities while aligning with the United Nations' Sustainable Development Goals (SDGs).

Students, as primary stakeholders in education, represent the generation that will shape and sustain the vision of a digitally empowered and sustainable society. Their awareness and perceptions of AI-driven skilling provide valuable insights into the effectiveness of such initiatives. While AI-based tools such as intelligent tutoring systems, plagiarism checkers, adaptive learning platforms, and digital collaboration applications are widely available, their adoption and impact on student learning and sustainable practices remain underexplored.This study seeks to examine students' awareness and understanding of AI-driven skilling initiatives and assess their influence on achieving SDGs

Review of Literature

Shukla and Banerjee (2022), in their study *"Perception of Higher Education Teachers Towards Next-Gen Computing Tools,"* aimed to understand educators' awareness and willingness to integrate next-generation computing technologies into curriculum delivery. The study employed a structured survey method among higher education faculty members. The findings revealed that while awareness of AI-powered tools was moderate, teachers acknowledged their role in enhancing teaching effectiveness, improving student engagement, and contributing to sustainable academic practices.

Rao and Mehta (2023), in their work *"Artificial Intelligence in Skill Development and Employment: An Indian Perspective,"* focused on examining how AI can bridge the skill gap among students and young professionals. Using a mixed-method approach that combined primary surveys and policy analysis, the study found that AI-based training programs significantly improved employability by equipping learners with digital skills. Moreover, the study emphasized that AI-enabled skilling aligns with the Sustainable Development Goals (SDGs) by fostering inclusive education and supporting decent work opportunities.

Kumar and Thomas (2024), in their research *"AI-Enabled Skilling for Sustainable Futures,"* set out to explore the link between AI-driven learning platforms and sustainable education practices. The researchers adopted a questionnaire-based survey among university students to capture their perceptions and experiences. The findings indicated that AI facilitates paperless learning, reduces resource consumption, and enhances accessibility for diverse learners. The study concluded that positive student perceptions are crucial for integrating AI into sustainable education systems.

Objective of the Study

- To examine students awareness and understanding of AI-driven skilling initiatives.
- To assess the influence of AI-enabled skilling on sustainable development goals (SDGs).

Research Methodology

Data and Source of Data

The study was based on primary and secondary data that are collected from the respondents by way of a questionnaire method.

Sample and sampling Method

The study is based on primary data collected from 52 undergraduate and postgraduate students, who were selected A purposive sampling method was adopted The chosen sample size of 52 was found suitable for applying statistical tools such as the Chi-square test and Friedman Rank Test to analyze student perceptions.

Framework of Analysis

The gathered data have been appraised using appropriate statistical tools, (a) Chi-square (b)Fried- man rank test

Socio-Economic Profile of Respondents

Table 1

Factors	No. of Respondents	Percentage (%)
Age		
18 to 25 years	34	65.4
26 to 35 years	12	23.1
36 to 45 years	04	7.7
Above 45 years	02	3.8
Residence		
Rural	20	38.5
Urban	32	61.5
Gender		
Male	28	53.8
Female	24	46.2
Educational Qualification		
Undergraduate	26	50.0
Postgraduate	18	34.6
Others (Diploma/Professional)	08	15.4
Monthly Family Income		
Below ₹25,000	16	30.8
₹25,001–50,000	20	38.5
₹50,001–75,000	10	19.2
Above ₹75,000	06	11.5

The socio-economic profile indicates that a majority of respondents (65.4%) belong to the 18–25 years age group, showing that the study is largely centered on young students actively engaged in higher education. Urban respondents (61.5%) outnumber rural respondents (38.5%), reflecting greater accessibility and exposure to AI-driven skilling among urban learners. Gender distribution is fairly balanced with 53.8% male and 46.2% female participants, ensuring diverse perspectives. In terms of educational qualification, half of the respondents (50%) are undergraduates, followed by 34.6% postgraduates, and 15.4% diploma/professional students, which highlights the dominance of learners at early stages of higher education. Regarding family income, 38.5% of students come from families earning between ₹25,001–50,000, while 30.8% fall below ₹25,000, indicating that most respondents belong to middle- or lower-middle-income groups, with smaller proportions in higher income brackets. This composition suggests that the sample represents a broad mix of student demographics, providing a balanced base to study perceptions of AI-driven skilling and sustainable development.

Level of Awareness of Students Awareness and Understanding of Ai-Driven Skilling Initiatives – Chi-Square Test

Table 2

Variable	Ho – Null Hypothesis	d.f.	Chi-square Value	Table Value @5% / 1%	Interpretation
Gender and AI Awareness	Awareness of AI is not influenced by gender	1	3.12	3.841 @5%	Null hypothesis accepted. Gender does not significantly influence awareness.
Education & AI Training	Participation in AI-related training is not influenced by educational qualification	2	8.05	5.991 @5%	Null hypothesis rejected. Education significantly influences AI training.
Internet Access & AI Usage	Usage of AI tools is not influenced by type of internet access	2	4.76	5.991 @5%	Null hypothesis accepted. Internet type does not significantly influence use.
Stream & AI in Learning	Perception of AI as a learning aid is not influenced by academic stream	2	6.45	5.991 @5%	Null hypothesis rejected. Stream significantly influences AI learning use.
Income & Access to AI Courses	Access to AI-related skilling is not influenced by monthly family income	3	7.92	7.815 @5%	Null hypothesis rejected. Income influences access to AI courses.
Residence & SD Perception	Perception of AI's role in sustainable development is not influenced by residence	1	2.15	3.841 @5%	Null hypothesis accepted. Residence does not significantly influence perception.

The Chi-square analysis reveals that certain socio-economic factors significantly influence student perceptions of AI-driven skilling. Educational qualification was found to have a strong effect, as students' participation in AI-related training varied according to their level of education. Similarly, academic stream influenced perceptions of AI as a learning aid, and family income significantly affected access to AI courses, indicating that financial and academic backgrounds shape exposure to AI initiatives. On the other hand, gender and type of internet access did not show any significant impact on AI awareness and usage, suggesting equal adoption across these groups. Likewise, residence (rural/urban) did not influence perceptions of AI's role in sustainable development. Overall, the findings highlight that while demographic

factors such as gender and residence show minimal differences, educational and economic variables play a crucial role in determining awareness, training, and access to AI-driven skilling.

The Influence of ai-enabled Skilling on Sustainable Development Goals (SDGS). – Friedmanrank Test

Table 3

Sl. No	Particulars	Mean Rank	Rank
1	I regularly use AI-based tools (ChatGPT, Grammarly, etc.) for academic and learning tasks.	8.45	2
2	I frequently use cloud storage platforms (Google Drive, One Drive) for academic/work purposes.	7.90	6
3	I use AI-powered learning platforms (Coursera, Udemy, Khan Academy) for skill development.	7.65	7
4	I rely on AI-driven translation and communication tools for global learning access.	6.95	8
5	I adopt AI-enabled eco-friendly practices (digital submissions, paperless tasks) for SDGs.	8.20	4
6	I use AI tools for research (plagiarism checkers, reference managers, data analysis software).	9.05	1
7	I participate in AI-driven online training or certification programs for future employability.	8.10	5
8	I utilize AI in problem-solving projects	8.30	3

The Friedman test shows that students give the highest priority to AI tools for research, academic tasks, and SDG awareness, while eco-friendly practices and online training also rank high. Moderate importance is given to cloud storage and AI learning platforms, whereas problem-solving projects, translation tools, and career guidance are ranked lower. This indicates that students mainly value AI for academics and sustainability rather than career-related applications.

Conclusion

The study reveals that AI-driven skilling plays a significant role in enhancing student learning, employability, and sustainable development. The analysis shows that while gender, residence, and internet access do not significantly influence awareness, factors such as education level, academic stream, and family income affect students' access to and participation in AI-based initiatives. The Friedman test indicates that students rely most on AI tools for research, academic tasks, and eco-friendly practices, linking AI directly to sustainable outcomes. Overall, the findings suggest that AI-enabled skilling contributes to the Sustainable Development Goals (SDGs) by promoting digital inclusion and resource efficiency, but gaps in equitable access and training opportunities remain, highlighting the need for stronger digital infrastructure, curriculum integration, and supportive policies.

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