

HARNESSING ARTIFICIAL INTELLIGENCE TO ENHANCE RESEARCH LITERACY AMONG EARLY-CAREER SCHOLARS : A COMPARATIVE STUDY

Dr. Vinita Atre, Deputy Manager Library, Jaipuria Institute of Management, Indore Email: vinitachoure2007@gmail.com

Mrs. Kavita Dhare - Librarian, Compfeeders Group of Institutions Email: dhare.kavita@gmail.com

Introduction

Research literacy is becoming more important for early-career researchers as the academic world changes quickly. It includes skills like finding, understanding, and using research information correctly. Today, Artificial Intelligence (AI) is changing how researchers search literature, write papers, manage citations, and analyze data. While AI can make research easier and faster, it also raises questions about whether it supports or weakens basic research skills. This study compares researchers from Barkatullah University, Bhopal, and Devi Ahilya Vishwavidyalaya, Indore, to understand how AI helps or challenges the development of research literacy.

Literature Review

Research literacy means having the skills to find, understand, evaluate, and use research information responsibly. It also includes critical thinking, writing, data handling, and proper citation. With digital growth, studies show that AI tools like Semantic Scholar, Grammarly, Turnitin, Zotero, NVivo, and SPSS improve research speed and accuracy by automating many tasks.

However, research also shows gaps in AI use because not all early-career researchers receive equal training or have access to good digital infrastructure. Some scholars warn that over-reliance on AI can reduce deep thinking. Overall, research literacy highlight that strong institutional support and proper training are essential to develop effective.

Research Methodology

- The study used a **mixed-methods approach** to understand how AI supports research literacy.
- Data was collected from faculty and PhD scholars at **Barkatullah University** and **Devi Ahilya Vishwavidyalaya**.
- Tools used: a **standard questionnaire** and **semi-structured interviews**.
- Quantitative analysis included **descriptive statistics** and **t-tests** to compare both universities.
- Qualitative (thematic) analysis identified key **benefits and challenges** of using AI.
- All ethical guidelines were followed to ensure accuracy and reliability

Demographic Details of Respondents

- The study included **132 participants** from two universities:
 - **48.48%** from Barkatullah University, Bhopal
 - **51.52%** from Devi Ahilya Vishwavidyalaya, Indore
- In terms of academic roles:
 - **68.18%** were **faculty members**
 - **31.82%** were **PhD scholars**
- Gender distribution was balanced:
 - **53.03%** male
 - **46.97%** female
- Overall, the sample was diverse and suitable for comparing **AI usage and perceptions** across institutions, roles, and gender.

Adoption of AI Tools among Faculty Members and Research Scholars

Key Findings on AI Usage

- **81.82%** of participants use AI tools in academic work.
- **Faculty (54.55%)** use AI more than **PhD scholars (27.27%)**.
- AI usage is slightly higher at **DAVV (43.18%)** than **Barkatullah University (38.64%)**, but not significant.
- AI is mainly used for **literature review, data analysis, writing, and reference management**.

AI and Research Tools Used by Academia

- **Most used tools:** ChatGPT & Gemini (77.27%) for writing and idea generation.
- **Reference tools:** Zotero & Mendeley (74.24%).
- **Language tools:** Grammarly/QuillBot (70.45%).
- **Literature discovery:** Elicit & Research Rabbit (58.33%).
- **Data analysis:** SPSS and similar tools (62.12%).
- **Key challenges:**
 - Lack of AI training (33%)
 - Ethical/reliability concerns (30%)
 - Limited access to premium tools (32%)
- **Conclusion:** Stronger institutional support and structured AI training are needed for responsible and effective AI use in research.

Key Findings on AI's Role in Developing Research Literacy

- **84.85% (112 respondents)** agreed that AI improves research literacy, with slightly higher agreement from **Indore (58)** than **Bhopal (54)**.
- **79.55% (105 respondents)** said they need AI training, showing high demand in both universities.
- **68.18% (90 respondents)** reported challenges using AI, mainly technical issues and limited support.
- Only **59.09% (78 respondents)** felt they receive adequate institutional support, indicating a major gap.
- Overall, results show AI is widely valued, but stronger **training** and **institutional support** are essential to maximize its benefits.

Perceived Benefits and Challenges of AI Tools in Research Literacy Development

- High benefits of AI:
 - **81.82%** reported improved research efficiency.
 - **78.03%** saw better data analysis.
 - **91.67%** agreed AI improves access to relevant information.
- **Challenges faced:**
 - **66.67%** experienced technical issues.
 - **65.15%** lacked awareness and proper training.
 - **51.52%** were concerned about AI output reliability.
- **Conclusion:**

AI strongly boosts research literacy, but better **training, technical support, and quality-check systems** are needed to fully leverage its benefits for early-career researchers.

Perceived Effectiveness of AI Tools in Research-Related Tasks

- **High effectiveness of AI tools:**
 - **90.91%** — strong support for literature review
 - **79.55%** — useful for data collection
 - **82.58%** — effective for data analysis
 - **77.27%** — improves writing and editing
- **Highest impact:**
 - **94.70%** said AI is extremely effective in **reference management**.
- **Lower effectiveness:**
 - Only **71.21%** found AI helpful for **collaboration and networking**.
- **Conclusion:**

AI strongly enhances core research tasks—especially literature review, reference management, and data analysis—though its role in collaboration is comparatively weaker.

T-Test Results for Perceived Effectiveness of AI Tools in Research Tasks

Research Task	Barkatullah University, Bhopal (M ± SD)	Devi Ahilya Vishwavidyalaya, Indore (M ± SD)	t-value	p-value
Literature Review	4.62 ± 0.49	4.75 ± 0.43	-1.23	0.221
Data Collection	4.50 ± 0.51	4.65 ± 0.48	-1.58	0.115
Data Analysis	4.55 ± 0.50	4.60 ± 0.44	-0.64	0.526
Writing and Editing	4.50 ± 0.54	4.40 ± 0.51	1.12	0.264
Reference Management	4.70 ± 0.45	4.85 ± 0.38	-1.82	0.071
Collaboration and Networking	4.30 ± 0.58	4.20 ± 0.62	0.74	0.464

T-Test Results for Perceived Effectiveness of AI Tools in Research Tasks

- A t-test comparison between Barkatullah University and Devi Ahilya Vishwavidyalaya showed **no significant differences** in perceptions of AI effectiveness across all research tasks ($p > 0.05$).
- Both groups viewed AI as **equally effective** for literature review, data collection, data analysis, writing/editing, and collaboration.
- Only **reference management** showed a near-significant difference ($t = -1.82$, $p = 0.071$), indicating a small variation worth future investigation.
- Overall, early-career researchers from both institutions share a **common positive perception** of AI's role in supporting the research process.

Findings

- Early-career researchers from both universities shared a **positive perception** of AI in enhancing research literacy.
- AI was rated highly effective for **literature review, data analysis, writing support, and reference management**.
- Major challenges included **technical issues, low awareness/training, and concerns about AI reliability**.
- **t-test results** showed **no significant differences** between the two universities, indicating similar views on AI's benefits and limitations.
- **Faculty members** demonstrated slightly higher AI adoption than research scholars, with tools like **ChatGPT, Mendeley, and Grammarly** being most used.
-

Suggestions

- **Conduct structured AI training programs** to enhance researchers' skills and address technical challenges.
- **Increase awareness and digital literacy** through workshops, orientations, and resource materials.
- **Promote collaborative learning** by encouraging researchers to share experiences and best practices related to AI tools.
- **Invest in reliable and transparent AI tools** to build trust and improve effective usage in research activities.

THANK YOU

