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Knowledge and Awareness on Potence and Usefulness of Artificial Intelligence Tools for Research among Academic Institutions in Tamil Nadu: A Study

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ABSTRACT

"AI tools for research, maximising your efficiency, and thereby, making your research process a breeze".-Alec Chambers (Alec Chambers, 2023)

In this era of human-technology co-evolution the growth in technology is intended for the good cause of mankind. (Ravindra S. Bankar & Shalini R. Lihitkar, 2023) As Ravindra S. Bankar Et al. said, "Artificial Intelligence (AI) has revolutionised the field of education and research by providing new and innovative tools that can help academia and researchers in various ways. AI-based tools offer many benefits such as personalisation, automation, accuracy, and efficiency. AI-based tools can potentially transform education and research by providing new and innovative ways to learn and research". The paper focuses on understanding the awareness of general knowledge and opinion on AI Tools for research application among Tamilnadu's academic and research fraternity. The respondents comprise an academic and research fraternity encompassing faculties, research scholars, postgraduate students, graduate students, and library and information professionals from various government and private higher education institutions in Tamil Nadu. It aims to bring out any misconceptions about AI Tolls and their usage among the academic and research fraternity and suggest the way forward.

Keywords: Artificial Intelligence, AI applications, AI tools, AI Tools for Research, Potential of AI Tools, usefulness of AI Tools on Research etc.,

1. Introduction

It is understood from a 2023 McKinsey survey that (McKinsey & Company, 2023)55% of businesses have adopted AI in some form, and as per the PWC research (Scott Likens, 2024), AI will boost the global economy by $15.7 trillion by 2030.In Addition, as predicted by Analyst Rowan Curran of Forrester (Rowan Curran, 2023)10% of employees will use generative AI in 2023. and as per 2023 Gartner survey (Gartner, 2023) it is found that "42% of HR leaders expected entry-level positions to be significantly impacted by AI".As Danish Thanvi (Danish Thanvi, 2024) said, "In the realm of research

and data management, the integration of artificial intelligence (AI) tools has revolutionised the way professionals approach their work. These tools, trained on vast datasets, offer myriad capabilities that streamline processes, enhance productivity, and unlock new insights. "The above illustrates that "we're living through the AI revolution". AI has entered all walks of our lives, especially since it plays a major role in the academic and research of higher education institutions. However, this technological revolution brings with it a critical concern and a lot of questions along with it:

Questions of Facts & Misconceptions on AI for Research

It is undisputed that Artificial Intelligence is one of the **most critical technologies being developed and has become more popular recently. Considering its power and potential, there are still plenty of questions about this emerging technology, its use, and its impact. Below** are some of the common questions listed based on the pilot study.

Sl. No.	Description
1	Who can use AI Tools for Research?
2	Can AI tools be used for publishing research?
3	Can AI Publish Research on its own?
4	Are Coding Skills essential for using AI Tools for Research?
5	AI tools for Research Expensive?
6	Any Privacy Concerns when using AI tools for Research?
7	Can AI tools be used for Handling sensitive information?
8	Can AI Tools completely replace Human Research?
9	Can AI Tools for Research guarantee accurate results?

Some questions for Pilot Study

2. Who can use AI Tools for Research?

AI has enormous potential to transform many industries and solve some of the world's biggest challenges(Calls9, 2024). As said by Andrew Ng, co-founder of Google Brain and founder of deeplearning.ai,"It is difficult to think of a major industry that AI will not transform. This includes healthcare, education, transportation, retail, communications, and agriculture. There are surprisingly clear paths for AI to make a big difference in these industries. "As stated above by Andrew Ng, AI Tools can be used by anyone involved in research in any field, including Research Scholars, Faculties, Students, Data Scientists, agriculturists, Market Research, Business analysts, Doctors, Lawyers, Stock Analysis, Engineers, etc.

Can AI tools be used for publishing research?

The answer to this question is Yes. The fact is that AI tools can be used to aid the research process, analyse data and even generate drafts. However, there is a limitation that the data interpretation, conclusions formation and research narrative framing still require human involvement and intervention. It's also important to correctly cite the use of AI tools in your research according to the standards of your respective field.(Madalsa, 2023) As stated by Madalsa "AI tools can simplify research, offer grammar corrections, and even produce content. However, there's a fine line between using AI as a helpful tool and becoming overly dependent on it. In essence, while AI offers numerous advantages for thesis writing, it's crucial to use it judiciously".

Can AI Publish Research on its own?

AI cannot replace (Calls9, 2024)human intelligence entirely, despite having enormous potential to transform many industries and improve our lives in many ways. AI may be able to perform specific tasks more quickly and accurately than humans, but it lacks the similar level of general intelligence, creativity, and social understanding that humans possess. Hence, the effective and mature approach views AI not as a replacement for human intelligence but rather use it as a tool to augment human intelligence. By viewing AI as a tool, the full potential of AI can be unlocked while preserving the value of human input and creativity.

As Sam Altman, CEO of OpenAI, said about Generative AI, "Like with all technological revolutions, I expect there to be a significant impact on jobs, but exactly what that impact looks like is very difficult to predict…I believe that there will be far greater jobs on the other side of this and that the jobs of today will get better…I think it's important to understand and think about GPT-4 as a tool, not a creature, which is easy to get confused, and it's a tool that people have a great deal of control over and how they use it. And second, GPT-4 and other systems like it are good at doing tasks, not jobs".

Are Coding Skills essential for using AI Tools for Research?

Artificial intelligence is a fascinating field. It can be learned even without having the required coding skills. There are many AI Tools and platforms for beginners which are designed to be user-friendly with intuitive interfaces, drag-and-drop features, etc. These help the users to explore and understand the AI concepts without writing codes. There are user-friendly AI tools like Google Cloud AI Platform, IBM Watson, and Microsoft Azure Machine Learning Studio. Additionally, online courses like Coursera's "AI For Everyone" offer non-technical insights into AI concepts. By using these resources, the understanding of AI and its applications can be enhanced.However, for some advanced tasks or customizable models, it is advantageous to have basic coding skills and knowledge.

AI tools for Research Expensive?

As an emerging field and because of the huge investment cost involved in R&D, the costs of AI tools for research vary widely. Since AI requires an enormous amount of human interaction during its development, some AI Tools are available for free / Open access or offer free versions with limited features, while others require a subscription or one-time purchase. Depending on the features needed, the service providers offer different pricing tiers.

Any Privacy Concerns when using AI tools for Research?

Data collection is a significant concern while deploying AI tools(WalkMe Team, 2024). AI systems require extensive datasets to improve their algorithms. However, this requirement for data can potentially infringe on individuals' personal privacy and raise other privacy concerns. Sensitive customer information is often involved in this data collection and analysis.

In addition, in the modern digital era, Privacy has taken on a new dimension. It's not just about keeping personal information confidential; it's about controlling and understanding how it is collected, used, and shared. To maintain customer trust and comply with increasingly stringent regulations as regulatory bodies scramble to catch up, it is essential to Respect and protect this aspect of privacy.

Can AI tools be used for Handling sensitive information?

Privacy concerns can arise when using AI tools for research, especially when handling sensitive information. Hence, it is essential to select tools that have strong data protection measures in place and to fully understand their terms of service before usage. The other way is to **Adopt other technological solutions.** (WalkMe Team, 2024)Technological advancements are available in AI that focus on enhancing privacy and protecting *sensitive information.* **Differential privacy**, for instance, adds 'noise' to data, meaning it remains useful for analysis but doesn't reveal individual information.

Federated learning is another approach in which AI models are trained across multiple decentralized devices or servers holding local data samples without exchanging them. This method allows AI to learn from a wide range of data sources while keeping that data securely

in its original location. Embracing these technologies can significantly reduce the privacy and sensitivity risks associated with AI.

Can AI Tools completely replace Human Research?

(Calls9, 2024)"Artificial intelligence (AI) used to be something we've all heard of but didn't exactly understand or know its real-life applications. But as free and easy-to-use AI tools like ChatGPT, Midjourney, or Whisper AI become available online, a new AI era has begun. Now, users can generate copy, long content, images, presentations and even websites using simple commands and instructions. Which is mind-blowing!".But, with respect to the natural question among everybody, "Can artificial intelligence replace human intelligence?" The short answer is "no" and "**AI cannot replace human intelligence entirely"**. "Howeverwhen compared with humans,AI can perform tasks more quickly and accurately, it lacks the same level of general intelligence, creativity, and social understanding humans possess".

Despite AI advances and possibilities, there are limitations for it:

1. AI is only as good as the data it's trained on. If the data is biased or incomplete, the AI system will reflect those biases and limitations.
2. AI is also incapable of true creativity or innovation.
3. AI can generate new ideas and solutions based on existing data, it cannot think outside the box and create original ideas.
4. AI is based on algorithms and patterns, whereas human creativity is driven by intuition, inspiration, and imagination.
5. AI can be a valuable tool for augmenting human ingenuity but can never replace it.
6. AI is not capable of empathy or emotional intelligence.
7. AI can recognise and analyse emotions; it is difficult for it to truly understand these emotions or respond to them in a meaningful way.
8. AI can't replace human relationships or social interactions, as these require a deep understanding of human emotions and behaviours.
9. AI can be a powerful tool for many applications, it's important to remember that it's not a substitute for human intelligence, empathy, and creativity.

The future of AI is that AI will likely continue to advance and become more sophisticated, which will enable it to perform an even wider range of complicated tasks. Still, human input and creativity is always required for some tasks and problems. Fields like research, design, strategic planning and more always requireHuman intelligence and skills. Roles such as Physicians, Teachers, HR professionals and Business Leaders, which require human relationships, decision-making, intuition and emotional intelligence, can't be automated. However, AI will make them more productive and effective. As stated in Call9, "Humans have a power that AI has yet to replicate:the power of intuition. Without intuition, AI can produce results that may seem correct but require a more nuanced interpretation something AI cannot do".

Ultimately, AI is not a replacement for human intelligence, it's a tool that can help us achieve our goals, but we need to ensure that we use it responsibly and ethically. Furthermore, humans bring a wide range of experiences, creativity, and intuition to the decision-making process that AI cannot replicate.

Can AI Tools for Research guarantee accurate results?

AI tools can manage and process huge amounts of data more accurately than human beings, but the results are not entirely infallible. The input data relevance and quality, the design of the algorithm and the proper use of the application decide the accuracy of results. Further, recognizing subtle nuances or making complex connections between pieces of information is a challenge to AI, and it often lacks the ability. (AIContentfy team, 2024) Overall, the potential benefits of AI are numerous and far-reaching in improving content accuracy. Even though there are still challenges to be addressed in the development and implementation of these technologies, the promise of more accurate, reliable, and trustworthy online content is an exciting prospect for the future.

The Need

In this dynamically changing environment, it is imperative that the Academic and Research Fraternity of higher education institutions should also change in accordance with the changing scenario. Understanding the very high potential of AI and the benefits arriving out of it is essential that the Academic and Research Fraternity of higher education institutions should update themselves and gain knowledge on the developments. They should have the right understanding and awareness about AI, without any misconceptions. This will enable them to take full advantage of AI and exploit the benefit of it.

Objectives

The objective of the study is to

(a) To understand the awareness of general knowledge and opinion on AI Tools for research application among the academic and research fraternity of Tamilnadu.

(b) To bring out any misconceptions about AI Tolls and their usage among the academic and research fraternity and suggest the way forward.

3. Methodology

Research Design

This study adopted a quantitative research approach, along with surveys and statistical analyses, to achieve its objectives.

Sample Selection

The study applied random sampling in order to select diverse participants from the Academic and Research Fraternity, encompassing, Faculties, Research Scholars, Post Graduate Students Graduate Students and Library and Information Professionals across multiple institutions, like Government and Private Higher Education Institutions within Tamilnadu. A set of structured questionnaires was framed. Google Forms was used as a survey instrument and circulated through e-mail & social media platforms like WhatsApp, Face book and LinkedIn to various respondents through network references. A total of 183 respondents have given their responses, and the Distribution of the Questionnaire and data collection details are shown in Table 1.

Description	eMailed	eMail Bounced	Primary data	Response Not Received	Responded	Valid Questioners	Invalid Questioners
Users	450	54	396	176	220	183	37
%	100.00%	12.00%	88.00%	39.11%	48.89%	40.67%	8.22%

Table 1. Questionnaire Distribution

The responses were analysed and represented in the table and graphical forms using MS Excel.

Data Analysis

Government and Private higher education Institutions, Government Universities, Private Universities, and Government Colleges and Private Colleges within Tamilnadu of various fields have represented this study. The responses were scattered between 31% of respondents from private institutions and 69%from government institutions, respectively (Ref. Table-3) among the various Higher Education Institutions within Tamilnadu comprising Universities and Colleges. Each reply was critically studied to formulate the variables and Socio-demographic details such as Age Distribution, Gender Distribution, and User Type like Faculties, Research Scholars, Graduate Students and Library and Information Professionals are shown below along with the responses of the respondents on the knowledge of the AI Tools / Applications among the Respondents are tabulated below.

From Table 2, the Age distribution shows that more than 68% of the respondents are below 30 years of age, followed by 30-35 years of age at 16%, and the balance is in single-digit percentages with 8%, 6%, 3%, and 2% for 35-40 years, 40-45 years, 45-50 years, and above 50 years, respectively.

Figure 2 shows the Gender Distribution: More than 54% are female, and 46% are male.

Regarding the Distribution of User Type in Figure 2, 30% are UG students, closely followed by 28% of Library Professionals, and 18% and 14% of respondents are PG students and Research Scholars, respectively. Only 10% of the respondents are faculties.

Age Distribution		
Sl. No.	Age Range	Number
1	0-25	72
2	25-30	53
3	30-35	24
4	35-40	15
5	40-45	11
6	45-50	5
7	above 50	3
	Total	183

Table 2

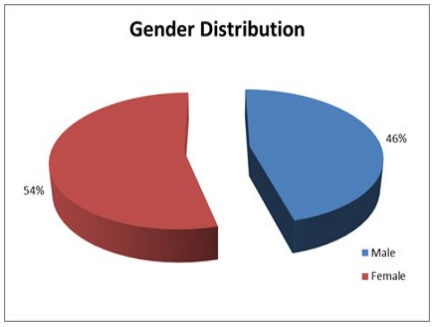

Figure 1

Institution Type			
Sl No	Description	Responses	%
1	Government Institutions	111	61%
2	Private Institutions	72	39%
	Total	183	100%

Table 3

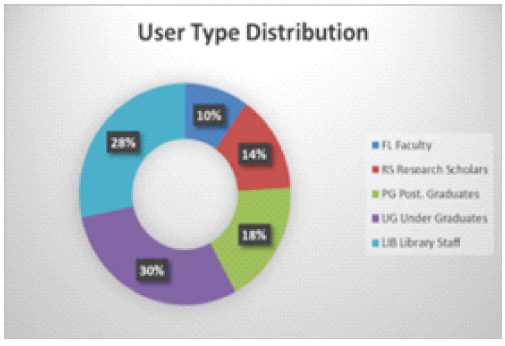

Figure 2

To understand the general awareness of AI among the Academic and Research Fraternity of higher educational institutions in Tamil nadu, a few general questions, listed below, were asked, and the results are detailed below.

Sl. No.	Description
1	Who can use AI Tools for Research?
2	Can AI tools be used for publishing research
3	Can AI Publish Research on its own
4	Are Coding Skills essential for using AI
5	AI tools for Research Expensive?
6	Any Privacy Concerns when using AI tools for Research?
7	Can AI tools use for Handling sensitive information
8	Can AI Tools completely replace Human Research?
9	Can AI Tools for Research guarantee accurate results?

Table 4

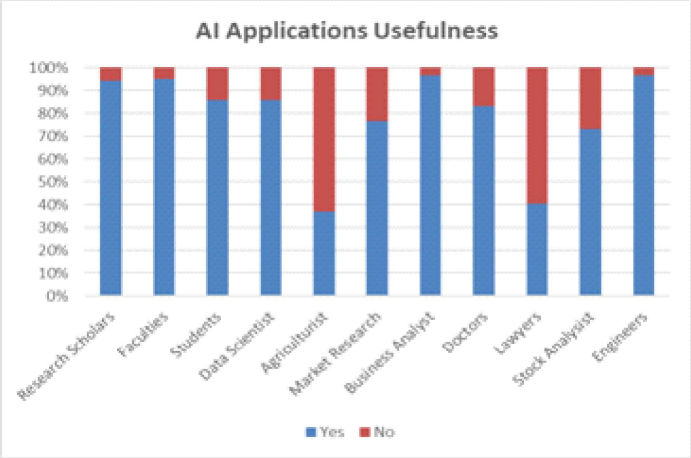

Figure 3. Who can use AI Tools?

The study, as referred to in Figure-3, found that a good majority of 97% of the respondents have stated that their first choice for using AI is Engineers and Business Analysts, 95% for Faculties and Research Scholars, 86% each for Students and Data Scientists, 83% for doctors, and 77% and 73% each for Market Research and Stock Analysts. Finally, 40% have responded that Lawyers and 37% of agriculturists use AI.

The Truth is that AI tools can be used by anyone involved in research in any field.

Regarding the question, "Can AI Tools be used for publishing research?" (Figure-4), 81% of the respondents have given positive feedback, and only 19% have stated negatively.

However, AI tools can be used for publishing Research, and it is ethical and legal. We can use them for the research process, data analysis, and even draft generation.

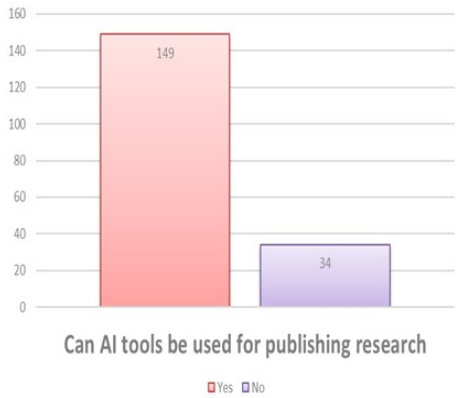

Figure 4

Can AI Publish Research on its own

Sl. No.	Description	Yes	Little Extent	No	Total No of Respondents
1	Can AI Publish Research on its own	21	30	132	183

Table 5

Regarding the general awareness question, "Can AI Publish Research on its own?" The Feedback from the respondents is tabulated in Table 5. It states that 72% said negatively, 11% said that it is possible, and 16% said that, to a small extent, it is possible that AI can publish Research on its own.

The reality is that, as of today, AI cannot publish research on its own; it requires human intervention. In spite of using AI for the research process, data analysis, and even generating drafts, the research study requires human intervention for data interpretation, formulation of conclusions, and framing of the research narrative.

With regard to "Are Coding Skills Essential for Using AI Tools for Research?" (Figure-5) the feedback is that 70% of the respondents say positively that coding is essential for applying AI Tools for Research, 21% say that it is essential to a little extent and 9% says negatively that coding is essential for applying AI Tools for Research.

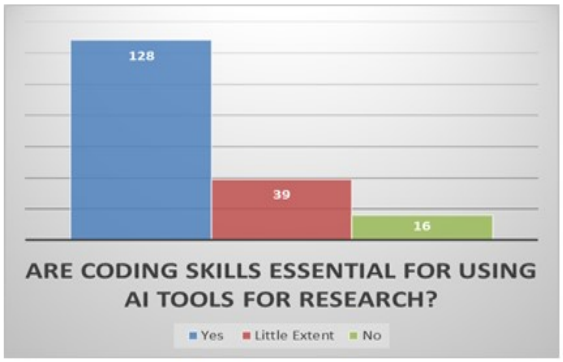

Figure 5

The truth is that many AI tools are interactive and user-friendly. Coding skills are not essential for research applications that require advanced tasks and customized models; knowledge of basic coding skills is an advantage.

About "AI tools for Research Expensive?" (Table-6), the feedback is that 65% of the respondents believe that AI tools are Expensive, 26% believe that, to a small extent, it is expensive, and only 9% believe that AI Tools are not expensive.

AI tools for Research Expensive?

Sl. No.	Description	Yes	Little Extent	No	Total No of Respondents
1	AI tools for Research Expensive?	119	48	16	**183**

Table 6

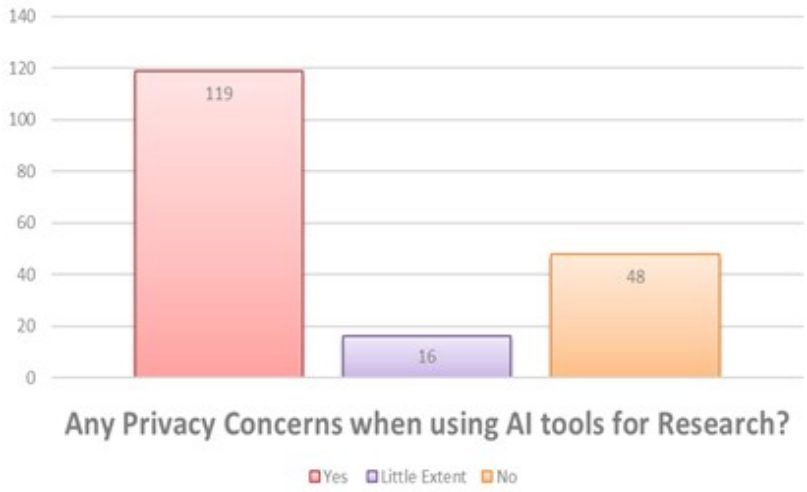

Figure 6

The truth is that not all AI tools are expensive. Many are open-access or free AI Tools with limited features.

With regard to the question " Are there Any Privacy Concerns when using AI tools for Research?", 65% say that they have concerns over privacy while using AI tools for sensitive research applications, 16% say that they have concerns to a small extent, and 26% say that AI tools are secure.

The reality is to select tools that have strong data protection measures after fully understanding the terms of service before using the AI tools for sensitive research applications.

Table -7 reflects the respondents' feedback on "Can AI Tools for Research guarantee accurate results?" 68% of the respondents have given positive feedback that AI can guarantee accurate results, 27% say that they don't know, and 5% have given negative feedback.

Can AI Tools for Research guarantee accurate results?

Sl. No.	Description	Yes	Don't Know	No	Total No of Respondents
1	Can AI Tools for Research guarantee accurate results?	124	50	9	**183**

Table 7

The truth is that AI provides and guarantees accurate results based on the quality and relevance of the data provided.

Figure 7 illustrates the respondents' feedback on the question, "Can AI Tools be used for handling sensitive information?" 65% have given positive feedback, 25% are neutral and say they don't know, and 9% have given a negative response. The reality is that it is the researcher's responsibility to select tools that have strong data protection measures after fully understanding the terms of service before using the AI tools for sensitive research applications.

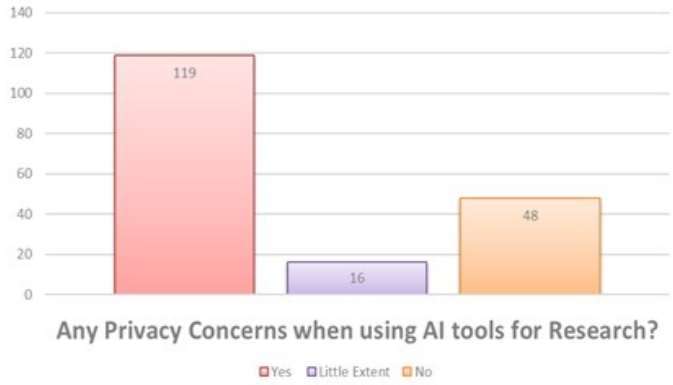

Figure 7

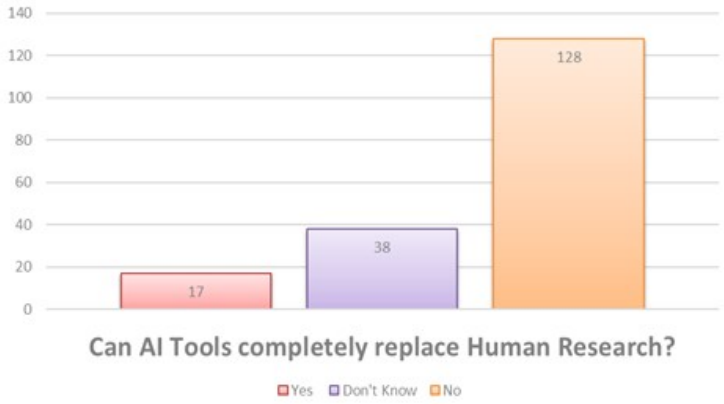

Figure 8

Figure 8 details the respondents' opinions on the question, "Can AI completely replace Human Research?" Seventy per cent have given a negative response and responded no, 21% are neutral and have said that they don't know, and 9% have said yes and have an opinion and believe that AI can completely replace human research.

The reality is that as a catalyst, AI tools can significantly speed up the research process, handle large volumes of data effectively, and contribute to complex analysis and calculations, but they lack human judgement and expertise. Researchers play a crucial role in creating and formulating research questions, forming hypotheses, interpreting results, and ensuring the adherence to ethical considerations.

4. Limitations of the Study

The author acknowledges that the study on the general perception of the knowledge and understanding of AI tools for research has certain limitations.

1. The study limits the opinion among the Academic and Research Fraternity of higher education Institutions, such as Faculties, Research Scholars, Postgraduate Students, Graduate Students, and Library and Information Professionals.

2. The scope of the study is limited only to Higher Education Institutions within Tamilnadu.

3. Among the various general questions regarding the perception of the knowledge and understanding of AI tools for research, due to constraints, only 9 questions were presented, and opinions were asked.

There is a very high scope in extending the study to professionals, individuals, and users of AI. There is better scope for extending the study to other research, and business organisations and institutions could provide a more comprehensive understanding of AI perceptions across diverse settings. Broader perspectives could be offered through a comparative study by extending it across regions at national and international levels across various geographical locations. The reliance on closed-ended surveys has been constrained with regard to the depth of responses. Qualitative methodologies, such as interviews or focus group discussions, could have been tried to get better and richer insights into nuanced opinions and experiences regarding AI Tools for research.

5. Findings and Conclusion

The survey results show that even though the Academic and Research Fraternity of higher educational institutions in Tamilnadu has a strong awareness of AI Technologies, certain misconceptions and opinions exist about the knowledge and general opinion on the potential and usage of AI tools for research applications.

1. AI Tools are available and can be applied to all fields of research and walks of life. These tools can be used by anyone involved in research in any field. The study reveals that awareness of using AI tools for legal and agricultural research is quite limited.

2. The findings also indicate that 13% of the respondents are not aware that AI tools can be used for research processes, data analysis, and even generating drafts in order to publish Research, and it is ethical and legal.

3. It is essential to create awareness among 11% of the respondents that, as of date, AI cannot publish research on its own and it requires human intervention. In spite of using AI for the research process, data analysis, and even generating drafts, the research study uses human intervention for data interpretation, formulation of conclusions, and framing of the research narrative.

4. It is unfortunate that a good majority of the respondents have few negative opinions and misconceptions that require intervention.

• 70% of the Respondents believe it requires Coding Skills to use AI tools.

• The truth is that there are many interactive and user-friendly AI tools, and Coding skills are not essential. However, for research applications that require advanced tasks and customized models, knowledge of basic coding skills is an advantage.

• 65% of the respondents are of the opinion that AI tools are expensive.

• The truth is that not all AI tools are expensive. Many are open-access or free AI Tools with limited features.

• 65% believe they have concerns over privacy while using AI Tools for sensitive research applications.

The reality is that before using AI tools for sensitive research applications, it is important to select the appropriate tools that have strong data protection measures after fully understanding the terms of service. The finding also shows that most respondents have a fair idea and awareness of the general knowledge and opinion on AI applications and Tools in Academics and Research.

The survey also highlights certain facts which require improvement such as:

1. There is a deficiency in the awareness of certain potential areas, such as knowledge of coding for using AI tools.

2. The deficiency in the awareness of Open access and Free AI Tools and applications.

3. Misconceptions regarding concern over privacy while using AI Tools for sensitive research applications.

It also highlights that the above shortcomings need to be addressed through periodic awareness programs, seminars, and conferences among the Academic and Research Fraternity, Students, Scholars, Faculties, and Library Professionals in this dynamic field experiencing rapid growth and change.

References

[1] AIContentfy team. (2024, March 21). The impact of AI on content accuracy and reliability. *AIContentfy*. https://aicontentfy.com/en/blog/impact-of-ai-on-content-accuracy-and-reliability

[2] Aithal, S., Aithal, P. S. (2023). Effects of AI-Based ChatGPT on higher education libraries. *International Journal of Management, Technology, and Social Sciences (IJMTS)*, 8(2), 95–108. https://doi.org/10.47992/IJMTS.2581.6012.0272

[3] Chambers, A. (2023). The best AI tools for research (September 2023). *Tools for Humans*. https://www.toolsforhumans.ai/toolkit/best-ai-tools-for-research

[4] Cox, A. (2022, February). How artificial intelligence might change academic library work: Applying the competencies literature and the theory of the professions. *JASIST*, 367–380. https://doi.org/10.1002/asi.24635

[5] Gupta, A., Nihal, P. (2021, February). Data analytics and artificial intelligence – A boon for start-ups. In *Emerge: Managing Innovation and Entrepreneurship in the New Normal* (Vol. 1, pp. 35–43).

[6] LaFountain, C. (2023). AI tools for libraries. *Feature*, 43(4).

[7] Calls9. (2024, March). Can artificial intelligence replace human intelligence? *Calls9 Insights*.

https://www.calls9.com/blogs/can-artificial-intelligence-replace-human-intelligence

[8] Thanvi, D. (2024, March 6). Top 20 AI tools for research and data. *LinkedIn*. https://www.linkedin.com/pulse/top-20-ai-tools-research-data-collection-2024-danish-thanvi-tb1me

[9] Arora, D., Bansal, A., Kumar, N., Suri, A. (2020, January). Invigorating libraries with application of artificial intelligence. *Library Philosophy and Practice*, 1–9. https://digitalcommons.unl.edu/libphilprac/3630

[10] Gartner. (2023). Labor market insights: Navigating the workforce impact of generative AI. *Gartner*. https://emtemp.gcom.cloud/ngw/globalassets/en/human-resources/documents/benchmark_with_gartner_labor_market_insights_key_takeaways_deck_july_edition.pdf

[11] Madalsa. (2023, October 12). AI for thesis writing — Unveiling 7 best AI tools. *SCISPACE*. https://typeset.io/resources/ai-for-thesis-writing/

[12] McKinsey & Company. (2023). The state of AI in 2023: Generative AI's breakout year. *McKinsey & Company*. https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2023-generative-ais-breakout-year

[13] Bankar, R. S., Lihitkar, S. R. (2023). Artificial intelligence-based utility tools for research communication: A brief overview. In *Revamping Libraries In Modern Era Proceedings of National Conference-2023* (pp. 251–262). Kolhapur: Prarup Publication.

[14] Curran, R. (2023). Tech trends to watch in 2023. *Forrester*. https://www.forrester.com/what-it-means/ep305-tech-trends-2023/

[15] Likens, S. (2024). Global AI and innovation technology leader - PwC, CEO survey 2024. *PwC*. https://www.pwc.com/gx/en/issues/artificial-intelligence.html

[16] Lee, S. (2023, June 23). Top 30 groundbreaking AI tools for librarians that will change libraries forever. *GR Tech*. https://www.grtech.com/blog/top-ai-tools-for-librarians

[17] Subaveerapandiyan, A., Gozali, A. A. (2024). AI in Indian libraries: Prospects and perceptions from library professionals. *De Gruyter - Open Information Science*, 1–13. https://doi.org/10.1515/opis-2022-0164

[18] Venkatesh, V. (2022, January). Adoption and use of AI tools: A research agenda grounded in UTAUT. *Annals of Operations Research*, 2–21. https://doi.org/10.1007/s10479-020-03918-9

[19] WalkMe Team. (2024, January 24). Addressing privacy concerns with AI: Strategies and solutions. *WalkMe*. https://www.walkme.com/blog/privacy-concerns-with-ai/

[20] Li, X. (2023). Engaging with artificial intelligence in research and writing. *Engaging with Emerging Technologies in Education*, 1(1), 1–13. https://www.cambridgemaths.org/Images/engaging_with_artificial_intelligence_in_research_and_writing.pdf