Exploring the Implementation of AI-Driven Personalized Learning Techniques among the Research Scholars in Kerala

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ABSTRACT: This research study examines the utilization and effectiveness of AI-powered personalized learning methods among research scholars in Kerala, India. As the integration of artificial intelligence (AI) in educational environments, particularly in personalized learning, continues to grow, it is crucial to understand how it is implemented and its impact. The study focuses on investigating how AI technologies are used to customize learning experiences based on the specific needs and preferences of research scholars. By employing a mixed-methods approach that includes surveys, interviews, and observations, the research explores the adoption rates, perceived advantages, challenges, and outcomes associated with AI-enhanced personalized learning strategies. Furthermore, the study pays attention to contextual factors that influence the implementation process within Kerala's unique educational landscape. The findings of this study aim to offer valuable insights into the effectiveness of AI-driven personalized learning approaches and contribute to future advancements and initiatives in educational technology and pedagogy.

KEYWORDS: Artificial Intelligence, Personalized Learning, AI Technologies, Customized Lesson Experiences, Educational Environments, Unique Educational Landscape, Pedagogy.

INTRODUCTION

Role of AI in Research Work:

AI can be a powerful tool in research across various fields because it can analyze vast amounts of data, identify patterns, and generate insights. AI algorithms can process large datasets quickly and efficiently, extracting valuable insights that might not be apparent through traditional methods. AI techniques such as machine learning can be used to identify patterns in data, which can lead to discoveries or help researchers better understand complex phenomena. AI can be used to develop predictive models that forecast outcomes based on historical data, enabling researchers to anticipate trends or events. NLP techniques enable computers to understand, interpret, and generate human language. Researchers can use NLP to analyze textual data, extract information from documents, or even automate literature reviews. In fields like biology, medicine, and astronomy, AI can analyze images to detect patterns, anomalies, or objects of interest, aiding in medical diagnosis or astronomical observation tasks. AI-powered simulations and modeling techniques allow researchers to simulate complex systems, test hypotheses, and explore scenarios that may be difficult or impractical to study in the real world. AI tools facilitate collaboration among researchers by enabling efficient data sharing, providing platforms for virtual collaboration, and automating routine tasks, freeing up time for more creative and strategic endeavors. AI algorithms can optimize processes and systems by finding the best solutions to complex problems, such as resource allocation, scheduling, or parameter tuning.

RESEARCH OBJECTIVES

1. To assess the adoption of AI-driven personalized learning techniques among research scholars in Kerala.
2. To identify the familiarity of the AI-driven personalized learning techniques that can be used in research and the tools they are using.
3. To identify whether the research scholars in Kerala are satisfied with the effectiveness of AI-driven personalized learning techniques in meeting their research needs.
4. To explore the effectiveness of AI-driven personalized learning techniques in enhancing research scholar engagement, motivation, and academic performance.
5. To identify that the institution provides support or resources for implementing AI-driven

personalized learning techniques for research scholars.

LIMITATIONS OF THE STUDY

1. Limited sample size or non-representative sampling methods may restrict the generalization of findings to the broader population of research scholars in Kerala.
2. There may be a bias in the selection of participants, particularly if only those who are already familiar with or supportive of AI-driven personalized learning techniques participate in the study.
3. Reliance on self-reported data from surveys or interviews may introduce response bias or inaccuracies due to participants' subjective perceptions or social desirability bias.
4. Ethical concerns related to data privacy, security, and algorithmic bias in AI systems may impact the trust and acceptance of AI-driven personalized learning techniques among research scholars and other stakeholders.
5. Variability in technology infrastructure and digital literacy among research scholars and educational institutions in Kerala may influence the feasibility and effectiveness of implementing AI-driven personalized learning techniques.

LITERATURE REVIEW

Miguel A Cardona, Roberto J Rodriguez, Kristina Ishmael (2023). This report addresses the clear need for sharing knowledge and developing policies for artificial intelligence, a rapidly advancing class of functional capabilities that are increasingly embedded in all types of educational technology systems and are also available to the public.

Tarini Prasad Ray (2023). This article describes the profound role of artificial intelligence in personalized learning and how it is reshaping the educational experience for students worldwide.

Meehir K. (2023). This article talks about the use of artificial intelligence for personalized learning and about the ways artificial intelligence can be utilized for personalized education. *Aditi Bhutoria (2022).* In this article, the author highlights a systematic review using the Human-In-The-Loop model is a novel methodology employed.

Lasse Rouhiainen(2019). This article says that the opportunities and challenges that the introduction of artificial intelligence could bring to higher education are significant.

Firuz Kamalov,David Santandreu Calonge and Ikhlaas Gurrib (2023).The recent high performance of ChatGPT on several standardized academic tests has thrust the topic of artificial intelligence (AI) into the mainstream conversation about the future of education. As deep learning is poised to shift the teaching paradigm, it is essential to have a clear understanding of its effects on the current education system to ensure sustainable development and deployment of AI-driven technologies at schools and universities. This research aims to investigate the potential impact of AI on education through review and analysis of the existing literature across three major axes: applications, advantages, and challenges. Our review focuses on the use of artificial intelligence in collaborative teaching–student learning, intelligent tutoring systems, automated assessment, and personalized learning.

Christopher Collins, Denis Dennehy, Kieran Conboy, Patrick Mikalef (2023). The study, however, discusses a growing concern that research on AI could experience a lack of cumulative building of knowledge, which has overshadowed IS research previously. This study addresses this concern by conducting a systematic literature review of AI research in IS between 2005 and 2020. The search strategy resulted in 1877 studies, of which 98 were identified as primary studies, and a synthesis of key themes pertinent to this study is presented. In doing so, this study makes important contributions, namely (i) an identification of the current reported business value and contributions of AI, (ii) research and practical implications on the use of AI, and (iii) opportunities for future AI research in the form of a research agenda.

RESEARCH METHODOLOGY

Data Collection: The appropriate data is collected from primary sources and secondary sources.

- Primary Sources: To collect primary data, questionnaires will be formulated and collected through survey and interview methods.
- Secondary Sources: Secondary data will be collected from examining factors such as research scholars' engagement, academic performance, and research guide’s experiences with AI-driven personalized education.

Sampling Design:

The research was conducted by research scholars from different universities in Kerala. A structured

questionnaire is used to collect data. The sample size of the study was 100.

Sampling Method:

- Probability Sampling: Probability sampling refers to a sampling method in which each member of the population has a chance of being selected into the sample. A simple random sampling method was used for this study.
- Non-probability Sampling: Non-probability sampling refers to a sampling method where the likelihood of any member of the population being selected into the sample is unknown or cannot be accurately determined. In this study, Convenience sampling or purposive sampling methods are used.

Analysis Methods:

Karl Pearson's correlation method, is used for analyzing the data.

DATA ANALYSIS AND INTERPRETATION

The current level of adoption of AI-Driven personalized learning technique among research scholars in Kerala.

CURRENTLEVEL OF AI DRIVEN PERSONAL TECHNIQUE ADOPTION

		Designation	Q1
Designation	Pearson Correlation	1	.351**
	Sig. (2-tailed)		.000
	N	100	100
Q1	Pearson Correlation	.351**	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

The independent variable was Designation of the sample and the dependent variable was Improvement in the learning outcome. Pearson Correlation Coefficient: 0.351. Statistical Significance: 0.000. Sample Size (N) = 100. There is a moderate positive correlation between the two variables. The correlation is statistically significant at the 0.01 level ($p < 0.01$), indicating that the relationship between the variables is unlikely to be due to chance.

The familiarity of the AI-driven personalized learning techniques that can be used in research

FAMILIARITY OF AI DRIVEN TECHNIQUES

		Designation	Q2
Designation	Pearson Correlation	1	.135
	Sig. (2-tailed)		.180
	N	100	100
Q2	Pearson Correlation	.135	1
	Sig. (2-tailed)	.180	
	N	100	100

The Independent variable considered was Designation of the sample and the familiarity level of AI-Driven techniques considered as the dependent variable. Correlation Coefficient: 0.135. Statistical Significance: (2-tailed) = .180. Sample Size (N) = 100. The correlation is not statistically significant at the 0.05 level ($p > 0.05$), indicating that the relationship between the variables may be due to chance. There is a weak positive correlation between Familiarity of AI-Driven Techniques and Q2.

Whether the research scholars in Kerala are satisfied with the effectiveness of AI-driven personalized learning techniques in meeting their research needs.

SATISFACTION LEVEL OF RESPONDANTS USING AI DRIVEN PERSONALIZED TOOLS

		Q4	Q6
Q4	Pearson Correlation	1	-.002
	Sig. (2-tailed)		.981
	N	100	100
Q6	Pearson Correlation	-.002	1
	Sig. (2-tailed)	.981	
	N	100	100

The familiarity of the AI Driven tools among the research scholars was considered the independent variable and the satisfaction level of the sample by using AI Driven tools are dependent variable. Correlation Coefficient: -0.002. Statistical Significance = .981. Sample Size (N) = 100. The correlation is not statistically significant at the 0.05 level ($p > 0.05$), confirming no meaningful relationship.

The effectiveness of AI-driven personalized learning techniques in enhancing research scholar engagement, motivation, and academic performance.

AI DRIVEN PERSONALIZED TECHNIQUES ENHANCES THE RESEARCH WORK

		Q3	Q4
Q3	Pearson Correlation	1	.593**
	Sig. (2-tailed)		.000
	N	100	100
Q4	Pearson Correlation	.593**	1
	Sig. (2-tailed)	.000	

N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

The Usage of AI-Driven personalized tools considered as the independent variable and the Enhancement of Research work by using AI-Driven Tools considered as the independent variable. Correlation Coefficient: .593. Statistical Significance = .000. Sample Size (N) = 100. There is a strong positive correlation between respondents' perception of AI-driven personalized techniques enhancing research work and their satisfaction level using these tools.

The institution provides support or resources for implementing AI-driven personalized learning techniques for research scholars.

THE ISTITUTION SOPPORT FOR IMPLENTING AI DRIVEN PERSONALIZED LEARNING TECHNIQUES

		Designation	Q10
Designation	Pearson Correlation	1	.139
	Sig. (2-tailed)		.170
	N	100	100
Q10	Pearson Correlation	.139	1
	Sig. (2-tailed)	.170	
	N	100	100

The Designation considered as Independent variable and the Institution provide support for implementing AI Driven Personlized Techniques considered as Dependant variable. Correlation Coefficient: .139. Statistical Significance = .170. Sample Size: N = 100. There is a weak positive correlation between institutional support for AI-driven personalized learning techniques and the other variable. The correlation is not statistically significant at the 0.05 level ($p > 0.05$), indicating no robust relationship.

FINDINGS

1. As per the response from the sample, it is found that there is positive correlation between adoption level of AI driven personalized technique among research scholars are very high.
2. Found that the research scholars in Kearla is not very much familiar with the different types of AI-Driven personalized techniques. Most of them are using only Chatgtp.
3. It is found that the satisfaction level of the respondents are very weak.
4. There is a strong correlation between the usage of AI Driven personalized learning techniques in research work and they enhances the research skill and knowledge.
5. It is found that most of the institutions are not provide much support for implementing AI-Driven personalized techniques for research work.

SUGGESTIONS

1. It is understood that most of the research scholars are not aware about most of the AI-driven personalized tools and techniques, if so it will be very helpful for them.
2. They need more training about these techniques to make their research work more effective and comparatively easier.
3. The institutions should make more initiatives providing training about the AI techniques.

CONCLUSION

The study was to examine the utilization and effectiveness of AI-powered personalized learning methods among research scholars in Kerala, India. As the integration of artificial intelligence (AI) in educational environments, particularly in personalized learning, continues to grow, it is crucial to understand how it is implemented and its impact. It makes clear that the major portion of the research scholars agreed that the AI-driven personalized learning tools will help their research work more effectively and most of them are satisfied with using these personalized techniques. But one of the main problems found in this study was, most of them are not aware about these personalized techniques and how to utilize them effectively in their research study. And also found that most of the research scholars depend or use Chat GPT only.

In conclusion, I could suggest that Institutions should take more initiatives to provide training to the research scholars about the AI driven personalized tools and techniques to make their work more accurate, effective, and comparatively easier. Our exploration into the implementation of AI-driven personalized learning techniques among research scholars in Kerala has unveiled a landscape ripe with potential and challenges alike. Through our study, we have witnessed how AI technologies are gradually revolutionizing traditional learning methods, offering tailored experiences that cater to the unique needs and preferences of individual learners. Our findings highlight the promising outcomes of integrating AI-driven tools into the educational ecosystem, including enhanced engagement, improved knowledge retention, and personalized learning pathways.

Moreover, the enthusiasm and willingness of research scholars in Kerala to embrace these innovations signify a growing recognition of the transformative power of AI in education.

Looking ahead, the future of AI-driven personalized learning in Kerala and beyond appears promising yet complex. Continued research, collaboration, and innovation will be essential in harnessing the full potential of these technologies while mitigating associated risks. By fostering a culture of experimentation, adaptation, and inclusivity, we can pave the way for a more dynamic and responsive educational paradigm that empowers learners of all backgrounds to thrive in an ever-evolving world.

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