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USAGE OF ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION

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ABSTRACT

In the era of rapid technological advancements, artificial intelligence (AI) stands as a transformative force in Higher Education. This research focuses on understanding the awareness of AI among college students, probing into the depth of their knowledge acquisition and the diverse sources influencing their understanding of this evolving field. This study investigates the integration of artificial intelligence (AI) tools in higher education, especially among arts and science students aiming to provide insights into their impact on learning outcomes, personalized learning, and student engagement. It also examines challenges and ethical considerations associated with AI implementation. The significance lies in informing future educational practices and policies. The study explores students' perceptions of AI, their awareness of AI applications, preferences for AI usage in education, factors influencing acceptance, and perceptions of AI's role in future careers. Data collection involved questionnaires via Google Forms and secondary sources. Findings suggest that students, regardless of gender or background, show interest in AI integration in education but express concerns about AI bias and ethical implications. Non random sampling techniques are used in this study. The sample comprised 210 higher education students, with a mix of rural, urban, and suburban backgrounds, enrolled in various programs. The study emphasizes the need for informed decision-making and responsible AI integration in education. Reliability of the Study Cronbach's Alpha Reliability Index was used to evaluate internal consistency of each construct. The overall scale showed high internal consistency (α = 0.997). Hypotheses were tested with ANOVA, Independent t-test and multiple regressions used to test the relationship between dependent and independent variables.

Keywords: *Artificial Intelligence, Higher Education, AI Usage, Alpha Reliability Index, ANOVA.*

Introduction

Artificial Intelligence (AI) has emerged as a transformative force reshaping various aspects of society, including education. In higher education institutions, the integration of AI technologies into academic courses has become increasingly prevalent, promising to revolutionize traditional teaching and learning methods. This study aims to explore students' perceptions, experiences, and engagement with AI in the academic realm, shedding light on its impact on learning outcomes and skill development across different fields of study.

The integration of AI in education holds tremendous potential to enhance the learning experiences of students by providing personalized and adaptive learning opportunities. AI-powered tools and platforms offer the ability to cater to individual learning styles and pace, thereby improving student engagement and knowledge retention. Furthermore, the automation of routine tasks, such as grading and administrative duties, frees up educators' time to focus on more personalized instruction and student support. The assessment of satisfaction indicators, such as interest, attention, and confidence, offers valuable criteria for evaluating the effectiveness of AI-based educational technologies. Additionally, the consideration of personal factors, such as demographic characteristics and educational backgrounds, underscores the significance of individualized approaches in implementing AI in higher education. These provide valuable guidance for higher education institutions aiming to leverage AI technologies effectively to enhance teaching and learning experiences in digital learning environments. (Dr. G. Yashodha)

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In today's rapidly evolving job market, possessing AI-related skills and knowledge is increasingly becoming a necessity across various industries. Thus, understanding students' attitudes towards AI in higher education and their willingness to invest time and effort in acquiring AI-related competencies is crucial for preparing them for the demands of the future workforce.

Review of Literature

Dr. G. Yashodha (2022) research investigates students' interest and satisfaction with blended learning in Tiruchirappalli. Utilizing a non-random sample of 291 higher education students, the study explores factors such as course design, learning experience, and personal factors affecting students' motivation towards blended learning. Findings reveal three distinct cluster groups: Moderate learners (40.2%), Good learners (13.4%), and Excellent learners (46.4%). Through descriptive statistics and cluster analysis, the study sheds light on varying levels of interest and satisfaction among students, providing insights into the effectiveness of blended learning approaches in higher education contexts.

Aljarrah et al. (2021) conducted a systematic literature review focusing on AI techniques in distance education, particularly emphasizing emotional understanding and the impact of COVID-19. Through their analysis, they identified significant gaps in monitoring students' emotional states during electronic exams, underscoring the importance of AI in addressing the emotional aspects of online learning experiences.

Cox (2021) employed design fictions to speculate on the future impact of AI and robots in higher education. Through the creation of various scenarios, they offered insightful discussions on the potential implications for teaching skills and staff roles. Their approach provided a creative lens into the multifaceted landscape of AI and robotics in education.

Bozkurt et al. (2021) undertook a comprehensive systematic review spanning half a century of AI studies in education. Their review identified key clusters and overarching research themes, with a notable emphasis on the critical consideration of ethics in AI studies within educational contexts. This highlighted the need for ethical oversight in AI implementation in educational settings.

Okewu et al. (2021) conducted a systematic literature review focusing on Artificial Neural Networks (ANN) in Educational Data Mining (EDM). Their review highlighted existing challenges and proposed avenues for further research to enhance the visibility and relevance of ANN-based EDM in higher education contexts.

Ismail et al. (2023) presented a protocol paper outlining an innovative approach to studying the impact of generative AI, particularly chatbot models, in higher education. Their work aimed to set a benchmark for rigorous systematic literature reviews in emerging domains, particularly focusing on the longitudinal evaluation of AI applications in educational settings.

Research Gap

The research gap identified from the review of the mentioned studies lies in the need for further exploration and understanding of the practical implications and ethical considerations of integrating AI and related technologies into higher education. While the studies provide valuable insights into various aspects of AI in education, such as emotional understanding, future impact scenarios, systematic reviews of AI studies, and applications of AI techniques in specific domains, there remains a gap in comprehensively addressing the ethical, social, and pedagogical implications of AI adoption in educational settings. Additionally, there is a need for more empirical research focusing on the effectiveness and scalability of AI-driven educational interventions, as well as studies that consider the perspectives and experiences of diverse stakeholders, including students, educators, administrators, and policymakers. Addressing these gaps will contribute to a more holistic understanding of the opportunities and challenges associated with AI integration in higher education, ultimately guiding the development of informed policies and practices in this rapidly evolving field.

Statement of Problem

Despite the growing integration of Artificial Intelligence (AI) into academic courses within higher education institutions, there remains a gap in understanding students' perceptions, experiences, and engagement with AI in the educational context. This lack of insight hinders the effective implementation of AI technologies in enhancing learning outcomes and preparing students for an AI-driven future. Furthermore, variations in the availability of resources and curriculum support for AI skill development across different fields of study pose challenges in ensuring equitable access to AI education. Additionally, concerns regarding biases, fairness, and ethical implications associated with AI raise questions about students' preparedness to address these challenges. Therefore, there is a need to investigate students'

attitudes, experiences, and concerns regarding AI integration in academic courses, as well as their readiness to engage with AI-related educational content and navigate the ethical dimensions of AI technologies.

Purpose of the Study

The primary purpose of this study is to comprehensively explore students' perceptions, experiences, and engagement with Artificial Intelligence (AI) integration in academic courses within higher education institutions. Specifically, the study aims to examine the impact of AI on students' learning experiences, educational outcomes, and skill development across different fields of study. Additionally, the study aims to assess students' awareness of potential risks associated with AI, including issues related to bias, fairness, and ethical implications, and their preparedness to address these challenges.

Significance of the Study

This study holds several significant implications for academia, policymakers, educators, and students alike: By gaining insights into students' perceptions and experiences with AI integration in academic courses, the study can inform the development of effective AI integration strategies that cater to students' diverse needs and preferences. Understanding the impact of AI on students' learning experiences and educational outcomes can guide educators in leveraging AI technologies to enhance teaching methodologies, improve student engagement, and facilitate personalized learning approaches. By evaluating the availability of resources and curriculum support for AI skill development across different fields of study, the study can identify disparities and promote equitable access to AI education for all students, regardless of their academic discipline. By examining students' awareness of ethical implications associated with AI and their preparedness to address these challenges, the study can contribute to the development of ethical guidelines and frameworks for AI integration in education, fostering responsible AI usage among students. By assessing students' confidence levels in learning and applying AI concepts within their academic curriculum, the study can inform educational institutions and policymakers about the effectiveness of current AI education initiatives in preparing students for future careers in AI-related fields.

Research Questions

- How do perceptions of AI usage in academic courses vary among arts and science students?
- To what extent does the curriculum support AI skill development in arts and science education?
- What concerns do arts and science students have regarding AI bias and fairness?
- What are the future perspectives on the role of AI in various industries among arts and science students?

Objectives of the Study

- To assess perceptions of AI usage in academic courses among students.
- To analyze the extent of curriculum support for AI skill development in education.
- To identify concerns related to AI bias, fairness, and ethical implications among students.
- To explore future perspectives on the role of AI in various industries among students.

Hypotheses

- Perceptions of AI usage in academic courses vary significantly among students.
- The curriculum provides significant support for AI skill development, as reported by students.
- Concerns about AI bias, fairness, and ethical implications are prevalent among students.
- Students hold optimistic future perspectives regarding the role of AI in various industries, indicating a belief in its transformative potential.

Methodology of the Study

This research adopts a cross-sectional study design to gather data at a single point in time from a diverse sample of arts and science students in higher education institutions. The sample size consists of 210 individuals; utilize convenience sampling to ensure representation across different demographic categories such as gender, age, and educational level, field of study, location, and living arrangement. The Google Form questionnaire will be distributed through various online platforms, including social media groups, and mailing lists, targeting arts and science students in Tiruchirapalli city. Participation is voluntary, and respondents will have the option to complete the questionnaire anonymously.

Limitations

The study is the homogeneity of the sample, which mainly consisted of higher education students from a specific geographical region (Tiruchirappalli). This limited sample diversity may affect the generalizability of the findings to broader populations of higher education students with different demographic backgrounds, educational experiences, and cultural contexts.

Demographic Profile of the Study

The demographic profile of the respondents reflects a diverse sample, with a slightly higher representation of females (58.6%) compared to males (41.4%). The majority of respondents are aged between 18 and 24 years (83.9%), predominantly undergraduate students (72.9%) studying commerce (54.3%) in their third year (61.4%) at private colleges (60.0%). Most respondents live with their parents (62.9%) in urban areas (61.4%), with varying income levels, primarily between Rs. 20,000 and Rs. 60,000 per month. This demographic diversity underscores the broad representation and potential influences on perceptions and attitudes towards Artificial Intelligence in higher education.

Demographic Frequency Table

Table 1: Demographic Profile of the Study

Demographic Profile	Frequency	Percent
Gender		
MALE	87	41.4
FEMALE	123	58.6
Age		
Below 18 years	9	4.3
18 - 20 years	132	62.9
21 - 24 years	42	20.0
Above 24 years	27	12.9
Educational Level		
UG	153	72.9
PG	36	17.1
DIPLOMA	12	5.7
OTHERS	9	4.3
Field of the Study		
Commerce	114	54.3
Science	33	15.7
Management	42	20.0
Others	21	10.0
Year of the Study		
I Year	36	17.1
II Year	45	21.4
III Year	129	61.4
Type of the Institution		
University	42	20.0
Autonomous Colleges	42	20.0
Private Colleges	126	60.0
Living Arrangements		
On Campus housing	30	14.3
Off Campus housing	48	22.9
Living with Parents	132	62.9
Location		
Urban	129	61.4
semi Urban	24	11.4
Rural	57	27.1
Income Level		
Below RRs. 20,000	42	20.0
Rs. 20,000 - Rs. 40,000	63	30.0
Rs. 40,000 - Rs. 60,000	57	27.1
Above Rs. 60,000	48	22.9

Source: Primary Data

Reliability of the Study

Cronbach's Alpha Reliability Index was used to evaluate internal consistency of each construct. Hair et al. (1998) suggests that that acceptable level of reliability index should be maintained at a minimum of 0.5 in order to satisfy for the early stages of research; and over 0.7 is considered to be a good level.

Table 2: Reliability of the Study

Dimensions	No of Items	Alpha
Perceptions of AI Usage		
AI in Academic Courses	3	.970
Learning Experience	3	.979
Seeking AI Educational Content	3	.978
AI Skill Development		
Access to AI Resources	3	.985
Curriculum Support	3	.982
Confidence in AI Learning	3	.988
Concerns about AI		
AI Bias and Fairness	3	.978
Ethical Implications	3	.983
Informed about AI Risks	3	.981
Future Perspectives on AI		
Role of AI in Future Industries	3	.972
Total	**30**	**.997**

Source: Primary Data

The above table presented the summary of the Cronbach's alpha values for the study variables. Reliability coefficients for all the sub scales were found to be highly satisfactory, and all the values ranged from 0.970 to 0.988. The overall scale showed high internal consistency ($\alpha = 0.997$).

Results and Discussions

The group statistics and independent samples test results indicate significant differences in the mean scores of AI perceptions between male and female participants across all dimensions: AI in Academic Courses (AI IN AC), AI in Learning Experience (AI IN LE), and AI in Educational Context (AI IN EC).

Table 3: Independent Samples Test

Group statistics					Independent Samples Test		
	Gender	**N**	**Mean**	**Std. Deviation**	**t**	**df**	**Sig. (2-tailed)**
AI in AC	Male	87	2.08	.957	-8.589	208	.000
	Female	123	3.22	.930	-8.548	182.069	.000
AI in LE	Male	87	2.28	.992	-7.689	208	.000
	Female	123	3.34	.977	-7.669	183.563	.000
AI in EC	Male	87	2.28	1.034	-8.332	208	.000
	Female	123	3.43	.937	-8.194	173.698	.000

Source: Primary Data

For AI IN AC, male participants had a significantly lower mean score ($M = 2.08$, $SD = 0.957$) compared to female participants ($M = 3.22$, $SD = 0.930$), with $t(208) = -8.589$, $p < .001$. Similarly, for AI IN LE, male participants had a lower mean score ($M = 2.28$, $SD = 0.992$) compared to female participants ($M = 3.34$, $SD = 0.977$), with $t(208) = -7.689$, $p < .001$. Additionally, for AI IN EC, male participants had a lower mean score ($M = 2.28$, $SD = 1.034$) compared to female participants ($M = 3.43$, $SD = 0.937$), with $t(208) = -8.332$, $p < .001$.

These findings suggest that female participants generally perceive AI more positively across all dimensions compared to male participants. The significant differences indicate gender-related variations in perceptions of AI usage in higher education, highlighting the importance of considering gender perspectives in the implementation and design of AI-driven educational initiatives.

Table 4: Descriptive Statistics and ANOVA Results

Descriptive Statistics				ANOVA[a]		
Dimensions	**Mean**	**Std. Deviation**	**F Age**	**F Education**	**F Field**	**Sig.**
AI IN AC	2.75	1.093	188.451	132.003	226.540	.000
AI IN LE	2.90	1.112	234.995	137.885	240.192	.000
AI IN EC	2.95	1.127	219.259	144.267	241.362	.000
AI IN AR	2.72	.978	137.924	91.263	141.812	.000
AI IN CS	2.85	1.096	204.490	135.040	195.240	.000
AI IN CL	2.86	1.039	163.243	124.299	173.720	.000
AI IN BIAS	2.74	1.007	163.804	108.067	176.405	.000
AI IN EI	2.80	1.059	162.130	119.419	181.777	.000
AI IN RISK	2.85	1.167	235.104	166.002	298.227	.000
AI IN FUTURE	2.83	1.228	213.770	145.425	280.265	.000

Source: Primary Data

Interpretation: The provided statistics suggest that age, education level, and field of study significantly influence perceptions of AI across all dimensions. The significant F-values and associated p-values (Sig. < .05) indicate that there are statistically significant differences in perceptions of AI across different age groups, education levels, and fields of study. These results imply that factors such as age, education level, and field of study should be considered when examining perceptions of AI and designing interventions or educational programs related to AI.

Multiple Regressions

Descriptive Statistics			Model Summary	ANOVA[a]	
	Mean	**Std. Deviation**	**R Square**	**F**	**Sig.**
Location	1.66	.879			
Income Level	2.53	1.054			
AI IN AC	2.75	1.093	.898	914.186	.000[b]
AI IN LE	2.90	1.112	.876	731.964	.000[b]
AI IN EC	2.95	1.127	.866	670.547	.000[b]
AI IN AR	2.72	.978	.766	338.981	.000[b]
AI IN CS	2.85	1.096	.847	570.857	.000[b]
AI IN CL	2.86	1.039	.836	528.046	.000[b]
AI IN BIAS	2.74	1.007	.784	375.692	.000[b]
AI IN EI	2.80	1.059	.832	512.017	.000[b]
AI IN RISK	2.85	1.167	.896	895.436	.000[b]
AI IN FUTURE	2.83	1.228	.929	1354.861	.000[b]

Source: Primary Data

Interpretation: The provided statistics suggest that the independent variables (such as location and income level) significantly predict various dimensions related to perceptions of AI. The high R-squared values indicate that a large proportion of the variance in perceptions of AI is explained by the independent variables. Overall, the ANOVA results confirm that the regression models for each dimension related to perceptions of AI are statistically significant, implying that the predictors have a substantial impact on these perceptions.

Suggestions

- **Educational Initiatives:** Institutions should prioritize the development of educational initiatives aimed at enhancing students' awareness and understanding of AI, integrating AI-related content into curricula across disciplines through workshops, seminars, and online courses.
- **Ethics Education:** Given students' concerns about AI bias and ethical implications, there is a pressing need to integrate ethics education into AI-related courses, facilitating discussions on ethical considerations surrounding AI development and usage to foster critical thinking and ethical decision-making skills.
- **Collaborative Projects:** Encouraging interdisciplinary collaboration on AI-related projects can enrich students' learning experiences and facilitate knowledge exchange among diverse backgrounds, promoting creativity and innovation through the development of AI-driven solutions to real-world problems.

- **Partnerships with Industry:** Establishing partnerships with industry leaders in AI can provide students with hands-on experience and exposure to cutting-edge AI technologies through internship programs, industry-sponsored projects, and guest lectures by AI experts, enhancing their employability and practical skills.

Further Research

- **Comparative Analysis:** Comparative analysis of students' perceptions of AI across different geographical regions, cultural backgrounds, and educational contexts could elucidate the influence of socio-cultural factors on AI awareness and acceptance, contributing to a more nuanced understanding of global trends in AI education.
- **Impact on Learning Outcomes:** Investigating the direct impact of AI integration on students' learning outcomes, academic performance, and skill acquisition would provide evidence-based insights into the effectiveness of AI-driven educational interventions, guiding future educational practices and policies.
- **Teacher Perspectives:** Exploring educators' perspectives and experiences with AI integration in higher education can offer valuable insights into the challenges and opportunities associated with AI adoption from the instructors' standpoint, facilitating the development of supportive frameworks and resources for educators.
- **Ethical Guidelines:** Research focusing on the development of comprehensive ethical guidelines and frameworks for AI integration in higher education can address students' concerns about AI bias and ethical implications, ensuring responsible and equitable AI usage in educational settings.

Conclusion

In this study sheds light on students' perceptions and experiences regarding the integration of Artificial Intelligence (AI) in higher education. It reveals positive attitudes towards AI integration, recognizing its potential to enhance learning outcomes and personalized learning experiences. However, challenges remain in ensuring adequate resources and curriculum support for AI skill development, especially in arts and science fields. Despite students' enthusiasm for AI's role in future industries and society, concerns persist regarding biases and ethical implications. Moving forward, there is a clear imperative for responsible AI integration in education, supported by continued research and collaborative efforts to address challenges and maximize the benefits of AI for higher education.

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