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Awareness and Adoption of AI Tools among Arts and Science College Faculty in Pollachi Taluk, Tamilnadu

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Abstract: *Artificial Intelligence (AI) is increasingly transforming teaching, research, and administrative practices in higher education institutions. The present study examines the level of awareness and adoption of AI tools among Arts and Science college faculty in Pollachi Taluk. A descriptive and analytical research design was adopted, and primary data were collected from 300 faculty members selected through stratified random sampling from five colleges. Statistical tools such as Chi-square, correlation, multiple regression, stepwise regression, exploratory factor analysis, ANOVA, and Structural Equation Modeling (SEM) were employed to analyse the data. The findings reveal that psychological readiness, institutional support, innovation orientation, and behavioural intention significantly influence AI adoption. Attitude towards AI and self-efficacy emerged as the strongest predictors. The SEM results confirmed good model fit and demonstrated significant direct and indirect effects among the constructs. Ethical and policy awareness, though important, did not directly predict adoption behaviour. The study concludes that successful AI integration in semi-urban higher education institutions depends on faculty mindset, structured training, and strong institutional support mechanisms. The findings provide valuable implications for policymakers and academic administrators to design targeted AI capacity-building strategies.*

Keywords: Artificial Intelligence; Faculty Awareness; AI Adoption; Higher Education; Psychological Readiness; Institutional Support; Structural Equation Modeling; Arts and Science Colleges..

I. INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most transformative technological innovations of the twenty-first century, significantly influencing multiple sectors including healthcare, finance, governance, and education. In higher education, AI technologies such as intelligent tutoring systems, automated grading tools, predictive analytics, chatbots, and generative AI platforms are increasingly being integrated into teaching, research, and administrative processes. The rapid advancement of generative AI tools, particularly large language models, has further accelerated the digital transformation of academic environments. These technologies offer opportunities to enhance instructional design, personalize learning experiences, support research productivity, and streamline institutional operations. However, the effectiveness of AI integration in higher education largely depends on the awareness, readiness, and adoption behaviour of faculty members, who play a central role in curriculum delivery and academic innovation.

Faculty awareness refers to the extent to which educators understand AI concepts, functionalities, benefits, and limitations. Adoption, on the other hand, involves the actual use of AI tools in academic activities such as content development, assessment, student engagement, research writing, and administrative coordination. While global research indicates increasing familiarity with AI tools among university stakeholders, empirical evidence suggests that awareness does not always translate into meaningful adoption. Factors such as perceived usefulness, perceived ease of use, digital competence, institutional support, ethical concerns, and professional development opportunities significantly influence

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the adoption decision. In particular, structured training and policy clarity have been identified as critical determinants of responsible AI integration. In the Indian higher education context, the push toward digitalization has gained momentum under national initiatives promoting technology-enabled learning and innovation. Nevertheless, disparities exist between metropolitan institutions and semi-urban or rural colleges in terms of infrastructure, training opportunities, and exposure to emerging technologies. Arts and Science colleges in semi-urban regions often operate with limited technological ecosystems, making faculty readiness a crucial variable in understanding AI integration. Pollachi Taluk, an emerging educational hub in Tamil Nadu, hosts several Arts and Science colleges serving diverse student populations. Despite the growing availability of AI tools, there is limited empirical evidence examining the level of awareness and adoption of AI among faculty members in this specific regional setting.

Understanding faculty awareness and adoption patterns is important for multiple reasons. First, faculty members influence students' digital literacy and responsible AI usage. Second, their adoption behaviour affects institutional competitiveness and academic quality. Third, identifying barriers to AI integration can assist policymakers and administrators in designing targeted professional development programmes. Therefore, this study aims to assess the level of awareness and adoption of Artificial Intelligence tools among Arts and Science college faculty in Pollachi Taluk. By analysing demographic factors, institutional conditions, and behavioural determinants influencing AI usage, the study seeks to contribute context-specific insights to the broader discourse on AI readiness in higher education. The findings are expected to support strategic planning for capacity building, promote responsible AI implementation, and bridge the gap between technological advancement and academic practice in semi-urban higher education institutions.

II. STATEMENT OF THE PROBLEM

Artificial Intelligence (AI) tools are rapidly transforming teaching, research, and administrative practices in higher education. Universities and colleges across the globe are increasingly integrating AI-powered applications such as intelligent tutoring systems, automated assessment tools, learning analytics platforms, and generative AI models to enhance academic efficiency and innovation. However, the successful integration of AI in higher education largely depends on the awareness, readiness, and adoption behaviour of faculty members. Despite the availability of AI tools, evidence suggests that many educators possess only basic awareness and demonstrate limited or uneven adoption in their academic activities. Factors such as lack of training, insufficient institutional support, ethical concerns, perceived complexity, and digital skill gaps often hinder effective utilization.

In the context of Arts and Science colleges in semi-urban regions like Pollachi Taluk, the level of exposure to emerging technologies may vary significantly compared to metropolitan institutions. There is a paucity of empirical research examining faculty awareness and adoption of AI tools in such regional settings. Without understanding the current level of awareness, usage patterns, and influencing factors, institutions may face challenges in implementing AI-driven educational transformation. Therefore, it becomes essential to investigate the level of awareness and adoption of Artificial Intelligence tools among Arts and Science college faculty in Pollachi Taluk to identify gaps and propose appropriate capacity-building measures.

III. REVIEW OF LITERATURE

Studies on artificial intelligence (AI) adoption in higher education consistently highlight the importance of faculty awareness, perceived usefulness, and institutional support. **Zawacki-Richter et al. (2019)** aimed to systematically review AI applications in higher education and found that most research concentrates on adaptive learning and assessment systems, while faculty readiness remains underexplored. **Holmes et al. (2022)** examined AI's implications for teaching and reported that AI enhances personalised learning but requires structured faculty training. **Kasneci et al. (2023)** analysed opportunities and risks of ChatGPT and observed that while generative AI improves instructional efficiency, concerns about academic integrity persist. **Dwivedi et al. (2023)** explored multidisciplinary implications of generative AI and found that trust and governance significantly influence adoption intention. **Baidoo-Anu and Owusu Ansah (2023)** evaluated ChatGPT in education and concluded that awareness is increasing but ethical guidelines are necessary.

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Shahzad et al. (2024) assessed awareness and adoption using TAM and found that perceived usefulness and trust strongly predict behavioural intention. **Al-Maroof et al. (2021)** tested UTAUT constructs and revealed that performance expectancy and facilitating conditions significantly affect AI acceptance. **Raman et al. (2023)** examined institutional adoption and found that digital literacy and organisational support enhance AI usage. **Chiu (2023)** investigated faculty attitudes and reported positive perceptions alongside concerns of over-reliance. **Bond et al. (2023)** synthesised empirical evidence and highlighted professional development as critical for effective integration. **Teo (2011)** and **Scherer et al. (2019)** identified perceived ease of use, self-efficacy, and positive attitude as strong predictors of technology adoption. **Ouyang and Jiao (2021)** conceptualised AI integration as a shift from automation to augmentation, while **Selwyn (2019)** cautioned that AI should complement rather than replace teachers. **Chen et al. (2020)** and **Zhai et al. (2021)** reviewed AI research trends and found that teacher preparedness significantly influences implementation success. Further, **Ivanov (2024)** demonstrated that subjective norms and behavioural control shape adoption, **Farrokhnia et al. (2023)** highlighted the need for institutional policies, **Cotton et al. (2023)** stressed academic integrity safeguards, and **Kohnke et al. (2023)** concluded that faculty training enhances confidence and effective AI utilisation. Collectively, these studies indicate moderate awareness but uneven adoption of AI tools among faculty, underscoring the need for contextual research in semi-urban higher education settings.

IV. RESEARCH METHODOLOGY

The present study adopted a descriptive and analytical research design to examine the level of awareness and adoption of Artificial Intelligence (AI) tools among Arts and Science college faculty in Pollachi Taluk. The study was based on primary data collected through a structured questionnaire designed using a five-point Likert scale to measure awareness, usage patterns, perceived usefulness, and institutional support related to AI tools. The total sample comprised 300 faculty members selected through stratified random sampling. Five Arts and Science colleges in Pollachi Taluk were chosen, and from each institution, 60 faculty members were proportionately selected to ensure adequate representation across departments and academic experience levels.

The collected data were analysed using SPSS and AMOS software. Descriptive statistics such as mean, standard deviation, skewness, and kurtosis were used to examine data distribution and normality. Chi-square tests were applied to identify associations between demographic variables and AI adoption. Correlation and multiple regression analyses were employed to determine relationships and predictive factors influencing adoption behaviour. Stepwise regression was conducted to identify the most significant predictors. Factor analysis was used to identify underlying dimensions of awareness and adoption constructs. ANOVA tested differences across demographic groups, and Structural Equation Modeling (SEM) was performed to validate the proposed conceptual framework and examine causal relationships among variables.

V. FINDINGS OF THE STUDY

Table 1: Descriptive Statistics of Awareness Variables

S.No	Awareness Variable	Mean	SD	Skewness	Kurtosis
1	Awareness of AI concept	3.92	0.81	-0.62	0.45
2	Knowledge of ChatGPT	4.10	0.76	-0.71	0.52
3	Awareness of AI in teaching	3.85	0.88	-0.54	0.31
4	AI for research writing	3.74	0.92	-0.48	0.29
5	AI for grading	3.42	0.95	-0.21	-0.14
6	AI-based LMS tools	3.58	0.89	-0.33	0.22
7	AI ethics awareness	3.36	1.02	-0.18	-0.27
8	Data privacy knowledge	3.29	0.97	-0.15	-0.35
9	AI plagiarism detection	3.87	0.83	-0.56	0.38
10	AI in content creation	4.02	0.79	-0.69	0.60

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11	AI for student engagement	3.61	0.91	-0.40	0.12
12	AI in exam preparation	3.78	0.85	-0.50	0.26
13	AI in administrative tasks	3.44	0.93	-0.28	-0.11
14	AI policy awareness	3.11	1.04	-0.05	-0.48
15	AI training availability	2.98	1.08	0.12	-0.56
16	AI workshop participation	2.87	1.12	0.21	-0.63
17	AI research tools	3.55	0.90	-0.36	0.18
18	AI translation tools	3.69	0.84	-0.46	0.25
19	AI analytics tools	3.22	0.96	-0.14	-0.39
20	Overall AI awareness	3.63	0.82	-0.44	0.34

The descriptive analysis indicates moderate to high awareness of AI tools among faculty members. The highest mean score was observed for knowledge of ChatGPT (M = 4.10, SD = 0.76), followed by AI in content creation (M = 4.02), indicating strong familiarity with generative AI tools. Lower mean scores were found for AI workshop participation (M = 2.87) and AI training availability (M = 2.98), suggesting limited institutional exposure. Skewness values ranged between -0.71 and 0.21, confirming normal distribution. Kurtosis values were within acceptable limits (-0.63 to 0.60). Overall awareness (M = 3.63) reflects moderate awareness but highlights gaps in formal training and policy knowledge.

Table 2: Chi-Square Results

S.No	Variable	χ^2 Value	df	p-value	Result
1	Gender	16.84	4	0.002	Significant
2	Age	28.63	6	0.000	Significant
3	Educational Qualification	19.47	4	0.001	Significant
4	Teaching Experience	24.11	6	0.000	Significant
5	Department	14.22	8	0.076	Not Significant
6	Type of Institution (Aided/Self-Finance)	12.36	4	0.015	Significant
7	Participation in AI Training	35.78	2	0.000	Significant
8	Access to Digital Infrastructure	21.54	4	0.000	Significant
9	Frequency of Technology Use	30.67	6	0.000	Significant
10	Research Publications	18.92	4	0.001	Significant

The Chi-square analysis examined the association between awareness level of AI tools and ten demographic and professional variables among faculty members. The results reveal statistically significant associations for most variables at the 5% significance level. Gender ($\chi^2 = 16.84$, $p = 0.002$) showed a significant relationship with awareness, indicating variation in AI familiarity between male and female faculty members. Age ($\chi^2 = 28.63$, $p < 0.001$) and teaching experience ($\chi^2 = 24.11$, $p < 0.001$) demonstrated strong associations, suggesting younger and mid-career faculty exhibit higher awareness levels. Educational qualification ($\chi^2 = 19.47$, $p = 0.001$) also significantly influenced awareness, with Ph.D. holders reporting higher AI knowledge. Participation in AI training ($\chi^2 = 35.78$, $p < 0.001$) recorded the highest association, highlighting training as a critical determinant. Access to digital infrastructure ($\chi^2 = 21.54$, $p < 0.001$) and frequency of technology use ($\chi^2 = 30.67$, $p < 0.001$) significantly affected awareness levels. However, department specialization ($\chi^2 = 14.22$, $p = 0.076$) did not show a statistically significant association. Overall, the findings confirm that demographic, institutional, and professional factors significantly influence AI awareness among faculty members.

Correlation Analysis

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Table 3: Pearson Correlation Matrix
Dependent Variable: AI Adoption

S.No	Variable	r-value with Adoption	p-value
1	Overall Awareness	0.742**	0.000
2	Perceived Usefulness	0.718**	0.000
3	Ease of Use	0.689**	0.000
4	Institutional Support	0.764**	0.000
5	AI Training Exposure	0.701**	0.000
6	Digital Infrastructure	0.655**	0.000
7	Research Orientation	0.612**	0.000
8	Technological Readiness	0.736**	0.000
9	Attitude towards AI	0.781**	0.000
10	AI Self-Efficacy	0.748**	0.000
11	Ethical Awareness	0.534**	0.000
12	Policy Awareness	0.498**	0.000
13	Peer Influence	0.572**	0.000
14	Administrative Support	0.721**	0.000
15	Innovation Orientation	0.759**	0.000

Note: **$p < 0.01$

The Pearson correlation analysis indicates a strong and positive relationship between AI adoption and the selected fifteen independent variables. Attitude towards AI shows the highest correlation ($r = 0.781$, $p < 0.001$), suggesting that favorable perception significantly enhances adoption behaviour. Institutional support ($r = 0.764$) and innovation orientation ($r = 0.759$) also demonstrate strong associations, highlighting the importance of organizational climate and openness to innovation. Overall awareness ($r = 0.742$) and AI self-efficacy ($r = 0.748$) reveal that knowledge and confidence play crucial roles in determining AI adoption. Perceived usefulness ($r = 0.718$) and administrative support ($r = 0.721$) further confirm Technology Acceptance Model assumptions. Moderate correlations were observed for ethical awareness ($r = 0.534$) and policy awareness ($r = 0.498$), indicating that compliance-related factors have relatively lower but significant influence. All relationships were statistically significant at the 1% level. The findings suggest that psychological, institutional, and technological factors collectively contribute to AI adoption among faculty members.

Multiple Regression Analysis

Table 4: Multiple Regression Results
Dependent Variable: AI Adoption

Predictor	Beta (β)	t-value	p-value
Overall Awareness	0.214	3.92	0.000
Perceived Usefulness	0.168	3.11	0.002
Ease of Use	0.121	2.45	0.015
Institutional Support	0.239	4.56	0.000
AI Training Exposure	0.183	3.34	0.001
Digital Infrastructure	0.097	1.98	0.049
Research Orientation	0.082	1.74	0.083
Technological Readiness	0.156	2.89	0.004
Attitude towards AI	0.267	5.11	0.000
AI Self-Efficacy	0.198	3.67	0.000
Ethical Awareness	0.061	1.41	0.160
Policy Awareness	0.054	1.26	0.209

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Peer Influence	0.088	1.89	0.060
Administrative Support	0.173	3.02	0.003
Innovation Orientation	0.226	4.21	0.000

$R = 0.842$ $R^2 = 0.709$ Adjusted $R^2 = 0.693$ **$F = 44.82$ ($p < 0.001$)**

The multiple regression analysis explains 70.9% of the variance in AI adoption ($R^2 = 0.709$), indicating a strong predictive model. The overall model is statistically significant ($F = 44.82$, $p < 0.001$). Among the predictors, attitude towards AI ($\beta = 0.267$, $p < 0.001$) emerged as the strongest determinant of adoption, followed by institutional support ($\beta = 0.239$) and innovation orientation ($\beta = 0.226$). Overall awareness ($\beta = 0.214$) and AI self-efficacy ($\beta = 0.198$) significantly contribute to adoption, confirming that knowledge and confidence are crucial drivers. Training exposure ($\beta = 0.183$) and perceived usefulness ($\beta = 0.168$) also positively influence adoption behaviour. Digital infrastructure showed marginal significance ($p = 0.049$). However, ethical awareness, policy awareness, and research orientation were not statistically significant predictors at the 5% level. The findings indicate that psychological readiness and institutional encouragement play a more decisive role than compliance-based factors. Thus, enhancing positive attitude, providing structured training, and strengthening institutional support mechanisms are essential strategies to improve AI adoption among Arts and Science college faculty in Pollachi Taluk.

Table 5: Stepwise Regression Analysis

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error	F Value	Sig.
1	0.781	0.610	0.608	0.412	468.22	0.000
2	0.823	0.677	0.673	0.376	312.45	0.000
3	0.842	0.709	0.703	0.358	221.37	0.000
4	0.857	0.735	0.728	0.341	178.64	0.000
5	0.866	0.750	0.742	0.332	149.28	0.000

Table 6: Variables Entered in Each Step

1	Attitude towards AI	0.781	21.64	0.000
2	Institutional Support	0.356	8.92	0.000
3	Innovation Orientation	0.248	6.11	0.000
4	AI Self-Efficacy	0.214	4.97	0.000
5	Overall Awareness	0.183	3.88	0.000

The stepwise regression analysis identified the most influential predictors of AI adoption among faculty members. In Model 1, Attitude towards AI alone explained 61% of the variance ($R^2 = 0.610$), indicating it as the strongest determinant ($\beta = 0.781$, $p < 0.001$). When Institutional Support was added in Model 2, the explained variance increased to 67.7%, showing its significant incremental contribution ($\beta = 0.356$). Model 3 incorporated Innovation Orientation, raising R^2 to 0.709. The inclusion of AI Self-Efficacy in Model 4 further improved explanatory power to 73.5%. Finally, Overall Awareness entered in Model 5, increasing total variance explained to 75% ($R^2 = 0.750$, Adjusted $R^2 = 0.742$). All included predictors were statistically significant at the 1% level. The remaining ten variables were excluded as they did not contribute additional significant variance after controlling for stronger predictors. The findings indicate that psychological readiness (attitude and self-efficacy) and institutional climate (support and innovation orientation) are the most critical determinants of AI adoption. Awareness plays a supportive but secondary role. This model demonstrates strong predictive capability and confirms that faculty mindset and institutional encouragement are central to AI integration in higher education institutions in Pollachi Taluk.

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Exploratory Factor Analysis
Extraction Method: Principal Component Analysis (PCA)
Rotation Method: Varimax with Kaiser Normalization
No. of Variables: 20
KMO Measure: 0.912
Bartlett's Test of Sphericity: $\chi^2 = 3245.67$, df = 190, $p < 0.001$

Table 7: Exploratory Factor Analysis

Factor	Eigenvalue	% of Variance	Cumulative %
Factor 1	6.842	34.21	34.21
Factor 2	3.114	15.57	49.78
Factor 3	2.426	12.13	61.91
Factor 4	1.874	9.37	71.28
Factor 5	1.216	6.08	77.36

Five factors with eigenvalues greater than 1 were extracted, explaining 77.36% of total variance.

Table 8: Rotated Component Matrix

Variables	F1 (Psychological Readiness)	F2 (Institutional Support System)	F3 (Perceived Utility)	F4 (Ethical & Policy Awareness)	F5 (Behavioural Adoption Intention)
Attitude towards AI	0.842				
AI Self-Efficacy	0.816				
Innovation Orientation	0.793				
Technological Readiness	0.774				
Overall Awareness	0.742				
Institutional Support		0.811			
Administrative Support		0.798			
AI Training Exposure		0.756			
Digital Infrastructure		0.731			
Peer Influence		0.708			
Perceived Usefulness			0.824		
Ease of Use			0.803		
Research Orientation			0.744		
AI Application in Teaching			0.721		
Ethical Awareness				0.781	
Policy Awareness				0.752	
Data Privacy Concern				0.719	
Transparency Concern				0.694	
Frequency of AI Usage					0.812
Intention to Continue AI Use					0.788

The KMO value of 0.912 indicates excellent sampling adequacy, and Bartlett's Test of Sphericity ($\chi^2 = 3245.67$, $p < 0.001$) confirms that the data are suitable for factor analysis. The PCA extracted five significant factors explaining 77.36% of the total variance, demonstrating strong construct validity. Factor 1 (Psychological Readiness) accounts for 34.21% variance and includes high loadings for attitude (0.842), self-efficacy (0.816), and innovation orientation (0.793),

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indicating that personal mindset strongly influences AI adoption. Factor 2 (Institutional Support System) explains 15.57% variance, highlighting the importance of infrastructure and training. Factor 3 (Perceived Utility) captures usefulness and ease of use, consistent with the Technology Acceptance Model. Factor 4 (Ethical & Policy Awareness) reflects concerns about data privacy and AI governance. Factor 5 (Behavioural Adoption Intention) represents actual usage behaviour and continuation intention. The absence of significant cross-loadings confirms discriminant validity. Overall, the factor structure validates the multidimensional nature of AI awareness and adoption among faculty members in Arts and Science colleges in Pollachi Taluk.

Table 8 : One-Way ANOVA Analysis

S.No	Variable	F-Value	Sig. (p)	Result
1	Overall Awareness	9.84	0.000	Significant
2	Attitude towards AI	12.67	0.000	Significant
3	AI Self-Efficacy	10.92	0.000	Significant
4	Institutional Support	6.45	0.001	Significant
5	Administrative Support	4.88	0.003	Significant
6	AI Training Exposure	11.36	0.000	Significant
7	Digital Infrastructure	3.94	0.009	Significant
8	Innovation Orientation	8.72	0.000	Significant
9	Perceived Usefulness	5.61	0.001	Significant
10	Ease of Use	4.23	0.006	Significant
11	Ethical Awareness	2.14	0.095	Not Significant
12	Policy Awareness	1.89	0.132	Not Significant
13	Peer Influence	3.21	0.024	Significant
14	Research Orientation	2.76	0.043	Significant
15	Frequency of AI Usage	13.54	0.000	Significant

The one-way ANOVA was conducted to determine whether significant differences exist among faculty age groups regarding AI adoption-related variables. The results indicate statistically significant differences for 13 out of 15 variables at the 5% significance level. Frequency of AI usage ($F = 13.54$, $p < 0.001$) and attitude towards AI ($F = 12.67$, $p < 0.001$) showed the highest variation across age groups, suggesting younger faculty members demonstrate stronger adoption behaviour. AI training exposure ($F = 11.36$) and self-efficacy ($F = 10.92$) also exhibited significant differences, indicating generational disparities in technological confidence and skill acquisition. Overall awareness ($F = 9.84$) and innovation orientation ($F = 8.72$) further confirm that younger and mid-career faculty are more proactive in embracing AI tools. However, ethical awareness ($p = 0.095$) and policy awareness ($p = 0.132$) were not statistically significant, implying uniform concern regarding governance issues across age categories. The findings highlight that demographic characteristics, particularly age, influence technological adoption patterns. Institutions should therefore design age-sensitive training and mentoring programs to bridge generational gaps and promote inclusive AI integration within Arts and Science colleges in Pollachi Taluk.

Table 9: Structural Equation Modeling (SEM) Analysis

Fit Index	Obtained Value	Recommended Value	Model Fit
Chi-square (χ^2)	412.36	—	—
Degrees of Freedom (df)	224	—	—
χ^2/df Ratio	1.84	< 3.00	Good Fit
GFI (Goodness of Fit Index)	0.912	> 0.90	Good Fit

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AGFI	0.887	> 0.80	Acceptable
CFI (Comparative Fit Index)	0.948	> 0.90	Excellent
TLI	0.939	> 0.90	Good Fit
NFI	0.921	> 0.90	Good Fit
RMSEA	0.053	< 0.08	Good Fit
SRMR	0.041	< 0.08	Good Fit

Table 10: Structural Model Path Coefficients

Dependent Variable: AI Adoption

Hypothesis	Path	Standardized β	CR (t-value)	p-value	Result
H1	Psychological Readiness → Adoption	0.41	6.87	0.000	Supported
H2	Institutional Support → Adoption	0.29	4.98	0.000	Supported
H3	Perceived Utility → Adoption	0.22	3.94	0.000	Supported
H4	Ethical & Policy Awareness → Adoption	0.08	1.56	0.118	Not Supported
H5	Behavioural Intention → Adoption	0.37	6.11	0.000	Supported

Indirect Effects :

1. Psychological Readiness → Behavioural Intention → Adoption,
   Indirect Effect = 0.15 ($p < 0.01$)
2. Institutional Support → Psychological Readiness → Adoption
   Indirect Effect = 0.12 ($p < 0.01$)

The SEM results indicate that the proposed model demonstrates strong goodness-of-fit indices ($\chi^2/df = 1.84$; CFI = 0.948; RMSEA = 0.053), confirming that the conceptual framework adequately represents the observed data. Among the structural paths, Psychological Readiness ($\beta = 0.41$, $p < 0.001$) emerged as the strongest predictor of AI adoption, indicating that faculty attitude, self-efficacy, and innovation orientation significantly influence adoption behaviour. Behavioural Intention ($\beta = 0.37$) and Institutional Support ($\beta = 0.29$) also showed substantial positive effects, highlighting the importance of organizational encouragement and motivational intention. Perceived Utility ($\beta = 0.22$) moderately influences adoption, supporting the Technology Acceptance Model assumptions. However, Ethical and Policy Awareness ($\beta = 0.08$, $p = 0.118$) was not statistically significant, suggesting that governance concerns do not directly determine adoption decisions. Significant indirect effects further reveal that institutional support enhances psychological readiness, which in turn promotes AI adoption. Overall, the SEM findings confirm that psychological and institutional factors play a dominant role in AI tool adoption among Arts and Science college faculty in Pollachi Taluk.

VI. DISCUSSION

The present study examined the level of awareness and adoption of Artificial Intelligence (AI) tools among Arts and Science college faculty in Pollachi Taluk using a comprehensive analytical framework. The findings consistently demonstrate that psychological readiness, institutional support, and perceived utility significantly influence AI adoption. Correlation and regression analyses revealed that attitude towards AI, innovation orientation, and self-efficacy are the strongest predictors of adoption behaviour. Stepwise regression further confirmed that attitude alone explained a substantial proportion of variance, indicating that mindset plays a foundational role in technology integration. The SEM results reinforced these findings, showing that psychological readiness ($\beta = 0.41$) and behavioural intention ($\beta = 0.37$) are the most influential determinants of AI adoption. Institutional support also had a significant direct and indirect effect, highlighting the importance of administrative encouragement and infrastructure development. Interestingly, ethical and policy awareness did not significantly predict adoption in the structural model, suggesting that faculty members prioritize functional benefits over regulatory concerns. ANOVA results revealed generational differences, with younger faculty

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demonstrating higher awareness and usage levels. Chi-square analysis also showed significant associations between training exposure, digital infrastructure, and awareness levels. Factor analysis validated five underlying dimensions—psychological readiness, institutional support, perceived utility, ethical awareness, and behavioural intention—explaining over 77% of total variance. Overall, the study confirms that both individual cognitive factors and organizational climate collectively determine AI adoption in higher education institutions located in semi-urban contexts.

VII. RECOMMENDATIONS

- Based on the findings, the following recommendations are proposed:
- Institutions should organize continuous professional development programs focusing on AI tools for teaching, research, and administration. Special emphasis should be given to improving faculty self-efficacy and practical exposure.
- Colleges should invest in robust digital infrastructure, licensed AI software, and technical support units. Administrative encouragement and incentives for innovative teaching practices will enhance adoption levels.
- Since attitude emerged as the strongest predictor, awareness campaigns, workshops, and peer mentoring programs should be conducted to reduce resistance and promote positive perception toward AI.
- Younger faculty with higher AI familiarity can mentor senior faculty members to bridge the digital gap and promote collaborative learning environments.
- Although ethical awareness was not a direct predictor, institutions should develop clear guidelines regarding data privacy, academic integrity, and responsible AI usage to ensure sustainable adoption.
- AI adoption should be aligned with institutional research strategies, encouraging faculty to use AI tools for data analysis, publication writing, and project development.

VIII. CONCLUSION

The present study investigated the level of awareness and adoption of Artificial Intelligence (AI) tools among Arts and Science college faculty in Pollachi Taluk using a comprehensive analytical approach. The findings reveal that AI adoption is significantly influenced by psychological readiness, institutional support, innovation orientation, and behavioural intention. Among these, attitude towards AI and self-efficacy emerged as the strongest determinants, indicating that faculty mindset and confidence play a crucial role in embracing technological transformation. Institutional factors such as administrative encouragement, digital infrastructure, and structured training programs also significantly contribute to adoption behaviour.

The statistical analyses—including correlation, regression, stepwise regression, factor analysis, ANOVA, and SEM—collectively confirm that both individual and organizational dimensions shape AI integration in higher education. While ethical and policy awareness were acknowledged, they did not directly predict adoption behaviour, suggesting that functional and performance-related benefits remain the primary motivators. Generational differences were observed, emphasizing the need for inclusive and targeted capacity-building initiatives.

Overall, the study highlights that successful AI implementation in semi-urban higher education institutions requires a balanced strategy focusing on psychological empowerment, institutional readiness, and continuous professional development. Strengthening these dimensions will enhance sustainable AI integration and academic innovation in Arts and Science colleges in Pollachi Taluk.

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