



Leadership Challenges in the Age of AI: The Role of Ethical Governance within Higher Education Institutions of Karachi

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Abstract

AI is reviewed for the utilization in the higher education where literature is available for the critical evaluation of the concept. The decision-making can be privileged with ethical leadership to understand the use of AI as a catalyst in development of country. The study aims to review the leadership challenges in the age of AI with expert insights on ethical governance within higher education institutions of Karachi in Pakistan. The study adopts primary quantitative method when the data is evaluated with the help of Smart PLS and supported a set of 150 samples. Results are derived based on Smart PLS SEM that is helpful to support the analysis and justify the hypotheses. This is ideal in revealing the results using deductive approach and positivism philosophy. The results are justified, three hypotheses are approved, and one is partially approved. Major leadership challenges are data privacy, ethical issues, and cyber concerns. AI adoption is offering a significant impact on the leadership challenge handling and when the leadership challenges are acting as a moderating agent then surely it is leading to the better performance of organization like higher education. The leadership roles can be aligned with the trainings provided to the leaders to apply AI in their routine activities and manage professional roles. Trainings and support of learning environment can be helpful to align leadership roles and meet challenges.

Keywords: Leadership Challenges, AI, Expert Insights, Ethical Governance, Higher Education Institutions, Karachi

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1. INTRODUCTION

1.1 Background

Artificial intelligence (AI) use is increased in multiple fields with time and is forecasted to be dominated in future with high utilisation to manage organisations including higher education (Begum, 2024; Crawford et al., 2023). The businesses can improve with the help of AI this is why its assistance has been founded diagnostic and facilitative in developing good experiences to handle leadership challenges. The role of AI is increased in Pakistan in multiple areas where technology with AI is supposed to be encouraged under the foundations of digital Pakistan plan (Shah et al., 2025; Rind, 2022). Better opportunities are available for using AI in the country where it is agreed that AI ethical support can be increased with time where decision-making can be privileged with ethical leadership to understand the use of AI as a catalyst in development of country. Digital literacy is an important foundation in the country where AI technology is supposed to be torture as an important subjective so the future leaders will be able to manage global challenges using ethical expertise under the privilege of AI gain of knowledge (Cox, 2021).

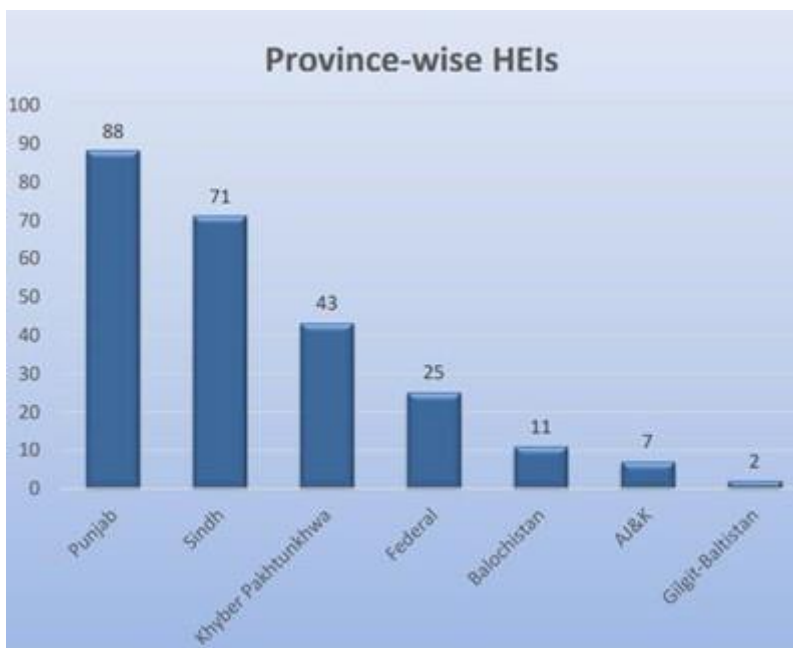


Figure 1: Province-Wise Higher Education Institutes (HEC Report, 2023)

Figure 1 mentions the analysis of the province wise universities in the country, HEC Report (2023) reported that there are about 30 higher education institutes in public sector and 41 in private sector in Sindh only. In another analysis for the country, Rind (2022) adds that both public and private sector in the country operates with the support of better leadership, however, Shah et al. (2025) refers that higher education plays an important role in the country because it is helpful in providing

graduates to the country every year but leadership needs to be polished further. It is important to understand the role of leadership in managing the higher education departments in the country this is why current study has utilized an analysis to outline the leadership challenges in the age of AI in Karachi higher education institutes. The study is focused on understanding the role of leadership and major challenges linked to the leadership applications in higher education specifically in Karachi that needs to be evaluated in the context of AI. An investigation to analyse the ethical governance from the lens of AI to understand the leadership challenges is helpful to reveal the idea that how better opportunities can be aligned with the working efficiency of AI in managing leadership roles.

In an analysis, Cox (2021) analyze the concept of a higher education with a clear understanding offer gaining insights for AI applications where it has been claimed that AI tools are playing a professional role in managing leadership challenges in the country. However, Crawford et al. (2023) recommended that it is essential to understand the practical utilization of ethical governance in managing leadership challenges because of AI needs to be handled by overcoming the cybercrime and privacy issues. The study is significant for investigating leadership challenges and understanding the key role of AI in managing the ethical governance. This emphasis on exploring the idea that how AI lens is important in dealing the ethical context and managing unique challenges by innovation and transformation. The study also explores the upgraded and transformative role of AI in providing a clear understanding of leadership utilization in higher education departments in the country.

1.2 Research Aim and Objectives

The study aims to review the leadership challenges in the age of AI with expert insights on ethical governance within higher education institutions of Karachi in Pakistan.

The main objectives are:

1. To analyse the leadership challenges in the age of AI within higher education institutions of Karachi in Pakistan
2. To review the expert insights in analyzing ethical governance in age of AI within higher education institutions of Karachi in Pakistan
3. To recommend better suggestions for managing leadership challenges for AI in ethical governance within higher education institutions of Karachi in Pakistan

1.3 Research Questions

1. What are leadership challenges in the age of AI within higher education institutions of Karachi in Pakistan?
2. What are the expert insights in analyzing ethical governance in age of AI within higher education institutions of Karachi in Pakistan?
3. How to manage leadership challenges for AI in ethical governance within higher education institutions of Karachi in Pakistan?

2. LITERATURE REVIEW

AI is reviewed for the utilisation in the higher education where literature is available for the critical evaluation of the concept. Mumtaz et al. (2025) analysed the AI based tools (AIT) to understand that how the higher education decision making can be reshaped based on the purposeful use of the AI. The specific support is possible in handling the decision making and managing stakeholders in the higher education (Truby, 2020). Another analysis from Shah et al. (2025) refers the use of digital Pakistan for ensuring AI applications where ethical leadership is supportive with the AI, the study supports the idea that transparency cannot be compromised, however, AI can be helpful if used responsibly. The incorporation of the AI in the context of leadership provides a true picture of managing the work plans and giving privilege to the processes of ethics in education if regulations are applied. Critical analysis claims the idea that how the AI can be the supportive paradigm for the leadership in shifting from traditional to modern modes but ethics should not be compromised. AI transformation is playing an important role because leadership is privileged under the context of innovation based on AI frameworks however there is essential need to understand that challenges still exist as evaluated by some authors (Mumtaz et al., 2025; Da Mota, 2024). The challenges like ethical governance framework lack is an important one that needs to be addressed with the guidelines and policy whereas the regulatory structures can be supported with the justifications of handling a governance under the paradigm of global concerns and policies application.

2.1 Ethical Issues

There is essential role of ethical issues that cannot be ignored because open AI is always dangerous and misuse can lead to the academic dishonesty and unfair decision making in the organisations that seem critical and challenging (Schiff, 2022). In link to Schiff (2022), another review of Ahmed et al. (2025) reviews it same way and recommends that a clear understanding of AI with the governance support where the practical use of accountability as well as transparency cannot be ignored, it encourages the use of AI with the legislative framework to empower the ethical governance in higher education. This refers the idea that how data privacy and surveillance play an important and professional role because data breaches and gap of surveillance is the driving agent for the failure of AI correct applications. This agrees from Ahmed et al. (2025) with the idea from Shah et al. (2025) that how the policy framework can facilitate the higher education leadership management by exploring the use of AI technology in higher education. There is important need to makes sure about the ethical grounds as if they will be compromised then surely the troubles will be higher and leadership would not be able to carry the quality with ethical tools. In another article, another opinion is added by Huma et al. (2025) where authors reviewed some universities including Karachi private and government higher education departments, it has been found that about 64% of the feedback mention concerns about AI use due to job security whereas 72% have been facing data privacy challenges.

There is also an important need to understand that how algorithmic biases are essential to address because inequality in the application of socio-economic parameters and understanding the regional biases needs to be handled because these leadership challenges are the driving agent for the failure of long run successful parameters of AI in higher education institutions (Fatile, 2025). In addition, another review from Da Mota (2024) and Ahmend et al. (2025) provides a clear understanding of AI applications is provided with the justifications where leadership challenges of transparency and accountability are important whereas academic activity classes are also persistence that needs to be handled with the automated assignments. The practical role of AI ascension as reviewed by some authors is elaborating the idea that leadership skill gap can be addressed with the AI literacy as if Shah et al. (2025) names the use of digital leadership skills and ethical training with the support of AI information and elaborated knowledge however training security needs to be responsible for AI literate leadership building application with ethical foundations on priority.

2.2 AI Adoption

It is important to understand that AI helps in managing the university leader's role but understanding the correct rules utilization and its implication is important because if exact tools are not applied then surely the issues will be there and the concerns will be higher. The approachable role of AI adoption is good because it supports the perspective of decision making and improving the teaching quality as agreed by some authors like Shah et al. (2025) and Mumtaz et al. (2025). In link to Schiff (2022), another review, another claim from Shah et al. (2025) added that they have been supporting the idea that AI adoption is a privilege for institutional performance and managing ethical challenges however leadership can be tackled under the foundations of using expertise in the context ethical support should be a priority and not a content that is ignored. The approachable role of AI adoption is helpful but it is applicable to governance because AI plays a practical and professional role in managing the efficiency and personalization. Further, it is agreed by some authors like Huma et al. (2025) that it offers automation and data-driven leadership which should be dealt with the utilization of relevant experience based on the foundation of ethical governance.

2.3 Leadership Challenges

Various authors have reviewed the opinion of AI use and AI literacy as an essential foundation in utilizing the leadership context and managing the leadership challenges (Shah et al., 2025; Cox, 2021). In contrast to this, Mumtaz et al. (2025) analysed the AI based tools and Shah et al. (2025) refers the use of digital Pakistan for ensuring AI applications. Some other studies like Ahmed et al. (2025) recommends a clear understanding of AI with the governance and Huma et al. (2025) reviewed some universities including Karachi private and government higher education departments. The studies are collaborative effort in provision of a critical evaluation to understand the role of AI in revealing the current status of a success parameters in higher education institutes in the country.

The ethical governance is an important consideration that has been minorly discussed by some of the authors like Shah et al. (2025) and Mumtaz et al. (2025), however there is an important need to review it critically and understand that how the moderating role of ethical governance is applicable in revealing the leadership challenges and managing it to have an impact on the overall performance of higher education institutes in the country especially in Karachi. The study is focused on meeting this literature there by critical analysis and providing an ample piece of authentic study based on the primary quantitative data and statistical operations supported by smart PLS software.

2.4 Theoretical Framework

Multiple theories are available to understand the integration of AI in learning practices and leadership foundations however Technology Acceptance Model (TAM) and a Unified Theory of Acceptance and Use of Technology (UTAUT) are found to be essential in this regard (Benjamin & Dangwal, 2020). TAM supports first hypothesis for AI adoption has a significant impact on leadership challenges. The practical role of technology acceptance theory is applicable where it has been found that AI is the modern technological foundation where ethical values can be applied and purposeful successful use of implementing AI can be a driving agent for parameters in self efficacy and professional utilization to handle the leadership challenges in higher education (Schiff, 2022). UTAUT justifies second hypothesis for AI adoption has a significant impact on leadership challenges by moderating role of ethical governance. There is important need to understand that how social technical factors work with unified theory of acceptance and use of technology is applicable not only in understanding the opportunities but also revealing the utilization of relevant further foundations that can be helpful in dealing the innovative support and leadership challenges. The emphasis of the two theories is important because they are found helpful in handling the ethical governance as a mediating context while handling the utilization offer leadership role in a performance of higher institutes in the country. Further, technology, organization and environment (TOE) framework supports technology, organization and environment to align the setup and make sure that functional production is possible based on choosing the exact theories for the study as it is emphasizing in alignment with the context of growth. TOE emphasis on third and fourth hypothesis for AI adoption has a significant impact on institute performance with the mediating role of leadership challenges and Ethical governance has a significant impact on leadership challenges in the age of AI.

2.5 Hypotheses Development

Huma et al. (2025) reviewed some universities including Karachi private and government higher education departments, it has been found that about 64% of the feedback mention concerns about AI use due to job security whereas 72% have been facing data privacy challenges. This shows the connection of the AI in the context of leadership challenges. Clear justifications are added in this regard to understand use of leadership challenges management under the privilege of adoption, which cannot be ignored in the modern era.

This is refining this hypothesis further and managing to understand that things can be further categorized and aligned based on the data privacy support and connection of AI with the leadership challenges management in the long run.

H1: AI adoption has a significant impact on leadership challenges.

Shah et al. (2025) names the use of digital leadership skills and ethical training with the support of AI information and elaborated knowledge however training security needs to be responsible for AI literate leadership building application with ethical foundations on priority. This mention that the connection of the ethical perspective exists while handling the AI in the practical context for the leadership management. The hypothesis is evidence based and supports the opinion that leadership challenges can be aligned with the AI adoption however the role of ethical governance cannot be avoided because moderating support is required to overcome the issues like cybercrime.

H2: AI adoption has a significant impact on leadership challenges by moderating role of ethical governance.

Mumtaz et al. (2025) analysed the AI based tools (AIT) to understand that how the higher education decision making can be reshaped based on the purposeful use of the AI. The specific support is possible in handling the decision making and managing stakeholders in the higher education. This supports the use of AI for the growth of the higher education leadership management. The hypothesis supports the evidence for institutional performance growth that is the ultimate result and it is the important thing when leaders are hired as the important leaders so they will be able to lead the institution and make sure that success is there.

H3: AI adoption has a significant impact on institute performance with the mediating role of leadership challenges.

AI transformation is playing an important role because leadership is privileged under the context of innovation based on AI frameworks however there is essential need to understand that challenges still exist as evaluated by some authors (Mumtaz et al., 2025; Da Mota, 2024). This encourages the use of AI in the leadership management with the help of AI mitigation tools and ethical thoughts. The important role of AI immigration is essential in the long run where essential utilization of handling the challenges and meeting the variables is a foundation which supports the idea that good things can be functional where leadership challenges are met by handling ethical utilization even in the AI age.

H4: Ethical governance has a significant impact on leadership challenges in the age of AI.

The development of hypothesis supports the evidence that variables are important and have justifications from the previous data found and traced in literature so keeping in view the importance of these context it is fair to emphasize on these hypotheses and check through an authentic and reliable conceptual framework.

They are helpful in generating A conceptual framework because important variables are outlined and further assistance is provided based on the conceptual framework that is playing an important role in analyzing and emphasizing on the application of practical justifications and implications of current study under the privilege of analyzing content from various authors and matching it with the response given through survey.

2.6 Conceptual Framework

The conceptual framework utilizes the important variables basically dependent and independent ones with the collaboration of mediating variables to an extent. The independent variable is AI adoption and its important utilization in handling the leadership challenges that has an independent context and the impact is not dependent on any other constraint. The mediating variables include leadership challenges that can be aligned with the utilization of addition moderating effect of ethical governance. Dependent variable is institutional performance that can be either increased or decreased based on the context of impact of AI adoption on it with the support of mediating variables. Figure 2 provides the drag dramatic overview of a conceptual framework.

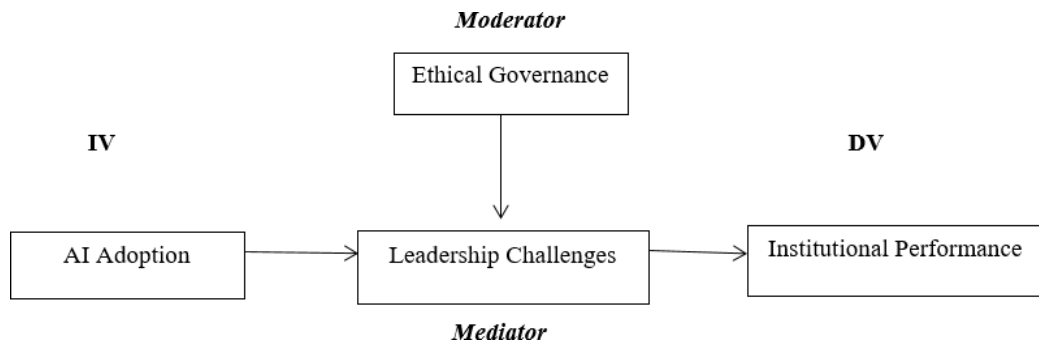


Figure 2: Conceptual Framework

3. METHODOLOGY

3.1 Research Design

Researcher adopts primary quantitative design where data is collected from the primary sources to understand the leadership challenges because this design is suitable because it helps the researcher to reveal the data directly from the respondents. The quantitative context is helpful in handling the data set with the help of closed ended responses where relevant answers are provided in alignment to justify the data set utilization. Primary research design enables the researcher to understand the role of available resources and utilize it with the help of a critical analysis by developing a comprehensive inquiry questionnaire using the literature context as a base (Subhaktiyasa, 2024). Positivism philosophy is chosen for it is

helpful in this regard to reveal the relevant content from the research analysis because it further encourages the researcher to understand the data center and explore into with the help of critical review using quantitative perspective.

Researcher further utilizes a deductive approach to handle the research design it encourages the researcher to understand the limitations of studies and make sure that is relevant information is avoided and specific content is taken from the available set by making sure that relevant data is available in critical evaluation (Mardiana, 2020). The researcher is in purposefully employing primary quantitative design because it is an incompatibility to utilize the conceptual framework and make sure that content is utilized with high justification when variable impact is chapter in understanding the hypotheses application.

3.2 Data Collection

Primary data collection method is preferred because it guides the researcher to take the data from the respondents and make sure that it is suitable to frame the primary quantitative design selected for the study. Ethical and constant approval is done in the initial level of research data collection process because human instrument is involved in the data collections. Various research instruments like literature review, interviews and survey are available; however, researcher adopts questionnaire instrument for surveying the population with the help of generating an online questionnaire with closed and dated answers to be selected (Mardiana, 2020). This is time and cost saving whereas relevant support is taken to ensure the utilization of data collection process and choosing the exact population. Primary data collection processor is completed with the help of generating a questionnaire with the help of Google survey online and is to be sent to the chosen population sample that is already aware of the purpose of studying so they will fill it and send it back to the researcher.

3.3 Population

Researcher is not able to review the whole population this is right a specific sector is chosen to analyse the data and make sure that relevant information is aligned. This is supportive where researchers choose the sample from the whole population and make sure that they are able to represent the population operating in leadership positions in Karachi higher education institutes in the country. The inclusion criteria was to make sure that the population is explored for the leadership position specific in higher education in Karachi, Pakistan.

3.4 Sampling

About 150 samples are reviewed for this purpose because it is an ideal set to collect the data and review it with the help of critical evaluation process. The

samples are also helpful in providing the exact information and stratified sampling is helpful to the researcher to review the whole population and make sure that chosen samples are quite relevant for the present study. Response rate was 95% and was supporting the data output.

3.5 Data Analysis

Data collection step proceeds with the data analysis where researcher is able to provide the results and make sure that analytical process is done with proper support of data. SmartPLS software is used for this purpose so the researchers will be able to analyse the numerical foundation and make sure that is relevant content is reviewed based on the data collected from the chosen samples (Subhaktiyasa, 2024). Relevant tests like HTMT, cronbach alpha, P values and R values are taken out to understand the impact of hypotheses whereas a diagrammatic view of hypotheses is used for reviewing the significance (Cheah et al., 2024). The discussion sums up with providing the answer research questions and justifying the season hypotheses set.

4. RESULTS AND DISCUSSION

Demographic and statistical results are provided here with the help of smart PLS software and are further discussed to support the study hypothesis.

4.1 Demographic Results

The demographic results are provided in table 1, where details are added in percentage form. They are further elaborated with the graphical presentation.

Table 1: Demographics

Demographic Variables	Details	Percentage
Gender	Male	55%
	Female	45%
Age	Below 20	0%
	20-30	10%
	31-40	21 %
	41-50	59 %
	Above 50	10%
	Bachelor degree	16%
Education	Master degree	45%
	MPhil PhD	39%
	Below 5 years	36%
Job Experience	5-10 years	35%
	Above 10 years	29%

Gender data in figure 3 shows that about 45% of the respondents were female however 55% were male.

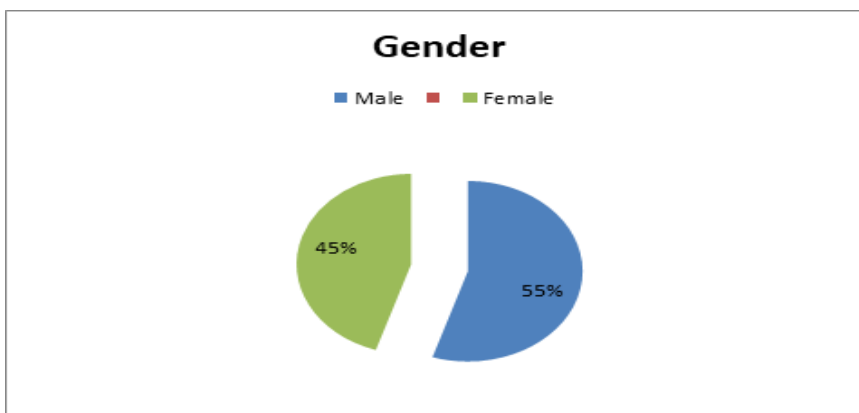


Figure 3: Gender of respondents

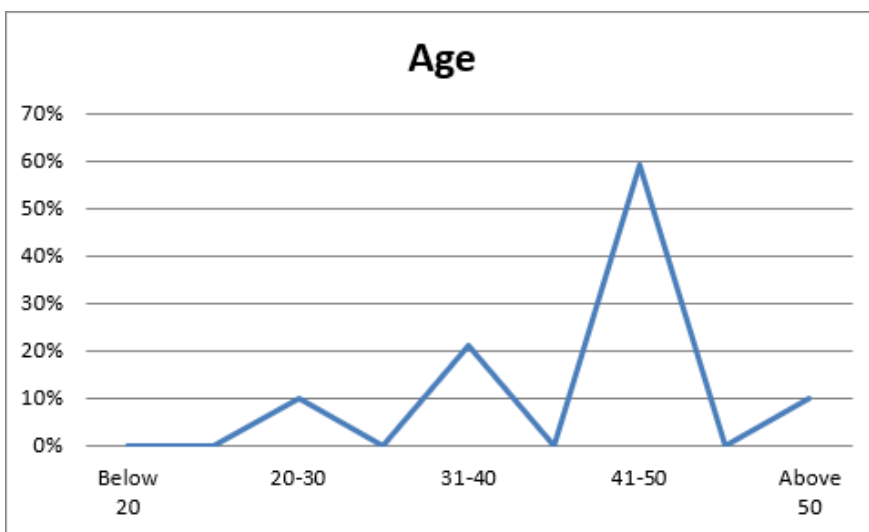


Figure 4: Age of respondents

The figure 4 mentioned that maximum respondents were belonging to the age group from 41 to 50, whereas 31 to 40 are also recorded preceded by this level.

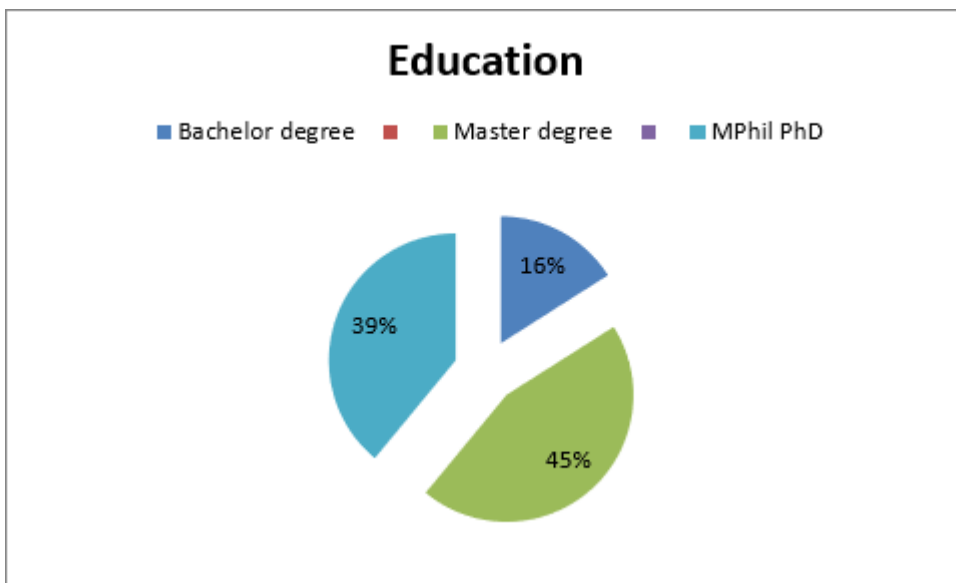


Figure 5: Education level

The data for education mentioned in figure 5 showed that maximum percentage records master degree which is followed by MPhil PhD and bachelor degree holders were least in our respondents.

Further the experience showed in figure 6 indicate that the maximum percentage of respondents were having experience below 5 years whereas experience of 5 till 10 year respondents are 35%, the minimum group is comprised of 10 year and above experience.

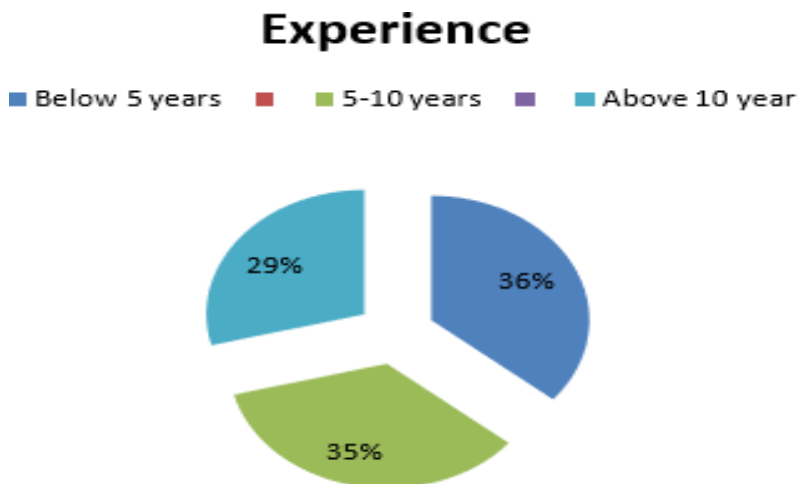


Figure 6: Experience of respondents

4.2 Further Statistical Analysis

Table 2: Reliability and Convergent Validity

Construct	Item	Factor Loading	Cronbach's Alpha	Composite Reliability (CR)	AVE
EG	EG1	0.717	0.782	0.854	0.582
	EG2	0.671			
	EG3	0.735			
	EG4	0.795			
	EG5	0.750			
AIA	AIA1	0.720	0.761	0.843	0.572
	AIA2	0.878			
	AIA3	0.550			
	AIA4	0.702			
	AIA5	0.726			
LC	LC1	0.734	0.770	0.846	0.582
	LC2	0.669			
	LC3	0.712			
	LC4	0.750			
	LC5	0.754			
IP	IP1	0.762	0.815	0.871	0.619
	IP2	0.694			
	IP3	0.759			
	IP4	0.768			
	IP5	0.808			

Notes: AI Adoption (AIA), Leadership Challenges (LC), Ethical Governance (EG), Institute Performance (IP)

The results of table 2 indicate acceptable to good internal consistency for all four constructs. Cronbach's alpha values range from 0.761 to 0.815, exceeding the commonly accepted threshold of 0.70. Composite reliability values range from 0.843 to 0.871, also comfortably above 0.70. The AVE values range from 0.572 to 0.619, exceeding the recommended 0.50 threshold, indicating adequate convergent validity. Most factor loadings are above 0.70. AIA3 (0.550) is comparatively low, but the construct still demonstrates acceptable overall reliability and convergent validity based on its CR and AVE.

Table 3: Fornell–Larcker Criterion

Construct	EG	AIA	LC	IP
EG	0.735	0.701	0.722	0.734
AIA	0.701	0.723	0.702	0.742
LC	0.724	0.712	0.724	0.717
IP	0.774	0.722	0.707	0.759

In table 3, as per Fornell–Larcker criterion, the square root of AVE for each construct is greater than its correlations with the other constructs.

Table 4: HTMT Criterion

Construct	EG	AIA	LC	IP
EG	—	0.70	0.68	0.67
AIA	0.84	—	0.59	0.69
LC	0.68	0.55	—	0.80
IP	0.77	0.67	0.81	—

The HTMT results in table 4 indicate that all values are below the required threshold of 0.85.

Table 5: Direct Path Analysis

Hypothesized Path	β	SE	t-value	p-value	Decision
AIA $\rightarrow$ LC	0.371	0.049	7.611	0.001	Supported
LC $\rightarrow$ IP	0.701	0.048	14.524	0.000	Supported
AIA $\rightarrow$ IP	0.782	0.044	17.864	0.02	Supported

The results of table 5 show that AI Adoption has a significant positive effect on Leadership Challenges ($\beta = 0.371$, $p = 0.001$). Leadership Challenges, in turn, has a strong positive relationship with Institutional Performance ($\beta = 0.701$, $p = 0.001$).

Table 6: Mediation Analysis: Leadership Challenges

Effect	β	SE	t-value	p-value
AIA $\rightarrow$ LC	0.371	0.049	7.611	<0.001
LC $\rightarrow$ IP	0.701	0.048	14.524	<0.001
AIA $\rightarrow$ IP (Total Effect)	0.782	0.044	17.864	<0.001
AIA $\rightarrow$ IP (Direct Effect, controlling LC)	0.241	0.048	4.999	<0.001
AIA $\rightarrow$ LC $\rightarrow$ IP (Indirect Effect)	0.541	—	—	<0.001

Table 6 results show that the indirect effect is approximately $\beta = 0.541$. The bootstrap/mediation analysis confirms that the indirect pathway is statistically significant. Because the direct effect of AIA on IP remains significant after LC is introduced ($\beta = 0.241$, $p = 0.001$), Leadership Challenges partially mediates the relationship between AI Adoption and Institutional Performance.

Table 7: Moderation Analysis: Ethical Governance

Predictor of LC	β	SE	t-value	p-value	Decision
AIA	0.371	0.049	7.611	<0.001	Significant
EG	0.559	0.049	11.502	<0.001	Significant
AIA $\times$ EG	-0.081	0.034	-2.404	0.017	Moderation Supported
R ²	0.759				
Adjusted R ²	0.756				

Table 7 results show that the interaction term between AI Adoption and Ethical Governance is significant ($\beta = -0.081$, $p = 0.017$). Therefore, Ethical Governance significantly moderates the relationship between AI Adoption and Leadership Challenges. The interaction coefficient is negative, higher Ethical Governance weakens the positive AIA $\rightarrow$ LC relationship.

4.3 Discussion

It is important to understand the role of leadership in managing the higher education departments in the country this is why current study has a utilized an analysis to outline the leadership challenges in the age of AI in Karachi higher education institutes. The study is focused on understanding the role of leadership and major challenges linked to the leadership applications in higher education specifically in Karachi that needs to be evaluated in the context of AI. The discussion is based on the data elaborated in the results. This is helpful to answer the research questions and outline the critical evaluation on hypotheses with the help of Figure 7 that shows the results of the statistical output.

H1: AI adoption has a significant impact on leadership challenges

A significant and positive impact is recorded for AI adoption on leadership challenges. AI adoption is a helping hand as agreed by various authors and it is already justified that it is playing an important and practical role in the modern age where AI provides time saving and efficient solutions to the project managers. Cox (2021) analyze the concept of a higher education with a clear understanding offer gaining insights for AI applications where it has been claimed that AI tools are playing a professional role in managing leadership challenges in the country. It supports the idea in higher education leadership roles that can be better dealt in this manner and regard is supported by AI adoption where this hypothesis is approved because AI adoption is playing a practical and professional role in managing the leadership challenges.

Evidence is provided to understand this hypothesis and justify that how AI adoption is playing an important role in understanding the leadership challenges and introducing complexity and critical evaluation in decision making to meet the leadership concerns. The application of AI is privileged in leadership roles because it is not only reshaping the leadership perspective but also helping to manage the decision-making system based on the technological change and resistance under the utilization of leadership styles as per demand of the modern

era. Huma et al. (2025) results and the results of the present study are in coordination where justifications are added to understand the performance rise in the end based on the foundations of leadership challenges meeting and improving the leadership effectively with the innovation and organizational efficiency available in the context of higher education.

H2: AI adoption has a significant impact on leadership challenges by moderating role of ethical governance

The second hypothesis elaborate the utilization of the leadership challenges with AI adoption in support of ethical governance which is reviewed in the current study and is helpful in revealing this influence connection. The ethical governance is applicable to high extent where a collaborative context of interpretation is again recorded for the leadership challenges based on the utilization of AI adoption and emphasizing on its better role while handling the leadership challenges. Shah et al. (2025) refers the use of digital Pakistan for ensuring AI applications where ethical leadership is supportive with the AI, the study supports the idea that transparency cannot be compromised; however, AI can be helpful if used responsibly. This hypothesis is also approved based on literature and results, it is agreed that if ethical governance rule exists then AI limitations will be provided and practical utilization of AI will be possible which is helpful not for breaching the policy and principal parameters in this perspective.

The hypothesis is justified to high extent because ethical governance cannot be avoided and it is playing a practical and professional role not only for building trust in AI applications but also making sure that student data is not misused. Authoritative role of leader cannot be avoided in this context however ensuring transparency is an important regard and it cannot be avoided when AI is applied however it is possible to merge it with AI foundation in leadership role where ethical governance is a helping hand in this context. Shah et al. (2025) also support current study output idea and justify the opinion that ethical frames are playing are important role not only in handling the challenges of higher education systems in Pakistan but also making sure that they are able to align the leadership roles in perfect blending with sector parameters of dealing with the challenges in loops.

H3: AI adoption has a significant impact on institute performance with the mediating role of leadership challenges

The third hypothesis claim the role of AI adoption in the institutional performance with the mediating perspective of leadership challenges which is highly approved with the justification that handling the indicial context of leadership challenges is the first step. Prefer the leadership challenges are handled as discussed in the first hypothesis then surely AI adoption is offering a significant impact on the leadership challenge handling and when the leadership challenges are acting as a moderating agent then surely it is leading to the better performance of organization like higher education. Da Mota (2024) provides a clear understanding of AI applications is provided with the justifications where leadership challenges of transparency and accountability are important whereas academic activity classes are also persistence

that needs to be handled with the automated assignments. Here, it is leading to the better performance of organization like higher education the role is further categorized when it is showing a value of .83 and it is proving a significant influence under the context of mediating role of leadership challenge management.

This hypothesis is also supporting the opinion for AI adoption in managing the institute performance that is automatically increasing and the end product because it is agreed that development of AI governance policies is playing a practical role because it allows to train leaders in AI literacy and understand their importance to promote vertical applications of leadership roles in success. Huma et al. (2025) recommendations are aligning with the examples of the current study where investment in the digital setup and ethical AI culture promotion are playing main foundations and developing a baseline while handling the context of artificial intelligence in a leadership challenges management adoption in higher education in the country. Supporting this idea and managing it with the utilization of theoretical foundation is helpful where TOE framework supports technology, organization and environment to align the setup and make sure that functional production is possible based on choosing the exact theories emphasizing it in alignment with the context of growth.

H4: Ethical governance has a significant impact on leadership challenges in the age of AI

The last hypothesis focuses on the emphasis of ethical governance in connection to the leadership role in the age of AI. It is justified to an extent but it is partially approved because the limited value of leadership challenge mentioned that ethical governance gives limitation to manage the leadership challenge because not all kinds of AI is allowed to manage leadership efficiencies. Shah et al. (2025) names the use of digital leadership skills and ethical training with the support of AI information and elaborated knowledge however training security needs to be responsible for AI literate leadership building application with ethical foundations on priority. This is in support as the idea that the hypothesis is justified to an extent but still there is need to understand that how things can be further categorized and aligned in the paradigm of managing leadership challenges and dealing with the ethical support at the same time to see better output offer performance parameters. There is important need to understand that how social technical factors work with unified theory of acceptance and use of technology is applicable not only in understanding the opportunities but also revealing the utilization of relevant further foundations that can be helpful in dealing the innovative support and leadership challenges (Schiff, 2022). The theory is justifying its importance where technology acceptance model under the privilege of Tam is proved however ethical governance utilization is important and it cannot be avoided as a fruitful resource to deal with the challenges and manage activity based foundations. The premium growth of organization is possible based on the transformational leadership style which is highly recommended by some of the authors including Shah et al. (2025) and Mumtaz et al. (2025) because it is allowing the success parameters of institutional deals that are also helpful in handling the leadership.

A finalized view of hypothesis is justified that how things can be aligned and a clear understanding can be purposefully added while dealing with the challenges of AI applications and understanding its utilization in dealing the context of understanding in a higher education. It is important to understand that AI helps in managing the university leader's role but understanding the correct rules utilization and its implication is important because if exact tools are not applied then surely the issues will be there and the concerns will be higher. The approachable role of AI adoption is good because it supports the perspective of decision making and improving the teaching quality.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study aimed to outline the context of AI utilization in higher education institutes especially in Karachi in Pakistan to understand that how it has a productive and professional role in managing leadership challenges and understanding the idea for dealing with the expertise in aligning the leadership role under the context of AI. The research has conducted comprehensive review and it has been found that all three questions are answered at the end of the study. The first question inquired about the challenges of leadership in the age of AI within higher education institutions where it has been found that ethical governance follows up and ethics policy implementation are major challenges further investigation supports the evidence that cybercrime and additional use of AI can be a driving agent for the failure of leadership fulfillment. The second question has revealed the expert insights to understand the ethical governance in the age of AI where it is found that higher education institutes are talking about utilizing AI because it is need of the day. Further, it is also agreed that Karachi higher education institutes are focusing on utilization of AI in managing their leadership challenges and dealing with the expertise to handle students and make them eligible so they will be able to meet the global context in education and professional life. The last question is answered where managing leadership challenges with AI in the ethical governance has been reviewed. It is agreed that the last hypothesis is partially approved so it is a great for reviewing the idea of ethical governance that seems a hurdle to an extent in some cases and cannot be managed as an expert opinion while dealing with the challenges of a success parameters in implementation in practical fields. Implementation in practical fields the role of AI is fair but ethical policy is applied in all ways. The emphasis of the two theories is important because they are found helpful in handling the ethical governance as a mediating context while handling the utilization offer leadership role in a performance of higher institutes in the country.

5.2 Recommendations

Some recommendations are added based on study output:

- Leaders in higher education just need to streamline their challenges and make sure that they are able to handle it with the help of AI but important justifications and ethical conditions apply.
- Karachi institute of higher education are competitive and needs to manage their competitiveness in future when leadership roles can be aligned with the

trainings provided to the leaders to apply AI in their routine activities and manage professional roles.

- Although, AI is a good addition and can be helpful in the long run to the leaderships however it is essential to make sure that ethics is a priority and when they are taking the trainings for AI, they are already aware of ethical foundations in addition.
- Government policies and support for AI needs to be addressed because adopting AI is a modern thing and it should be emphasized with the ease and international training support both online and on the ground for the leaders so they will be able to manage their workplace meet leadership challenges.

5.3 Implications

The study has implications for policymakers and project managers for higher education leadership roles in Pakistan. Policymakers need to understand the importance of leadership roles and manage it with the utilization of better opportunities. The essential need of policy is helpful in this regard because policymakers need to understand the challenges of leaders and align them with trainings and other projects so they will be able to manage things. Project managers in higher education can be supportive with the results of the leadership challenges management based on the results of the current study because it is often good recommendations from content of respondents and statistical operations.

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