Impact of Generative AI on Academic Tasks: An Exploratory Study of Emerging Trends

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Bahria University Islamabad Campus

2025

THESIS APPROVAL SHEET

July 24, 2025

Topic of Research: **"Impact of Generative AI on Academic Tasks: An Exploratory Study of Emerging Trends"**

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This is to certify that all the contents of the thesis “Impact of Generative AI on Academic Tasks: An Exploratory Study of Emerging Trends” is the product of my own research except of cited work as mentioned in the references. The purpose of taking material from such sources is to elaborate, support and compare the topic with previous work. It is also certified that this work has never been submitted by me previously for any degree, nor shall it be submitted by me in future to obtain a degree. The wrong information, if proved at any stage, shall authorize the university to cancel my degree.

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DEDICATION

This work is dedicated to my beloved parents without whom nothing is, and nothing was. Their sacrifices, encouragement and faith in me has made this achievement possible.

ACKNOWLEDGEMENTS

First and foremost, I am deeply grateful to Almighty Allah for His infinite blessings, guidance, and mercy throughout the course of my academic journey. It is by His will that I was granted the strength, patience, and endurance to persevere through the challenges of this master's program and to complete this thesis. I would like to thank my supervisor, Dr. Sohima Anzak, whose continuous support, invaluable guidance, and encouragement have been central to the completion of this work. Her insightful feedback, intellectual rigor, and constructive criticism challenged me to think more critically and to refine my ideas with clarity and purpose. I am equally indebted to all my teachers in the department, who have played an integral role in shaping my academic foundation. Each course, discussion, and interaction with them contributed significantly to the development of my analytical, theoretical, and methodological understanding. Finally, I wish to express my heartfelt thanks to everyone who has supported and encouraged me along the way, which includes my friends, colleagues, and family members, whose words of kindness, patience, and understanding have been a steady source of strength and reassurance. To all of them, I am sincerely grateful.

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ABSTRACT

As we undergo the Fourth Industrial Revolution, the emergence and widespread adoption of artificial intelligence (AI) marks a pivotal moment in the transformation of human systems. Among its various forms, generative AI has rapidly gained prominence, introducing new ways of working, learning, and creating. While AI as a field has existed for decades, its exponential growth in recent years has outpaced policy, regulation, and pedagogy, leaving many areas under-explored. Understanding the challenges and opportunities presented by generative AI is crucial for institutions, systems, and processes that are either directly integrating these tools or being reshaped by their presence.

This qualitative study focused on higher education in Pakistan, a context where the adoption of generative AI is emerging but remains understudied. Using in-depth interviews, participant observation, and focus group discussions, this research explored how students and educators engage with generative AI tools, particularly ChatGPT, in their academic work. Actor-network theory (ANT) was used as the analytical framework to map the human and non-human actors involved in this evolving network.

Findings revealed three core insights. First, generative AI tools are being used by both students and teachers to assist with academic tasks, influencing not just efficiency but also the processes of knowledge production. Second, ethical concerns emerged due to the absence of clear institutional policies, leading to uncertainty and improvised strategies around acceptable use. Third, participants expressed an urgent need for formal guidelines, training, and digital infrastructure to ensure responsible and equitable use of AI in academic settings. Additionally, region-specific challenges such as digital literacy gaps and the digital divide were found to significantly affect accessibility and the depth of generative AI integration. This study contributes to the growing discourse on AI in education by offering a grounded, context-specific analysis of how generative AI is reshaping academic practices in Pakistan.

Keywords: generative AI, higher education Pakistan, actor-network theory, digital anthropology, digital literacy, digital divide, academic practices, qualitative research

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LIST OF ABBREVIATIONS

AI: Artificial Intelligence

ANT: Actor-Network Theory

FGD: Focus Group Discussion

Gen AI: Generative Artificial Intelligence

HEC: Higher Education Commission

STEM: Science, Technology, Engineering and Mathematics

CHAPTER 1
INTRODUCTION

Artificial Intelligence (AI) is defined by IBM as "technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy" (IBM, 2024). From enhancing healthcare using predictive diagnostics to revolutionizing transportation with autonomous vehicles, AI has become a pivotal driver of innovation in the 21st century (Klein & Patrick, 2024; Vempati, 2018). AI analyzes large amounts of data and uses it to recognize different patterns, over which is then trained to perform the tasks it is designed for. This results in AI systems being used in various applications, ranging from personal assistants like Siri and Alexa (Brodsky, 2024; Tuohy, 2024), to sophisticated algorithms powering financial systems and urban planning (Aldasoro et al., 2024). AI empowers markets to bypass conventional infrastructure entirely, enabling a rapid transition from traditional financial systems and redefining the concept of financial inclusion (Hendi, 2025). This transformation is facilitated by the widespread adoption of user-friendly mobile devices. Long before its emergence as a tool to be used in the modern world, the understanding of AI in popular culture came from the literature and films in which AI was presented as an anthropomorphized entity that is highly intelligent (Hermann, 2023). Presented both as a friend and foe, this fictional AI was depicted as a technology that would be a catalyst to the human race's progress while bringing a major change, both positive and negative, in their lifestyle.

AI's influence reaches into nearly every aspect of human life. In the workplace, AI systems are streamlining routine tasks and even taking on complex decision-making roles. This can augment human capabilities and remove drudgery. For example, AI assistants and software can handle data processing or customer queries, freeing people for more creative work (Downie & Hayes, 2024). Studies have shown tangible productivity boosts: one experiment found that using an AI tool like ChatGPT improved consultants' task productivity by about 25%, and programmers using AI assistance saw a 26% increase in coding efficiency (Bradford, 2024). Beyond efficiency, AI is also shaping organizational culture. Companies that successfully integrate AI have reported strengthened team collaboration, innovation, and learning, suggesting AI's impact

extends far beyond automation (Bradford, 2024). However, these positive outcomes coexist with serious challenges. AI-driven processes can disrupt traditional social interactions and norms. For instance, as more communication and services are mediated by AI, some worry about reduced human face-to-face interaction and "human closeness" in professional and community settings (Tai, 2020). In workplaces ranging from factories to offices, tasks that once required human labor like assembly, data entry, customer service are increasingly handled by robots or algorithms, which in turn is contributing to job displacement (Tai, 2020).

AI has been highly transformative in the field of education over the past years. Early applications of AI in education focused on intelligent tutoring systems, adaptive learning platforms, and data-driven analytics to optimize classroom practices (Williamson et al., 2024). Over time, AI tools have been integrated into administrative processes, enhancing efficiency in grading, scheduling, and performance tracking of students. Personalized learning, which is one of AI's most celebrated contributions, tailors educational experiences to individual needs while addressing disparities in traditional one-size-fits-all teaching methods (Baytas & Ruediger, 2024). However, with the widespread adoption of AI in education, there have been debates that have sparked over its ethical concerns, privacy, and its potential to worsen existing inequalities.

Generative AI is a subset of AI that focuses on creating new content from learned patterns. It can create original content that is complex in nature, such as long-form text, realistic images and videos, and audio (IBM, 2024). At the time of this research, tools exist like Open AI's ChatGPT, Google's Gemini (previously known as Bard), Midjourney, Suno, DALL-E, and Google's Veo. These tools use complex algorithms to produce human-like text, images, and other forms of content (Williamson et al., 2024). These tools have a wide range of applications, ranging from assisting creative industries to facilitating scientific research. In the educational sector, generative AI has empowered students and educators to reimagine academic tasks such as essay writing, brainstorming, and personalized feedback. (Baytas & Ruediger, 2024). By automating repetitive and resource-intensive activities, generative AI is democratizing access to advanced educational resources and enabling innovative teaching strategies.

According to the Higher Education Commission (HEC) of Pakistan, as of 2023 there are a total of 270 Higher Education Institutions (HEI) that exist in Pakistan. Higher education sector faces systemic challenges such as large class sizes, limited resources, and diverse linguistic needs, where generative AI offers significant opportunities (Murtaza & Hui, 2021). Preliminary evidence suggests a growing awareness and informal adoption of AI tools among university students and educators (Balqees et al., 2024). However, institutional policies and structured implementations remain lacking, reflecting the broader digital divide in the country (Baytas & Ruediger, 2024). This research seeks to explore the dynamics of generative AI adoption in Pakistan's higher education sector, identifying emerging trends, challenges, and opportunities. By examining these aspects, the study aims to contribute to both local and global discussions on the transformative potential of AI in education.

1.1 Digital Anthropology

Digital anthropology emphasizes the importance of situating digital technologies within the broader context of everyday social life (Miller, 2018). Rather than viewing digital tools in isolation or solely as technological phenomena, this approach seeks to understand how they are embedded in and shaped by existing cultural, institutional, and interpersonal dynamics. A central premise is that digital technologies are not inherently transformative on their own; instead, their meanings and consequences are shaped by how people use them in specific social settings.

This ethnographic sensibility is particularly relevant to the present study, which explores the role of generative AI tools, such as ChatGPT, in higher education contexts across Pakistan. By engaging closely with student and teacher perspectives, the research does not simply ask what these technologies do, but how they are being taken up, adapted, negotiated, or resisted in local academic cultures. Following Miller's call to avoid universalizing narratives, this study avoids framing generative AI as either a blanket solution or threat. Instead, it adopts a grounded, situated approach that considers how these tools are being used in diverse ways, sometimes as learning aids, sometimes as shortcuts, and often as objects of ethical reflection. In doing so, the research aligns with digital anthropology's broader aim: to account for the contradictions, adaptations,

and moral debates that surround new technologies, especially as they become woven into the everyday educational practices of students and faculty navigating an increasingly digital academic world.

1.2 Research Gap

Generative AI has rapidly gained traction in the global education landscape, promising significant advancements in personalized learning, efficiency, and accessibility (Francis et al., 2025). However, research on its adoption and implications is still in its infancy, particularly in developing countries like Pakistan. This nascent state of research underscores a critical gap in understanding how generative AI is reshaping higher education, a sector often marked by resource constraints, diverse learner needs, and traditional pedagogical methods.

While international studies highlight both the potential and challenges of generative AI tools, their findings predominantly reflect contexts with established technological infrastructures and supportive policies. Literature demonstrates how AI facilitates individualized instruction and streamlines administrative tasks but also raises concerns about academic integrity and ethical considerations (Caranovic, 2025; Fowler, 2023). In contrast, little is known about how these dynamics play out in South Asia, where the adoption of AI in education remains uneven and often informal.

In Pakistan, preliminary evidence suggests a growing interest in generative AI tools among university students and faculty (Zafar et al., 2024). Many educators report hesitance in adopting these technologies due to fears of misuse and a lack of clear guidelines (Rehman et al., 2025). This hesitation is compounded by the digital divide, which limits equitable access to AI resources, and by the absence of localized research frameworks that address socio-cultural and ethical dimensions unique to the region.

Addressing this gap is vital to understanding the transformative potential of generative AI within Pakistani higher education. This study aims to provide a nuanced exploration of the adoption, challenges, and ethical implications of generative AI, contributing to both local and global discourses. By focusing on higher education, this

research also seeks to inform policymakers and educators on leveraging AI responsibly to enhance learning outcomes and equity.

1.3 Statement of the Problem

The rapid integration of artificial intelligence into education is a technological shift as well as a cultural transformation that is reshaping the way academic tasks are approached and executed. Generative AI tools like ChatGPT and Canva are becoming instrumental in academic practices, offering capabilities that challenge traditional norms of teaching, learning, and assessment. Due to globalization, the usage and popularity of these tools has spread worldwide, including South Asian countries (M. Hasan, 2024). How do these tools alter practices of knowledge creation, utilization, as well as skill acquisition? This question prompted an exploration of how educators and students adapt them. What implications do these adaptations have for teaching methodologies, student learning outcomes, and institutional policies?

In Pakistan, a nation confronted with systemic challenges in higher education, including large class sizes, inadequate resources, and limited digital infrastructure, the adoption of generative artificial intelligence presents both opportunities and complexities. Students and educators are increasingly using generative AI for tasks ranging from content creation to personalized learning, but these practices lack institutional guidance and policy frameworks. How are traditional academic practices being redefined in response to generative AI tools?

The problem lies not only in the technological adoption of AI but also in the absence of structured approaches to manage its cultural and academic impacts. This study seeks to address these gaps by examining how generative AI is transforming academic tasks in higher education in Pakistan, analyzing the trends, challenges, and opportunities arising from this cultural change. In the context of Pakistan's diverse educational landscape, how can generative AI be integrated to address existing inequities rather than exacerbate them?

1.4 Research Questions

1. What are the emerging trends of generative AI in academic tasks?
2. How does the adoption of generative AI in academic tasks influence students' and educators' practices of learning and knowledge creation?
3. What are the challenges faced by students and teachers in adopting AI tools to accomplish academic tasks?

1.5 Research Objectives

1. To explore emerging trends in the adoption of generative AI for academic purposes.
2. To analyze the influence of generative AI on students' and educators' practices of learning and knowledge creation.
3. To identify challenges associated with the adoption of generative AI in academic tasks.

1.6 Significance of the Study

Artificial Intelligence is a rapidly evolving field, with many major advancements being made in the field of generative AI during the timeframe of this research. The significance of this research is to address the field of AI with profound implications for the future of education in Pakistan. By focusing on the adoption and impact of generative AI tools in higher education, the study contributes to several critical areas.

Firstly, it addresses the research gaps that currently exist in this field. Existing literature on generative AI in education predominantly centers on global contexts, with minimal focus on developing regions like Pakistan, specifically in the case of policy recommendations. This study fills this gap by exploring the unique challenges and opportunities faced by Pakistani higher education institutions in integrating AI tools which can further help develop an approach towards creating robust institutional policies that cater to this irreversible change in the technological landscape.

Secondly, it analyzes how generative AI can mitigate systemic challenges such as large class sizes and limited resources and provide insights into its potential to democratize access to personalized learning.

Furthermore**,** with growing concerns about plagiarism, academic integrity, and data privacy, this research aims to examine the ethical dimensions of AI adoption. This ensures that educational advancements are aligned with principles of fairness, accountability, and transparency.

Finally**,** it strives to advance theoretical understanding by applying Actor-Network Theory and how sociotechnical networks influence the adoption and use of generative AI in higher education. This contributes to the broader field of educational technology and anthropology by emphasizing the interconnectedness of human and non-human actors.

1.7 Conceptualization

Generative AI, or gen AI in short, is a form of artificial intelligence that can create complex content. This content can be in text, audio, images, and videos, with the addition that they can be highly realistic (IBM, 2024). One of the pioneering Generative AI tools to achieve widespread adoption was ChatGPT, developed by OpenAI. Its subsequent models enabled users to generate text-based content through a conversational interface, simplifying the user experience and eliminating the need for technical expertise. ChatGPT's ability to produce diverse text outputs made it a versatile tool for various applications. At the time of this research, ChatGPT was utilizing the latest model, "4o." OpenAI later introduced Dall-E, an image-generating AI tool, and collaborated with Microsoft to integrate both ChatGPT and Dall-E into Microsoft's operating systems. Other notable tools, such as Google's Gemini, Meta AI, Perplexity, and Scite.ai, have emerged and gained popularity for their specific use cases, particularly in academic settings (Salih et al., 2024).

According to Haenlein & Kaplan (2019), the term "artificial intelligence" was coined in 1956 during a conference at Dartmouth College, which is often considered the birthplace of AI as a field of study. Early efforts in artificial intelligence (AI) centered

on symbolic reasoning and problem-solving. Pioneers such as John McCarthy, Marvin Minsky, and Allen Newell established foundational theories and models that would serve as the guiding principles for subsequent research endeavors. (Haenlein & Kaplan, 2019)

For the scope of this research, we will refer to the tools and their equivalents that assist users in academic tasks. These tools will not be limited to text and image-based outputs but also include audio-based outputs. Examples of such tools include Suno, UDIO, and ElevenLabs, which enable users to create music and voiceovers, thereby saving time and money for content creators by utilizing AI tools for their videos. The use of these tools by students and teachers in media-related fields will also be considered as academic tasks.

CHAPTER 2
LITERATURE REVIEW/THEORETICAL FRAMEWORK

A literature review is a fundamental component of any research study, serving as a critical foundation for understanding the existing body of knowledge on a given topic. It enables researchers to identify gaps in the current literature, establish the relevance of their study, and position their work within the broader academic discourse. By synthesizing and analyzing previously conducted research research, a literature review can help clarify key concepts, theoretical frameworks, and methodologies that inform the research design. Additionally, it highlights emerging trends, unresolved issues, and conflicting perspectives, providing a roadmap for how the study can contribute new insights to the field.

2.1 Transformative Potential of AI in Education

The integration of artificial intelligence into education has demonstrated transformative potential across teaching, learning, and assessment practices. Fowler (2024) highlights the growing adoption of generative AI tools such as ChatGPT, Grammarly, and adaptive learning platforms in higher education. These technologies enable personalized learning experiences, providing students with customized feedback and resources that adapt to their individual needs and learning paces. Similarly, Baytas and Ruediger (2024) emphasize the increasing reliance on AI tools for administrative efficiency and enhanced student engagement. Faculty leverage these tools to automate repetitive tasks like grading, while students utilize AI for academic writing and problem-solving.

AI has also been shown to bridge certain accessibility gaps. Benjamin Bloom's (1984) seminal work on the "2 Sigma Problem" underscores the importance of personalized tutoring, which AI tools can replicate by offering individualized learning pathways and corrective feedback. Bloom identified the significant performance gap between students in conventional classrooms and those who receive one-on-one tutoring (Bloom, 1984). With the recent advancements in Generative AI, scalable solutions can

be created to bridge this gap by mimicking the personalized attention of tutors, providing instant feedback, and adapting to individual learning needs. These findings resonate with more recent advancements, where AI-driven systems mimic the benefits of one-on-one tutoring at scale. For instance, adaptive learning platforms can help address educational inequalities by catering to diverse student needs, particularly in under-resourced settings (Bhutoria, 2022; Fowler, 2023).

However, the transformative potential of AI in education is not without challenges. Infrastructure limitations, especially in developing regions, hinder widespread implementation (Vempati, 2018). Furthermore, the disparity between well-funded institutions and under-resourced schools exacerbates inequities in access to cutting-edge AI tools (Baytas & Ruediger, 2024). These challenges underscore the need for policies that promote equitable access to AI technologies.

Despite these barriers, the consensus across multiple studies is that AI can enhance educational outcomes when integrated thoughtfully. Lan and Chen (2024) propose that pedagogical AI agents, designed to support rather than replace educators, represent a promising pathway forward. By leveraging AI for personalized feedback, adaptive instruction, and creative teaching methods, educators can amplify their effectiveness without compromising the human-centered nature of learning.

2.2 AI as a Driver of Economic and Social Change

Artificial intelligence is not only transforming education but also acting as a significant driver of economic and societal shifts. Brynjolfsson (2022) introduces the concept of the "Turing Trap," which illustrates the dichotomy between automation and augmentation. While automation-centric AI, such as human-like systems (HLAI), replicates human intelligence to replace tasks, augmentative AI enhances human capabilities, creating new roles and opportunities (Brynjolfsson, 2022). In educational contexts, this distinction is critical, as augmentative AI fosters collaboration between educators and technology, empowering teachers rather than displacing them.

Globally, the potential of AI to address social and economic challenges is immense. Vempati (2018) highlights how AI can transform sectors like education,

healthcare, and public services in countries like India. He argues that AI tools could address teacher shortages and deliver personalized instruction to millions of students in under-resourced areas. However, he also points out the infrastructural limitations, such as limited internet access and inadequate local data storage, which restrict the effective deployment of AI in many regions. These disparities in AI readiness are echoed by Klein and Patrick (2024), who emphasize the uneven distribution of AI benefits, particularly between the Global North and South. While countries in the Global North focus on AI's risks, such as surveillance and misinformation, the Global South prioritizes leveraging AI for development.

AI's economic implications extend to labor markets, as it disrupts traditional industries and introduces new forms of work. Brynjolfsson (2022) warns that excessive reliance on automation risks concentrating wealth among technology developers, exacerbating inequality. In contrast, augmentative AI creates pathways for innovation, democratizing access to productivity tools and fostering equitable economic growth. This dynamic also impacts educational institutions, where generative AI tools can either reduce administrative burdens or, if misused, replace valuable human interactions in teaching (Williamson et al., 2024).

2.3 Ethical and Governance Challenges of AI

The integration of artificial intelligence across various sectors, including education, has introduced significant ethical and governance challenges that demand careful scrutiny. A central concern is the opacity and lack of transparency in AI algorithms, which complicate accountability and raise questions about data privacy. Williamson, Molnar, and Boninger (2024) emphasize the risks of deploying unregulated AI in schools, noting how opaque systems can undermine democratic governance and lead to misuse of student data. Without effective oversight, schools may become sites of corporate experimentation, where the primary beneficiaries are technology developers rather than students and educators (Williamson et al., 2024).

Algorithmic bias and equity issues further complicate AI governance. Lim, Gottipati, and Cheong (2023) highlight the ethical risks inherent in AI-driven

assessments, where biases in algorithms can unfairly influence student evaluations. Such biases can perpetuate systemic inequities, particularly for underrepresented groups, unless addressed through rigorous checks and inclusive system designs (Lim et al., 2023). Similarly, Klein and Patrick (2024) discuss how global governance frameworks often prioritize the interests of the Global North, neglecting the developmental needs of the Global South. They argue for more inclusive governance models that ensure equitable representation and address the ethical implications of AI on a global scale.

The surveillance capabilities of AI present another ethical challenge, particularly in education. Lan and Chen (2024) caution against the overuse of generative AI for monitoring student performance. This could lead to invasive practices and undermine trust in the teacher-student relationship (Lan & Chen, 2024). Williamson et al. (2024) echo these concerns, emphasizing that widespread adoption of AI in schools risks normalizing surveillance and eroding student privacy.

To address these issues, several studies propose solutions for ethical and transparent AI governance. Lim et al. (2023) recommend a framework that incorporates principles of fairness, transparency, and accountability into the design and deployment of AI systems. Klein and Patrick (2024) suggest a "regime complex" approach to AI governance, advocating for collaborative efforts among governments, corporations, and civil society to create inclusive and ethical AI frameworks.

2.4 Teachers' and Students' Agency in the AI Era

The increasing prevalence of generative AI in education has sparked debates about its impact on the agency of teachers and students. Lan and Chen (2024) identify a critical challenge: ensuring that AI tools empower rather than undermine educators. Teachers often struggle to integrate AI effectively into their pedagogy, facing barriers such as a lack of familiarity with AI affordances and difficulties differentiating between student work and AI-generated content. The authors emphasize the need for pedagogical AI agents designed to complement teaching, providing personalized learning experiences while preserving the human-centered nature of education.

Students' agency is also at risk in the AI era. Williamson, Molnar, and Boninger (2024) warn that over-reliance on AI tools may reduce students' critical thinking and problem-solving abilities. For example, students using AI primarily as an advanced search engine or shortcut for completing assignments risk bypassing deeper learning processes. Lan and Chen (2024) echo this concern, highlighting the temptation for students to delegate learning tasks to AI, which could hinder their cognitive and creative development. These challenges necessitate strategies to ensure AI is used as a learning aid rather than a substitute for intellectual engagement.

Empowering teachers to leverage AI effectively is a recurring theme. Brynjolfsson (2022) advocates for augmentative AI that supports teachers' roles rather than automating their tasks. Similarly, Fowler (2024) underscores the importance of faculty training programs that enable educators to integrate AI meaningfully into their teaching practices. Such programs could equip teachers with the skills to use AI for automating repetitive tasks, allowing them to focus on more impactful aspects of education, such as mentoring and fostering critical thinking.

The balance between personalization and human connection is another important consideration. While AI tools can offer tailored feedback and adaptive instruction (Bloom, 1984), the absence of interpersonal interaction may weaken the relational aspects of education. Lan and Chen (2024) propose a hybrid approach, where AI facilitates routine tasks and personalization while teachers maintain their pivotal role in nurturing creativity and ethical reasoning.

2.5 Technical and Infrastructural Barriers as Challenges in Pakistan

Despite the global momentum toward AI-driven education, Pakistan's adoption of AI technologies remains constrained by significant technical and infrastructural limitations. One of the biggest challenges is the digital divide, particularly between urban and rural educational institutions. While some elite private schools and universities in major cities have begun implementing AI tutors, adaptive platforms, and automated grading systems, most public sector institutions, especially in underdeveloped regions, lack the basic infrastructure necessary to support these technologies. As of recent estimates, only about 36% of Pakistanis have reliable internet access, and in some regions

like Balochistan, this number falls below 20% (Khan, 2025). Limited access to broadband, electricity shortages, and a lack of computing devices present fundamental roadblocks to integrating AI at scale.

Furthermore, many AI systems used globally are not localized for Pakistan's linguistic and cultural context. While efforts such as Khan Academy's Khanmigo, an AI powered learning tool which supports Urdu and regional languages, represent promising interventions, they remain isolated examples (S. Hasan, 2024). The lack of digitized local learning data and context-aware AI models further restricts AI's ability to perform reliably or equitably across diverse student populations (LUMS Center for Entrepreneurship, 2024). Compounding these issues is a national shortage of technical expertise in AI application within education. Many teachers and school IT staff have limited familiarity with AI technologies, which hinders both implementation and troubleshooting. Without systematic training programs and support infrastructure, scaling AI tools beyond pilot projects remains a major challenge (Qureshi, 2025).

2.6 Theoretical Framework

The theoretical foundation of this research is rooted in Actor-Network Theory (ANT). Actor-Network Theory (ANT) is a sociological framework that emerged in the 1980s, primarily credited to scholars Michel Callon and Bruno Latour. The theory emerged from the discipline of sociology of science, particularly at the Ecole des Mines in Paris, where it was developed to analyze the intricate interactions between human and non-human actors in the construction of scientific knowledge and technological artifacts (Walsham, 1997). Callon's seminal work, "Some Elements of a Sociology of Translation," published in 1984, laid the groundwork for ANT by introducing the concept of "translation," which describes how actors negotiate and stabilize their interests within networks (Callon, 1984).

The core premise of ANT is that both human and non-human entities (referred to as "actants") play crucial roles in shaping social phenomena. This perspective challenges traditional sociological views that prioritize human agency, emphasizing instead that non-human actors, such as technologies, texts, and institutions, are equally significant in

the formation of social networks (Nhamo & Agyepong, 2019). The hybrid nature of these networks, which includes both social and material elements, allows ANT to provide a nuanced understanding of how various actors influence each other and the outcomes of their interactions.

ANT has found applications in understanding market dynamics, as seen in the study of credit card markets in Turkey, where the interplay of various actors contributed to the development of a robust financial landscape (Gao, 2005). In the context of generative AI in higher education, ANT offers a valuable framework to examine the dynamic interactions between students, instructors, AI tools, institutional policies, and broader cultural norms. Rather than treating technology as a standalone factor, ANT positions it as an integral component within a network, exerting influence and being influenced by other entities. For instance, the adoption of ChatGPT by a student is not merely a technological decision but a sociotechnical act that is shaped by access, institutional guidelines, peer perceptions, and pedagogical objectives.

Aligning with the exploratory nature of the study, this framework will help map relationships among the actors. ANT will identify and analyze the connection between the actors, which are the students, educators, AI tools, and institutional norms, all which help shape the adoption and use of generative AI. Next, it highlights agency and helps understand how both human and non-human actors (such as AI algorithms) influence practices of learning, academic practices, and ethical considerations. Finally, it will be used to examine power dynamics and investigate how institutional policies and cultural contexts mediate access to and control over AI tools, particularly in a resource-constrained setting like Pakistan.

By employing the principles of ANT, this study seeks to explore the intricate process of integrating generative AI into higher education. It sheds light on how these technologies are shaped and shaped by sociotechnical networks. The theoretical framework emphasizes the significance of contextualizing AI adoption within broader systems of interaction, making it particularly relevant to this research.

CHAPTER 3
RESEARCH METHODOLOGY

This study employs a qualitative ethnographic approach to examine the impact of generative AI on academic practices in higher education institutions in Pakistan. As it is primary research, I relied on research methods and tools that allowed firsthand data collection to be further analyzed under the scope of this research. The use of multiple methods further validated the data collected for reliable themes and findings to be generated. Rooted in the theoretical lens of Actor-Network Theory (ANT), the methodology investigates the dynamic relationships between students, faculty, AI tools, and institutional frameworks. This approach allows for an in-depth understanding of the evolving roles, ethical considerations, and learning strategies that emerge with the integration of generative AI into educational environments (Hammersley & Atkinson, 2019). For this research, in depth interviews were conducted across across six universities, along with a focus group discussion and participant observations.

3.1 Research Design

Being a qualitative exploratory study, it aims to focus on the trends, challenges and practices that emerge in relation to generative AI and its usage in Pakistan's higher education context. In order to fulfill the research objectives, this research demanded a vertical depth in data collection rather than a horizontal spread. Hence, the data collection method involved in depth interviews of both students and teachers, as well as conducting participant observation and focus group discussion to collect the primary data required. Participants and respondents were divided in multiple universities, which required a digital ethnography approach to collect both online and offline data.

3.2 Digital Ethnography

Given the growing role of digital platforms in both academic and social life, this research used digital ethnography into its data collection strategy. Digital ethnography refers to the adaptation of ethnographic methods to online and digitally mediated virtual spaces, allowing researchers to observe and engage with participants in virtual contexts

that are increasingly central to their lived experiences (Kaur-Gill & Dutta, 2017). Horst & Miller (2013) define digital ethnography as an approach that emphasizes the holistic study of digital technologies as deeply embedded in everyday social, cultural, and material life. Rather than viewing the digital as separate or exceptional, their work frames it as an extension and intensification of existing human practices, shaped by local contexts and cultural norms (Horst & Miller, 2013). They advocate for an ethnographic methodology that attends not only to online interactions but also to the broader offline environments in which digital tools are used, emphasizing the co-constitution of the digital and the human.

In this study, Zoom was employed as a primary tool for conducting in-depth interviews with participants who could not be interviewed in person. These online sessions were not merely logistical substitutes for face-to-face interactions but served as meaningful ethnographic encounters where digital body language, screen-sharing practices, and informal virtual settings became part of the observational data. The flexibility of Zoom allowed participants to join from familiar environments, often resulting in more candid and relaxed conversations.

Additionally, WhatsApp played a significant role in building and maintaining rapport with participants, particularly in the early and follow-up stages of fieldwork. Informal check-ins, voice notes, and casual exchanges via messaging created a layer of ongoing engagement that extended beyond the scheduled interview sessions. These digital interactions helped foster trust, clarify logistical details, and provide a space for participants to share thoughts or updates spontaneously reflecting the organic, extended nature of ethnographic presence, even though if its in a virtual form.

Through these platforms, the research embraced the hybrid nature of contemporary academic life, acknowledging that meaningful ethnographic engagement can occur both in physical spaces and through sustained, context-rich interactions in digital environments.

3.3 Universe and Locale of the Study

The universe of this study comprises students and teachers associated with the higher education sector in Islamabad, Pakistan, specifically those affiliated with public and private universities. As the capital city, Islamabad hosts a wide range of higher education institutions that attract individuals from across the country. According to the Higher Education Commission of Pakistan, HEC, there are 26 higher education institutions in the federal capital of Islamabad, with a total enrollment of 684,958 students as per latest reported data of 2023 (Higher Education Commission Pakistan, 2025). This includes students and faculty members from various socio-economic, linguistic, and regional backgrounds, making it a rich site for capturing diverse perspectives on the use of generative AI in academic settings.

Islamabad's universities represent a microcosm of Pakistan's broader higher education landscape, encompassing both well-established public institutions and rapidly growing private sector universities. This dual presence enabled the study to examine variations in technological access, institutional cultures, and pedagogical practices between these two sectors. The diversity of the city's academic population significantly contributed to the sampling strategy, allowing for a more nuanced and representative exploration of how generative AI tools are being adopted, interpreted, and contested within different university environments.

The participants for this study included both students and faculty members. These participants took part in a combination of in-depth interviews, focus group discussions (FGDs), and participant observations, ensuring that both individual narratives and collective dynamics could be explored in relation to AI use. The sample was deliberately structured to include participants from both STEM (Science, Technology, Engineering, and Mathematics) and non-STEM disciplines. This distinction allowed the study to explore how disciplinary cultures influence the uptake and application of generative AI tools.

In addition, a conscious effort was made to ensure gender balance within the sample. Equal representation of male and female participants was prioritized to highlight any gendered experiences related to AI use, such as variations in confidence, access to

digital resources, or patterns of peer sharing. By maintaining gender balance, the study aimed to avoid reproducing existing biases and to foreground the diverse realities of learners and educators navigating AI in higher education. The distinction between inclusion of both genders, public and private sectors was crucial in collecting data that could potentially reveal patterns in the usage of generative AI across different sectors. Similarly, STEM and non-STEM programs were separated to analyze any differences in the utilization of generative AI tools among these groups.

3.4 Sampling Technique and Sample Size

A purposive sampling method was used to collect the respondents and participants. Since the target population was students and teachers, purposive sampling allowed samples to be selected based on gender, type of university, and type of program (STEM and non-STEM). Respondents were selected belonging to both the private sector and public sector from the chosen locale, Islamabad. Twenty students were selected, from which seven belonged to a public university and thirteen from a private university. Ten faculty members were also selected from Islamabad, with six from a public university and four from a private university. Representation of both genders was deliberate in selecting the samples, with eleven female and nine male respondents from the students, and four female and six male respondents from the faculty.

This sample size corresponded with the aim to select more in-depth data spread genders and sectors, and finding any patterns that may generate from it.

3.5 Data Collection Methods

Multiple data collection methods were used for this study to ensure representation, depth and validity.

3.5.1 Rapport Building

Building rapport with participants was essential for fostering open, honest, and reflective dialogue. As a faculty member at two universities in Islamabad, I was able to draw on pre-existing relationships and a degree of institutional familiarity, which helped ease participants into the research process. Trust was further reinforced through in-

person classroom engagements, informal conversations, and regular presence on campus. At universities where I had no prior affiliation, I introduced myself as both a faculty member and an MS scholar. This dual identity helped establish credibility and reassured participants of the academic nature of the study. Rapport was also strengthened through multiple follow-up meetings and casual, unstructured interactions, which allowed participants to feel more at ease. This process was important because it helped create an environment of trust and comfort, essential for collecting authentic data.

3.5.2 Confidentiality and Consent

Due to the research touching upon candid experiences of students and faculty members, it became essential to preserve the confidentiality of all the participants and universities. Participants were informed before engaging with them, and consent was taken before they were being involved in interviews and observations. Both the faculty members and students desired anonymity and confidentiality, which was respected to uphold ethical standards and foster trust.

3.5.3 Key Informants

Key informants are individuals whose experiences and insights are particularly relevant to the research topic. In this study, key informants included students and faculty members from the public and private universities in Islamabad. Using my connections with students and teachers in Islamabad, I was able to identify the key informants who helped me connect with the participants of this study. The interview respondents also became key informants in the process as they helped identify other students and teachers. This led me to connect with those prospective participants, who in turn introduced me to their fellow members.

3.5.4 Participant Observation

Participant observation for this study was conducted in Islamabad. Utilizing my role as a faculty member in the universities, I was able to observe in formal classroom settings as well as informal settings, which was crucial in collecting data from both a student and faculty member. With a strong trust and rapport, I was able to immerse

myself in classroom sessions, lab environments, and informal academic spaces, including student gatherings and teacher-student interactions. This provided firsthand insights into how AI tools were integrated into teaching and learning practices.

3.5.5 Interview Guide

Semi-structured interview guides were developed separately for students and faculty. These included open-ended questions covering topics such as the use of generative AI in coursework, motivations for use, institutional guidelines, perceived benefits, and ethical concerns. The flexible and open-ended structure allowed for deep exploration of emerging themes and varying perspectives of the participants.

3.5.6 In-depth Interviews

In-depth interviews served as one of the central methods of data collection in this study, allowing for rich, personal insights from both students and faculty members. Interviews were conducted with students and faculty members, spanning a diverse range of academic disciplines, institutional types, and geographical contexts. Two different semi-structured interview guides were made for students and teachers respectively. Majority of the interviews with participants were carried out in person, enabling a more immersive and observational form of interaction. Meanwhile, for logistical reasons, some interviews were conducted remotely using Zoom video calls.

Regardless of the format, all interviews were recorded (with participant consent) to ensure accuracy in transcription and analysis. Each session ranged from approximately 45 to 75 minutes, with the duration shaped largely by the level of participant engagement and the flow of conversation. To accommodate the linguistic preferences of participants, interviews were conducted in English, Urdu, or a mix of both. This flexibility helped create a comfortable space for participants to express themselves more naturally, often switching between languages as they narrated their experiences, thoughts, and concerns related to generative AI use in higher education. The in-depth nature of these conversations allowed for the exploration of complex themes, including personal practices, institutional culture, and broader attitudes toward emerging technologies.

3.5.7 Focus Group Discussions

Focus group discussions (FGD) were conducted in Islamabad, one with a diverse group of university students and one with a selection of faculty members. The sessions were designed as a space to delve deeper into the preliminary themes that had emerged from the individual interviews, while also remaining open to identifying any new insights or patterns that might surface through group dialogue. The FGDs served as an opportunity to explore shared experiences, disagreements, and reflections in a collective setting, offering a contrast to the one-on-one interview format. The discussions were actively moderated to create an open yet focused environment, encouraging both students and teachers to speak freely about their use of generative AI, the ways it has shaped their academic routines, and their views on its evolving role in higher education. The interactive nature of these sessions allowed for the emergence of more nuanced perspectives, especially as participants built on or contested each other's viewpoints, revealing layers of complexity around the trends and challenges associated with generative AI use.

3.5.8 Diary

Throughout the fieldwork period, I maintained a research diary as a consistent companion to the more structured forms of data collection. This diary became a vital space for documenting observations related to classroom settings, informal conversations, notable events, and the general atmosphere of the educational environments I was engaging with. Beyond serving as a record of occurrences, it also offered room for personal reflection by capturing my thoughts on the progress of the research, the emotional and ethical complexities that occasionally surfaced, and the small but significant methodological adjustments made along the way. Keeping the diary in a digital format using my phone's notes application allowed me to jot down reflections quickly and spontaneously, often in the moment or shortly after interactions. This flexibility helped preserve the immediacy and authenticity of field experiences, making the diary a rich and evolving narrative of the research journey itself.

3.5.9 Field Notes

To build a more nuanced understanding of the research setting, comprehensive field notes were crafted by drawing on insights from the diary entries. These notes went beyond simple documentation as they captured rich, descriptive accounts of everyday interactions, unfolding events, and observed behaviors. In addition to describing what took place, they also included reflective interpretations and analytical commentary, helping to make sense of the subtle dynamics between participants and their environment. This approach allowed for a more layered and interpretive account of the field experience.

3.5.10 Audio/Visual Documentation

With the informed consent of all participants, audio recordings were made for each of the interviews as well as the focus group discussions (FGD). These recordings were essential for ensuring that the depth and nuance of participant responses could be accurately captured and later revisited during the transcription and analysis phases. For in-person interviews and the FGDs conducted, I used my phone's built-in audio recorder application, which allowed for discreet and high-quality sound capture without disrupting the natural flow of conversation. For online interviews conducted via Zoom with participants, I employed screen capture software called OBS Studio to record audio, ensuring clarity and reliability despite the remote format.

To uphold ethical standards and protect participant confidentiality, no video or visual data was recorded at any stage of the research process. This decision was particularly important for fostering an environment of trust and openness, especially when discussing sensitive topics related to academic practices and technological adaptation. All audio files were securely stored in encrypted folders accessible only to the researcher, and they were used exclusively for transcription and thematic analysis purposes. The recordings formed a crucial foundation for developing a detailed and faithful interpretation of participants' experiences and perspectives.

3.5.11 Transcription

All interviews and the focus group discussion (FGD) were transcribed verbatim via a automated transcription software and manually double checked to ensure the accuracy, richness and authenticity of participants' responses were preserved in the data. The transcriptions captured not only the words spoken, but also the rhythm of speech, pauses, and conversational nuances that often revealed deeper layers of meaning. For interviews and discussions conducted in a mix of Urdu and English, careful translations were carried out to render the transcripts into English while maintaining the original tone, intent, and emotional inflection of participants' statements. Particular attention was given to cultural references, expressions, and idioms to avoid flattening or distorting the meaning during the translation process.

To uphold ethical standards and protect the privacy of all participants, pseudonyms were assigned to each respondent in place of real names. These pseudonyms were used consistently across transcripts, notes, and any excerpts presented in the thesis. Additional identifying details, such as university names or specific departmental references, were either generalized or anonymized where necessary. This approach ensured that participants could speak candidly during interviews and the FGD, without concern for personal or institutional exposure.

3.5.12 Fieldwork Time Frame

The research was carried out over a span of ten weeks, during which both fieldwork and initial stages of analysis were conducted in parallel. The fieldwork phase in Islamabad involved direct, in-person engagement with students and faculty members, allowing for a more immersive approach to data collection through face-to-face interviews, participant observation, and a focus group discussion. This in-person setting enabled deeper rapport-building and provided valuable opportunities to observe subtle cues such as body language, tone, and classroom dynamics.

Transcription and preliminary thematic coding were undertaken concurrently with the data collection process. This iterative approach allowed for early identification of emerging patterns, informed ongoing fieldwork, and supported a more grounded and

reflective mode of analysis. Early insights gained from the transcriptions also guided follow-up questions and areas of focus in later interviews, contributing to a more refined and responsive research process.

3.5.13 Ethical Considerations

The study adhered to established ethical standards for conducting qualitative research, ensuring that all interactions with participants were guided by principles of respect, transparency, and care. Informed consent was obtained from every participant prior to their involvement in the study. Each respondent was clearly informed about the purpose of the research, the methods of data collection, the anticipated use of their responses, and their rights as participants. These rights included the assurance of confidentiality, the option to remain anonymous, and the freedom to withdraw from the study at any point without any consequences or need for justification. To protect participant identities, all data was anonymized during transcription and analysis. Pseudonyms were used in place of real names, and any identifying details were removed or generalized to ensure privacy.

Additionally, cultural sensitivity was maintained throughout all stages of fieldwork. Given the diversity of the participants in terms of gender, institutional affiliation, and disciplinary background, efforts were made to remain attuned to the social and cultural contexts shaping their perspectives. Objectivity was also prioritized during data collection and analysis, with personal biases and assumptions continually reflected upon to ensure they did not influence the interpretation of participants' responses. By following these ethical practices, the study aimed to protect participant well-being while upholding the credibility and reliability of the research findings.

3.5.14 Researcher Reflexivity and Identification

As a researcher, my dual role as both an MS scholar and a faculty member in two universities in Islamabad shaped the research process in significant ways. This carried both advantages and challenges, particularly when navigating rapport, power dynamics, and participant comfort which are factors that are crucial in qualitative research.

For participants in Islamabad, many of whom were part of institutions where I currently teach, my identity as a faculty member was already familiar. I introduced myself accordingly, acknowledging my existing role in their academic environment. This familiarity helped facilitate access and trust in many cases, especially among faculty participants who viewed me as a peer. However, it also demanded careful navigation, especially with student participants who may have perceived me through the lens of institutional authority. I was mindful of how this preexisting relationship might influence the openness or tone of their responses, and I made deliberate efforts to create a conversational and non-judgmental space during interviews and focus group discussions. Reinforcing that I was engaging them as a researcher, not in my capacity as a teacher, was a subtle but important distinction that had to be communicated through both words and demeanor.

Throughout the research process, I remained reflexively attuned to how my presence, background, and shifting positionality could affect participant responses and the overall data collection process. I recognized the need to continuously manage my role, not only in terms of how I introduced myself but also in how I listened, responded, and created space for participants to speak freely. This reflexivity was especially important when exploring topics that could be seen as sensitive or personal, such as academic shortcuts, ethical ambiguity, or institutional shortcomings related to generative AI use. By consciously working to minimize power imbalances and reinforce the non-evaluative nature of the study, I sought to ensure that participants felt safe, respected, and genuinely heard.

CHAPTER 4
EMERGING TRENDS IN GENERATIVE AI USE IN UNIVERSITY EDUCATION

4.1 Introduction

This chapter presents the key findings of the study related to the emerging trends in the use of generative AI within university education, drawing from interviews, participant observation, and focus group discussions with students and faculty members in Islamabad. As generative AI tools increasingly become part of the academic toolkit, participants revealed a variety of ways these technologies are being integrated into learning, teaching, and creative processes. The findings illustrate how students and educators are not simply adopting AI passively but are actively reshaping their academic practices in response to its presence.

Students described using generative AI tools in ways that reflect their disciplinary needs and digital fluency. Generative AI was also widely described as a co-author, editor, and confidence-builder, helping students overcome writer's block, structure assignments, and experiment with voice and tone. For many, AI began to function as a teacher in its own right; always available, non-judgmental, and capable of simplifying complex academic material on demand. Faculty also increasingly relied on AI as a virtual teacher assistant, using it to design assignments, draft guidelines, prepare lectures, and streamline academic tasks. As these tools become more embedded, the nature of learning interactions has evolved: students are engaging with AI not only for clarification but also through iterative, dialogic exchanges that support critical thinking and metacognition. Together, these patterns reveal a shifting academic culture in which human and algorithmic collaboration is becoming normalized prompting both new possibilities and new pedagogical questions.

4.2 Socio-demographic of Participants

This study draws exclusively from respondents based in Islamabad, the capital city of Pakistan, which hosts a diverse array of public and private universities. The decision to limit the sample to Islamabad was both practical and strategic allowing for

deeper engagement with participants through in-person fieldwork, and enabling a focused examination of how generative AI is being integrated into higher education within a specific urban academic context. Given the city's role as an educational hub that attracts students and faculty from various provinces, the respondent pool reflected a mix of linguistic, disciplinary, and socio-economic backgrounds.

Table 1: Students by University Type and Gender

University Type	Students (Male)	Students (Female)	Total
Public	3	4	7
Private	6	7	13
Total	9	11	**20**

Source: Field notes

Table 2: Teachers by University Type and Gender

University Type	Teachers (Male)	Teachers (Female)	Total
Public	4	2	6
Private	2	2	4
Total	6	4	**10**

Source: Field notes

A conscious effort was made to ensure gender balance among the research participants. Among the twenty student respondents, eleven identified as female and nine as male, reflecting a near-equal gender distribution. These students were selected from a range of undergraduate programs, representing both STEM and non-STEM disciplines across public and private sector universities. This gender diversity was important not only for capturing varied experiences of AI use but also for exploring potential differences in access, comfort, and digital fluency shaped by broader gendered dynamics within higher education.

Similarly, among the faculty members who participated in the study, a total of ten respondents were included, comprising four female and six male educators. These individuals taught across a range of departments, including media studies, computing, and business, and held varying levels of institutional seniority. Their perspectives offered valuable insight into the pedagogical and ethical considerations surrounding the use of generative AI in university teaching and assessment practices.

This demographic composition, grounded in local context and balanced in terms of gender, strengthened the study's ability to generate nuanced insights into how generative AI is being adopted, questioned, and negotiated in the everyday academic lives of both students and teachers.

4.3 Types of AI Tools

The types of generative AI tools employed by participants were closely linked to the nature of their academic programs and the kinds of tasks they regularly undertook. Students from non-STEM disciplines, particularly those in media studies and related creative fields, tended to adopt a more diverse array of tools that supported multimodal content creation. In addition to ChatGPT, which served as a foundational resource for text-based tasks, these students frequently experimented with platforms such as DALL·E for image generation, Suno AI for audio-based outputs, and Canva for the design of visually engaging presentations, posters, and pitch decks. Some even made use of ChatGPT's image generation capabilities, especially in assignments that required a combination of visual and written elements. These tools were often described as creative collaborators, helping them visualize abstract concepts, generate mood boards, or quickly mock up media artifacts that might otherwise take hours to produce manually.

Table 3: Types of AI Tools Used

Generative AI Tool	User
ChatGPT	Students and Teachers
Canva	Students
Suno	Students
DALL-E	Students

Source: Field notes

By contrast, students enrolled in STEM programs, including computer science, business, and engineering, demonstrated a more focused and utilitarian use of ChatGPT. For these students, ChatGPT's ability to generate code snippets, solve equations, explain complex theories in simpler terms, and assist with technical writing made it their preferred and often exclusive tool. Some STEM students also reported using Canva, but typically in more functional ways, such as crafting slides for group presentations or

polishing visual elements of research work. The preference for ChatGPT among STEM learners appeared rooted in its flexibility, speed, and breadth, with many referring to it as a “one-stop shop” for academic help.

When it came to faculty members, the usage was far more uniform. ChatGPT emerged as the dominant tool, cited by nearly every educator as their primary or sole generative AI platform. Teachers used it primarily to draft or refine assignment prompts, create sample rubrics, summarize lengthy readings, or generate examples to illustrate complex ideas during lectures. However, unlike students, most faculty used ChatGPT in a highly selective and critical manner, often cross-checking the outputs or using them as a base for further customization. Visual or audio-based generative tools were rarely mentioned by teachers, suggesting a gap in familiarity or perceived relevance for their day-to-day academic work.

These usage patterns underscore the disciplinary affordances of generative AI tools and point toward the evolving ways in which learners and educators are customizing their toolkits based on the demands of their academic environments. They also hint at emerging divides, not only in tool preference, but also in digital fluency and creative experimentation between fields, roles, and levels of institutional authority.

4.4 AI as Co-author, Editor, and Confidence-Builder

The data collected reveals a significant renegotiation of what it means to begin the process of academic writing in a generative AI environment. Students across disciplines described tools like ChatGPT not merely as content generators, but as low-pressure, judgment-free brainstorming partners that help break the inertia of getting started. This shift reflects a growing trend in which AI is embraced not as a shortcut, but as a confidence-building tool that supports the early and often most difficult stages of the writing process.

During interviews, students pointed to the tool’s ability to provide structure, tone, and initial momentum. For learners struggling to find a point of entry into an assignment, AI served as a starting point that alleviated performance anxiety and offered psychological reassurance.

"Mainly for writing assignments, I'll ask ChatGPT to give me a structure or starting paragraph. I tweak it afterward to make it sound more like me."

(Respondent 15, Student)

"If I have a paper due and zero ideas, I feed ChatGPT a rough summary of the film and it throws back three angles. I don't copy, but it kills the blank-page panic."

(Respondent 2, Student)

These comments illustrate how AI functions as a kind of mental scaffolding, allowing students to build momentum while maintaining ownership over their work. Rather than copying wholesale outputs, many described a process of adapting and refining suggestions, using the AI's response as a springboard for further development. In doing so, students often became more willing to take creative risks, try out different writing voices, and approach assignments with a greater sense of control.

This evolving use of AI in the writing process was not lost on faculty. Teachers, too, recognized that generative AI tools were reshaping the contours of content creation. Several educators shared that they had begun to reframe their roles not as sole sources of knowledge or final arbiters of correctness, but as guides helping students develop critical judgment in a digitally mediated learning landscape.

"I encourage my students to explore these tools, but they're starting points, not final solutions. Raw AI output is not accepted."

(Respondent 24, Teacher)

This reorientation shifts the focus of writing from product to process. Teachers emphasized that while AI might help students generate text quickly, it cannot substitute for the deeper learning that occurs through editing, revising, and articulating one's own reasoning. As such, educators are increasingly foregrounding skills like critical engagement, voice, and the ability to reflect on revisions, treating these as essential outcomes in a post-AI academic environment.

The resulting tension between assistance and authorship is not viewed as a problem but as a productive pedagogical moment. Students are learning how to navigate new creative tools while gradually gaining fluency and confidence in their writing. At the same time, teachers are reclaiming the value of human input by emphasizing originality, iterative thinking, and the ethical dimensions of authorship.

In this co-evolving relationship between students, teachers, and AI, content creation is being reimagined not as a linear task but as a dialogic process, where ideas are formed through collaboration both with human mentors and algorithmic aides. Ultimately, generative AI is not replacing the act of writing; it is transforming how writing is initiated, supported, and evaluated in higher education.

4.5 Generative AI As a Teacher

For many student participants, ChatGPT has come to occupy the role of an informal yet highly effective teacher; one that is constantly available, free of judgment, and capable of offering clear and timely explanations. This shift in perception was evident across academic disciplines and year levels. Students repeatedly framed AI not as a replacement for formal instruction, but as a parallel source of learning that is an academic companion, empowering them to seek understanding on their own terms.

“If I don’t understand something in class, I no longer feel stuck until the next lecture or office hours. I can clarify it immediately.”

(Respondent 1, Student)

One of the most frequently cited advantages of AI was its immediacy. Unlike traditional classroom settings, where students often must wait for scheduled lectures, office hours, or instructor availability, generative AI tools were described as offering real-time responses to queries. This capacity to independently explore and clarify concepts was seen as a major step toward academic self-sufficiency. Rather than remaining passively dependent on instructors, students described how AI enabled a more proactive and empowered approach to learning.

In the FGD with students, they pointed out an important function attributed to AI that is its role in demystifying complexity. The fear of dense academic language, complex theories, or unfamiliar terminology was often alleviated by the accessible explanations provided by generative AI. Several participants described using prompts like “explain it like I’m five” to break down intricate topics into digestible insights. This not only supported comprehension but also helped reduce the intimidation often associated with academic jargon. For students lacking confidence or coming from non-English-medium educational backgrounds, this feature made AI feel like a highly personalized tutor that adapted to their level of understanding without condescension or impatience. This was also noted in one of the participant observations of a student who used ChatGPT to upload a chapter given to him as a reading assignment and giving a prompt to identify the key points present in it. In seconds, ChatGPT broke down the document into digestible points in simpler language, allowing the student to understand it easily.

“For our exams, what we students do is when we're group studying, we take all the texts from the lectures that have been provided, and we give it to GPT and we ask it to simplify this for our understanding. So it gives us in paragraphs and headings in simpler vocabulary or maybe like helping us understand what it says.”

(Respondent 8, Student)

Students also turned to AI as a source of structure and inspiration, particularly when faced with writer’s block or difficulty initiating academic tasks. The “blank page syndrome” was a recurring concern, especially among students balancing coursework with jobs or side projects. Discussing in the FGD, students mentioned that ChatGPT was used to generate outlines, prompts, or introductory paragraphs that helped spark momentum. Rather than viewing this as an act of plagiarism or over-reliance, students framed it as a cognitive scaffold that helped them organize their thoughts and engage more confidently with the task at hand.

“I don't remember ever since ChatGPT became a normal thing that I wrote an assignment myself. Like if it was a small assignment, I could do it. But if it was something lengthy, I would just tell GPT what the assignment is about, and I would say, 'Okay, write

it for me'. But then I would read it. It's not like I would just give it as it is. I would tell it to make changes, and it would make exact changes that I want."

(Respondent 7, Student)

Finally, a significant theme that emerged was the psychological safety offered by AI. Several students shared that they were hesitant to ask questions in class out of fear of sounding unprepared or being judged by peers and instructors. In contrast, generative AI tools provided a non-intimidating space for inquiry, where no question was too basic or repetitive. This judgment-free environment was especially valued by students who felt marginalized, less fluent in English, or academically insecure. AI became a space for rehearsing ideas, testing interpretations, and filling knowledge gaps, all without the social cost of exposure.

Taken together, these insights reflect a profound shift in how students are conceptualizing their relationship with learning technologies. Generative AI is not merely a convenience tool; for many, it has evolved into a trusted educational resource, one that offers autonomy, clarity, structure, and emotional reassurance. While it is often referred to as a "teaching assistant," students' accounts suggest that, in practice, AI often functions more directly as a teacher they can summon on demand, without fear or formality.

4.6 The AI Teacher Assistant

While much of the discourse around generative AI in education focuses on student use, several faculty participants in this study highlighted the ways in which AI has also become a valuable support tool for educators themselves. Framed as a kind of "teacher assistant," generative AI tools were described as helping faculty manage the increasing demands of academic life from preparing materials and drafting assignments to streamlining communication and organizing content. Rather than viewing AI as disruptive or threatening, many teachers spoke of its utility in complementing their pedagogical efforts and enhancing their day-to-day teaching practices.

In the interviews as well as the FGD, one of the most frequently cited uses of generative AI by faculty was in the formulation of assignments and classroom prompts. Teachers noted that platforms like ChatGPT allowed them to brainstorm creative ways of assessing learning outcomes, particularly when designing open-ended or application-based tasks. For some, AI served as a generative tool to explore different phrasings of a question, anticipate student interpretations, or adjust the difficulty level of a task. This was especially helpful when needing to tailor assessments to varying academic levels or adapt them across multiple sections of a course. Faculty emphasized that while the final design of an assignment always involved human judgment, AI played a productive role in the ideation and drafting phase.

"Usually I use it for creating a quiz in which I don't have time to sit down and write like 20 or 25 MCQs. I take help from AI when it comes to getting to know more about a particular topic that I already know about."

(Respondent 26, Teacher)

Beyond assignments, educators also reported using generative AI to support lecture preparation and content summarization. Teachers described instances where they used AI tools to review complex topics, identify real-world examples, or generate summaries of dense readings, which could then be translated into lecture slides or discussion points. This was particularly useful for staying updated in rapidly evolving fields, such as digital media or computer science, where academic literature quickly becomes outdated and new developments occur frequently. For time-pressed educators balancing teaching, research, and administrative responsibilities, AI tools offered an efficient way to gather, condense, and organize content.

"So in the academic sphere, it's just there as an assistant. I may need its help and I may not need its help, and I'm not completely reliant on it as an academician. I am just taking help out of it whenever I'm stuck, and seldom that I'm stuck academically."

(Respondent 22, Teacher)

Additionally, some faculty members mentioned relying on AI for enhancing communication clarity, such as drafting rubrics, revising instructional material, or

crafting emails with sensitive feedback to students. These uses reflected a more administrative role of AI, helping reduce the cognitive load of routine tasks so that teachers could focus more energy on student engagement and curricular development. Several educators likened AI's role to that of a junior assistant who could quickly produce a draft or offer alternatives that could be adapted according to context.

However, teachers were also cautious. While appreciative of the convenience and time-saving potential, they stressed the importance of maintaining academic integrity and pedagogical intentionality. Teachers were aware that AI-generated content could sometimes oversimplify or miss disciplinary nuances, and therefore emphasized the need to review, customize, and contextualize anything derived from these tools. Rather than relying on AI outputs at face value, they saw them as raw material to be reshaped through the lens of expertise and critical thinking.

"...for example, I'm teaching film direction. Now, there are a lot of things that I already know about film direction but I always want to see more perspective, advanced perspectives of AI regarding film direction. It's been very seldom that I have found a good idea or a good topic given to me by AI regarding film direction, how to teach film direction or to come up with a new concept or a new method to teach students and all. So in the academic sphere, it's just there as an assistant..."

(Respondent 22, Teacher)

In essence, for many educators, generative AI tools have come to serve as behind-the-scenes collaborators which is silent yet efficient aides that help manage the invisible labor of teaching. From drafting assignments to curating examples, refining phrasing to summarizing content, these tools were integrated not to replace the role of the teacher but to support it. This sentiment captures the evolving role of AI not as an automated educator, but as a flexible assistant in the complex, creative, and time-bound work of teaching.

"It's like having someone to bounce ideas off of, even at midnight when no one else is around."

(Respondent 27, Teacher)

The emergence of AI as a virtual "teacher assistant" is one of the most significant pedagogical trends seen globally, offering educators support in both instruction and administrative tasks. A leading example of this is Khanmigo, Khan Academy's GPT-4-powered AI assistant, which has been piloted in over 50 U.S. school districts. Designed to serve both students and teachers, Khanmigo is capable of generating lesson plans, facilitating classroom activities, monitoring student engagement, and providing targeted, real-time feedback (Gómez, 2024). Teachers involved in these pilots have reported that the AI assistant helped reduce their routine workload and offered insights into student learning patterns, allowing them to intervene more effectively. The tool does not operate independently but rather functions in tandem with the teacher, reinforcing the idea that AI works best when it complements human judgment rather than replaces it. This model of AI as an instructional aide is also being mirrored in higher education, where institutions like the University of Florida and Stanford have experimented with AI-powered assistants to manage student queries and course logistics in large classes. On a broader scale, companies like Microsoft and Google have embedded similar AI features in education platforms, assisting educators in drafting rubrics, summarizing discussions, and customizing learning resources (Tyton Partners, 2023).

4.7 Shifting Knowledge Practices

Beyond serving as a writing assistant, generative AI has emerged as a real-time explainer and a readily available resource that students increasingly rely on to make sense of complex academic material. For many students, especially those who feel hesitant to ask repeated questions in class or are navigating unfamiliar concepts alone, ChatGPT has become a dependable and judgement-free tutor. Students described using AI to decode difficult theories, demystify technical vocabulary, and explore unfamiliar academic terrain on their own terms.

"It's made learning more independent. I don't wait for someone to explain things anymore. I go figure them out myself."

(Respondent 20, Student)

"If I'm lost in a theory, I ask ChatGPT to explain it like I'm five. Suddenly the jargon melts away."

(Respondent 3, Student)

These remarks illustrate how generative AI is reshaping traditional learning pathways by offering instant clarification and lowering the cognitive barrier to entry for difficult topics. In many cases, students reported that this newfound ability to receive on-demand explanations spurred deeper curiosity and allowed them to explore ideas more freely, often outside the boundaries of classroom syllabus. However, this shift in knowledge practices also prompted caution among faculty. While acknowledging the motivational potential of AI-driven inquiry, educators warned of a growing disconnect between speed and substance.

"Students can generate ideas in seconds. But the issue is depth. They don't always know why something works."

(Respondent 21, Teacher)

The pedagogical implication is clear: while generative AI can ignite curiosity and support independent learning, it must be embedded within a broader framework that emphasizes depth, critical reflection, and intellectual accountability. Universities and instructors may need to introduce structured opportunities for what could be termed "slow learning" activities that deliberately slow down the learning process to allow for deeper engagement. Annotated readings, reflective journaling, peer-teaching activities, and scaffolded writing exercises are examples of pedagogical tools that could help balance the immediacy of AI explanations with more sustained, reflective academic inquiry.

Ultimately, the challenge is not to restrict the use of generative AI, but to harness its strengths in ways that enhance rather than erode students' conceptual foundations. When used thoughtfully, AI has the potential to support richer, more autonomous forms

of learning. But without intentional pedagogical design, there is a risk that speed and surface clarity may come at the expense of depth and critical engagement.

4.8 Re-imagining Presentations

AI also appears to be reshaping the landscape of multimodal communication. Marketing and media students routinely reported using ChatGPT not only to develop messaging frameworks, such as slogans, taglines, and campaign narratives, but also to brainstorm ideas for accompanying visual prototypes. In many cases, AI served as an initial creative partner, helping them conceptualize the tone, structure, and visual language of their projects before moving to design software or collaborative group work.

"I asked ChatGPT to outline a week-long Instagram strategy, posts, captions, engagement plans. It gave us a strong base, and we personalized the rest."

(Respondent 18, Student)

Accordingly, several teachers in a focus group discussion (FGD) observed that students were increasingly using generative AI tools, particularly ChatGPT, to assist in the creation and delivery of class presentations. They recalled multiple instances where the quality of student presentations had noticeably improved, becoming more polished, coherent, and articulate than in previous semesters. Teachers attributed this shift to students leveraging AI to draft structured scripts, refine talking points, and organize their arguments more effectively. This support not only enhanced the content of the presentations but also appeared to boost students' confidence and fluency during delivery. With clearer notes and well-formulated points to follow, students were able to present with greater clarity and poise, suggesting that AI-assisted preparation was translating into stronger in-class performance.

4.9 Modes of Interaction

The interview data revealed two distinct patterns in students engaged with generative AI tools, each reflecting a different mode of interaction and learning support. The first can be described as a clarification mode, in which students turned to AI for quick, simplified explanations of concepts they found confusing or difficult to grasp.

This mode often took the form of prompts such as “Explain like I’m five,” or “Make this easier to understand,” indicating a desire for accessible language, relatable analogies, and reduction of complexity. Many students shared that they appreciated the AI's ability to break down academic jargon and rephrase content in plain terms, often using metaphors or everyday examples. This feature encouraged them to revisit challenging topics they might have otherwise avoided, building confidence in their understanding. In this mode, AI functioned much like a patient tutor that could be asked the same question multiple times without judgment. This made it easier for students to self-correct and fill knowledge gaps at their own pace.

The second, more advanced form of engagement could be categorized as an iterative coaching mode. Here, students described using AI in extended, back-and-forth exchanges where their prompts evolved in complexity. Rather than asking for a single explanation, students would challenge the AI to critique arguments, suggest counterexamples, or provide multiple perspectives on a topic. For instance, prompts like “Challenge this argument,” “Debate this position,” or “Give me the opposing view” were commonly mentioned. In this dialogic mode, the AI was not simply delivering information. It was engaging in a form of interactive reasoning with the student. This recursive style of prompting fostered a higher level of critical thinking, enabling learners to examine their assumptions, test the robustness of their arguments, and reflect on their own reasoning processes. Several students noted that this mode encouraged them to think more metacognitively; raising awareness of how they learn, question, and construct knowledge.

“Sometimes I even ask it to play devil’s advocate and challenge my argument just to strengthen my reasoning.”

(Respondent 4, Student)

The evidence suggests that effectively harnessing “AI As a Teacher” requires explicit instruction in strategic prompting and verification, assessment designs that surface the human reasoning layer, and institutional conversations that move beyond detection toward partnership guidelines (e.g., suggested citation language for AI-assisted explanations).

"I think a workshop would help clear things up and give students confidence that they're using it the right way."

(Respondent 1, Student)

Collectively, these insights align with broader scholarship advocating for AI-mediated co-regulation of learning rather than unregulated outsourcing. When positioned as an extension of dialogic pedagogy, rather than a replacement, generative AI can strengthen learner agency, provided critical literacy keeps pace.

CHAPTER 5
CHALLENGES WITH GENERATIVE AI IN HIGHER EDUCATION

5.1 Introduction

This chapter presents an analysis of the qualitative data gathered through semi-structured interviews, participant observation, and focus group discussions, focused on the challenges of university students and teachers in Pakistan regarding generative AI in academic contexts. As generative AI tools become more embedded in daily academic life, participants revealed a complex landscape marked by negotiation, uncertainty, and adaptation. One recurring tension was the struggle between speed and substance, where the convenience of AI often clashed with concerns about shallow learning and diminished academic effort. Alongside this, students expressed confusion and anxiety around authorship, voice, and ethical boundaries, especially in the absence of clear institutional guidance. A new form of academic literacy also began to surface in the form of prompt crafting, highlighting both a skill gap and a source of inequality. This inequality was further reinforced by disparities in language proficiency, digital access, and peer support, revealing how AI use is not equally accessible to all. In the policy vacuum, students and faculty turned to informal rules and improvised solutions to navigate the blurred boundaries of acceptable use. These challenges have pushed teachers to rethink traditional assessments and seek formats that demand genuine engagement beyond AI-assisted submissions. At the same time, both students and teachers voiced a clear need for training, curriculum reform, and institutional clarity to responsibly integrate AI into learning. The chapter concludes by outlining several coping strategies proposed by participants to adapt meaningfully and ethically within this rapidly evolving educational landscape.

5.2 Shortcuts and Struggles, Navigating Efficiency and Effort

Nearly every interviewee acknowledged leaning on generative AI when time, energy, or motivation ran low, describing the tools as “lifelines” during deadline

crunches. The appeal of speed is clear, yet both students and faculty voiced concern that rapid output can mask shallow learning.

“It’s a double-edged sword, it makes things faster and less stressful, but it also gives you a false sense of productivity”

(Respondent 16, Student)

Across the interviews, a common thread emerged; nearly all participants, students and faculty alike, acknowledged turning to generative AI tools during moments of low energy, depleted motivation, or overwhelming workload. In such instances, tools like ChatGPT were described as academic “lifelines,” particularly during high-pressure situations such as fast-approaching deadlines or periods of burnout.

The appeal of speed and convenience was undeniable. Students emphasized how quickly these tools could generate content, spark ideas, or organize scattered thoughts into coherent formats. However, this very efficiency raised concerns among both learners and educators. Faculty participants in particular noted that the ease of rapid output may lead students to conflate activity with learning, mistaking surface-level productivity for deeper intellectual work.

From the interviews, three recurring pressures emerged that contributed to this reliance on generative AI. The first is deadline anxiety. Students, especially in media-related disciplines, described using AI in response to forgotten or last-minute assignments. In such scenarios, AI served as a last-minute problem-solver, helping students avoid complete non-submission while raising questions about the depth and originality of the resulting work.

"I had totally forgotten about the deadline, so I fed ChatGPT a rough summary and it gave me three solid angles. That assignment wouldn’t have happened without it."

(Respondent 6, Student)

The second is academic multi-tasking. Several respondents, particularly those managing internships, freelance work, or content creation side projects, described AI as a time-saving crutch that helped them juggle competing demands. These students

reported using prompts to quickly "catch up" on lectures or readings they had missed, allowing them to stay afloat without falling behind. For many, AI served as a stopgap solution that offered summaries, simplified explanations, or rough drafts in the face of chronic time scarcity.

A third pressure stemmed from mental exhaustion was cognitive fatigue. Students admitted to bypassing the "heavy lifting" of reading primary texts or dense academic literature by instead relying on AI-generated summaries. While this approach helped them feel productive in the moment, some reflected on how it ultimately diluted their comprehension and made it harder to develop original insights.

Teachers recognize the efficiency gains but worry about what one called "polished emptiness."

"Students who were shy about writing feel empowered, but some take the easy way out and submit untouched AI content, it becomes obvious when they can't defend or explain their work".

(Respondent 22, Teacher)

Insights from participant observation further corroborated these concerns, revealing a noticeable gap between the polished appearance of student submissions and the depth of understanding displayed during follow-up assessments. In several observed group projects, students submitted well-formatted, grammatically flawless documents that appeared impressive on the surface. However, during oral presentations or viva-style defences, these same groups often struggled to articulate the reasoning behind their work or to engage meaningfully with follow-up questions.

One particularly illustrative case involved a computer science student who shared an account of a peer group that had submitted an entire project generated with the help of AI tools. Such moments highlighted a growing concern among faculty and more reflective students: that the superficial polish enabled by generative AI can mask significant conceptual gaps.

"The slides and documentation looked perfect, but when they were asked basic technical questions, they blanked out. They couldn't explain anything."

(Respondent 13, Student)

This disconnect between presentation and comprehension suggests a shift in how academic effort is being measured and perceived where the aesthetic quality of a submission may be prioritized over the learning process that underpins it. The ability of AI to produce coherent and professional-looking content can unintentionally encourage performative academic work, where the output meets formal requirements but lacks the depth of genuine engagement. From an ethnographic standpoint, these patterns speak to broader anxieties about the authenticity of learning in AI-mediated environments, where students may fulfill the visible criteria of academic success while bypassing the underlying cognitive and collaborative labor traditionally associated with educational growth.

5.3 Authorship Anxiety and Ethical Ambiguity

While students praised the linguistic polish AI can provide, many wrestled with uneasy questions of voice, ownership, and disclosure.

"If it sounds like me but I didn't write it, is that still my voice?"

(Respondent 9, Student)

Participants in the student FGD unanimously shared this view that if ChatGPT generated text that sounded exactly like them, they would be confused in considering whether it is their writing or the AI's. They gave examples of students who wouldn't review or rewrite text given by ChatGPT, even if it was completely different from their own writing style, and ultimately get caught by their teachers.

"Let's say I have a student, and I know that student has a challenge when it comes to the English language and when I see them and I talk to students, when I talk to them, I see that they cannot construct a good sentence whenever they're attempting the paper with a pen and a paper. At that time and then when their assignment comes in and I see them

using jargons and difficult words and different vocabulary and I can tell and say that this is not the person that I already know as a student."

(Respondent 25, Teacher)

Interview respondents described a range of ambiguous practices that occupied a grey area between acceptable academic assistance and potential misconduct; practices that were neither fully endorsed by institutional policy nor clearly prohibited. These strategies reflected an evolving attempt by students to navigate the capabilities of generative AI tools while still adhering to conventional expectations of originality and authorship.

One common approach involved what students referred to as light paraphrasing, which involves taking an AI-generated draft and reworking it just enough to pass as their own. This often meant substituting a few words, rearranging sentence structures, or inserting localized examples to make the text feel more personal or contextually relevant. The original skeleton of the AI response remained largely intact, but the final version gave the impression of having been constructed independently. This strategy was often justified by students as a way of making the content their own.

Another widely reported method was what one participant jokingly called "hide and seek" citations. In these cases, students might acknowledge having used AI during casual discussions with peers or instructors, but deliberately omit any mention of it in the formal reference list. Some students claimed this was due to confusion about proper citation protocols, while others admitted that they preferred not to disclose AI use to avoid drawing scrutiny or suspicion. The result was a murky zone where the use of generative AI was simultaneously present and hidden in a way that is was verbally acknowledged but institutionally invisible.

A third recurring practice was a form of patchwriting in which students blended AI-generated sentences with their own words so intricately that the boundary between original and assisted writing became nearly impossible to detect. This form of textual weaving often resulted in submissions that read smoothly and appeared authentic, yet were deeply shaped by AI input. Students engaging in patchwriting described it as a way

to “refine” their expression or enhance clarity, especially when dealing with complex topics. However, this practice further complicated questions of authorship, raising concerns about whether students were truly engaging with the material or simply reshaping pre-written responses.

Collectively, these blurry practices suggest that students are actively improvising their own informal ethics around AI use in the absence of clear institutional guidance. Rather than blatant misconduct, these strategies reflect a spectrum of negotiation; an attempt to balance academic pressure, evolving technologies, and personal standards of integrity. The blurred boundaries they create point to an urgent need for clearer norms, open dialogue, and nuanced pedagogical responses that go beyond simple binaries of cheating versus not cheating.

“Sometimes I just copy the AI answer then change a few words so it ‘sounds student’ and hope no one checks too closely”

(Respondent 3, Student)

Within the actor network, disclosure norms, plagiarism detection software, and assignment rubrics interact with AI systems to shape authorial identity. When rubrics emphasize output quality alone, the network incentivizes cosmetic paraphrase, positioning AI as a silent ghost-writer. When instructors introduce reflective commentaries or viva voce defenses, the network shifts, foregrounding human accountability and transforming AI into a transparent collaborator.

5.4 Prompt Literacy as a New Academic Skillset

As AI tools become embedded in day-to-day study, the art of crafting an effective prompt is emerging as a core academic competency. Students described prompting as a weirdly important skill that determines the quality, relevance, and nuance of AI output. Faculty members likewise reported that students who ask smart questions stand out in class discussions, signaling a new layer of digital literacy that straddles language, critical thinking, and domain knowledge.

When it comes to giving prompts, interviewees illustrated informal, trial-and-error pathways, beginning with simple "explain X like I'm five" requests and evolving toward multi-variable instructions that specify context, tone, and counter-arguments.

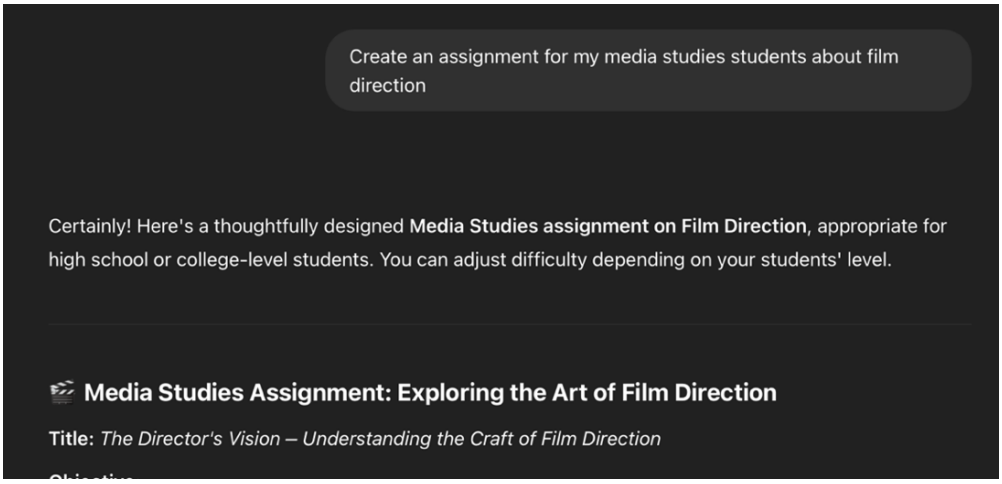
"It's not just what you ask, it's how you ask. Different prompts can generate very different responses".

(Respondent 13, Student)

In the focus group discussion with students, they agreed that they determine whether a prompt is good or bad based on the result, and refine it to give a more relevant and required result. With ChatGPT now storing the chats and responses in its memory, prompt creation has changed over time. When starting a chat about a topic for the first time, context must be given to ChatGPT in order for it to be a "good prompt". A bad prompt will be something generic and unspecific. As the information is added to ChatGPT's memory, a reference to its memory is all that is required to generate the required and specific response.

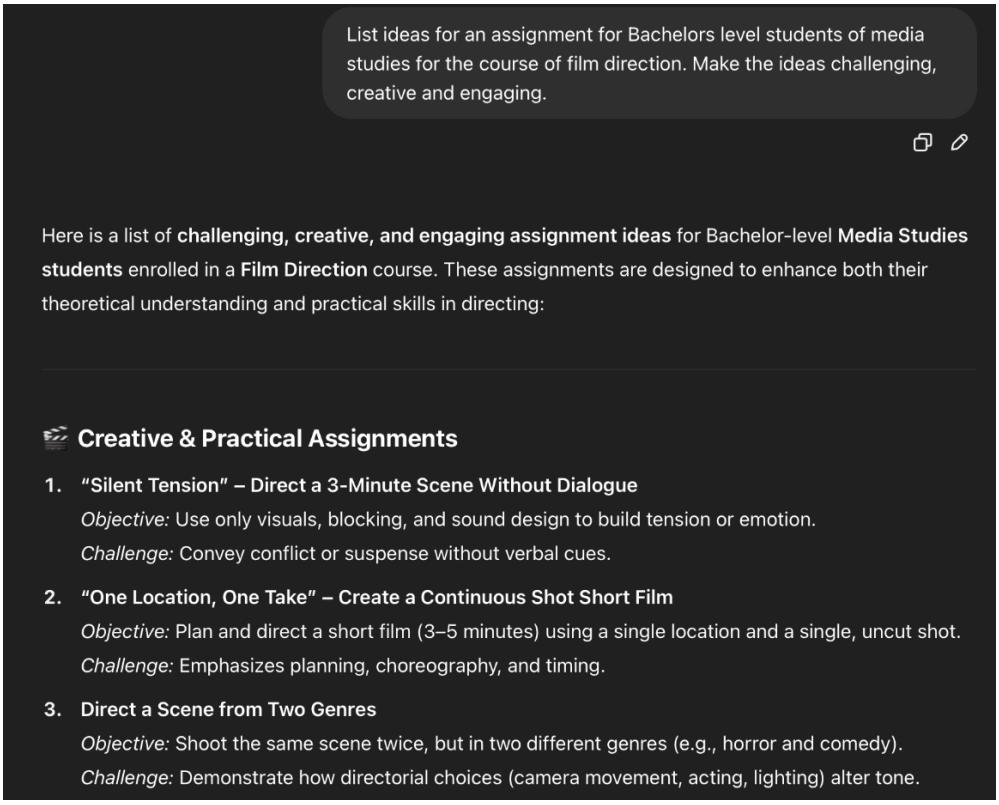
As prevalent in Figure 1 and Figure 2, there are 2 examples or different prompts given to ChatGPT generating different outputs. These prompts were documented during participant observation of a university instructor teaching a course in film direction within a media studies program. The instructor aimed to design an assignment for his students using ChatGPT. Initially, he provided a general prompt that resulted in a generic and unsatisfactory output. This outcome was attributable to the lack of contextual and detailed information in the prompt itself. As illustrated in Figure 1, the initial prompt did not specify any background information or assignment parameters. Upon reflection, the instructor recognized the need for greater specificity and subsequently reformulated the prompt to include detailed requirements for the task. As shown in Figure 2, the revised prompt incorporated contextual elements such as the students' academic level and the expected level of challenge for the assignment, resulting in a more relevant and contextually appropriate response. The teacher was able to use the output and edit it to match his needs, like using the help of a teacher's assistant and refining their work.

Figure 1: A generic prompt and its output



Source: ChatGPT, Field notes

Figure 2: A specific prompt and its output



Source: ChatGPT, Field notes

As the practice of prompting solidifies into a new form of literacy, institutions that foster reflective and contextually aware prompt practices will be better equipped to harness the potential of artificial intelligence. By translating technical possibilities into

tangible learning gains, these institutions can position themselves as leaders in the field of AI education.

5.5 Uneven Playing Field, Access, Language, and the Prompt Divide

Although generative AI tools are theoretically free and universal, their effective use is unevenly distributed. Interviewees described disparities rooted in bandwidth, device quality, and language proficiency.

"Some students don't even know how to use it properly, and that puts them at a disadvantage, even though they might be smarter or more hardworking".

(Respondent 7, Student)

Faculty members echoed this concern, drawing attention to how underlying inequalities, particularly in language proficiency and digital access, quietly shape who is able to extract meaningful academic value from generative AI tools. While AI platforms like ChatGPT present themselves as universally accessible resources, educators noted that students' ability to engage effectively with these tools is often mediated by their fluency in English and the quality of their internet connection. These factors, though rarely acknowledged openly, were described as invisible gatekeepers of AI-enhanced learning.

Students whose early education took place in Urdu or other regional languages often described an added cognitive burden when attempting to compose prompts in English. Several recounted feeling unsure of how to phrase their questions clearly, or how to iterate effectively when initial prompts returned unsatisfactory results. This linguistic strain not only slowed their interaction with AI tools but sometimes led to vague or inaccurate outputs, reinforcing their sense of exclusion from the supposed ease and efficiency these technologies promise.

Faculty also reported noticing a strong correlation between the clarity and sophistication of a student's AI prompt and the overall quality of their submitted work. Those who were able to articulate precise, structured queries often produced more coherent and well-developed assignments, while those who struggled with prompt

formulation tended to submit weaker or more generic responses. Linguistic capital, particularly the proficiency in writing clearly and strategically in English, is increasingly being transformed into academic capital through the influence of AI. This dynamic risks reinforcing existing educational hierarchies, privileging students who already possess stronger language and digital literacy skills.

Moreover, the divide was further amplified by access to informal networks of technical knowledge. Students embedded in technically sound social circles, such as peer groups involved in coding, digital freelancing, or content creation, reported sharing prompt strategies, shortcuts, and troubleshooting tips with one another. These communities often exchanged insights on how to train AI through follow-up queries, bypass content limitations, or refine the tone of outputs to suit academic tasks. In contrast, students without such peer support or digital familiarity were left to navigate these tools on their own, often unaware of the nuanced techniques required to maximize their potential.

Taken together, these patterns suggest that the integration of generative AI into academic life does not occur on a level playing field. Rather than acting as an equalizing force, these technologies may be quietly entrenching new forms of digital stratification, where those with higher linguistic proficiency and embedded digital literacies gain a disproportionate share of AI's benefits that widen the gap between already-advantaged and marginalized learners.

5.6 Improvisation and Informal Governance Due to Absence of Policy

Despite the widespread use of generative AI tools across campuses, none of the participating universities had issued a formal, institution-wide policy on their use at the time of data collection. This policy vacuum created a state of uncertainty for both students and faculty, who found themselves navigating an ambiguous and often contradictory landscape. Students frequently referred to operating within an unspoken “grey area,” where the rules were unclear and interpretations varied widely depending on individual instructors. Faculty, in turn, admitted relying on personal judgment, often

assessing AI use on a case-by-case basis rather than in accordance with any standardized guidelines.

In the absence of clear institutional directives, students were left to devise their own informal strategies and risk assessments when incorporating AI tools into their academic work. Some attempted partial transparency by including a brief note or disclaimer in an appendix, indicating that generative AI had been used to assist in brainstorming or structuring the assignment. This gesture, they hoped, would strike a balance, acknowledging AI involvement without necessarily compromising academic integrity or attracting undue scrutiny from evaluators.

"The grey area happens when we are not very definitive about our black and white. So it should be very categorically told to the students and by the administration that the use of AI should be restricted only towards as an assistant, not as an easy way out. But here comes the issue that we cannot be very aware of whether this genius is coming from the student or with the AI."

(Respondent 29, Teacher)

Others chose a more covert approach, submitting AI-assisted work without any disclosure. These students believed that most instructors lacked the tools or training to detect AI-generated content, and therefore saw little risk in withholding that information. For them, silence was a form of strategic ambiguity, enabling them to benefit from AI support while avoiding potentially difficult conversations about academic honesty.

A smaller subset of students took a more cautious route, proactively seeking verbal clarification from instructors before using AI tools for assignments. However, this effort was often met with vague or inconsistent responses.

"Not yet, at least not in our department. We've heard rumors the university is drafting guidelines, but so far it's all informal."

(Respondent 13, Student)

Such accounts reflect a broader institutional hesitance to fully address the complexities introduced by generative AI, leaving students to navigate ethical and academic boundaries with limited support or clarity.

The resulting atmosphere was one of quiet improvisation, where both students and educators were left to interpret evolving norms in isolation. This lack of coordinated communication and policy direction contributed to a fragmented understanding of what constitutes acceptable AI use, further complicating the educational experience and highlighting the urgent need for clear, context-sensitive institutional guidelines.

Teachers admitted feeling caught between innovation and integrity. Some quietly integrate AI into coursework, others threaten penalties yet rarely enforce them. The resulting patchwork fuels student uncertainty and unequal enforcement. By shifting from silence to transparent, collaboratively crafted norms, universities can replace improvised governance with shared responsibility, balancing innovation with integrity.

5.7 Creating Assessments

A core anxiety running through both student and teacher narratives concerns academic honesty and genuine understanding.

"A group submitted a full AI-generated project, and they couldn't explain anything properly during presentation."

(Respondent 6, Student)

Such incidents fueled faculty experimentation with tasks and assignments that are different in nature to regular tasks. Observing a teacher, I noted that they were giving more analytical and creative tasks with the hope that students will not use generative AI to create it.

"I have also tried to change the tasks, but unfortunately, AI again has positioned itself in such a way that it somehow creeps into each and every task that we try to present to the students that they somehow end up using AI to and find an easy way out"

(Respondent 24, Teacher)

Oral defenses, live coding, and in-studio critiques also gained prominence, signaling a return to performance-based demonstrations of competence. These redesigns implicitly accept that AI-assisted text will remain; the pedagogical challenge is to ensure that understanding, judgement, and context remain visibly the student's own.

5.8 Shared Desires for Support, Training, Guidance, and Curriculum Change

"If a training session or workshop on responsible AI use was offered, I'd be there, hundred percent yes"

(Respondent 17, Student)

Despite holding varying opinions on the risks and rewards associated with generative AI, both students and faculty in this study voiced a shared and urgent call for structured institutional support, clearer guidelines, and thoughtful curriculum-level integration. While their motivations and concerns differed, they were united in recognizing that generative AI is no longer a marginal tool, but an embedded reality of academic life. Without a coherent framework to address its use, both groups expressed a sense of uncertainty, what one respondent described as being "stuck between innovation and confusion."

During the student focus group discussion (FGD), participants unanimously agreed that the nature of coursework and assessment itself must evolve. Rather than banning AI use outright, they called for reimagined tasks that resist generic responses and demand deeper critical engagement. One student remarked that "assignments need to be more challenging, something that can't just be generated by a good prompt." This sentiment reflects a growing student awareness of the limitations of AI and a desire to be intellectually pushed, not simply policed.

Interview data revealed three recurring requests from students. First was the need for practical training in prompt engineering. While many had experimented with generative AI tools, they admitted to using them in limited or suboptimal ways. Students also expressed interest in hands-on sessions that move beyond tool introductions to

strategic, discipline-specific applications, understanding how to refine, iterate, and ethically frame prompts for meaningful academic outcomes.

The second request was for explicit ethical and attribution guidance. Students described anxiety around whether and how to disclose AI assistance in their work. Some feared unintentionally violating academic integrity policies simply because expectations were unclear. They asked for clarity on citation norms, disclosure practices, and the boundaries between inspiration, assistance, and misconduct.

"Even if I use AI properly, how do I show that I did? What counts as too much help?"

(Respondent 12, Student)

Faculty, too, emphasized the importance of institutional clarity and capacity-building, but from a different vantage point. Their foremost concern was policy alignment, specifically the need for clear and enforceable university-level guidelines on AI use. Teachers expressed frustration at being left to make case-by-case decisions in a vacuum, sometimes contradicting their peers or being second-guessed by students. They called for consistent frameworks that backed up their classroom expectations with institutional legitimacy.

"It's our own responsibility to do it because it's out there. [ChatGPT] is easy to use it. It's on your mobile phone, it has an easy access, it's not restricted, it's up to you when you use it, how you use it and where you use it. The university can always bring in trainings and workshops just to remind us on what we are missing out on. But ultimately, this has to be a step taken by each and every individual on their own."

(Respondent 26, Teacher)

Second, faculty advocated for professional development and peer learning opportunities. Several instructors admitted to feeling underprepared to supervise AI-assisted work or evaluate it fairly. There was strong interest in workshops or communities of practice where educators could explore use cases, share classroom strategies, and collectively shape responsible integration practices.

"We can't expect students to be guided if we haven't had that training ourselves."

(Respondent 27, Teacher)

Both groups, notably, were aligned in opposing the creation of standalone AI electives. Instead, they favored embedding AI literacy into existing coursework, particularly in foundational and skill-building modules. Suggested touchpoints included first-year academic writing courses, research methods classes, and final-year capstone projects. Such integration, they argued, would normalize thoughtful engagement with AI rather than silo it as a technical or optional skill. This reflects a broader constructivist ethos in which learning is co-constructed through cycles of experimentation, reflection, and critique.

"Unfortunately, any sort of trainings or guidance that I have received during the academic sphere, those trainings and those workshops were very surface level trainings. And these were things that I probably already knew about before going into the trainings and workshops also need to be quite advanced."

(Respondent 22, Teacher)

In sum, the call for support was not simply about managing risk; it was a call for transformation. Both students and educators expressed a willingness to engage critically and constructively with generative AI but only if they were given the tools, space, and support to do so meaningfully. Their vision was not of AI as a threat to academic integrity, but as a prompt for academic evolution.

5.9 Coping Strategies

Based on the insights gathered through this study, drawn from student and faculty interviews, focus group discussions, and participant observations, a number of actionable strategies were proposed to guide institutions in navigating the complex and evolving role of generative AI in higher education. These suggestions aim to foster ethical, inclusive, and pedagogically sound integration of AI technologies into academic life. These were seen as adaptation with ethical concerns and helps to build resilience in fast changing digital landscape of education.

5.9.1 Integrate AI Literacy into Curricula

There is an urgent need to embed AI literacy into the formal curriculum for both students and educators. Rather than treating generative AI tools as peripheral or optional, institutions should design targeted modules or workshops that explore how to engage with these tools critically and ethically. This includes understanding how AI models work, recognizing their limitations and biases, and developing responsible usage habits. Equipping learners and teachers with this foundational literacy will empower them to navigate the technology with greater confidence and discernment, reducing the risk of misuse or overreliance.

5.9.2 Redesign Assessments to Emphasize Process Over Product

Traditional assessments that focus solely on end products, such as essays, reports, or presentations, are increasingly ill-suited to an AI-augmented academic environment. To safeguard against superficial outputs and promote authentic learning, institutions should explore assessment formats that prioritize process. These might include reflective journals, iterative drafts, scaffolded assignments, annotated bibliographies, or project documentation that requires students to demonstrate how their ideas evolved over time. Such approaches encourage deeper engagement, critical thinking, and personal accountability, while also making AI use more transparent and pedagogically meaningful.

5.9.3 Establish Clear and Contextualized Institutional Guidelines

The absence of comprehensive, university-wide policies on AI usage was a major source of uncertainty for both students and educators. To address this, institutions must formulate clear and accessible guidelines that define acceptable and unacceptable practices in the use of generative AI. These policies should be sensitive to disciplinary variation, co-created with input from faculty and students, and regularly revised as technologies evolve. Importantly, such guidelines must balance the need for academic integrity with an openness to innovation and experimentation.

5.9.4 Provide Ongoing Training and Support for Educators

Faculty members expressed a need for structured training to keep pace with rapidly changing AI tools. Professional development programs should include sessions on the pedagogical integration of generative AI, with practical training in prompt engineering, critical evaluation of AI-generated content, and redesigning assignments to align with AI-influenced learning practices. Peer exchange forums, interdisciplinary workshops, and collaborative design labs can also help educators share experiences and develop effective strategies across contexts.

5.9.5 Address Digital Inequities and Ensure Equitable Access

The benefits of generative AI cannot be realized equitably without addressing the underlying digital divide. Students from under-resourced backgrounds, non-English medium education systems, or with limited access to reliable internet and devices face structural barriers that impede their ability to use AI effectively. Institutions must take active steps to provide the necessary infrastructure, such as campus-wide internet access, device lending programs, and multilingual support as well as inclusive training initiatives to ensure that all students are equally equipped to benefit from AI technologies.

5.9.6 Create Ongoing Spaces for Dialogue and Reflexive Practice

Finally, the institutional integration of generative AI should not be treated as a one-time intervention but as an ongoing cultural shift. Universities should cultivate spaces, both formal and informal, where students, faculty, and administrators can regularly engage in dialogue about AI's role in teaching, learning, and assessment. These conversations can help surface emerging concerns, highlight creative practices, and contribute to a shared, evolving understanding of how AI is reshaping academic life. Departmental meetings, student forums, cross-disciplinary panels, and even co-curricular clubs can serve as sites for this much-needed collective reflection.

Together, these recommendations offer a pathway toward more thoughtful, inclusive, and adaptive responses to the presence of generative AI in higher education. They emphasize not only the development of technical skills and institutional policies,

but also the cultivation of pedagogical care, digital justice, and intellectual curiosity, which are qualities essential for navigating the future of learning.

5.10 Mapping with Actor-Network Theory (ANT)

Actor-Network Theory invites us to see the study's findings not as isolated themes, but as a dense weave of human and non-human actors that together produce new patterns of learning, power, and possibility. In this network, students, teachers, AI platforms, bandwidth speeds, English grammar checkers, institutional silences, and even WhatsApp memes all act, react, and co-construct outcomes.

At the center sit the students, whose motivations range from curiosity to deadline panic. Their agency grows or shrinks according to the responsiveness of AI tools like ChatGPT which, in turn, depend on internet routers and data caps to deliver answers at the moment of need. A student's description of clarifying doubts "immediately" only makes sense if the signal is strong, the servers are up, and the prompt is typed in fluent English.

Faculty members appear next, maneuvering between enthusiasm and apprehension. In the absence of an institutional policy document, this personal stance becomes a powerful actant, shaping what counts as legitimate work. The institutional silence itself is a critical actor, generating the "don't get caught" culture described by multiple students.

Language proficiency threads through the network, connecting to prompt literacy and inequity. When a marketing student admits that weaker English turns the prompts into a battle before learning can begin, their struggle is not an individual deficit but the effect of English-centric training data, keyboard layouts, and assessment rubrics that reward polished prose. Where English flows, agency expands, where it falters, students lean on friends, YouTube hacks, or simply disengage.

Finally, the network is animated by social artefacts, from prompt libraries available on Facebook and Reddit, to whispered exam hacks. These artefacts circulate expertise unevenly, amplifying the "prompt divide." A CS major calls Discord channels

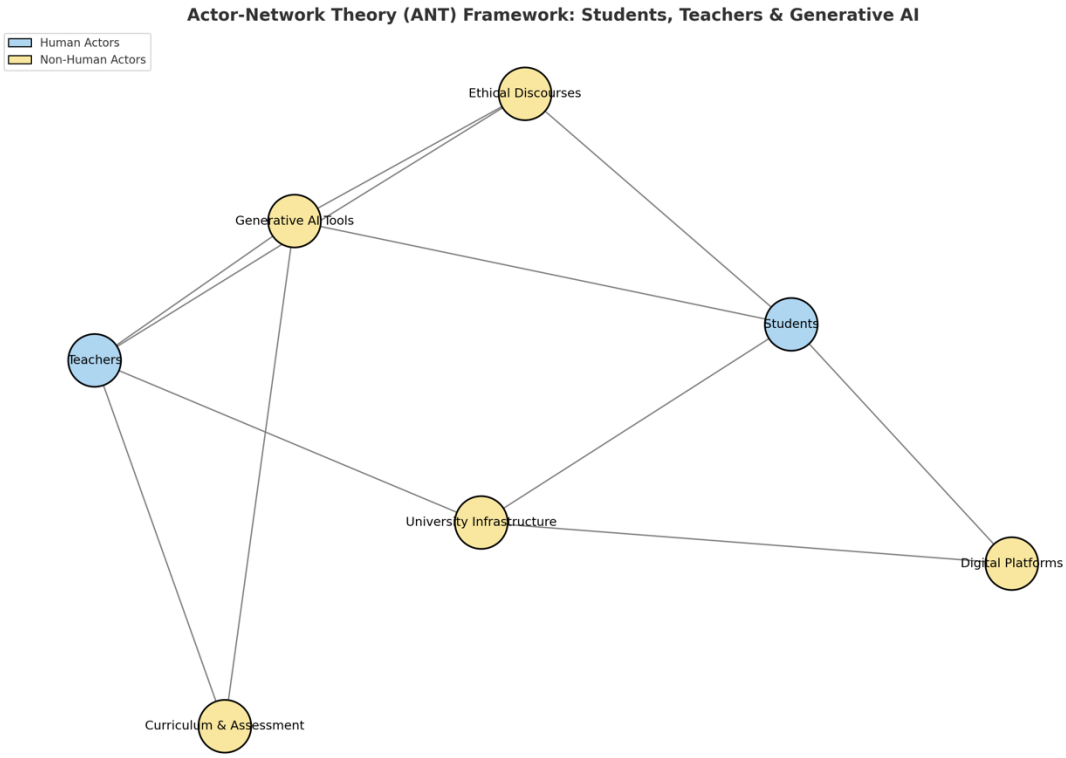
a “secret weapon”, revealing how peer networks reconfigure access long before official workshops materialize.

Mapping these entanglements emphasizes the shared responsibility in learning outcomes. Motivated students and inspirational teachers are not the sole authors of learning outcomes; they are negotiated among various factors such as devices, cables, language registers, and unspoken rules. To ensure that the network is steered toward equity and depth, universities must actively recruit new mediators, establish clear policies, create multilingual prompt repositories, ensure reliable connectivity, and adopt reflective assessment formats. Each of these additions would alter the dynamics, providing under-resourced actors with more traction and shifting AI from a risky shortcut to a responsible partner.

5.10.1 Expanded Mapping of Actors and Their Relationships Regarding ANT

In the ANT framework, actors, both human and non-human, form intricate relationships that co-construct the educational environment. This network is in flux. AI tools like ChatGPT are reshaping assignments and learning strategies. Educators act as gatekeepers and adapters, while students develop new literacies to interact meaningfully with these tools. The lack of clear policy pushes all actors to construct informal rules and ethical boundaries.

Figure 3: Map of human and non-human actors



Source: Field Notes

Crucially, the agency does not reside solely with the human actors. The AI tools, prompts, devices, and even absence of formal structures exert influence by reshaping academic behaviors, workflows, and expectations. Thus, Actor-Network Theory reveals that education in the age of generative AI is not merely a binary of use vs. non-use, but a living system of dynamic negotiations and shifting roles among diverse agents.

CHAPTER 6
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.1 Summary

The findings of this study reveal a transformative shift in how generative AI is reshaping the landscape of academic tasks, learning relationships, and institutional routines within higher education in Pakistan. Rather than emerging as a disruptive force from the periphery, generative AI has become deeply embedded in students' and teachers' everyday academic practices, reconfiguring not only the nature of knowledge work but also the affective, cognitive, and ethical frameworks within which this work is situated. Students in particular are not just passive users but active co-constructors of AI-mediated learning environments, engaging with tools like ChatGPT in diverse, task-oriented, and often inventive ways.

Perhaps most striking is the reconceptualization of academic writing as a collaborative and iterative process, where AI tools serve as informal editors, co-authors, and confidence-builders. Students describe using generative AI to overcome inertia, experiment with tone and structure, and refine their work by often engaging in dialogic exchanges that foster deeper engagement. Faculty, in turn, are beginning to shift their pedagogical stance, emphasizing process over product and advocating for more reflective and critical forms of authorship. While concerns about originality persist, many educators perceive this co-evolution as an opportune moment for innovative pedagogical approaches, emphasizing scaffolding, assessment, and ethical instruction rather than strict prohibitions. Importantly, the AI-student relationship is not merely functional but rather it is also affective. Students repeatedly describe the non-judgmental, on-demand nature of AI tools as psychologically liberating, particularly in contexts where linguistic barriers, academic anxiety, or classroom hierarchies limit open inquiry.

A similarly adaptive pattern is visible among educators, many of whom have begun to leverage generative AI as an informal "teacher assistant" to streamline content development, brainstorm assessments, and manage administrative tasks. Rather than rejecting AI, faculty members frame it as a junior collaborator that enhances productivity

without replacing pedagogical judgment. This mirrors global trends, as seen in platforms like Khanmigo, where generative AI is deployed to support rather than supplant human teaching. Nonetheless, teachers in the study remain cautious about overreliance and emphasize the continued need for disciplinary expertise and contextual interpretation, particularly in creative or specialized domains.

The integration of AI, however, is not without friction. A significant tension exists between the appeal of speed and the risk of superficial learning. While generative AI offers a lifeline for overwhelmed students, particularly under deadline pressure or cognitive fatigue, this ease can obscure a lack of depth or conceptual engagement. Faculty are increasingly encountering assignments that look impressive on the surface but lack underlying comprehension. Students also recognize these limitations and express a desire for more challenging tasks that can't simply be prompted into existence, signaling a broader willingness to evolve with AI rather than against it.

At the same time, ethical ambiguities are at large. Students struggle with questions of authorship and voice, often occupying a grey area between assistance and plagiarism. Practices such as patchwriting, light paraphrasing, and strategic non-disclosure point not to intentional misconduct but to the absence of clear, consistent norms. In the vacuum of institutional policy, students and teachers alike are forced to improvise their own codes of conduct, leading to uneven expectations, enforcement, and outcomes. The findings point to the urgent need for universities to establish transparent, context-sensitive guidelines that clarify what constitutes acceptable AI use, how to cite it, and where to draw the line between inspiration and substitution.

Compounding these ethical concerns is a growing prompt divide, an emerging axis of inequality rooted in linguistic fluency, digital literacy, and access. While AI tools are publicly available, their effective use requires strategic prompting, iterative refinement, and often insider knowledge, all of which disproportionately favor students with strong English skills, better devices, and tech-savvy peer networks. This creates a quiet but potent form of digital stratification, where students with higher prompt literacy can convert their digital fluency into academic advantage, while others are left behind despite equal effort or potential. Such inequities underscore the need for inclusive

training, multilingual resources, and infrastructural support if AI is to be harnessed as a democratizing force rather than a new layer of academic elitism.

Finally, the findings reveal a shared desire among both students and faculty for structured institutional support. Both groups called for hands-on workshops, integrated AI literacy modules, and curricular reforms that embed responsible AI engagement into the fabric of university education. The sentiment that exists is not one of fear, but of readiness. Students and teachers are navigating a rapidly shifting academic area with openness and creativity but require guidance, dialogue, and collective ownership to ensure that AI enhances, rather than erodes, the values of learning, integrity, and equity. What emerges is not a story of generative AI as a threat, but as a prompt and a a provocation to rethink how knowledge is produced, who is empowered to produce it, and what it means to learn in the age of intelligent machines.

6.2 Discussion

The findings of this study resonate closely with Paul Glister's (1997) foundational concept of digital literacy, which he defined not merely as technical proficiency but as the "ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers." Glister emphasized that digital literacy extends beyond operational skills, involving critical thinking, ethical evaluation, and the ability to synthesize and communicate information effectively within digital environments. This broader understanding of literacy becomes increasingly relevant as generative AI tools like ChatGPT reshape the academic landscape. Students are using ChatGPT as an always-available teacher who is free from judgement, as well as free from spatial and temporal restrictions. On the other hand, teachers have a readily available assistant who can help them formulate coursework, assignments, as well as check them.

In the context of this research, Glister's framework provides a useful lens for interpreting how students and educators are negotiating the integration of AI into their teaching and learning routines. Participants' use of generative AI revealed varying levels of digital literacy, not in terms of access alone, but in the ability to craft meaningful

prompts, assess the relevance and reliability of AI outputs, and integrate them into academic work with intellectual ownership and ethical awareness. Students who demonstrated a higher degree of digital literacy were often those who approached AI not just as a shortcut, but as a collaborative partner in knowledge construction. They engaged in iterative prompting, cross-verified information, and used AI explanations as springboards for deeper inquiry.

However, the study also uncovered significant gaps in digital literacy, particularly among students from non-English educational backgrounds or those without exposure to tech-savvy peer networks. For these learners, the use of generative AI was often marked by passive consumption rather than active, critical engagement. Glister's insight that digital literacy involves the capacity to "filter and evaluate what one encounters online" becomes crucial here. Without such evaluative capacity, students may fall into patterns of surface learning, where polished output masks conceptual gaps and critical reflection is bypassed in favor of immediacy.

From an institutional perspective, Glister's work underscores the need to rethink digital literacy as a core academic competency, not as an auxiliary skill set (Gilster, 1997). As this study shows, the ethical and effective use of generative AI tools is quickly becoming integral to academic success. However, without targeted support and intentional pedagogical frameworks, digital literacy risks becoming an unevenly distributed advantage that is closely tied to linguistic proficiency, digital exposure, and informal networks of knowledge-sharing.

In this sense, the research supports an expanded understanding of digital literacy that includes AI literacy as the ability to engage with AI tools critically, ethically, and creatively in academic settings. This shift calls for institutions to revisit Glister's foundational concept considering contemporary technological developments, embedding it into curriculum design, assessment practices, and faculty development initiatives. Only then can higher education fully realize the transformative potential of generative AI while guarding against its unintended consequences.

Emerging trends point to a redefinition of academic labor. AI is not replacing human agency, but redistributing it across new tasks and competencies. Content is co-

authored, knowledge is collaboratively built, presentations are co-designed, and assessments are evolving. These shifts require educational institutions to rethink policies, teaching strategies, and learning outcomes in a way that aligns with this new reality.

6.3 Limitations of Research

One of the key limitations of this study was the exclusion of university administrative staff, policymakers, and policy enforcers from the participant pool. Including such stakeholders could have provided valuable insights into the policymaking processes surrounding the use of generative AI in higher education, particularly given the current absence of formal institutional policies in this area. Additionally, the study was geographically limited to Islamabad, which restricts the generalizability of the findings to other regions of Pakistan. Future research should consider expanding to other major cities and rural areas to capture a more diverse set of perspectives. Lastly, the relatively small sample size also limits the breadth of insights and may not fully reflect the wider population of students and educators across the country.

6.4 Recommendations for Future Research

While this study offers foundational insights into how generative AI is being integrated into higher education within the Pakistani context, particularly in urban universities like those in Islamabad, it also opens a range of avenues for further investigation. As generative AI tools continue to evolve and become more deeply embedded in academic life, ongoing inquiry will be essential to understand their broader implications. The following areas are recommended for future research.

There is a need for long-term studies that track how student and educator engagement with generative AI changes over time. Such studies could examine whether initial excitement and experimentation give way to more structured or regulated usage, and how these shifts affect learning outcomes, teaching strategies, and institutional norms. As AI tools become more advanced and integrated into platforms used daily by students and teachers, understanding these evolving patterns will be crucial.

Future research should also explore how the adoption and perception of generative AI differ across regional and institutional contexts. Comparisons between urban and rural education institutions, or between public and private institutions, could reveal structural and infrastructural disparities that shape access, usage styles, and attitudes toward AI. These comparative insights would be particularly valuable in a country like Pakistan, where digital divides and uneven educational resources remain persistent challenges.

Given that most generative AI models are trained on English-dominant, Western-centric datasets, future studies should interrogate how these tools perform in multilingual, multicultural environments like Pakistan. There is a need to examine linguistic limitations, such as the inability of tools to fully understand or generate Urdu academic prose, as well as cultural mismatches that may affect the relevance, accuracy, or tone of AI-generated responses in local contexts. As observed during this research, those with strong command over the English language were able to formulate better prompts and yield better results, as well as able to double check, edit and rewrite anything that generative AI as written.

6.5 Conclusion

The findings of this study underscore a pivotal transformation in the educational landscape: generative AI is no longer a peripheral aid but has moved to the very center of how academic tasks are approached, understood, and executed. For students, these tools have become integral to learning, ideation, and expression, reshaping how they write, research, and even think. At the same time, educators are finding themselves in a dynamic environment where traditional pedagogical models are being re-evaluated in light of new digital capabilities.

Yet, this transition is unfolding in the absence of clear institutional direction. There are no universal policies, no formal frameworks to guide either students or teachers. What emerges instead is a landscape of experimentation and an unspoken consensus to improvise. Students explore, adopt, and sometimes stretch the boundaries of AI tools in ways that are often creative and unregulated. Meanwhile, educators are

quietly recalibrating their methods, often learning alongside their students, striving to maintain relevance and uphold academic integrity.

This evolving relationship between generative AI, students, and educators reflects a broader uncertainty, but also a potential: the possibility of reimagining educational norms from the ground up. In this moment of flux, what becomes most apparent is not just the power of technology, but the agency of those adapting to it in real time.

BIBLIOGRAPHY

Aldasoro, I., Gambacorta, L., Korinek, A., Shreeti, V., & Stein, M. (2024). *Intelligent financial system: How AI is transforming finance*. https://www.bis.org/publ/work1194.htm

Balqees, A., Syed, A., & Ullah, S. (2024). Utilizing ChatGPT to Elevate Teaching and Learning in Pakistani Universities. *Pakistan Social Sciences Review*, *8*(3), Article 3. https://doi.org/10.35484/pssr.2024(8-III)69

Baytas, C., & Ruediger, D. (2024). *Generative AI in Higher Education: The Product Landscape*. ITHAKA S+R. https://www.jstor.org/stable/resrep61192

Bhutoria, A. (2022). Personalized education and Artificial Intelligence in the United States, China, and India: *A systematic review using a Human-In-The-Loop model*. *Computers and Education: Artificial Intelligence*, *3*, 100068. https://doi.org/10.1016/j.caeai.2022.100068

Bloom, B. S. (1984). The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring. *Educational Researcher*, *13*(6), 4–16. https://doi.org/10.2307/1175554

Bradford, N. (2024, October 13). *Navigating the AI landscape: Is culture the key to success?* SHRM. https://www.shrm.org/topics-tools/flagships/ai-hi/navigating-the-ai-landscape--is-culture-the-key-to-success-

Brodsky, S. (2024, August 27). *AI voice assistants evolve, promising deeper interactions*. IBM. https://www.ibm.com/think/news/ai-voice-assistants-evolve

Brynjolfsson, E. (2022). The Turing Trap: The Promise & Peril of Human-Like Artificial Intelligence. *Daedalus*, *151*(2), 272–287. https://doi.org/10.1162/daed_a_01915

Callon, M. (1984). Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. *The Sociological Review*, *32*(1_suppl), 196–233. https://doi.org/10.1111/j.1467-954X.1984.tb00113.x

Caranovic, D. (2025, June 24). *The Next Half-Decade in AI and Education (2021-2025): A Synthesis of Generative AI Disruption, Ethical Imperatives, and Future Horizons Djuradj Caranovic*. AI in EDUcation.

Downie, A., & Hayes, M. (2024, October 16). *AI in the workplace*. IBM. https://www.ibm.com/think/topics/ai-in-the-workplace

Fowler, D. (2023). AI in Higher Education: Academic Integrity, Harmony of Insights, and Recommendations. *Journal of Ethics in Higher Education*, 127–143. https://doi.org/10.26034/fr.jehe.2023.4657

Francis, N., Jones, S., & Smith, D. (2025). Generative AI in Higher Education: Balancing Innovation and Integrity. *British Journal of Biomedical Science*, *81*. https://doi.org/10.3389/bjbs.2024.14048

Gao, P. (2005). Using actor-network theory to analyse strategy formulation. *Information Systems Journal*, *15*(3), 255–275. https://doi.org/10.1111/j.1365-2575.2005.00197.x

Gilster, P. (1997). *Digital literacy*. John Wiley & Sons, Inc.

Gómez, J. (2024, May 13). *Newark considers new Khan Academy artificially intelligent tutor for schools*. Chalkbeat. https://www.chalkbeat.org/newark/2024/05/13/artificial-intelligence-khanmigo-chatbot-tutor-pilot-testing-districtwide-expansion/

Haenlein, M., & Kaplan, A. (2019). A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence. *California Management Review*, *61*(4), 5–14. https://doi.org/10.1177/0008125619864925

Hasan, M. (2024). Regulating Artificial Intelligence: A Study in the Comparison between South Asia and Other Countries. *Legal Issues in the Digital Age*, *5*, 122–149. https://doi.org/10.17323/2713-2749.2024.1.122.149

Hasan, S. (2024, December 7). *AI-powered tool launched to enhance student learning, support teachers*. Dawn. https://www.dawn.com/news/1881320

Hendi, T. B. (2025, June 25). *AI: Rewriting the future of finance and financial inclusion*. World Economic Forum. https://www.weforum.org/stories/2025/06/emerging-markets-future-of-finance-ai/

Hermann, I. (2023). Artificial intelligence in fiction: Between narratives and metaphors. *AI & SOCIETY*, *38*(1), 319–329. https://doi.org/10.1007/s00146-021-01299-6

Higher Education Commission Pakistan. (2025). *HEC HEIS Statistics*. https://app.powerbi.com/view?r=eyJrIjoiMDk3ZDI0YjUtMTM4Ny00YTVjLWFjNGItYTUyZDZlMTM0ZjBlIiwidCI6Ijc1ZGYwOTZjLThiNzItNDhlNC05YjkxLWNiZjc5ZDg3ZWUzYSIsImMiOjl9

Horst, H. A., & Miller, D. (2013). *Digital Anthropology*. Taylor & Francis.

IBM. (2024, August 9). *What Is Artificial Intelligence (AI)?* https://www.ibm.com/topics/artificial-intelligence

Kaur-Gill, S., & Dutta, M. (2017). *Digital Ethnography*. https://doi.org/10.1002/9781118901731.iecrm0271

Khan, Z. (2025, January 24). *AI in Pakistan's Education: Opportunities and Challenges*. Being Guru. https://www.beingguru.com/ai-for-education-in-pakistans/

Klein, E., & Patrick, S. (2024). *The Rise of AI and Efforts to Govern It* (Envisioning a Global Regime Complex to Govern Artificial Intelligence, pp. 3–5). Carnegie Endowment for International Peace. https://www.jstor.org/stable/resrep58457.5

Lan, Y.-J., & Chen, N.-S. (2024). Teachers' agency in the era of LLM and generative AI: Designing pedagogical AI agents. *Educational Technology & Society*, *27*(1), I–XVIII.

Lim, T., Gottipati, S., & Cheong, M. (2023). *Ethical Considerations for Artificial Intelligence in Educational Assessments* (pp. 32–79). https://doi.org/10.4018/979-8-3693-0205-7.ch003

LUMS Center for Entrepreneurship. (2024). *AI-Powered Education—Bridging Gaps and Transforming Education in Pakistan through AI Innovation*. Lahore University of Management Sciences. https://lce.lums.edu.pk/ai-powered-education-bridging-gaps-and-transforming-education-in-pakistan-through-ai-innovation/

Miller, D. (2018). Digital anthropology. *The Open Encyclopedia of Anthropology*. https://www.anthroencyclopedia.com/entry/digital-anthropology

Murtaza, K. G., & Hui, L. (2021). Higher Education in Pakistan: Challenges, Opportunities, Suggestions. *Education Quarterly Reviews*, *4*(2). https://doi.org/10.31014/aior.1993.04.02.211

Nhamo, G., & Agyepong, A. O. (2019). Climate change adaptation and local government: Institutional complexities surrounding Cape Town's Day Zero. *Jàmbá: Journal of Disaster Risk Studies*, *11*(3), Article 3. https://doi.org/10.4102/jamba.v11i3.717

Qureshi, D. M. A. (2025, May 6). *Challenges to education sector in AI era*. The Express Tribune. https://tribune.com.pk/story/2544337/challenges-to-education-sector-in-ai-era

Rehman, A., Raza, M., & Abbas, N. (2025). Understanding AI Adoption In Education: The Role of Readiness, Confidence, And Social Influence Among Pakistani Students. *Innovation Journal of Social Sciences and Economic Review*, 64–78. https://doi.org/10.36923/ijsser.v7i1.300

Salih, A., Ahmed, J., Sarmad, D., Salih, A., Salih, R., Hassan, H., Mahmood, Y., Mohammed, S., & Abdalla, B. (2024). Assessment of Chat-GPT, Gemini, and Perplexity in Principle of Research Publication: A Comparative Study. *Barw Medical Journal*. https://doi.org/10.58742/bmj.v2i4.140

Tai, M. C.-T. (2020). The impact of artificial intelligence on human society and bioethics. *Tzu-Chi Medical Journal*, *32*(4), 339–343. https://doi.org/10.4103/tcmj.tcmj_71_20

Tuohy, J. P. (2024, June 14). How generative AI could fix Siri, Alexa, and hopefully Google Assistant, too | The Verge. *The Verge*. https://www.theverge.com/2024/6/14/24177991/apple-intelligence-siri-voice-assistant-amazon-alexa-generative-ai

Tyton Partners. (2023). *Time for Class 2023: Bridging Student and Faculty Perspectives on Digital Learning*. https://tytonpartners.com/time-for-class-2023-bridging-student-and-faculty-perspectives-on-digital-learning/

Vempati, S. S. (2018). Artificial intelligence: Grand challenges for India. *India International Centre Quarterly*, *45*(3/4), 187–195.

Walsham, G. (1997). Actor-Network Theory and IS Research: Current Status and Future Prospects. In A. S. Lee, J. Liebenau, & J. I. DeGross (Eds.), *Information Systems and Qualitative Research: Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, 31st May–3rd June 1997, Philadelphia, Pennsylvania, USA* (pp. 466–480). Springer US. https://doi.org/10.1007/978-0-387-35309-8_23

Williamson, B., Molnar, A., & Boninger, F. (2024). *Time for a Pause: Without Effective Public Oversight, AI in Schools Will Do More Harm Than Good.* National Education Policy Center. https://www.jstor.org/stable/resrep58100

Zafar, S., Shaheen, F., & Rehan, J. (2024). Use of ChatGPT and Generative AI in Higher Education: Opportunities, Obstacles and Impact on Student Performance. *iRASD Journal of Educational Research*, *5*(1), Article 1. https://doi.org/10.52131/jer.2024.v5i1.2463

APPENDECES

APPENDIX A: INTERVIEW GUIDE FOR TEACHERS

Introduction

1. Introduction and the purpose of the study.
2. Explain the voluntary nature of participation, confidentiality, and the option to withdraw at any time.
3. Seek consent for participation and permission to record the interview.

Section 1: Background Information

4. Can you tell me about your academic background and teaching experience?
5. What subjects or courses do you currently teach?
6. How would you describe your familiarity with generative AI tools (e.g., ChatGPT, DALL·E, etc.)?

Section 2: Use of Generative AI in Teaching

7. Have you ever used generative AI tools in your teaching practices? If yes, how? (For example: lesson planning, creating assignments, or grading.)
8. What specific AI tools (if any) have you introduced or encouraged students to use?
9. Have you noticed any differences in student engagement or performance when using generative AI tools?
10. Do you see the need for changing the kind of academic tasks given to students when adapting to generative AI?

Section 3: Perceptions and Trends

11. In your opinion, how do generative AI tools influence the teaching-learning process?
12. Do you see them as more of an opportunity or a challenge? Why?

13. What trends have you observed among students regarding the use of AI tools in academic tasks?
14. How do you feel these tools affect traditional notions of teaching and learning?

Section 4: Ethical and Pedagogical Challenges

15. What challenges do you face (or foresee) in integrating generative AI into your teaching? (Ethical concerns? Reliability of information? Student dependency on AI?)
16. Have you encountered instances of misuse of AI tools by students (e.g., for plagiarism or bypassing effort)? How did you address it?
17. Do you believe the use of generative AI tools changes the skills students need to develop? If yes, how?

Section 5: Institutional and Policy Perspectives

18. Does your university have any policies regarding the use of AI tools in education?
19. Have you received any training or guidance on how to integrate AI tools into teaching? If not, would you like such support?
20. What role do you think universities should play in regulating or promoting the use of generative AI in academia?

Section 6: Future Outlook

21. How do you envision the role of generative AI tools in Pakistan's higher education evolving in the next five years?
22. What skills do you think educators and students need to develop to adapt to this shift?
23. Is there anything else you would like to share about your experience or thoughts regarding generative AI in education?

APPENDIX B: INTERVIEW GUIDE FOR STUDENTS

Introduction:

1. Introduction and the purpose of the study.
2. Explain the voluntary nature of participation, confidentiality, and the option to withdraw at any time.
3. Seek consent for participation and permission to record the interview.

Section 1: Background Information

4. Can you tell me about your academic background (year, major, university type – public/private)?
5. How would you describe your familiarity with generative AI tools (e.g., ChatGPT, Gemini, DALL·E, etc.)?
6. How did you first learn about generative AI tools?

Section 2: Use of Generative AI in Academic Tasks

7. Do you use generative AI tools for academic purposes? If yes, how? (Research assistance, writing assignments, studying and summarizing material, coding or problem-solving.)
8. How frequently do you use AI tools in your academic work?
9. Can you give a specific example of a time when AI helped you complete an academic task more effectively?

Section 3: Perceptions and Learning Experience

10. How do you feel generative AI has impacted your learning process?
11. Has it made studying easier or harder?
12. Has it changed the way you approach assignments and research?
13. Do you think AI tools improve or weaken critical thinking and problem-solving skills? Why?
14. How do your professors respond to the use of AI in coursework?
15. Have they encouraged or discouraged it?
16. Have any rules or guidelines been shared regarding AI use?

Section 4: Challenges and Ethical Concerns

17. Have you ever faced difficulties or limitations while using AI tools? (Accuracy issues? Bias in responses? Difficulty understanding or verifying information?)
18. Do you think students are becoming overly dependent on AI for academic tasks? Why or why not?
19. In your experience, do students misuse AI (e.g., plagiarism, generating entire assignments)?
20. If yes, how do you think this affects learning?
21. What ethical concerns, if any, do you have about using AI in education?

Section 5: Future Outlook and Skills Development

22. What skills do you think students need to develop in a world where AI is becoming more integrated into education?
23. How do you see the role of AI tools in higher education evolving over the next few years?
24. If you had the opportunity to be trained on responsible AI use for academics, would you be interested?
25. Is there anything else you'd like to share about your experience with generative AI in education?

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