

**RESEARCH PAPER****Approaches of Generation Z towards AI Integration in Pakistani Classrooms****Muhammad Rafi Khan<sup>1\*</sup> Shahzadi Meh Jabeen<sup>2</sup> Saadia Tariq<sup>3</sup> Samia Bashir<sup>4</sup>**<sup>1</sup> Faculty of Social Sciences and Humanities, Minhaj University Lahore, Pakistan<sup>2</sup> Faculty of Language and Literature, University of Central Punjab, Lahore, Pakistan<sup>3-4</sup> Faculty of Basic Sciences and Mathematics, Minhaj University Lahore, Pakistan\*Corresponding Author [rafi.ro@mul.edu.pk](mailto:rafi.ro@mul.edu.pk)

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**ABSTRACT**

This research study delves into how Generation Z views the use of AI in schools, in Pakistan. As this is the generation whose upbringing has been aligned with the era of technological advancements, i.e., 1995-2010, and it is considered as a threshold between the Millennials and the Generation AI. By using Google Forms, the authors conducted a survey with Generation Z, Millennials, and Generation X. The survey focused on three ideas; (a) ethical issues related to AI integration (b) Importance of having clear AI policies and guidelines and (c) ensuring fair access to AI technology in the classrooms. The three ideas also serve as predictor variables for this study. These ideas were analyzed through statistical testing. The results show that Generation Z has concerns about ethics (H1:  $p < .001$ ), values policies (H2:  $p < .001$ ), and is aware of disparities in AI access among students at diverse levels (H3:  $p < .001$ ). These findings highlight the worries that Generation Z has about incorporating AI into classrooms, in Pakistan. This study uses Quantitative Comparative Analysis (QCA) to draw results which have policy implications.

**Keywords:** AI integration, Generation Z, Education, Classroom, Pakistan.

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**INTRODUCTION**

The integration of AI in schools by Generation Z in Pakistan is pivotal and its perspective is a precondition for the following causes. Primarily, they have a significant impact as they will eventually be future education and the workforce being digital natives who are used to the fast-paced and futuristic technologies. They provide options related to the strengths and weaknesses that using artificial intelligence had in the learning environment (Chan & Lee, 2023). The next factor which can also affect AI programs is the feeling and attitudes of generation Z towards AI integration because it can reflect to the adoption of programs and their implementation at schools and so has an impact on the quality and inclusivity of the education (Ho et al., 2022; Low et al., 2023; Vitezić & Perić, 2021). AI integration empowers educators to tailor support and resources to students' apprehensions, considerations, and priorities. This increases acceptance, equity, and

innovation (Alamäki & Marttinen, 2021). Therefore, students can access high quality information. Consequently, it will be essential to explore how Gen Z deals with AI adoption as that will bring in the awareness of upgrading methods and facilitating successful admission of AI (Kamalov et al., 2023) in Pakistani schools.

The research article restricts itself to a quantitative approach for analyzing the opinions of individuals in Generation Z about AI in the educational system of the country. The emphasis is made on the exploration of different aspects such as policy formulation, and the inclusion of all students as beneficiaries in terms of access and the verification whether the generation Z has some prior knowledge and experience of the emerging technology world. These are key aspects considering the emerging areas of AI technology that potentially affect education. Therefore, a survey was directed which centers around collecting a diverse range of relevant views on how AI can be applied in education. This research was set to investigate Generation Z's worries and main areas of interest concerning the integration of AI, which includes policy, the necessity for strategies and perceptions of disparities in access to AI tools.

## **HYPOTHESES**

H1: Generation Z is more concerned with ethics regarding the AI integration in Pakistani classrooms.

an academic tool in Pakistani classrooms.

H2: Generation Z is more concerned with the implementation or effectiveness of AI related policies at different levels.

H3: Generation Z is more concerned with inequalities in access to AI tools across different student levels.

## **LITERATURE REVIEW**

### ***Ethics in AI Integration***

Concerns about data security and privacy are voiced over most digital technology. The development of artificial intelligence (AI) has elevated these issues to even greater importance (Stahl et al., 2023). Boulay (2022) uses a case study approach to examine student perceptions of AI, focusing on issues like bias, transparency, and data privacy. There are justifiable concerns that the autonomy of students and teachers will be violated, that student data will be gathered and misused for other objectives, and that artificial intelligence will add more prejudices to decisions made about education. In this regard, Mahmood et al (2022) highlighted the value of ethical considerations surrounding artificial intelligence in education (AIED) as well as how AI might enhance pedagogical practices, teaching, and learning in educational contexts. Their results emphasized “two prominent factors for further research in AIED; the specification of “Digital Ethics” and “Potential Research areas in the implementation” of ethics AI in education.” Moreover, the data analyzed by Ahmad et al. (2023) suggested that AI makes people lethargic and has a major influence on the loss of human decision-making. It affects privacy and security as well. Jabar et al. (2023) revealed their finds that Gen Z thinks about privacy, secrecy, and anonymity as

possible risks and difficulties posed by AI and Internet of Things (IoT) to humans. Furthermore, there are hazards to security and data privacy due to the ethical issues raised by AI and IoT. Students in Generation Z propose that adequate education and the development of technological ability can accelerate people's knowledge of these technologies. This suggests that ethical education in higher education institutions should address technological ethical concerns and connect them to social, environmental, health, and economic challenges.

For integrating AI into educational settings, it is crucial to consider the viewpoints of Generation Z (Chan & Lee, 2023; Bostrom & Yudkowsky, 2014). As individuals who have grown up surrounded by technology (Alwin, 2002), Generation Z plays a key role in discussions about the implications of incorporating AI in schools (Boulay, 2022) in Pakistan. Given the social context of Pakistan and its rapidly evolving educational landscape, it is important to explore whether Generation Z has specific concerns regarding the ethical aspects of AI integration.

### ***Need for Clear Policies in AI Integration***

As “in the digital world, growing bias in diversity, equity, and inclusion (DEI) is increasingly influencing people’s thoughts and behaviors” (Low et al., 2023) therefore, Chan & Lee (2023) emphasized how crucial it is to integrate technology with conventional teaching techniques to create a more engaging learning environment. Their findings have implications for the development of evidence-based policies and guidelines for the integration of generative AI for the development of students' digital literacy and critical thinking abilities, and for the promotion of responsible use of generative AI technologies in higher education. Concerning this, Vitezić & Perić (2021) suggest that legislators and academic establishments should endeavor to enhance their courses by highlighting the significance of emerging technology such as AI. Emphasizing the need for policy, Yu et al. (2022) presented their study to put training plans into place. According to Ho et al. (2022), the traditional literature on human-machine connections from the 20th century is inadequate for the current era of intelligent machines that are capable of sensing, tracking, and monitoring human sentiment, emotion, and feeling. Their findings draw attention to significant design and governance concerns that must be addressed to guarantee that emotional AI devices and systems act in the best interests of people and society. The implementation of policies on AI when addressing education is also crucial to curb how teaching and learning are affected significantly at all levels of education (Boulay, 2022). In the context of the proliferation of AI and the constant evolution of educational methods in Pakistan today instead of assuming that current policy frameworks are perfect, it should be questioned whether the members of Generation Z believe that the relevant policies properly address the issues and constraints which the AI integration brings about (Vitezić & Perić, 2021). The point of view of Generation Z on how policies are applied would lead to getting invaluable insights, which, in turn, will lay a good background for the policies allowing AI incorporation in Pakistani educational institutions.

### ***Equality in AI Integration in Education***

Kamalov et al. (2023) state that the sense for sustainability starts with the development and implementation of the AI-powered educational technologies and due to this it is necessary to have a profound knowledge about how those technologies will affect the existing educational system.

Holmes et al. (2022) studied the impact of AI&ED on children's rights to education, human dignity, autonomy, hearing, nondiscrimination, privacy and data protection, openness and explainability, protection from economic exploitation, and the ability to withhold or withdraw consent for their involvement with any technology. The authors stressed the interconnection between human rights, democracy, and the rule of law in educational empowerment where AI is both the utility and a transcendent factor. Alamäki & Marttinen (2021) emphasized that AI is widely accepted in higher education to bring in process innovations and learning efficiencies. Accordingly, the most advisable approach is to opt for the “shifting of traditional teaching practices to incorporate the use of AI by Generation Z”. Through this, the students will be equally empowered by this technology. Inclusivity means advocating equality of AI in integration (Omoteso, 2012) to educational attitudes is one necessary factor in the formation of the learning space which is free from barriers for all people. As a part of Pakistan's social reality that is made up of many social groups, it is critical to deal with the inequality in AI classrooms, to support equitable education. Analyzing the ideas of pupils from generation Z on the pervasiveness and use of AI systems among the students can be helpful in forming strategies for shrinking the merit distribution and in the attempt to ensure egalitarianism in the education ecosystem featuring AI (Mahmood et al., 2022).

**CONCEPTUAL AND THEORETICAL FRAMEWORK**

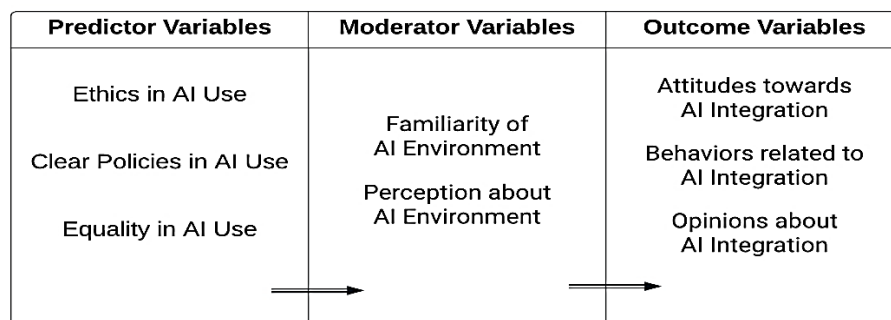


Figure 01: Conceptual Framework

This conceptual framework revolves around Generation Z’s growing involvement in AI integration in Pakistani classrooms. At its core, the framework revolves around three predictor variables: ethics, policy matters, and equality. These factors include ethical considerations in AI use, perceptions, of effectiveness of policies and attitudes to build equity of AI in education sector. Besides, familiarity of the AI environment and perception about the AI environment serve as moderator variables which are crucial to constructing the relationship between the predictor and outcome variables. The moderators express the technical highlights of the AI technologies and embody Generation Z’s subjective view of potential of AI in education. They reflect different perspectives, thus creating attitudes, behaviors, and opinions towards AI. Conclusively, the outcome variables which are attitudes toward the AI integration, behaviors related to AI integration, and beliefs about AI integration, unveil the general evaluations, actions, and mindsets that Generation Z has towards the integration of AI technologies in Pakistani classrooms. These factors take the shape of a multifactorial framework that gives clarity to the discussion around ethical AI use, policy effectiveness, equity, familiarity, perception, and attitude, behaviors and

opinions of Generation Z as they relate to AI integration. This framework can thus be used to guide policies or practices of the use of AI in education in Pakistan.

**RESEARCH METHODOLOGY**

With a blend of quantitative approach (Vance et al., 2013), this research uncovers how youngsters of Generation Z in Pakistan feel about the adoption of AI in learning environments. The study involves conducting a survey through Google Forms to gather data from Generation Z participants, who were born between the mid-1990s and early 2010s, as well as prior generations to have a clear insight. The survey aims to collect responses related to three variables that reflect in their respective hypotheses: (1) ethics in AI integration (2) need for clear policies in AI integration and (3) equality in AI integration in education.

Participants are chosen through purposive sampling (Tongco, 2007) from students currently attending institutions in Pakistan. The survey included primary questions covering aspects of AI integration such as ethics, policy implementation and accessibility to AI tools (Table 1) as well as supplementary questions concerning familiarity of respondents with AI and perception about AI (see Appendix). Demographic details (Table 2) like age, gender and educational background are also gathered for analysis purposes. The data was accumulated using a five-point Likert Scale according to the following levels of agreement (Table 1).

<i>Null Hypotheses</i>	<i>Alternative Hypotheses</i>	<i>Primary Questions</i>	Measurement	<i>Variable</i>
H <sub>0</sub> : There is no meaningful relationship between age and the ethical considerations in AI integration in Pakistani classrooms.	H <sub>1</sub> : Generation Z is more concerned with ethics regarding the AI integration in Pakistani classrooms.	Are you concerned with ethics related to AI adoption in classrooms?  Are you concerned with data privacy, data biasness, or transparency in the use of AI in classrooms?	Five-Point Likert Scale	Ethics in AI Integration
H <sub>0</sub> : There is no profound association between age and concerns about policy formulation and implementation about AI integration as an academic tool	H <sub>2</sub> : Generation Z is more concerned with the implementation or effectiveness of AI related policies at different levels.	Are you aware of existing AI-related policies or guidelines?  Are you aware of the implementation or effectiveness of AI related policies at different levels	Five-Point Likert Scale	Need for Clear Policies in AI Integration

in Pakistani classrooms.		(primary, secondary, higher education)?		
H <sub>0</sub> : There is no meaningful association between age and perception of inequalities about AI integration in Pakistani classrooms.	H <sub>3</sub> : Generation Z is more concerned with inequalities in access to AI tools across different student levels.	Are there inequalities in access to AI tools across different student levels?  Should every student have the right to use and integrate AI?	Five-Point Likert Scale	Equality in AI Integration in Education
<i>Supplementary Questions</i>				
Are you familiar with artificial intelligence (AI) technologies in education?			Five-Point Likert Scale	Familiarity
Do you think AI is a positive force for learning enhancement?			Five-Point Likert Scale	Perception

Table 01: Construct of Questionnaire with corresponding variables and hypotheses

A total of 336 responses were accumulated and the demographic enquiry was conducted for gender, age, employment, and education level (Table 2).

<i>Line of Inquiry</i>	<i>Selections</i>	<i>Percentage of Responses</i>
Gender	Female	62.5
	Male	35.7
Age	18-24	62.5
	25-34	17.9
	35-44	7.1
	45-54	10.7
	Prefer not to say	1.8
Education Level	High School	3.6
	College	12.5
	University	83.9
Employment	Employed	32.1

Unemployed	48.2
Self-Employed	14.3
Prefer not to say	5.4

Table 02: Demographic Inquiry of respondents

After the survey was completed, the data is organized in an Excel sheet for analysis. Statistical Package for the Social Sciences (SPSS) was used to process the data by employing Chi Square tests to investigate the connections between variables and assess whether the hypotheses could be supported or refuted.

**RESULTS**

***H1: Generation Z is more concerned with ethics regarding the AI integration in Pakistani classrooms***

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	100.180 <sup>a</sup>	16	.000
Likelihood Ratio	99.948	16	.000
N of Valid Cases	336		

a. 9 cells (36.0%) have expected count less than 5. The minimum expected count is .54.

Table 03: Chi-Square Tests

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.479	.000
N of Valid Cases	336	

Table 04: Symmetric Measures

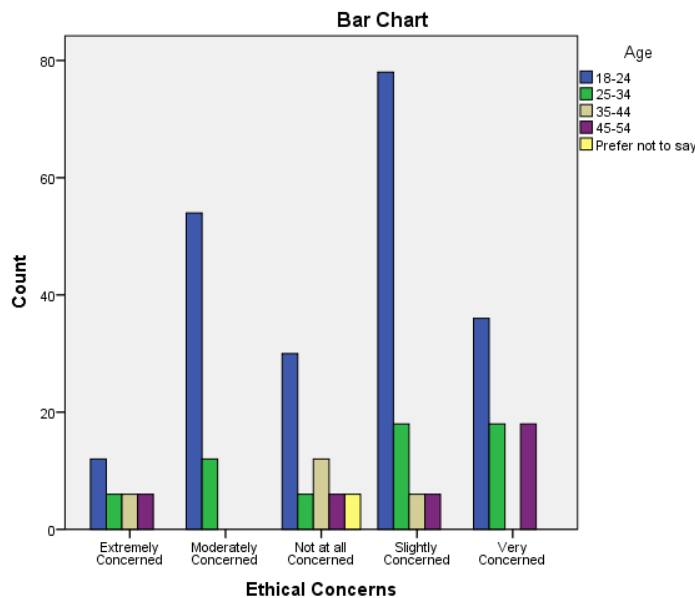


Figure 02: Ethical Concerns \* Age

The age cohort (18-24) inclines to display more ethical concerns. The Chi-Square tests point out that there is a correlation between age and ethical concerns due to AI integration in the Pakistani schools ( $p < .001$ ). Chi-square and likelihood ratio tests both yield a similar result regarding the statistical significance. Looking at the contingency coefficient we can see that there's a moderate connection between age and ethical indiscretions regarding the AI integration and it is deemed to be 0.479.

**H2: Generation Z is more concerned with the implementation or effectiveness of AI related policies at different levels (primary, secondary, higher education).**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	104.387 <sup>a</sup>	12	.000
Likelihood Ratio	119.853	12	.000
N of Valid Cases	336		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is .64.

Table 05: Chi-Square Tests

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.487	.000
N of Valid Cases	336	

Table 06: Symmetric Measures

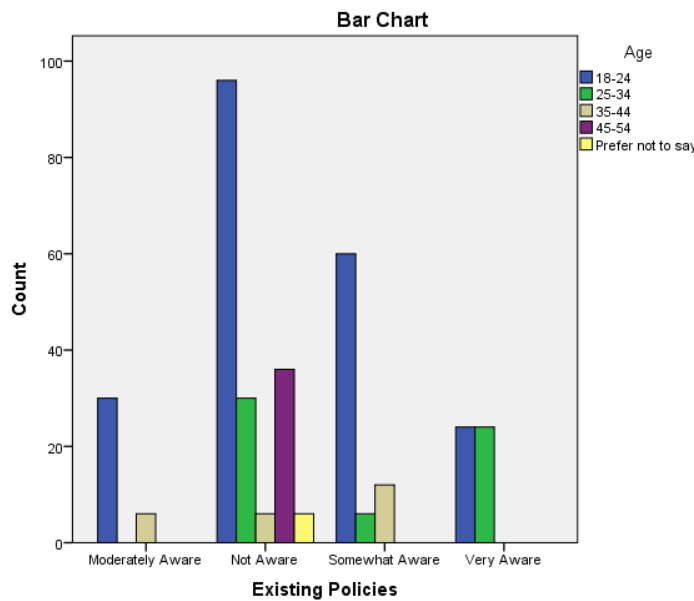


Figure 03: Existing Policies \* Age

Generation Z have shown a relatively higher level of knowledge on the pre-existing policy regulations concerning artificial intelligence in comparison with the other older ages. The chi-square test reveals that there exists a significant association between age and the policy issue knowledge of pre-existing related AI policies across various levels of education ( $p < .001$ ). Besides the Pearson Chi-Square and Likelihood Ratio test, they also give statistical support to the



significance of the research. The contingency coefficient between age and awareness level of AI-related policies is 0.487.

**H3: Generation Z is more concerned with inequalities in access to AI tools across different student levels.**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	97.239 <sup>a</sup>	16	.000
Likelihood Ratio	126.095	16	.000
N of Valid Cases	336		

a. 12 cells (48.0%) have expected count less than 5. The minimum expected count is .21.

Table 07: Chi-Square Tests

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.474	.000
N of Valid Cases	336	

Table 08: Symmetric Measures

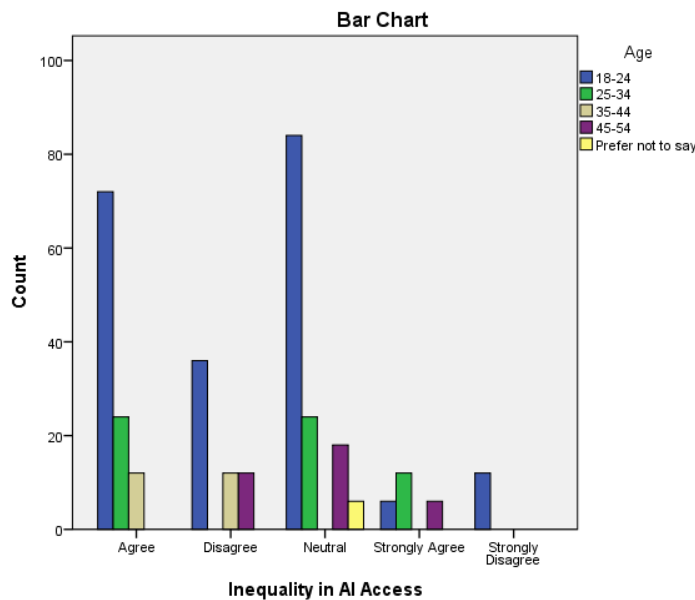


Figure 04: Inequality in AI Access \* Age

Discrepancy in the way the different age groups distributed their answers stands out in terms of the pattern. The chi-square tests analyze the correlation between age and the perception of inequality in utilizing AI technologies. The results also indicate that responders to this question have a correlation with ages ( $p < .001$ ). It may be deduced this intention found expression in how persons of different age groups noticed disparities in the use of AI-assisted devices in Pakistani schools. Demonstration of the expected counts less than 5 of 12 cells may cause doubt in the finding’s interpretation, and overall significance are somehow retained though. The estimated contingency coefficient (0.474) classifies the association between age and perceptions of inequality in AI access as substantial. Altogether, the close significance level ( $p < .001$ ) captures

the idea that age does make a big difference with these views. The answer to the question of whether there is an injustice to AI access as well as the answer to the question of whether younger respondents (18-24 years) are more likely to agree or strongly agree with the statement about inequalities in AI access than older age groups will be based on the response options that the age group chooses. For appealing statement, the proportion of those aged 45 to 54 years old tended to agree or strongly disagree that if they perceive unequal access of AI to different generations.

Having found that age has a close relation with ethical complications due to AI technology penetration into Pakistani classrooms (while the medium strength is to further) we can conclude that there is a support for this hypothesis. Gen Z, which is the youngest age group, (18-24) is overly concerned with the ethical implications of AI integrations (H1). As of the H2, Generation Z is concerned about whether policies concerning AI are successfully implemented at different educational levels including higher ones, this fact proves the greater awareness of the issue among younger people compared to elder representatives of society. Accordingly, based on the above the argument is accepted that gen Z is focused to examine the impact or effectiveness of AI-based policies adopted by the classrooms at different educational levels in Pakistan. Because there are strong and moderate levels of associations between age and the extent of perceptions of inequalities in access to AI tools across different student generations, Generation Z in advance of their older counterparts foremost appears to be craving for the reduction in inequality of AI accessibility among students at varying levels. This logic may also support the statement, which is H3.

<i>Hypothesis</i>	<i>Result</i>
H <sub>1</sub> : Generation Z is more concerned with ethics regarding the AI integration in Pakistani classrooms.	Accepted
H <sub>3</sub> : Generation Z is more concerned with inequalities in access to AI tools across different student levels.	Accepted
H <sub>2</sub> : Generation Z is more concerned with the implementation or effectiveness of AI related policies at different levels (primary, secondary, higher education).	Accepted

Table 09: Result of Hypothesis Analysis

## DISCUSSION

The Gen Z’s approaches towards AI may open fresh perspectives towards this rapidly growing technology especially in the context of a developing country such as Pakistan. Technically there is no assurance that Artificial intelligence matters in the system specifically to the policies for AI which is used in the education sector (Ahmad et al., 2023). This vacancy is on the one hand throwing a snag on the side of teachers, administrators, and policy makers (Alamäki & Marttinen, 2021). On the other hand, one cannot consider the issue of data privacy when there is a lack of some clear rules governing the handling of the students' data as an organization of privacy mechanism is important (Boulay, 2022).

An AI that is moral should be seen as a transparent version of algorithms and decision-making processes in which the government, educationists, tech wizards, and students must be involved (Mahmood et al., 2022). Bimonthly deliberations may result in decisions that are well founded. Hence, creating a set of guidelines which are tailored in the vicinity of Pakistani schools would be vital and the frameworks should bid on data ethics, bias cancellations, and openness (Ahmad et al., 2023). Teachers must be well cognizant of AI's assumptions and its capabilities and its limits. Developing business skills should include AI ethics, fairness, and responsible utilization. The learners are encouraged to know AI changes how they take their classes (Jabar et al., 2023). Therefore, digital literacy courses are a chance for them to learn together and hone their skills to use AI-driven tools effectively (Stahl et al., 2023).

### ***Ethical Concerns in AI Integration (H1)***

This study emphatically supports the hypothesis that morality regarding AI usage at schools (Stahl et al., 2023) in Pakistan provokes interest and concern primarily among Generation Z. Age is the second most significant, only coming behind youth, in the correlation between age and ethics. This reveals the most active engagement of under-aged respondents with ethical problems that the use of AI technology can cause. Being digital natives with such a promising future living amidst the successive technological developments, Generation Z seem to perceive the ethical problems as almost inevitable when integrating AI into teaching processes (Boulay, 2022). Such outcome underscores, among others, the need to incorporate the ethical questions that AI policy and education poses to ensure that AI technology, in which the rising generation can easily accommodate, is used responsibly and ethically.

### ***Policy Effectiveness in AI Integration (H2)***

The data confirms the constancy that generation Z, in their part, is backing the implantation and effectiveness of AI-policies at different educational levels. This notion could be the reason for spiked connection between age and information on current AI-related policies since younger respondents show greater concern and keenness in integrating AI effectively and continuously. This reiterates the need to formulate comprehensive, adaptable policies that enable the structuring of AI technology to fit education development (Chan C. K., 2023; Miao et al., 2021). Gen Z status quo involves policy makers considering the views of Generation Z and demanding their input in the policy-making process (Kamalov et al., 2023). Such an approach will help the policymakers tailor their solutions to the aspirations of learners of the next generation and promote an all-inclusive and more responsive education system.

### ***Inequalities in Access to AI Tools (H3)***

The test results give us a clue that Generation Z has the problem of seeing the difference in AI tool as a significant barrier to education, rather than another tool that can be used to gain knowledge. The remarkable link existing in the relationship between age, and perceptions about the AI access inequalities brings to light Generation Z a higher degree of consciousness for such inequalities in educational opportunities (Stahl et al., 2023). This brings out the essence of the problem and it requires dealing with digital divides and giving equal chances to students who come from different socio-economic classes or levels of education. Only when tackling these

inequalities, the policymakers and educators can design a supporting environment that enables students to fully realize the impact of AI to their incumbent and new careers and hence provide the skills for the forthcoming digital integrated era (Chan C. K., 2023; Miao et al., 2021).

## CONCLUSION

This research sheds light on how Generation Z views the use of AI in schools, in Pakistan, touching on concerns the effectiveness of policies and disparities in AI access. By analyzing data, it shows that Generation Z is worried about the impact of using AI, emphasizes the need for clear educational policies and recognizes inequalities in accessing AI tools among students. These results highlight the significance of involving Generation Z in discussions about integrating AI into education. Policymakers and educators should listen to Generation Z's worries focusing on ethics implementing policies and ensuring access to AI tools.

Creating conversations among Generation Z, policymakers, educators, and stakeholders is essential for navigating the complexities of using AI in classrooms. By using insights from this study stakeholders can maximize the benefits of AI technology while reducing risks and giving educational opportunities to all students. By taking this step, we can create a path, towards a tomorrow where the use of AI in schools in Pakistan boosts students encourages ideas and brings about changes, in society. Through recognizing ethics, policy, and access inequality among the technological tools of Gen Z, stakeholders can then develop more respond and inclusive strategies for AI's implementation in education. Future research, therefore, may hypothesize about the actual ethical dilemmas for Generation Z under human - technology integration and find innovative solutions to promote the use of ethical AI usage in educational settings. Along are longitudinal studies that could be utilized to trace generation Z's views even further on the integration of AI in their education and society. The same outcome is expected to be realized concerning the influence of technology on education and society in general. Based on the results the following suggestions can be expressed with clarity.

- The policymakers should add accountability as an instrument.
- AI tools being tailored to a given community can take the form of their local curricula, languages, and values.
- The provision of AI tools to the end users requires proper addressing of disparities between the channels and other means of getting AI resources.
- The policymakers should make sure that the AI applications will work for all students, even if they come from poor communities or have special educational needs.
- The academia should stake out the solutions concerning AI integration in classrooms with the national context in mind especially about equality and access of use.
- Opening a dialogue between families about AI integration also supports the development of an overall perception and encourages rational application.

## Authors' Contributions

All authors contributed equally. MRK conceptualized the study and wrote the primary content. SMJ assisted in preparing the survey, and in editing, and proofreading. ST and SB assisted in

applying statistical techniques to obtain results. All authors effectively participated in conducting surveys.

### Conflict of Interest

Authors declare that there is no conflict of interest.

### Disclosure

The authors disclose that this study has not been funded by any public or private organization.

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