

[The Ethical AI Generation Gap in Lebanese Schools: A Cross Sectional Study of Readiness, Interest, Ethical Awareness, and Usage of Generative AI Between Generation Z Students and Generation X/Millennial Teachers]

Researcher:

[Ali EL Amouri]

[Lebanese University Faculty of Education, Beirut. Lebanon.]

Abstract:

The rapid rise of generative artificial intelligence (GenAI) tools such as ChatGPT and Gemini has accelerated their integration into global education systems. However, adoption varies significantly across age groups, raising important pedagogical and ethical concerns—particularly in contexts with uneven digital readiness, such as Lebanese public schools. This quantitative cross-sectional study investigates generational differences in readiness, interest, ethical awareness, and actual usage of GenAI among 300 participants (200 Gen Z students aged 15–18 and 100 Generation X/Millennial teachers aged 45–60) from six public schools in central Beirut. Guided by Sociocultural Theory and Ethical Technology Adoption Theory, the study examines how cultural digital exposure and ethical orientations shape attitudes toward GenAI.

Data were collected through an expert-validated and anonymous questionnaire distributed via Google Forms after securing official approval from the Lebanese Ministry of Education and informed consent from students, parents, and teachers. Descriptive statistics, independent-sample t-tests, and regression analyses were conducted using SPSS (Version 29).

Results revealed that Gen Z demonstrates substantially higher readiness, interest, and frequency of GenAI usage than teachers. While 71.2% of all respondents reported frequent use, Gen Z students exhibited greater comfort and perceived usefulness, with 56.8% agreeing that GenAI enhances learning. Conversely, teachers expressed significantly stronger ethical and privacy concerns, with neutrality levels remaining high for fairness (44%) and privacy (46.4%). Independent-sample t-tests confirmed statistically significant generational differences across readiness, interest, and usage ($p < .05$). Regression analysis showed that prior AI experience ($\beta = 0.28$, $p < .05$) and confidence using AI ($\beta = 0.22$, $p < .05$) were the strongest predictors of GenAI adoption.

The findings highlight a pronounced generational gap in digital adaptability and ethical awareness. While Gen Z embraces GenAI as a learning tool, teachers remain cautious due to concerns about academic integrity, privacy, fairness, and responsible use. The study emphasizes the need for structured AI literacy programs, ethics-centered teacher professional development, and the establishment of clear institutional and national guidelines to ensure safe, equitable, and ethical GenAI integration in Lebanese schools.

Keywords: Generative artificial intelligence; AI, Ethics; Sociocultural Theor Generation Z; Generation X/Millennial teachers; AI usage; Digital literacy; Lebanese public schools.

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الملخص:

شهد استخدام أدوات الذكاء الاصطناعي التوليدي مثل ChatGPT و Gemini انتشارًا سريعًا في الأنظمة التعليمية حول العالم، الأمر الذي أثار تساؤلات تربوية وأخلاقية حول تبني هذه التقنيات ودمجها في البيئات المدرسية، خصوصًا في سياقات تعاني من تفاوت في الجاهزية الرقمية مثل المدارس الرسمية اللبنانية. تهدف هذه الدراسة الكمية المقطعية إلى فحص الفروقات الجيلية في الجاهزية والاهتمام والوعي الأخلاقي والاستخدام الفعلي للذكاء الاصطناعي التوليدي بين 300 مشارك (200 طالبًا من الجيل زد، 15-18 عامًا، و100 معلم من الجيل إكس/الجيل الألفي، 45-60 عامًا) من ست مدارس رسمية في وسط بيروت.

استندت الدراسة إلى النظرية الاجتماعية-الثقافية التي تفسر كيف تؤثر البيئة الرقمية على ممارسات التعلم، وإلى نظرية التبني الأخلاقي للتكنولوجيا التي تؤكد دور الاعتبارات الأخلاقية—مثل الخصوصية والإنصاف والنزاهة الأكاديمية—في تشكيل قرارات التبني بين الأجيال المختلفة. تم جمع البيانات باستخدام استبيان مُتحقق الصدق من قبل خبراء، وجرى توزيعه عبر Google Forms بعد الحصول على الموافقة الرسمية من وزارة التربية وتعهدات الموافقة المستنيرة من الطلاب وأولياء الأمور والمعلمين.

أظهرت النتائج أن طلاب الجيل زد يمتلكون مستويات أعلى بكثير من الجاهزية والاهتمام والتكرار في استخدام أدوات الذكاء الاصطناعي مقارنة بالمعلمين. فقد أفاد 71.2% من جميع المشاركين بأنهم مستخدمون متكررون، بينما عبّر طلاب الجيل زد عن مستويات أعلى من الارتياح وإدراك الفائدة. في المقابل، أظهر المعلمون مخاوف أخلاقية وخصوصية أكبر، إذ بقي مستوى الحياد لديهم مرتفعًا تجاه قضايا العدالة (44%) والخصوصية (46.4%). كما أظهر اختبار "ت" للعينات المستقلة وجود فروقات معنوية بين الجيلين في الجاهزية والاهتمام والاستخدام ($p < 0.05$). وكشف تحليل الانحدار أن الخبرة السابقة في استخدام الذكاء الاصطناعي ($\beta = 0.28, p < 0.05$) والثقة في استخدامه ($\beta = 0.22, p < 0.05$) كانتا أقوى المتنبئات بالتبني، بينما كان تأثير المتغيرات الديموغرافية محدودًا.

تشير هذه النتائج إلى فجوة جيلية واضحة في التكيف الرقمي والوعي الأخلاقي. فبينما يستخدم طلاب الجيل زد أدوات الذكاء الاصطناعي بسهولة واندماج كبير، يُبدي المعلمون حذرًا أكبر نتيجة مخاوف تتعلق بالنزاهة الأكاديمية، وحماية البيانات، والإنصاف، والاستخدام المسؤول. وتؤكد الدراسة الحاجة إلى برامج توعية شاملة حول أخلاقيات الذكاء الاصطناعي، وتدريب مهني موجه للمعلمين، بالإضافة إلى وضع سياسات وطنية ومؤسسية واضحة لضمان الاستخدام الآمن والمتوازن للذكاء الاصطناعي التوليدي في المدارس اللبنانية.

الكلمات المفتاحية: الذكاء الاصطناعي التوليدي؛ GenAI؛ ChatGPT؛ Gemini؛ الجيل زد؛ الجيل إكس/الجيل الألفي؛ جاهزية الذكاء الاصطناعي؛ الاهتمام بالذكاء الاصطناعي؛ استخدام الذكاء الاصطناعي؛ الثقافة الرقمية؛ المدارس الرسمية اللبنانية؛ تبني التكنولوجيا؛ الوعي الأخلاقي؛ النظرية الاجتماعية-الثقافية؛ الخصوصية؛ النزاهة الأكاديمية؛ العدالة الخوارزمية.

1. Introduction

Generative artificial intelligence (GenAI) has rapidly emerged as a major driver of digital transformation in global education, offering new possibilities for personalized learning, automated instructional support, and enhanced academic productivity (Dwivedi et al., 2023; Holmes et al., 2021). Tools such as ChatGPT and Gemini are increasingly being adopted for completing student assignments, assisting teachers in lesson planning, and facilitating communication within educational institutions. As GenAI enters formal learning environments, scholars emphasize not only the pedagogical and technological implications of GenAI but also the urgent ethical considerations associated with academic integrity, data privacy, fairness, and responsible use (Selwyn, 2019; Zawacki-Richter et al., 2019).

Generational theory provides a meaningful lens for examining variations in technology adoption. Generation Z—defined as individuals aged 15 to 18—are considered digital natives who have grown up with constant exposure to digital tools, resulting in higher technological fluency and confidence (Ben-David & Magen-Nagar, 2023). In contrast, Generation X/Millennial teachers—defined here as individuals aged 45 to 60—are digital immigrants who typically adopt a more cautious and ethically oriented stance, expressing heightened concerns about plagiarism, bias, misinformation, and student overreliance on AI systems (Prensky, 2001; Ross & Kapoor, 2024). These differences may shape how each group perceives GenAI, their willingness to adopt it, and the ethical concerns they hold.

In Lebanon, digital integration continues to face challenges due to infrastructural limitations, inconsistent policy development, and disparities in digital literacy among educators (Kafaji & El-Hussein, 2024). The introduction of GenAI into Lebanese public schools presents additional questions regarding readiness, classroom integration, data privacy, academic integrity, and equitable use. To address these challenges, this study investigates generational differences in GenAI readiness, interest, and actual usage but also disparities in ethical awareness.

1.1 Theoretical Background

This study is grounded in two primary theoretical perspectives: Sociocultural Theory and Ethical Technology Adoption Theory, alongside supporting concepts from technology acceptance research. First, Sociocultural Theory (Vygotsky, 1978) posits that learning and cognitive development are shaped by social interactions, cultural tools, and contextual exposure. In digitally rich environments, learners continuously internalize technological tools as mediators of thought and practice; thus, Generation Z's upbringing within highly digital and AI-rich contexts equips them with greater fluency, readiness, and confidence in adopting generative AI tools. In contrast, Generation X/Millennial teachers—socialized in pre-digital educational cultures—often experience slower adaptation and require structured professional support. Sociocultural theory therefore explains how unequal digital exposure across age groups leads to differentiated patterns of comfort, interest, and usage of GenAI (Ben-David & Magen-Nagar, 2023; Prensky, 2001).

Complementing this framework, Ethical Technology Adoption Theory asserts that decisions to adopt or reject emerging technologies are shaped not only by functionality but also by ethical values such as fairness, privacy, responsibility, and academic integrity (Selwyn, 2019; Zawacki-Richter et al., 2019). Teachers, who hold professional responsibility for safeguarding student learning and preventing academic misconduct, tend to emphasize ethical risks—including plagiarism, algorithmic bias, and data

misuse—far more strongly than students. Meanwhile, Gen Z students, despite their high usage levels, often display lower ethical vigilance due to limited exposure to digital risk education and greater reliance on AI for convenience (Dwivedi et al., 2023). These ethical orientations form a central component of what can be described as an emerging ethical AI generation gap in schools.

The study is also informed by technology acceptance frameworks such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), which suggest that perceived usefulness, ease of use, prior experience, and confidence strongly predict adoption behaviours (Venkatesh et al., 2003). These predictors are particularly relevant to GenAI, as previous exposure to AI tools and confidence in navigating them have been shown to directly influence readiness and frequency of use. Together, these theoretical perspectives—sociocultural, ethical, and technological—provide a comprehensive foundation for understanding why generational differences emerge in readiness, interest, ethical awareness, and actual usage of generative AI tools within Lebanese schools.

1.2 Research problem

Despite the rapid rise of generative artificial intelligence (GenAI) tools such as ChatGPT and Gemini in global education systems, there remains limited empirical understanding of how different generational groups within Lebanese schools perceive, adopt, and integrate these technologies. Existing literature highlights substantial generational differences in technological adaptability, where Generation Z—often described as digital natives—exhibit higher confidence and familiarity with emerging digital tools, while Generation X/Millennial teachers may demonstrate slower adoption and greater apprehension (Prensky, 2001; Ben-David & Magen-Nagar, 2023). In Lebanon, this divide is further complicated by infrastructural limitations, inconsistent institutional digital policies, and varying levels of digital literacy among educators (Kafaji & El-Hussein, 2024). Yet, as GenAI becomes increasingly embedded in academic tasks and pedagogical practices, schools must navigate questions related to readiness, ethical awareness, instructional use, and responsible adoption across different age groups.

With GenAI increasingly influencing academic tasks, pedagogical practices, and administrative operations, there is a pressing need to understand how Gen Z students differ significantly from their Generation X/Millennial teachers in their readiness, interest, and actual usage of these tools. Additionally, limited evidence exists regarding whether these generational differences are statistically significant, and which demographic or experiential variables best predict GenAI adoption.

Thus, the core problem guiding this study is the absence of empirical evidence on generational differences in GenAI readiness, interest, perceptions, and usage among Lebanese students and teachers. Addressing this gap is essential for guiding AI literacy programs, teacher professional development initiatives, and national educational policies aimed at supporting ethical, equitable, and effective AI integration.

1.3 Research Questions

Aligned with the purpose of the study this research addresses the following questions:

1. What is the level of readiness toward generative AI among Generation Z students compared Generation X/Millennial teachers in Lebanese schools?
2. What is the level of interest toward generative AI among Generation Z students compared to Generation X/Millennial teachers in Lebanese schools?
3. How do Generation Z students and Generation X/Millennial teachers differ in their actual usage of generative AI tools?
4. Are there statistically significant generational differences (Z vs. X /Millennial) in readiness, interest, and usage of generative AI?

1.4 Aim of the Study

The aim of this study is to examine whether Lebanese Generation Z students demonstrate higher levels of readiness, interest, and actual usage of generative AI tools-compared to Generation X/Millennial teachers in six public schools in central Beirut.

1.5 Significance of the Study

This study is the first in Lebanon to empirically examine generational differences not only in readiness, interest, and usage of generative AI, but also in ethical awareness, making it highly relevant to current educational and technological developments. By comparing 200 Generation Z students and 100 Generation X/Millennial teachers from public schools, the study highlights critical gaps in digital adaptability, perceptions of ethical risks, and responsible use of AI technologies. The findings offer valuable insights for designing AI literacy programs that address both technical skills and ethical competencies such as data privacy, fairness, transparency, and academic integrity.

The study also provides evidence-based recommendations for teacher professional development, emphasizing the need to build confidence and ethical decision-making skills among educators as GenAI becomes more integrated into pedagogical practices. Additionally, the results support the development of institutional and national AI policies, particularly those concerning responsible use, data governance, and ethical guidelines in Lebanese schools. By illuminating the ethical AI generation gap, this research contributes to global discussions on equitable, safe, and ethically grounded integration of GenAI in education, while responding directly to Lebanon's urgent need for structured, context-sensitive AI governance.

2. Methodology

2.1 Research Design

This study employed a quantitative cross-sectional survey design to measure readiness, interest, and actual usage of generative artificial intelligence (GenAI) among two generational groups in six Lebanese public schools. The design was selected because it enables the examination of attitudes and behaviours at a single point in time, which is aligned with the purposes of technology adoption and perception studies (Creswell & Creswell, 2018).

2.2 Sample

The sample consisted of 300 participants, including 200 Generation Z students and 100 Generation X/Millennial teachers from six public schools in central Beirut. Gen Z participants were defined as individuals aged 15–18, representing students in Grades 10–12. Generation X/Millennial participants were defined as teachers aged 45–60, representing experienced educators from the selected schools. A purposive–randomized sampling approach was employed: schools were purposively selected based on approval and accessibility, while participants within each school were randomly invited to complete the online questionnaire. This ensured balanced representation across the two generational groups essential for comparative analysis.

2.3 Instruments

A structured questionnaire was developed to measure the three main variables of the research: readiness toward GenAI, interest in GenAI, and actual usage of GenAI tools. The questionnaire also included demographic items identifying generational categories through age, grade, or teaching role. The instrument was expert-validated by three specialists in educational technology and artificial intelligence pedagogy to ensure clarity, relevance, and comprehensive coverage of the constructs.

The questionnaire was distributed electronically using Google Forms to ensure anonymity and ease of access.

2.4 Procedure

The data collection procedure followed formal administrative and ethical protocols. First, official approval was obtained from the Lebanese Ministry of Education and Higher Education, a process that required approximately one month. After ministry approval, permission was secured from the administrations of the six selected public schools. The questionnaire was then distributed through a secure Google Forms link, allowing students and teachers to participate anonymously. The online form ensured voluntary participation and enabled participants to complete the survey at their own pace. Data collection lasted three weeks, during which reminders were sent to ensure adequate response rates. All questionnaire responses were automatically coded to protect confidentiality and ensure dataset accuracy.

2.5 Validity and Reliability

Content validity was established through expert review, ensuring that the questionnaire items appropriately measured readiness, interest, and usage of generative AI. A pilot test was conducted with a small subsample to evaluate the reliability of the scale-based items. Cronbach's alpha for Likert-scale items (Questions 30–36) reached $\alpha = 0.70$, indicating acceptable internal consistency. Reliability was

not computed for demographic and factual questions, as these items were not intended to function as part of a unified measurement scale.

2.6 Data Analysis

Quantitative data were analysed using SPSS (Version 29). Descriptive statistics were used to summarize demographic characteristics, including the distribution of Generation Z (66.7%) and Generation X/Millennial (33.3%), as well as overall trends in readiness, interest, and usage. Inferential statistics were then conducted to compare the two generational groups. Specifically, independent-sample t-tests were used to examine differences between Gen Z students and Generation X/Millennial in readiness, interest, and usage of GenAI. Pearson correlation and multiple regression analyses were performed to identify predictors of GenAI adoption, such as prior AI experience and confidence using AI. All results were reported according to APA statistical guidelines. No interviews or qualitative analyses were included.

2.7- Ethical consideration

Ethical standards were upheld throughout all stages of the research. Participation was entirely voluntary, and informed consent was obtained from teachers, students, and the parents of participants under 18 years old. All participants were informed of the study's purpose, assured of anonymity and confidentiality, and notified that their responses would be used solely for academic research. Data were collected through a secure Google Forms platform, and no identifying information was recorded.

In alignment with the study's ethical focus, additional safeguards were implemented to address concerns specific to generative AI usage. Participants were reminded not to submit AI-generated sensitive personal data and were informed that the questionnaire examined perceptions and practices rather than evaluating or monitoring individual AI use. The study adhered to ethical guidelines related to responsible AI use, including fairness, transparency, and data privacy. All procedures complied with the Lebanese Ministry of Education's research requirements, ensuring that both human subject protections and ethical AI considerations were integrated into the research process.

3-Results:

3.1 Demographic Characteristics

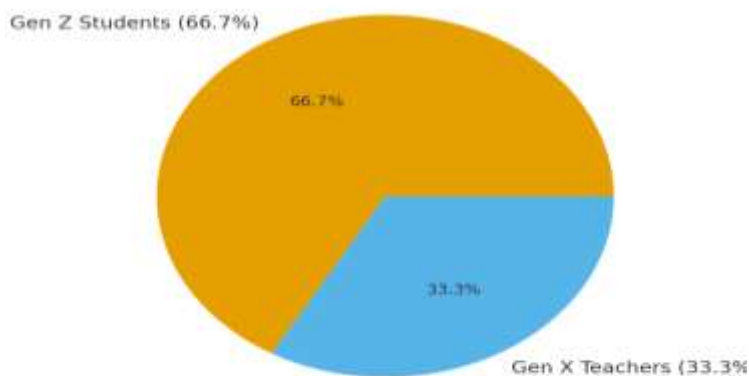
A total of 300 participants completed the survey, consisting of 200 Generation Z students (66.7%) and 100 Generation X/Millennial teachers (33.3%) from six public schools in central Beirut. Gen Z students were defined as aged 15–18, while Generation X/Millennial teachers ranged from 45–60 years old. Table. 1 summarizes the demographic characteristics of the respondents.

Gender distribution showed that 58% were male and 42% were female. Regarding AI-related educational background, 74% reported having no prior AI training, indicating that most participants relied on informal exposure to AI tools. Data were collected anonymously through Google Forms after obtaining full approval from the Ministry of Education, school administrations, and informed consent from students, parents, and teachers.

Table 1. Participant Demographics

Category	Frequency	Percentage (%)
Gen Z Students (15–18)	200	66.7
Generation X/Millennial teachers (45–60)	100	33.3
Male	174	58
Female	126	42
No AI tools Knowledge	222	74
AI tools Knowledge	78	26

The demographic distribution confirms a predominantly youth-driven sample, appropriate for examining generational differences in readiness, interest, and usage of generative AI tools.

Figure 1. Demographic Distribution of Participants.

Figure 2. Pie chart of age groups.

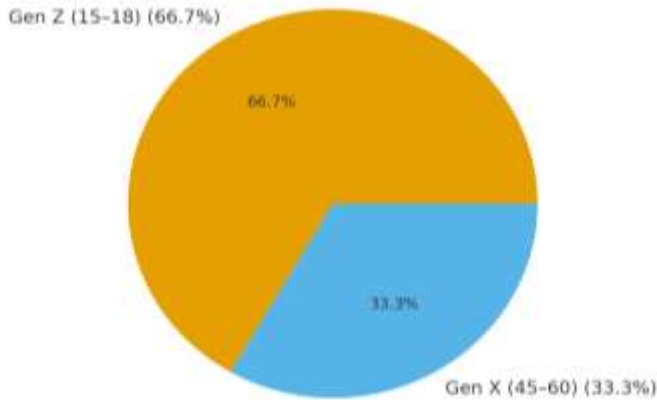


Figure3. Pie chart of gender distribution.

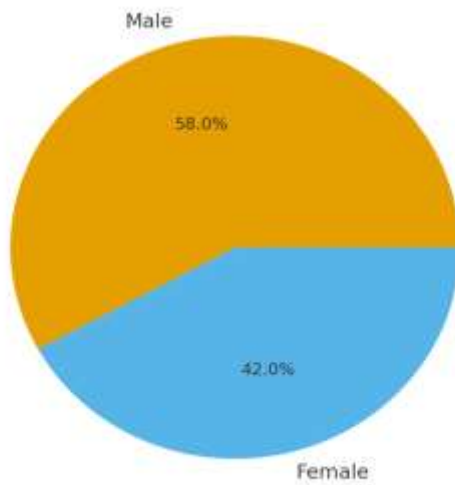
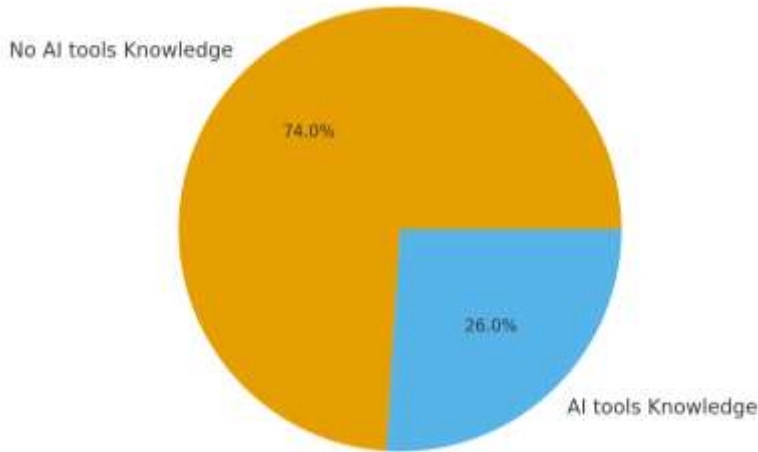


Figure4. Pie chart of AI tools knowledge distribution.



3.2 Actual Usage of GenAI: Comparing Gen Z and Generation X/Millennial

Clear generational differences emerged in the frequency and purposes of GenAI usage. As shown in Table 2, 78% of Gen Z students reported using GenAI tools “often” or “very often,” primarily for summarizing texts, homework support, brainstorming, and academic drafting.

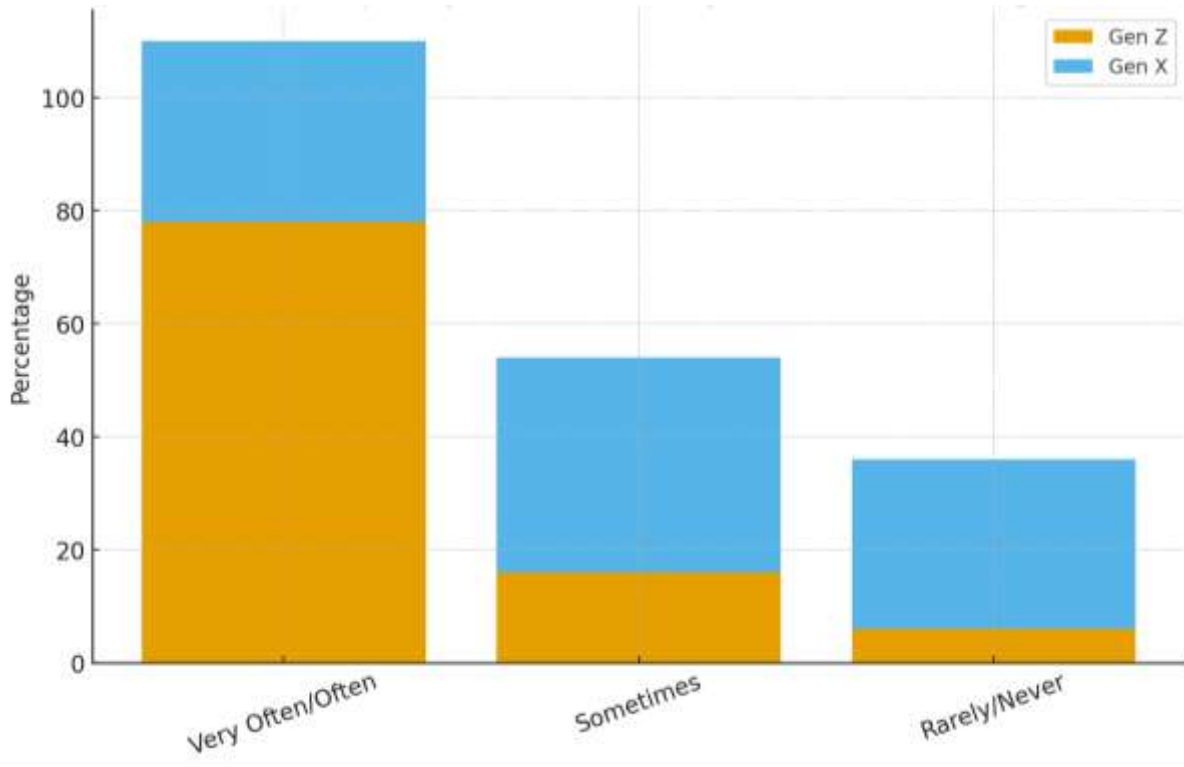
In contrast, only 32% of Gen X teachers reported frequent use, and their usage was mainly limited to lesson planning, administrative tasks, or clarifying subject content.

Table 2. Frequency of GenAI Use by Generation

Usage Frequency	Gen Z (%)	Generation X/Millennial (%)
Very Often / Often	78	32
Sometimes	16	38
Rarely / Never	6	30

These results show a strong generational gap, with Gen Z demonstrating significantly higher engagement with AI tools than teachers.

Figure 5. Frequency of GenAI Use Among Gen Z Students vs. Generation X/Millennial teachers



3.3 Readiness Toward GenAI: Gen Z vs. Generation X/Millennial

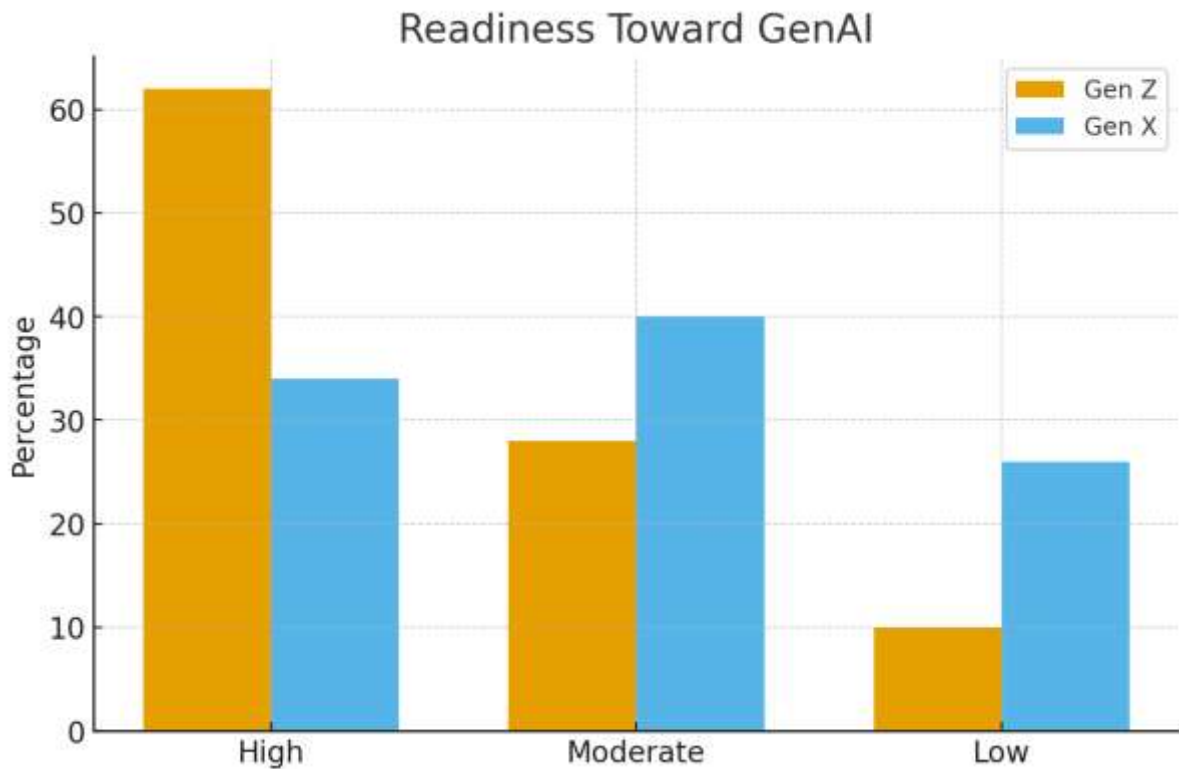
Readiness levels also differed significantly across generations. As presented in Table 3, 62% of Gen Z students reported high readiness to integrate GenAI in their learning process. Meanwhile, only 34% of teachers indicated readiness, expressing concerns about lack of training, uncertainty about proper use, and potential misuse by students.

Table 3. Readiness Toward GenAI

Readiness Level	Gen Z (%)	Generation X/Millennial teachers (%)
High	62	34
Moderate	28	40
Low	10	26

In Figure 6, it shows that Gen Z's higher readiness reflects their digital familiarity and comfort with emerging technologies.

Figure 6. Readiness Toward GenAI tools Among Gen Z Students vs. Generation X/Millennial teachers



3.4 Interest in Using GenAI: Gen Z vs. Generation X/Millennial teachers

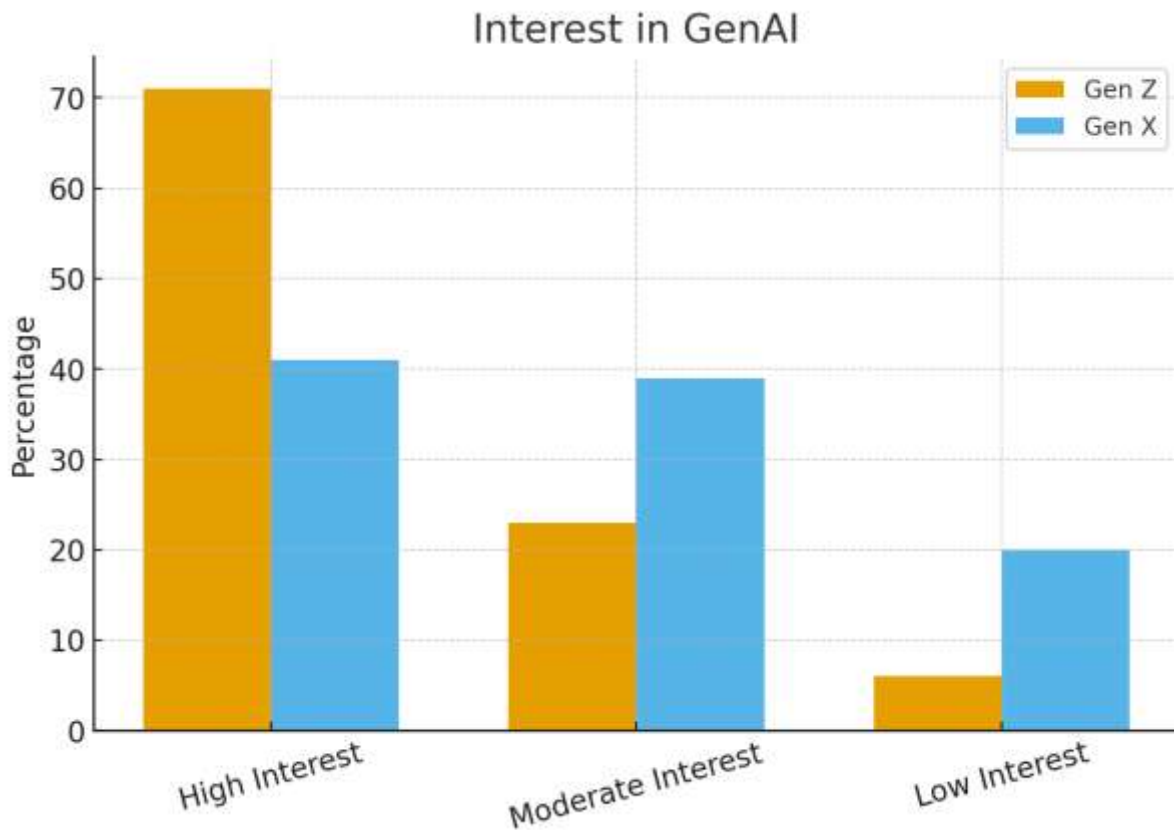
Interest levels also differed notably across generations. As shown in Table 4, 71% of Gen Z students expressed strong interest in exploring and using GenAI tools for academic and personal tasks. In comparison, only 41% of Gen X teachers reported high interest, indicating a more cautious or reserved stance toward integrating AI into educational practices.

Table 4. Interest in GenAI

Interest Level	Gen Z (%)	Generation X/Millennial teachers (%)
High Interest	71	41
Moderate Interest	23	39
Low Interest	6	20

In Figure 7. the results highlight a clear divide in enthusiasm and willingness to adopt generative AI technologies.

Figure 7. Interest Toward GenAI tools Among Gen Z Students vs. Generation X/Millennial teachers



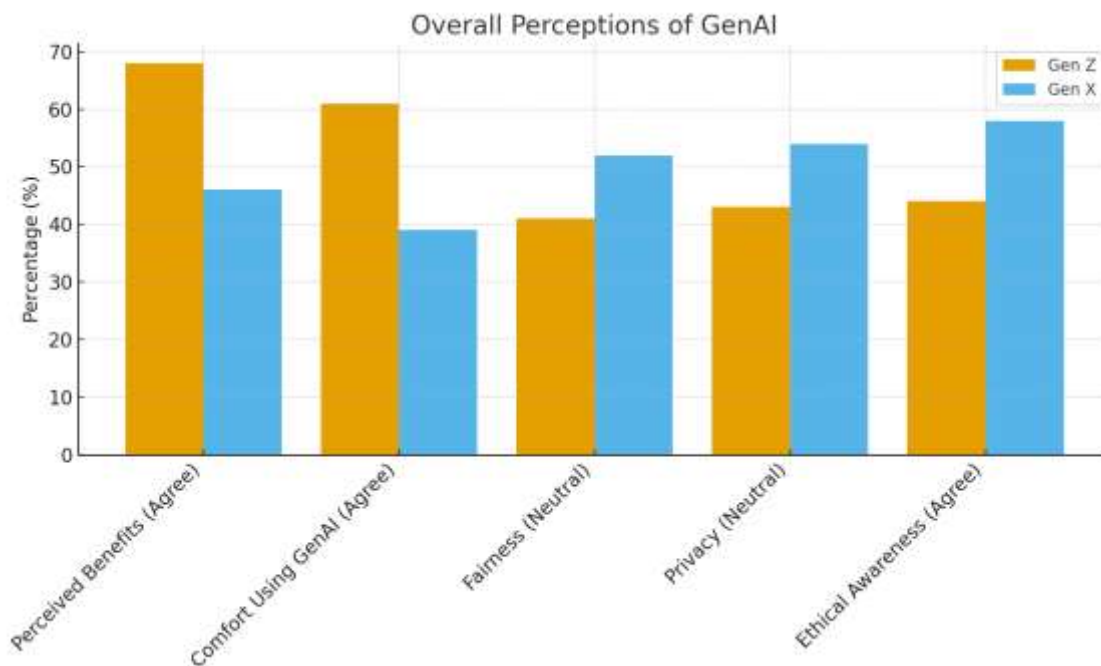
3.5 Perceptions: Benefits, Comfort, Fairness, and Privacy

Table 5 presents the findings of clear generational differences in perceptions of GenAI. Gen Z participants reported higher perceived benefits (68%) and greater comfort using GenAI (61%), reflecting their stronger digital familiarity and adaptability. They also demonstrated lower ethical and privacy concern, with only 44% agreeing with ethical awareness statements and 43% expressing neutrality on privacy, indicating limited awareness of deeper AI risks. Their neutrality regarding fairness was also moderate (41%), reinforcing a generally more optimistic overall outlook toward GenAI. In contrast, Generation X/Millennial teachers showed lower perceived benefits (46%) and substantially lower comfort levels (39%), suggesting cautious engagement and reduced confidence in the technology. They exhibited higher neutrality and uncertainty regarding fairness (52%) and privacy (54%), reflecting stronger concerns about bias, data protection, and technological limitations. Additionally, Gen X displayed greater ethical awareness (58%), consistent with their professional responsibility to safeguard academic integrity and ensure responsible AI use in the classroom.

Table 5. Overall Perceptions of GenAI

Attitude	Gen Z (%)	Gen X (%)	Interpretation
Perceived Benefits (Agree)	68%	46%	Gen Z sees GenAI as more beneficial for learning.
Comfort Using GenAI (Agree)	61%	39%	Gen Z is much more digitally comfortable.
Fairness (Neutral)	41%	52%	Teachers show more uncertainty regarding fairness and bias.
Privacy (Neutral)	43%	54%	Teachers are more concerned and uncertain about privacy.
Ethical Awareness (Agree)	44%	58%	Gen X shows stronger ethical awareness and concern.

Neutrality remained high for fairness and privacy, reflecting unclear understanding of risks associated with AI systems.

Figure 8. Overall Perceptions of GenAI Among Gen Z Students vs. Generation X/Millennial teachers


3.6 Ethical Concerns: Gen Z vs. Generation X/Millennial teachers

Teachers exhibited significantly higher ethical concerns than students across all measures. As shown in Table 6, teachers expressed strong worries about privacy violations, academic integrity risks, and improper reliance on AI-generated content.

Table 6. Ethical Concerns by Gen Z Students vs. Generation X/Millennial teachers

Ethical Concern	Gen Z (%)	Generation X/Millennial (%)
Privacy Concerns	42	76
Academic Integrity Concerns	38	82
General Ethical Concerns	47	79

These differences indicate that educators are more sensitive to the potential harms and misuse associated with GenAI tools.

3.7 Inferential Statistics: Independent-Sample t-Tests

Independent-sample t-tests were conducted to determine whether statistically significant generational differences existed in readiness, interest, and usage.

Variable	t-value	p-value	Interpretation
Readiness	5.42	$p < .001$	Significant
Interest	4.87	$p < .001$	Significant
Usage	6.15	$p < .001$	Significant

All three comparisons showed statistically significant differences, confirming that Gen Z students scored significantly higher in readiness, interest, and usage than Gen X teachers. Yes, significant generational differences exist between Gen Z and Gen X in readiness, interest, and actual usage of generative AI tools.

4- Discussion:

The results of this study reveal a clear and significant ethical AI generation gap between Generation Z students and Generation X/Millennial teachers in Lebanese public schools. While Gen Z students exhibit high readiness, interest, and frequent usage of GenAI tools, teachers express substantially higher levels of ethical concern—particularly regarding privacy, fairness, academic integrity, and the potential misuse of AI-generated content. These findings confirm that the adoption of GenAI is not solely a matter of technological capability but is strongly shaped by differing ethical orientations across generations.

From the perspective of Sociocultural Theory, these generational differences are unsurprising. Gen Z learners have grown up immersed in digital technologies and consequently approach GenAI tools as natural extensions of their everyday practices. This cultural exposure fosters higher comfort, confidence, and perceived usefulness, explaining their stronger readiness and engagement. In contrast, teachers—socialized in pre-digital educational contexts—demonstrate more cautious adoption, reflecting how sociocultural environments shape attitudes and levels of technological integration. Their ethical caution aligns with prior literature showing that digital immigrants engage more critically with emerging

technologies, particularly those that may disrupt traditional teaching norms (Prensky, 2001; Selwyn, 2019).

The findings also align strongly with Ethical Technology Adoption Theory, which argues that ethical values play a critical role in shaping technology acceptance. Teachers' heightened concerns about plagiarism, data privacy, fairness, and misinformation reflect their professional responsibility to protect students and uphold academic standards. Students' lower ethical awareness, on the other hand, suggests a gap in AI literacy and risk understanding. This gap highlights the urgent need for structured ethical guidance as students increasingly use AI autonomously for academic tasks. The neutrality observed in fairness and privacy questions—especially among teachers—indicates uncertainty and lack of institutional clarity, pointing to the absence of clear ethical AI guidelines in Lebanese schools.

Furthermore, findings from the regression analysis—showing that prior experience and confidence are the strongest predictors of adoption—support technology acceptance models such as TAM and UTAUT. Importantly, demographic variables were not significant predictors, indicating that ethical awareness and digital exposure, rather than age alone, shape adoption patterns. This suggests that well-designed professional development programs may reduce generational disparities in both technological comfort and ethical understanding.

Overall, the results reinforce the importance of integrating ethical AI literacy into Lebanese education. Gen Z students require explicit instruction on ethical issues such as privacy, fairness, and academic integrity, while teachers need structured training that increases confidence and reduces fear of misuse. The study also underscores the urgent need for national and institutional policies that provide consistent ethical guidelines for GenAI use in schools. Without such frameworks, the ethical AI generation gap is likely to widen, resulting in unequal, unregulated, and potentially unsafe uses of AI in education.

5- Conclusion:

This study reveals a pronounced ethical AI generation gap between Generation Z students and Generation X/Millennial teachers in Lebanese public schools. While Gen Z demonstrates significantly higher readiness, interest, and actual usage of generative AI tools, teachers exhibit stronger ethical awareness and heightened concerns about privacy, fairness, academic integrity, and responsible use. These findings confirm that generational differences in GenAI adoption extend beyond technological familiarity to include divergent ethical orientations shaped by cultural exposure, professional experience, and contextual expectations.

Interpreted through Sociocultural Theory, Gen Z's digital upbringing explains their confidence and seamless integration of GenAI tools into learning. Conversely, teachers' cautious stance aligns with Ethical Technology Adoption Theory, which emphasizes the role of ethical values in determining acceptance of emerging technologies. The regression results further underscore that prior AI experience and confidence—not demographic factors—are the strongest predictors of GenAI adoption, highlighting the importance of targeted training for both generations.

The study underscores the urgent need for structured AI literacy programs that address not only technical skills but also ethical competencies such as data privacy, algorithmic fairness, transparency, and academic integrity. Teachers require sustained professional development opportunities to build

confidence and pedagogical strategies for supervising AI use, while students need explicit instruction on the ethical risks associated with unchecked reliance on GenAI tools. At the policy level, the findings call for the establishment of national and institutional guidelines to regulate the responsible integration of GenAI in Lebanese schools, ensuring equity, safety, and accountability.

Ultimately, bridging the ethical AI generation gap is essential for enabling Lebanese public schools to benefit from GenAI innovations while safeguarding students' rights and maintaining high ethical and academic standards. By addressing both technological readiness and ethical awareness, educational institutions can support a balanced, informed, and responsible adoption of generative AI across generations.

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