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GAI FOR THE CLASSROOM: UNDERSTANDING TEACHER AND TEEN PERSPECTIVES ON GENERATIVE AI INTEGRATION THROUGH FOCUS GROUP INSIGHTS

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Abstract

The rapid adoption of tools powered by generative artificial intelligence (GAI) in education necessitates research to understand use and perceptions among key stakeholders. We conducted 14 focus groups with teachers and teens across the United States to explore their experiences with GAI and to inform the design of GAI tools for educational contexts. Our findings indicate that participants share similar perceptions and moral frameworks regarding the use of GAI in education; however, fragmented institutional guidance leads teachers to adopt independent policies and teens to use GAI within unclear boundaries for what is allowed and what is prohibited. These findings reveal the need for clear policies and AI education programs, which we discuss, as well as implications for the design of future GAI-powered EdTech. This work contributes to the AIED community by providing insights into how teens and teachers in the United States interact with GAI systems within academic contexts and implications for the design and implementation of GAI tools in the classroom.

Keywords: Technology Enhanced Learning, K-12 Education, Generative Artificial Intelligence, Policy.

1 INTRODUCTION

The rapid adoption of generative artificial intelligence (GAI) tools is profoundly influencing education as it becomes embedded into everyday technologies used in classrooms and homes in high-income and industrialized countries. GAI systems, such as ChatGPT and Gemini, can rapidly produce novel content that can be supportive of education and make teaching and learning more efficient, but also often contain errors and perpetuate biases and discrimination [1], [2]. Thus, discussions on how to implement responsible and ethical use of these tools are ongoing. Moreover, there is also considerable variation in educators' degree of understanding how to use and teach AI [3], [4] and inconsistency in school policies that could guide equitable, ethical, and responsible implementations of AI. At the same time, widespread concerns persist regarding technology's impact on youth [5], and insight into educators' perspectives on guiding teen engagement with these tools remains limited. There is a pressing need not only to better understand teens' and teachers' perceptions of these systems, but also how they actually use and integrate them into their academic lives.

In this work, we examine teachers' and teens' reported use of general-purpose (e.g., ChatGPT, Claude.AI, Snapchat AI, etc.) and specialized (e.g., MagicSchool, Khanmigo, etc.) GAI-powered tools and how they navigate their integration in education. We describe the results of an analysis of concerns from teens and teachers to answer the following research questions: 1) How do teachers and teens use and manage GAI tools in and beyond the classroom? 2) What factors influence the integration of GAI tools in education from the perspectives of teachers and teens?

We conducted focus groups with 48 participants (Teachers=31; Teens=17) in the U.S., through teachers-only ($n=8$) and teens-only ($n=6$) sessions to address these research questions. Our findings revealed that due to limited institutional support and governance for GAI integration, teachers and teens create independent policies and moral frameworks that, on the surface, are in conflict. However, these piecemeal decisions are rooted in similar needs for AI literacy education and shared goals and boundaries for GAI use. Both groups value principles like ownership and critical thinking, while acknowledging the ways in which GAI augments their academic practices. Based on these findings, we discuss the need for clear policies and AI literacy education to support AI integration in learning and provide recommendations for the design of future GAI-powered educational technology. Our contributions are two-fold: 1) we provide a parallel account of teachers' and teens' perspectives using

general-purpose and specialized GAI tools, comparing how their usage and perspectives align and differ, and 2) we contribute four actionable implications for future educational GAI systems: process-oriented GAI for critical thinking, real-time authorship tracking to support students' ownership, unified learning support with GAI, and standardized frameworks for the responsible use of GAI.

2 RELATED WORK

With the rapid advancement of LLMs, particularly GAI technology, these technologies have become a central focus in Human Computer Interaction (HCI) and EdTech research [6]. Research has examined both general-purpose systems (e.g., ChatGPT) and specialized tools (e.g., Khanmigo, MagicSchool) to support education [7], [8], [9], highlighting their potential to support teaching and learning. For teachers, GAI tools can streamline workflows by providing scaffolding for content generation; however, existing systems lack detailed feedback, meaningful support for lesson plan modification, and adequate training materials for long-term integration [7], [10]. Students, in turn, value GAI for its capacity to improve comprehension and provide immediate feedback, but surface challenges related to navigating the user interface, self-efficacy [9], and ethical and cultural pedagogy [8].

As the importance of studying K-12 stakeholders' understanding of GAI has gained attention, research has explored how teachers and students perceive GAI. Survey-based research suggests that teachers generally hold positive perceptions of GAI tools and are likely to integrate AI into their teaching [11]. At the same time, students' perspectives are more nuanced, in which students view GAI tools as learning partners and tutors, yet raise concerns about their mathematical accuracy, highlighting issues of trust, accuracy, bias, and misinformation [12], [13]. Notably, students also proposed policy considerations such as restricting teacher use in cases of low AI literacy and requiring parental consent before drafting students into using GAI tools to increase transparency and awareness of potential risks [13].

Collectively, this body of work suggests an interest in integrating GAI into classrooms but highlights the need for additional support. Extending this growing body of research on GAI, our work seeks to provide a holistic understanding of current and evolving attitudes by investigating teachers' and students' perspectives in parallel.

3 METHODOLOGY

We conducted focus group discussions with teachers and teens to explore their understanding and use of GAI. This study was approved by the Institutional Review Board at the University of California, Irvine, NORC at the University of Chicago, and Foundry10.

3.1 Participants

We recruited 31 K-12 teachers and 17 teens aged 13-17 to participate in the focus groups. Participants provided informed consent or assent before joining the focus group. Additionally, their parents also provided informed consent for their child to participate in the study. Teachers represented all grade levels from kindergarten to 12th grade with 1.5 to 31 years of experience, teaching diverse subjects including language, arts, sciences, technology, and specialized programs (e.g., special education, AP courses). Due to the data protection policy of the research panel, only limited information about the teen participants was collected.

3.2 Data Collection and Analysis

We designed a set of semi-structured questions to investigate the attitudes, views, and experiences of K-12 teachers and teenagers regarding GAI usage. Topics included their initial impressions of GAI, how they define it, whether they currently use GAI technologies, and, if so, which tools they use and why. We also explored their views on the role of AI in education and their expectations or hopes for the future of AI. Each focus group session lasted approximately 90 minutes and was moderated by two researchers. The researchers aimed for balanced participation, preventing dominance by any one individual and encouraging quieter participants to share. To reduce power dynamics between adults and adolescents, teachers and teens were not assigned to the same groups.

Focus group sessions were audio-recorded, transcribed, and analyzed using Rapid Qualitative Inquiry (RQI) [14]. The researchers developed a standardized RQI table aligned with the questions, and each session transcript was assigned to a researcher to extract relevant quotes, key points, and preliminary interpretations. Once all RQI tables were completed, we synthesized findings to generate themes

regarding teachers' and teens' perspectives on GAI. Three researchers met regularly to discuss themes, reconcile interpretive differences, and ensure no single researcher's perspective dominated the analysis. Through this iterative process, the RQI tables served as a shared analytic scaffold, tracking insights systematically while remaining open to emergent issues. This resulted in the final themes on stakeholder usage behaviors, concerns, and barriers to GAI integration.

4 RESULTS

4.1 Teachers' Perspectives of GAI

4.1.1 Teachers' Use of GAI as Administrative Assistants

Teachers described using GAI tools, such as ChatGPT, Claude.ai, and MagicSchool, mainly as a starting point for creating lesson plans, curriculum outlines, assignment prompts, or drafting emails and other documents for administrative tasks. Notably, we did not observe evidence in our data of teachers employing GAI to develop large projects or select units to study, which might be considered more advanced work, but they did report using it to align their teaching with predefined government-mandated standards and their pedagogical choices. For example, one teacher shared how she uses AI to match her teaching content with her state's standards, stating, "A lot of times you can upload the standards into the AI, and then you can upload anything else you want... [and] it matches it to the standard" (Savannah, Teacher, FG1). However, some teachers viewed the use of GAI by educators as inappropriate. This is illustrated by Laney (Teacher, FG8) when discussing grading students' work, who said, "There have been a couple of recommendations for how you could use AI to grade. I have not sought those services because... I don't feel like it would be professional for me to relinquish that because it's my job to give the feedback to my students." These views highlight the tensions between teachers' desire to save time and their concerns that the tools could make errors and that relying on them might be shirking their responsibilities as educators. While such tools can automate tasks, these teachers stress the importance of assessing student work and providing meaningful feedback.

4.1.2 Concerns About Critical Thinking and Student Competency

Teachers shared experiences and concerns about students submitting assignments using GAI tools. Teachers' perspectives ranged from uncertainty about whether students were actually learning to deeply held beliefs about what GAI use behaviors are disallowed to what teachers might have to do in the future in response to such behaviors. For example, one teacher voiced her concern, stating, "*You don't really know if it's the student actually conveying stuff, or is it because they got the response back and they copy and paste*" (Jerrica, Teacher, FG2). These remarks underscore a broader issue: students' ability to demonstrate competence in the subject matter and in the communication mechanism (e.g., essay writing) rather than relying on content generated by AI models. Thus, when students turn to GAI systems to complete their work more quickly and reduce mental effort [15], they may forfeit the ability to develop and master specific skills that their assignments are meant to cultivate. In response, teachers have found ways to adapt assignments to account for the possibility of GAI use rather than forbid it by establishing guidelines for GAI use, but even these efforts have their limitations when approaches to integrating these tools in classrooms are dispersed.

4.1.3 Structural Barriers to GAI Integration

Structural barriers include fragmented institutional policies, the need for professional development, and AI literacy. Teachers indicated that their institutions either allowed GAI use with some restrictions or banned GAI tools *entirely*. Some teachers *described* web filters that "block ChatGPT on student devices" (Lionel, Teacher, FG2). Others shared that their districts banned the use of GAI, taking the decision *away from* individual administrators and teachers. For *those* allowed to use these tools, there was *minimal* guidance on how, its own kind of barrier to responsible use and integration. Instead, admins would encourage them to "mess around with it and find out what happens" (Autumn, Teacher, FG1), leaving teachers to seek information and support on their own. Despite the lack of formal guidance, teachers discussed approaches to regulating and integrating AI tools in their classrooms. For instance, Jamal (Teacher, FG6), a computer science teacher, shared that he is "teaching what AI is, how it works, the benefits, [and] the drawbacks," because "[it's] here, they're using it, they should use it correctly." As such, teachers described the value of additional training on applying GAI technologies in their classrooms. Currently, many are left to educate themselves, as one teacher shared, "*We had no formal training through the district, we had no formal training through admin. It*

was kind of, discover at your own risk" (Brandy, Teacher, FG6). Despite the lack of structural support from state and district leadership, teachers are willing to invest time and effort to educate themselves and acquire the proper knowledge about AI tools and how they can be useful in supporting their pedagogical efforts.

Overall, teachers described the use of GAI tools as *"uncharted territory"* (Amy, Teacher, FG5), requiring further communication and refinement of expectations as GAI expands and becomes more embedded in schools. These findings suggest that teachers recognize the need for structural guidance and education about integration of GAI in schools rather than the scattered approaches they were experiencing. Teachers' sentiments highlight a clear need for approaches that support professional development for teachers and literacy for implementing GAI tools in their pedagogical practices.

4.2 Teens' Perspectives on GAI

4.2.1 Teens' Use of GAI as Thinking and Learning Partners

Teens primarily described using GAI tools for further learning outside of class and exploring concepts taught in class, completing homework, and generating ideas for projects and writing assignments. Specifically, many participants found GAI useful for processing and organizing their thoughts for writing assignments, and summarizing difficult content discussed in class. For example, one teen shared that she uses GAI to *"give [her] a sense of what [she] wants to write in English class"* (Zane, Teen, FG1), while another described using Snapchat AI to help her learn chemistry concepts and apply them to other problems. Additionally, teens occasionally describe using systems like ChatGPT and Snapchat's AI for math and science homework or other school assignments, but typically only after exhausting other resources. For example, one teen shared that these can be helpful *"when you have no other support system, and you don't really know how to do those things"* (Jill, Teen, FG2).

These findings demonstrate how teens use GAI for further learning and breaking down content, positioning these tools as thinking partners and learning sources. These patterns suggest that teens view GAI primarily as a source for inspiration and additional learning resources. Importantly, teens generally reported refraining from using GAI to receive answers or complete their work for them. Notably, there is social pressure to respond in this way, and it would be surprising if a participant, even in the setting of a confidential research setting, confessed to serious academic misconduct.

4.2.2 Teens Navigating GAI Use, Critical Thinking, and Authenticity

Teens also demonstrated critical awareness of GAI as a learning tool—they deliberately avoided using it, despite its potential usefulness, because they were concerned it might compromise their thinking and wanted to retain ownership of their ideas. For example, one teen shared that using GAI *"makes you stupid,"* because *"you stop using your own brain and you just rely on a computer to tell you what to think"* (Bella, Teen, FG2). Similarly, other teens stated that using GAI felt like *"it's basically cheating,"* but said *"it's good for some people that don't want to cheat their way through life"* (Amber, Teen, FG1). Here, we see teens considering the moral and ethical implications of using GAI as they process what constitutes academic dishonesty when using these tools.

Participants typically suggested that using GAI as a starting point or for understanding a concept is morally acceptable, but taking what GAI gives as your own is not. Additionally, teens approached using GAI tools for schoolwork with a mixture of optimism and reservations, with some students preferring to do their assignments *"the old school way"* (Jason, Teen, FG4) and others who were *"more open to the idea"* (Jackie, Teen, FG2) of using GAI to help them. Further, teen participants discussed concerns that GAI would diminish their drive, work ethic, and creativity. Such discussions revealed concerns about biased outputs, trust, and misinformation. In particular, participants discussed whether the answers returned to them by GAI were biased or taken from reputable sources and responsible people, with one teen sharing, *"I think the biggest risk is whoever creates it can put biases in it that you don't necessarily agree with and stuff. It can push you towards writing your essays one way or another, especially with politics and stuff"* (Bri, Teen, FG3). Bri's comment, along with those made by other teens about the risks of encountering biased content when using GAI, demonstrates their awareness of the potential impacts these tools can have on their thinking and perception of the world around them. The inability to trace GAI output origination caused some level of distrust when using these systems, making teens more cautious of the information they receive.

4.2.3 Structural Barriers: Teens' Needs for GAI Literacy and Guidance

Teens shared that conversations with parents and teachers involve adults telling them not to use GAI tools at all for school. Despite this discouragement, teens still reported using these tools and wanting more scaffolding. For example, Bri (Teen, FG3) stated, *"I think parents and teachers need to make sure they're not putting it in a negative way the whole time, because it kind of makes you want to use it. They need to teach you, I think, how to use it the right way and how you can use it positively to help you."* Bri's comment highlights a phenomenon that arises when adults caution against engaging in certain behaviors (e.g., underage drinking and sexual activities), leading youth to be more intrigued and tempted to partake in stigmatized activities. Similarly, teachers attempt to prohibit teens from using GAI tools for school, but students use them anyway, resulting in the outcomes teachers fear. For example, teens shared stories of "cheating" that how restrictive policies and a lack of governance on responsible use can ultimately backfire, leading to flagrant uses of GAI tools.

While teachers and teens alike may struggle with what access to provide and how to teach about AI, the teens in our study described expecting school personnel to teach them to be AI literate explicitly. For example, Rory (Teen, FG4) stated, *"I think there should be classes in school on how to deal with AI."* This highlights both teens' desire for autonomy in using these tools and their wish for guidance from educational institutions to develop their AI literacy through structured classes.

5 DISCUSSION

Our study frames the challenge of GAI integration in education as a failure to deliver what both groups want and, in many cases, have requested, not a problem of contradicting or incompatible needs. The convergence of needs suggests that solutions must enable channels of collaboration among stakeholders, rather than addressing individual needs. AI literacy education serves both groups. Ethical frameworks should be made through joint dialogue rather than top-down approaches, and GAI tools should be designed to support pedagogical goals *and* student learning needs. The boundaries both groups draw point to specific design opportunities for systems that respect stakeholders' shared principles. As we discuss in the following section, addressing GAI integration requires acknowledging and engaging both teachers and teens as partners navigating this new frontier together.

5.1 AI for Learning: Needs for AI Literacy Education & Policy

AI literacy is essential for students and teachers; yet, our findings indicate that both students and teachers need to develop AI literacy competencies and face barriers accessing training and resources. With open-ended and seemingly limitless GAI tools, effective strategies are needed to train teachers and students in their educational use. Opportunities to enhance AI literacy in education include integrating AI literacy concepts throughout curricula, establishing media and AI literacy courses at national and international levels [16], and employing sustainable approaches that value learning through experimentation and play [17], such as hands-on activities (e.g., AI Bingo, the Teachable Machine tool [18]) can help teens learn and better grasp some of the complexities of technical systems, such as GAI, in accessible ways regardless of their STEM skills and knowledge [19].

However, limited and inconsistent policies for regulating GAI use in schools hinder the development of AI literacy among teachers and teens. While there are some national policies in the U.S. on AI [20], implementation can vary from state to state, potentially contributing to the different approaches to AI regulation seen in our focus groups. In the U.S., decisions are made at the state level and communicated down to the district and school levels [21], which creates a fragmented landscape where many institutions lack guidelines for the ethical use of AI. Current institutional approaches --- website blocking tools, VPNs, and firewalls --- may protect students, but they also reduce users' agency and self-efficacy in learning how to apply these tools. Students compose the largest group of education stakeholders, but their perspectives are rarely considered regarding educational policies that directly impact them [22]. Therefore, a closer look at current policies that allow such practices should be examined to determine more ethical approaches for protecting students while enabling them to explore such technologies to enhance their AI literacy and learning. Taken together, policymakers can benefit from incorporating teachers' and students' insights into their processes to create protocols and guidelines that are most reasonable and impactful when enacted. One potential starting point is creating student- and teacher-led committees that engage with policymakers at national, state, and district levels to assist in decisions regarding AI governance in education.

5.2 Design Recommendations for Future GAI Education

Process-oriented GAI for Critical Thinking. Our findings suggest design insights for future GAI that are geared towards education and relevant environments. In their current state, many GAI tools tend to provide answers to prompts that may limit opportunities for students to engage in critical thinking and to take ownership of their ideas [23]. To promote teens' critical thinking while using GAI tools, future GAI systems for education should be designed to be more conversational and process-oriented to emulate approaches teachers may take in guiding students through a topic to further sharpen their critical thinking ability. For example, when teens explore problems they do not understand, the system could offer hints or partial scaffolds instead of full answers, encouraging learners to wrestle productively with the material before revealing more guidance. These suggestions are similar to approaches that have been considered for intelligent tutoring systems [24]. As GAI tools begin to become more conversational, admit to their own limits, and provide questions alongside answers, it will be important to balance the kind of clear answers teens want, particularly in the space of STEM education and other areas of need beyond what is taught in the classroom. More exploratory and hands-on pedagogies can, in these cases, focus on critical thinking and engagement.

Real-time Authorship Tracking in GAI. To address concerns related to ownership and plagiarism, developers of GAI-powered writing systems could implement the use of real-time tracking features that distinguish between AI-generated text and student-produced text, with interfaces potentially including visualizations that illustrate how a student's authorship shifts when they rely on GAI support. Some tools like Grammarly Authorship and Originality.ai have already adopted similar approaches, and higher education institutions have begun to use existing tools (e.g., TurnItIn, Grammarly, Google Docs) to determine authorship by reviewing the edit history. A potential challenge with these methods is the definition of ownership when a student's writing is altered by systems such as Grammarly, which are used to improve student writing. Additionally, real-time tracking and other interventions may introduce further concerns related to user privacy, copyright of materials, and concerns about plagiarism (and self-plagiarism) from drafts to final reporting.

Unified Learning Support with GAI. Future GAI tools for education could also be designed as part of unified learning support systems that reflect the range of tools teachers and teens already use to fulfil their roles. Although many existing GAI tools are marketed as classroom-ready, they seem to lack the structure and guidance needed for teachers and students to integrate them meaningfully into everyday learning activities at this point. A more streamlined and structured system could facilitate smoother adoption by providing teachers with automated support for their administrative tasks, while offering students guided, personalized feedback and homework support. Such a system could reduce workload, enhance learning opportunities, and tackle existing challenges in both teaching and learning. Additionally, it should be designed to function effectively across diverse learning environments, including traditional and online classrooms, and homeschooling contexts. Future research should explore opportunities for collaboration with educational content-generating companies, teachers, and teens to create tools that are accessible and acceptable across these user groups for more seamless integration into curricula and classroom practice.

Standardized Frameworks for Responsible Use of GAI. Participants pointed out that the unavoidable diffusion of GAI alongside a lack of clear guidelines creates challenges regarding ownership, plagiarism, privacy, and misinformation that cannot be adequately addressed by individual students and teachers alone. Moreover, mandating the use of specific tools may raise concerns regarding autonomy and academic freedom. Consequently, it is crucial that governmental bodies, relevant regulatory agencies, developers, and broader societal and community groups, as well as educational institutions, engage in timely discussions to establish clear guidelines and policies that can keep pace with the rapid development of GAI. Coordinated efforts of this nature could provide standardized frameworks for the responsible use of AI in education, implement transparent reporting mechanisms for GAI-assisted work, and establish safeguards to protect student privacy, thereby ensuring that ethical considerations are integrated alongside technological innovation.

Furthermore, given the current political instability surrounding educational institutions in the U.S., there is an even more pressing need for proactive collaboration among school stakeholders, education and EdTech professionals, and HCI researchers. Given that the challenges posed by GAI are not confined to the U.S. context, addressing them effectively will also require sustained international cooperation. Strengthening these cross-sector and cross-national partnerships will be essential for developing more robust and trustworthy frameworks for the responsible integration of GAI in educational environments.

6 CONCLUSIONS

This study provides insights into how teachers and teens in the U.S. navigate the evolving landscape of GAI in education, revealing both opportunities and challenges as well as complex ethical implications. While they shared concerns about skill development, information integrity, and trustworthiness, limited institutional support undermines their agency, leading to ad hoc approaches such as teachers creating personal rules and teens bypassing prohibitions. The decentralized landscape exacerbates fears of misuse and hinders the development of AI literacy. These findings underscore the need for comprehensive AI literacy and training programs, clear integration policies and regulations, and transparent technologies that support critical thinking and protect student privacy. This study contributes to our understanding of human-AI interaction in education contexts and offers valuable recommendations for educators, policymakers, and technology designers to develop frameworks and systems that support meaningful learning while addressing key concerns.

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