Relief or displacement? How teachers are negotiating generative AI's role in their professional practice

Aayushi Dangol
University of Washington
Seattle, WA, USA

Smriti Kotiyal
University of Washington
Seattle, WA, USA

Robert Wolfe
Rutgers University
New Brunswick, NJ, USA

Alex J. Bowers
Columbia University
New York, NY, USA

Antonio Vigil
Aurora Public Schools
Aurora, CO, USA

Jason Yip
University of Washington
Seattle, WA, USA

Julie A. Kientz
University of Washington
Seattle, WA, USA

Suleman Shahid
Lahore University
Lahore, Punjab, Pakistan

Tom Yeh
University of Colorado Boulder
Boulder, CO, USA

Vincent Cho
Boston College
Chestnut Hill, MA, USA

Katie Davis
University of Washington
Seattle, WA, USA

ABSTRACT

As generative AI (genAI) rapidly enters classrooms, accompanied by district-level policy rollouts and industry-led teacher trainings, it is important to rethink the canonical "adopt and train" playbook. Decades of educational technology research show that tools promising personalization and access often deepen inequities due to uneven resources, training, and institutional support. Against this backdrop, we conducted semi-structured interviews with 22 teachers from a large U.S. school district that was an early adopter of genAI. Our findings reveal the motivations driving adoption, the factors underlying resistance, and the boundaries teachers negotiate to align genAI use with their values. We further contribute by unpacking the sociotechnical dynamics—including district policies, professional norms, and relational commitments—that shape how teachers navigate the promises and risks of these tools.

KEYWORDS

Generative AI, Educational Technology Integration, Sociotechnical Systems

ACM Reference Format:
Aayushi Dangol, Smriti Kotiyal, Robert Wolfe, Alex J. Bowers, Antonio Vigil, Jason Yip, Julie A. Kientz, Suleman Shahid, Tom Yeh, Vincent Cho, and Katie Davis. 2026. Relief or displacement? How teachers are negotiating generative AI's role in their professional practice . In *Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems (CHI '26), April 13–17, 2026, Barcelona, Spain.* ACM, New York, NY, USA, 21 pages. https://doi.org/10.1145/3772318.3791904

CHI '26, April 13–17, 2026, Barcelona, Spain

ACM ISBN 979-8-4007-2278-3/2026/04
https://doi.org/10.1145/3772318.3791904

1 INTRODUCTION

Visions for how generative AI (genAI) could reshape education are rapidly evolving, fueled by billions of dollars in investment from companies like OpenAI, Microsoft, and Google, alongside federal initiatives that position genAI integration as a national priority [47, 129]. A recent U.S. executive order, for example, directs schools to incorporate genAI "across all subject areas" and train teachers to develop student expertise "from an early age" [47]. Moreover, whether formally or informally, genAI platforms have already reshaped the ecology of schooling [36, 95, 105]. Students are using genAI to plan, write, and revise essays, design presentations, and produce creative media, while school districts are beginning to formalize adoption.

Though these developments seem promising, successful teaching is relational, and it entails more than simply conveying the right information at the right time [56, 85]. What's more, the introduction of new technologies into classrooms can have unintended and sometimes adverse consequences, as in the case of smartphones, or even serve to widen and reinforce inequities they were expected to rectify [113, 116, 117, 138]. If, as is often the case, policy and purchasing decisions are made at the state or district level with insufficient input from teachers [62, 149] or regard for how the new technology will be integrated into existing practices, genAI has little chance of standing up to the realities of classroom instruction.

Because teachers sit at a pivotal intersection between system-level directives and students' day-to-day learning, understanding how they negotiate genAI's role in their professional practice is essential for informing responsible design, development, and integration. Teachers' perceptions, adaptations, and concerns not only determine how genAI tools take shape in classrooms but also surface frictions, opportunities, and unintended consequences that designers and policymakers might otherwise miss. Yet while existing scholarship has largely focused on genAI's potential applications in education and students' interactions with genAI [6, 91, 111, 120, 158], far less is known about the practices teachers develop, the tensions they navigate, and the new forms of labor that emerge as they bring

genAI tools into their workflow. Our study centers these dynamics, examining how teachers make sense of genAI, the opportunities they identify, and the challenges they encounter as they incorporate these tools into their instructional practices. This leads us to ask:

> **RQ1:** How do teachers perceive the introduction of genAI tools in K–12 settings?
> **RQ2:** What opportunities and challenges arise as schools introduce genAI tools into teaching processes?

To answer these questions, we conducted semi-structured interviews with 22 teachers from BPS (anonymized for review), a large US public school district that began encouraging educators to integrate genAI–and specifically MagicSchool AI, a teacher-focused genAI platform–into their classrooms since late 2023. Findings from our thematic analysis of the interview transcripts revealed that teachers are not simply adopting or resisting genAI but are actively negotiating its role within their professional identities, pedagogical goals, and classroom relationships. Central to this negotiation is a tension between relief and displacement. While teachers welcomed genAI's ability to streamline routine tasks, alleviate burnout, and expand instructional possibilities, they also worried about what might be lost when intellectual and relational aspects of their work were delegated to genAI systems.

By surfacing how teachers navigate this tension and set boundaries around their practice, our study contributes a teacher-centered, sociotechnical account of genAI integration in K–12 education, highlighting the conditions necessary for responsible and sustainable design, development, and adoption. Specifically, we show how institutional policies, peer networks, and professional norms shape teachers' decisions and offer implications for the design of genAI-supported tools that balance technological affordances with teachers' pedagogical commitments and practical realities. In the remainder of this paper, we begin by reviewing related work on genAI in education. We then describe our study's methodological approach, including data collection procedures and analysis. Finally, we present our findings and discuss their implications for designing genAI-supported tools that align with teachers' values and reflect the complexities of real-world classrooms.

2 RELATED WORK

In this section, we review four strands of scholarship that inform our study. First, we examine emerging studies of genAI in teaching and learning, with attention to both creative applications and instructional uses. Second, we situate these developments within the broader history of educational technologies. Third, we draw on work in Human–AI Interaction (HAI) and sociotechnical studies within the field of Human-Computer Interaction (HCI) that emphasize the interpretive, relational, and professional dimensions of teachers' engagement with AI systems. Finally, we turn to the Teacher Response Model (TRM) [83], which provides a process-oriented lens on technology integration, foregrounding teachers' values and in-the-moment decision-making as central to understanding how genAI is taken up in classrooms.

2.1 Generative AI for Teaching and Learning

Recent advances in genAI have introduced new possibilities for teaching and learning, particularly through large language models (LLMs) and text-to-image models [16, 20, 87]. HCI research has examined the potential of genAI in education across several domains, including creative authoring and design support (e.g., text-to-image systems that enable students to illustrate stories or concepts) [63, 101, 146], collaborative writing and knowledge construction (e.g., LLM-powered tools that scaffold brainstorming, drafting, and revision) [77, 114, 156], and dialog-based tutoring systems that allow open-ended question–answer exchanges [12, 29, 70].

Building on broader explorations of creative and collaborative uses, HCI researchers have also examined how genAI is being integrated into core instructional practices [1, 98, 100]. LLMs have been used to generate customized practice materials across subjects. including mathematics [94, 157], English language learning [81, 135], and data science [126]. LLMs have also been used to provide AI-generated explanations to support students' iterative work in programming courses [57]. Teachers are also adopting genAI to support instructional design tasks, such as producing differentiated materials and adapting activities for diverse learners [50, 82, 93, 134]. Finally, genAI is being piloted within interactive classroom contexts, where AI agents function as peer teammates, coaches, or role-play partners to facilitate collaborative problem-solving [103, 131].

Beyond classroom-level applications, a growing line of research examines how schools and districts are implementing genAI tools at scale. For example, the Indiana Department of Education's 2023–2024 pilot across five AI platforms illustrates both the promise and fragility of large-scale integration [71]. Teachers highlighted time-saving benefits and opportunities for personalized learning, yet many also reported difficulties with usability, uneven subject coverage, and a lack of training support [71]. These patterns echo national trends, where teachers increasingly express curiosity about genAI but often lack clear guidance, professional development, and policy frameworks to support meaningful use in classrooms [58, 75, 79]. Students, too, are experiencing these inconsistencies as access, expectations, and instructional practices differ widely across classrooms and school districts [10, 111]. At the same time, long-standing inequities in resources, AI literacy, and prior experience with AI technologies raise critical questions about who benefits from these tools and on what terms. In the next section, we situate these emerging uses of genAI within the broader history of educational technologies, highlighting how prior waves of innovation reveal patterns that can help interpret the promises and challenges of the current moment.

2.2 Placing Generative AI in the Context of Prior Educational Technologies

The introduction of genAI in schools builds on a long history of educational technologies, from early computer-assisted instruction [9, 18] and intelligent tutoring systems [7, 59] to MOOCs [15, 147] and adaptive learning platforms [45, 78]. Each wave has carried the promise of personalized instruction, increased engagement, and expanded access. Prior research, however, shows that such promises are unevenly realized as technologies often deliver the greatest benefits where schools have the resources to integrate them thoughtfully [113, 116]. Well-resourced schools, for example, can provide teacher training and time for experimentation, allowing new tools to support more meaningful and interactive

learning experiences [42, 74, 115, 124]. In contrast, schools with fewer resources may incorporate new technologies in ways that largely replicate existing practices by streamlining content delivery or administrative tasks rather than enabling new forms of pedagogy [34, 35, 116, 138].

Scholars describe this pattern as one of amplification, where technologies magnify the strengths and limitations of the contexts into which they are introduced [138]. For example, Reich et al.'s [117] analysis of over 180,000 public school wikis found that teachers in affluent schools often used wikis for student-driven collaboration, whereas under-resourced schools relied on them primarily as static information repositories. Similarly, Rafalow's [113] ethnography of different middle schools described how teachers in a predominantly white, elite private school encouraged students to interact with technologies in open-ended and creative ways, while those in a Latinx-majority school discouraged digital "play" and prioritized rote learning. These examples suggest that the impact of educational technology is rarely determined by the tool itself [122, 124]. Instead, outcomes depend on how technologies are interpreted, implemented, and adapted by educators within specific institutional, cultural, and material contexts. Our work builds on this prior insight by shifting attention from the rhetoric of genAI-enabled transformation to the practical, situated work of educators as they encounter and integrate genAI into their teaching practice.

2.3 Teacher Sensemaking and Adaptation of Generative AI

While prior research has examined genAI's technical capabilities and educational applications [99], important gaps remain in understanding how teachers' professional expertise and classroom contexts shape the interpretation and adoption of these systems [139, 140]. Within HCI, recent scholarship in HAI argues that professionals, including educators, are not passive recipients of AI recommendations but active negotiators of these systems [13, 28, 66, 80]. Within this broader HAI perspective, sociotechnical studies show how professionals surface breakdowns, reconfigure workflows, calibrate trust and reinterpret AI outputs in ways that draw on their domain expertise and accountability structures [4, 14, 26, 155]. Complementing these perspectives, scholarship on AI in professional settings highlights the invisible labor, oversight, and sensemaking that emerge as workers adapt tools to situated constraints, often while navigating tensions around fairness, authorship, and responsibility [55, 68, 118, 141].

Although, empirical research on how teachers negotiate genAI's role in their professional practice is still emerging, early findings offer important insight [139]. Toci et al. [137] show that successful AI integration depends on teachers' ability to exercise pedagogical autonomy, using AI to extend, rather than replace, human instruction. This emphasis on teacher judgment resonates with studies documenting how educators actively adapt and reinterpret AI tools in ways developers did not anticipate [104, 136]. Yet as teachers engage in this ongoing work of adapting AI for their classrooms, they are also responding to shifts in student behavior. Tripathi et al. [139] found that teachers increasingly encounter uncritical or excessive student reliance on genAI, which they felt undermined authentic learning and made it difficult to accurately assess student competencies. Some teachers described a related erosion of classroom authority, noting that students often compared teacher-led instruction to AI-generated alternatives [139]. These dynamics highlight that effective teaching is fundamentally relational, rooted in trust, attunement, and the everyday interactions that support student learning [43, 56, 85]. Building on these perspectives, our study examines how K–12 teachers make sense of genAI within the complex sociotechnical systems of schooling. We investigate how teachers are integrating these tools into their workflow, how they reconcile genAI with pedagogical goals and professional values, and how they navigate tensions between efficiency, accuracy, and their responsibility to support meaningful learning experiences.

2.4 Teacher Response Model as a Lens for Understanding Generative AI Integration

To understand how K-12 teachers are integrating genAI into their instructional practices, we draw on a sociotechnical systems approach to genAI and teacher practice that recognizes the mutual constitution of technological and social dimensions in educational contexts [76, 89, 92]. This perspective acknowledges that focusing solely on genAI's technical capabilities without attending to how these tools are incorporated into specific cultural and institutional contexts risks replicating inequitable patterns of EdTech adoption [5, 130]. Within this broader tradition, we specifically adapt the Teacher Response Model (TRM) introduced by Kopcha et al. [83], which reconceptualizes technology integration not as a fixed outcome, but as a fluid, situated decision-making process embedded in teachers' everyday work. This includes how they perceive the tool's possibilities, how they respond to emergent needs in the moment, and how internal factors (e.g., beliefs, experience, professional identity) interact with external conditions (e.g., curricular goals, student behavior, resource access) in real time [83]. This process-oriented lens is particularly well-suited to the case of genAI. Unlike more bounded educational technologies like cognitive tutors or adaptive learning platforms, genAI systems function through open-ended interaction, requiring teachers to actively interpret what the system can do, when it is appropriate to use, and how its outputs align or conflict with their pedagogical intentions. As a result, genAI amplifies the interpretive, relational, and ethical dimensions of teaching, placing new demands on educators' professional judgment and in-the-moment decision-making. Below, we distill elements of TRM into three key characteristics that inform our study.

(T1) **Technology integration is value-driven:** Teachers use technology not to achieve externally defined standards of "high-level use," but to accomplish what they perceive as best for their students and their teaching context [83]. These values may reflect instructional goals, social-emotional needs, time constraints, or classroom management concerns. In the case of genAI, this means examining how teachers define "helpful" or "harmful" use in relation to their professional and ethical commitments.

(T2) **Decision-making is embedded in a dynamic system:** Classrooms are complex, ever-changing environments in which teachers constantly adapt to shifting needs, constraints, and feedback loops [83]. Technology integration decisions

are thus emergent and context-dependent. As teachers experiment with genAI, we attend to how these systems are taken up, resisted, or reconfigured in response to unexpected student reactions, institutional mandates, or evolving pedagogical goals.

(T3) **Teacher action is shaped by perceptions of what is possible:** Drawing on embodied and situated cognition [3, 121], the TRM emphasizes that teachers act based on what they perceive as doable within a given moment [83]. These perceptions are informed by prior experience, access, familiarity, and perceived risk. With genAI, what is perceived as "possible" is often in flux, making teacher experimentation, improvisation, and uncertainty central to the integration process.

Drawing on this theoretical framing, our study examines how teachers navigate the situated, interpretive process of integrating genAI into their pedagogy. In doing so, we position teachers' perspectives as a useful lens for understanding how professional values, contextual constraints, and sociotechnical dynamics shape both their practices and their evolving perceptions of what genAI can and should do.

3 METHODS

Our study was conducted at BPS (anonymized for review), a large urban-suburban school district located in the United States. As of the 2024–25 school year, BPS serves more than 38,000 students across 59 schools, including traditional elementary, middle, and high schools, as well as charter and magnet programs. The district serves a multilingual and socioeconomically diverse student population with students coming from over 130 countries and speaking more than 160 languages; 42% are second-language learners (77.8% of whom speak Spanish). Racial and ethnic demographics include 56.4% Hispanic, 17.3% Black, 14.0% White, 4.9% Asian, and 5.8% students identifying as two or more races. Nearly three-quarters of students (74.6%) qualify for free or reduced-price lunch, a widely used indicator of economic need in U.S. schools. Additionally, 14.5% of students receive special education services, and 4.9% are identified as gifted and talented.

Since early 2023, BPS has actively encouraged teachers to explore genAI tools in their instructional practice, including the district-wide adoption of MagicSchool AI,[1] an LLM-enabled platform that provides guided, teacher-oriented workflows. Many teachers also used general-purpose LLMs (e.g., ChatGPT, Gemini), which provide open-ended conversational interfaces, giving us insight into how educators engaged with both structured, task-focused tools and more flexible genAI systems. Interviews took place from March through May 2025, at a time when no formal district-wide policies for classroom genAI use had been established. This allowed us to examine how teachers were independently navigating emerging tools in the absence of centralized guidance.

3.1 Semi-Structured Interviews

3.1.1 Participants. We recruited participants in collaboration with the Director of Educational Technology at BPS, who distributed a recruitment email to teachers across the district. Interested teachers completed an initial screening survey that collected information about their teaching context, grade level, and prior experience with genAI tools. Based on these responses, we conducted purposive sampling [107] to select a diverse group of educators (see Table 1). Participants taught across elementary, middle, and high school grade levels and represented a range of subject areas, including STEM, Social Studies, Special Education, Culturally & Linguistically Diverse Education (CLDE). Teaching experience ranged from 1–2 years to over 11 years, with 63.6% of teachers reporting over a decade of classroom experience. Time in their current role also varied, with 40.9% participants in their first 1–2 years, 31.8% had 3–5 years of experience, and 27.3% had been in the same position for over 6 years. Participants also reported using a wide range of genAI tools. Alongside general-purpose LLMs such as ChatGPT and Gemini, many relied on educator-oriented platforms like MagicSchool AI, TalkingPoints, and Diffit.

3.1.2 Procedure. Each interview lasted approximately one hour and was conducted remotely via Zoom. We developed our interview protocol (see Appendix A) based on our research questions and theoretical framing, drawing on the TRM [83]. During the interviews, we asked teachers to describe how they first encountered genAI tools, how they currently use them in their professional practice, and the broader shifts they have observed in their schools. Teachers also reflected on both opportunities and challenges of using genAI tools in their classrooms. The semi-structured online format allowed teachers to participate from their own homes and enabled the research team to probe further or clarify ideas depending on each participant's experience. Teachers received a $75 Amazon gift card for their participation.

3.1.3 Data Analysis. We audio recorded all interviews and transcribed them for analysis using Rev.ai,[2] a secure transcription service. We analyzed the teacher interview data using Reflexive Thematic Analysis (TA) [22–24]. Because Reflexive TA centers the researcher's subjectivity as an analytic resource, it was well suited to our aims. Our analytic judgments were shaped by our own proximity to the environments and concerns described by participating teachers. The first and last authors' experiences as former K–12 teachers and the second author's training in library science sensitized us to the negotiations teachers navigated around genAI integration, and we approached the data with this grounding in mind. Our theoretical framing, particularly the TRM [83], further shaped our analytical lens by sensitizing us to teachers' decision-making about how they perceived the tool's possibilities, navigated contextual constraints, and balanced evolving pedagogical goals.

The coding team, comprising the first and second authors, began by independently open coding two randomly selected transcripts. This initial round of coding generated a wide range of preliminary codes, such as *"Lesson Planning"* (use of genAI to generate instructional materials), and *"District Policy"* (references to genAI-related policies or administrative decisions). We then met to compare our interpretations, using representative excerpts to explore where our perspectives converged or diverged. These discussions served as moments of collective sensemaking in which we refined our interpretations and deepened our understanding of the data. For

[1] https://www.magicschool.ai

[2] https://www.rev.ai/

Table 1: Overview of self-reported teacher information, including current role, years of professional experience, race/ethnicity, gender, grade-level setting, genAI use frequency, and tools used.

ID	Current Role	Years of Teaching	Years in Current Role	Grades	Age	Gender	Race	AI Use Frequency	AI Tools Used
P01	Classroom teacher	11+	11+	K–5	35–44	Woman	Black, Native American	NA	Canva, ChatGPT, Magic School AI, Adobe AI, Gemini
P02	Classroom teacher	1–2	1–2	K–5	25–34	Woman	Hispanic or Latino	NA	ChatGPT, Brisk Learning, TalkingPoints
P03	Special Education, Staffing Chair, 504 Coordinator	11+	3–5	K–5	35–44	Woman	White	NA	Magic School AI, ChatGPT, Canva
P04	STEM teacher	6–10	3–5	K–5, 6–8	35–44	Man	Asian, White	NA	Magic School AI, ChatGPT, Gemini
P05	STEM teacher	11+	1–2	9–12	55–64	Man	White	Few times a Week	ChatGPT, Gemini, Copilot
P06	CTE Media teacher	11+	11+	9–12	35–44	Man	Prefer not to respond	Daily	ChatGPT, Adobe AI
P07	Science/Social Studies teacher	3–5	1–2	6–8	25–34	Man	White	Few times a Week	ChatGPT, Gemini
P08	Math teacher	11+	3–5	6–8	45–54	Woman	White	Daily	ChatGPT, TalkingPoints
P09	Classroom teacher	3–5	3–5	K–5	18–24	Woman	White	Few times a Week	Magic School AI, ChatGPT, TalkingPoints
P10	Science teacher	1–2	1–2	9–12	18–24	Non-binary	White	Once/ Week	Magic School AI, ChatGPT
P11	CLDE Teacher Leader	11+	1–2	9–12	45–54	Woman	Native American, White	Daily	EdPuzzle, Magic School AI, EduAid, ChatGPT, Diffit, Gemini, Moat, Screencastify, Pear Deck, Claude, Read Along, Kahoot
P12	CLDE Teacher Leader	11+	3–5	6–8	25–34	Woman	Hispanic or Latino	Few times a Week	Magic School AI, TalkingPoints
P13	Social Studies teacher	11+	11+	6–8	35–44	Woman	White	Once/ Month	Magic School AI, ChatGPT, Diffit
P14	Substitute Teacher, Case Manager	11+	1–2	K–5, 9–12	45–54	Man	White	Daily	Magic School AI, ChatGPT, Claude
P15	Classroom teacher	1–2	1–2	9–12	18–24	Woman	White	Few times a Week	ChatGPT
P16	Social Studies teacher	3–5	1–2	9–12	25–34	Non-binary	Black, White	Few times a Week	ChatGPT, Brisk Learning, Gemini, HeyGen
P17	Science teacher	11+	6–10	6–8	35–44	Woman	White	Few times a Week	ChatGPT, Magic School AI, Pear Deck
P18	Math teacher	3–5	3–5	K–5	25–34	Woman	Black, White	NA	NA
P19	Special Education teacher	11+	11+	K–5	35–44	Woman	White	Daily	ChatGPT, Canva
P20	CLDE Teacher Leader	11+	6–10	9–12	45–54	Woman	White	Once/ Week	Magic School AI
P21	Literacy teacher	11+	1–2	6–8, 9–12	45–54	Woman	White	Once/ Month	Magic School AI
P22	Classroom teacher	11+	3–5	K–5	35–44	Woman	White	Rarely	Magic School AI, ChatGPT

Note. Grades are labeled as follows: K–5 (elementary), 6–8 (middle), 9–12 (high school). "NA" in the **AI Use Frequency** column indicates that participants mentioned AI tools but did not report how often they used them. "504 Coordinator" refers to a school staff member who oversees accommodations and support services for students with disabilities under Section 504 of the U.S. Rehabilitation Act.

example, codes such as *"Efficiency"* (mentions of genAI increasing productivity) and *"General Advantages"* (broad references to genAI's helpfulness) were refined into the more specific code *"Time*

Saving", capturing mentions of genAI saving time for tasks like lesson planning or grading. These collaborative discussions resulted in a preliminary codebook. The team then used this evolving codebook to explore two additional transcripts, refining it further during subsequent discussions. We repeated this process across four rounds, each time using our conversations and the interpretive tensions they surfaced to guide adjustments to the codebook. By the end of this iterative process, the codebook had developed into a version that felt analytically meaningful for our aims.

The final codebook consisted of 10 top-level codes and 45 subcodes (see Appendix B). Consistent with TRM, the codes captured three interrelated dimensions of teachers' genAI integration. First, they reflected teachers' value-driven orientations, including their attitudes toward genAI (e.g., *Critical*, *Conditional*, *Embracing*), perceived benefits (e.g., *Time Saving*, *Burnout Prevention*, *Extra Support for Students*), and concerns (e.g., *Plagiarism*, *Over-Reliance*, *Loss of Human Connections*). Second, the codebook represented the contextual nature of teachers' decision-making, capturing how institutional policies, classroom dynamics, and individual backgrounds shaped choices about when and how to use genAI (e.g., *Decision-Making Practices*, *District Policy*, *Teacher Background*). Finally, the codes highlighted teachers' perceptions of possibility, as reflected in codes such as *Future AI Use*. With the final codebook established, the team systematically applied it to the full dataset. We organized the resulting codes into overarching themes through multiple iterative rounds of refinement and discussion, drawing on our research questions and theoretical framing. After finalizing the themes, the first author revisited the entire dataset to select representative quotes that best illustrated each theme.

4 FINDINGS

To address our research questions about how teachers perceive the introduction of genAI tools (RQ1) and what opportunities and challenges arise as schools introduce these tools (RQ2), we organize our findings around four key areas. First, seeking to understand benefits teachers perceive in genAI (RQ1), we examine the drivers that motivate teachers to adopt genAI, revealing both the opportunities they perceive and the social dynamics that shape uptake. Second, to understand potential drawbacks teachers perceive in genAI (RQ1), we explore the sources of teacher reluctance and resistance that can lead to key challenges in implementation. Third, to understand how challenges that arise during genAI deployment in educational settings (RQ2), we analyze how teachers actively negotiate boundaries in their genAI use, demonstrating the complex perceptions and professional considerations that guide their decision-making. Finally, to understand how genAI might durably realize opportunities in education (RQ2), we examine the conditions teachers believe are necessary for sustainable integration, which ultimately speaks to both the ongoing challenges and the systemic opportunities they envision.

Our presentation of these findings reflects the often incomplete and tentative deployment of genAI in educational workplaces, as teachers may test out the use of new technologies before receiving institutional guidance. On the other hand, they may resist incorporating a new technology into certain aspects of their professional lives. Thus, rather than attempting to compare teachers' work in a time before genAI adoption to a time after adoption, we instead describe how teachers have made situated decisions shaped by evolving technical, institutional, social, and ethical constraints.

To preserve anonymity, participants are identified by a "P" followed by a unique ID (e.g., P06, P14). We also provide general teaching background, including the grade band they primarily teach (elementary, middle, or high school), their subject area, and their total years of teaching experience. For example, "P17 (Middle School Science, 11+ years of experience)" refers to a teacher who has taught middle school science for more than a decade.

4.1 Drivers of Generative AI Adoption

4.1.1 Institutional Incentives and Policies. Participants emphasized the role of district policies and communications in legitimizing and motivating their adoption of genAI tools. Formal signals from the district, whether through explicit encouragement, professional development offerings, or the assurance that use would not lead to reprimand, played a critical role in shaping teachers' willingness to experiment. For example, P17 (Middle School Science, 11+ years of experience) described how district endorsement shifted her stance from initial hesitation to greater openness and continued use of genAI tools, *"This year the district did the push for it. So then I was like, oh, good. They want us using it, so I won't get in trouble for using it, so I'll keep using it."* Teachers also described how institutional incentives, such as salary advancement courses that provide credits toward pay increases, encouraged them to try genAI during professional development. P12 (Middle School CLDE, 11+ years of experience) shared that these incentives often tipped the balance when time was scarce, *"There was like a salary advancement course. So when there's like an incentive tied to it that makes it more like, okay, I'm open to trying it out. And then if you can see what it actually looks like successfully, then I feel like it's easier because I think sometimes at first it's kind of like I don't have time for this."*

4.1.2 Peer Sharing and Validation. Teachers described the role of peer networks in normalizing and encouraging genAI use. Rather than adopting genAI in isolation, they often recounted moments of discovery and exchange with colleagues, where trying out genAI became a shared endeavor. For example, P04 (Elementary and Middle School STEM, 6-10 years of experience) traced a series of encounters that moved him from casual exposure to becoming an advocate for genAI in his school.

> I was introduced by our social studies teacher — 'Hey, have you seen this? Wonderful.' And then around that time, our district tech person who I am friends with pointed out that BPS has a subscription. And over summer, I was kind of playing around with it, and it just like blew my mind. I was all in at that point. And I showed another teacher this and I gave her kind of a quick ten second elevator pitch on it. And then she's like, you should run a [professional development]. So I ended up running a [professional development] for our school.

Peer networks also extended beyond the walls of the school. P09 (Elementary School Classroom Teacher, 3-5 years of experience) explained how online communities helped spark her own experimentation, "*I hear a lot about stuff through like TikTok or other social*

media and I honestly just saw a lot of other teachers being like, 'Hey, look at how cool this tool is.' And I kind of started incorporating it into some of my practices." Hearing from trusted colleagues helped counter the perceived stigma that genAI use was thoughtless or lazy. As P13 (Middle School Social Studies, 11+ years of experience) put it, "*When [other teachers] talk to those of us who have used it successfully...they think we're just plugging in and using no thought. It's like, no, I'm skipping the steps that are just bureaucratic nonsense [to] save time.*" Lastly, sometimes, peer validation came from unexpected places, including administrators who had previously discouraged genAI. For example, P03 (Elementary Special Education, 11+ years of experience) recalled, "*My boss told me I couldn't use it last year. I sat down and he's like, I don't know how to respond to this stupid email. And I said, put it in ChatGPT and say, make it nice. And he did it and he was like, what? This is so perfect. And I'm just like, you're welcome.*"

4.1.3 Burnout Prevention and Sustainability. Participants described the relentless pace of teaching, long hours, heavy paperwork, and the cognitive demands of responding to students and families. Thus, for many teachers, the motivation to try genAI was about protecting their ability to show up fully for students without being consumed by their work. P12 (Middle School CLDE, 11+ years of experience) captured this perspective by linking genAI adoption to burnout prevention, *"I don't have to take so much time doing brainstorming for lessons by myself. I can use technology to help me...I wanna save time because I don't wanna burn myself out."* Similarly, P13 (Middle School Social Studies, 11+ years of experience) described the overwhelming scope of their workload and framed genAI as a way to sustain good teaching,

> Our jobs are like 80 hour week jobs...the amount of time grading and also like creating things, the writing lesson plans, it's so much that is not the best use of your time. So then you can't be the best teacher you can be when you're in the classroom with kids. And it's like, well, what if it didn't have to be?...It's kind of like having an assistant or someone who could deal with some of the more bureaucratic stuff.

For others, the motivation came from wanting relief from the emotional strain and mental fatigue that made teaching unsustainable. P11 (High School CLDE, 11+ years of experience) described turning to genAI as a way to reduce stress and lighten the cognitive load that often led to burnout, *"The most significant benefit that AI has brought to my life as a teacher is having like, work-life balance. It has decreased my stress like 80 fold because I am able to have a thought partner. Teachers are really isolated, even though we work with people constantly...When I'm exhausted, it gives me support and help with ideas. The most important thing for me is the decrease in stress, decrease in cognitive load."*

4.1.4 Broadening Instructional Approaches. Several teachers described adopting genAI because it gave them a sense of creative possibility in their own practice. They spoke about using it as a playground for testing ideas, experimenting with new modalities, and re-imagining instructional approaches that felt fresh and exciting. For example, P01 (Elementary Classroom Teacher, 11+ years of experience) explained, *"[My] students are researching Colorado historical figures. So what's cool in Magic School is...they can have a conversation with the historical figure through the chatbot! So if they're studying like Dr. Martin Luther King...they can have a conversation like, when were you born?"* For other teachers like P06 (High School Media Teacher, 11+ years of experience), the appeal was in extending his own instructional toolkit, *"I ask ChatGPT, what's new here? What can I use AI to support this lesson with? That does help me fill in the gap sometimes, especially when I've taken on new classes and had to learn as quick as I could. It's opened my eyes to how many things could help us."* This spirit of experimentation also reached beyond day-to-day classroom lessons, shaping how some teachers designed and delivered instruction more broadly. For example, P16 (High School Social Studies, 3-5 years of experience) noted,

> I'm a professional development content creator for my school district as well. So I create micro [professional developments] that are roughly like seven to 10 minutes long. And I use HeyGen to do that because I don't like necessarily being on camera all the time. So I write my script out and I choose an avatar from Heygen and the avatar then presents my professional development. Next year, I'm gonna be using it even more, so like when I'm absent, I'm gonna have Heygen do my lessons for me so that my substitute teacher can just push the play button on the video.

4.1.5 Supporting Multilingual Learners. Teachers also described supporting multilingual learners as a major factor motivating their adoption of genAI tools. Several educators described how translation and language scaffolding needs were outpacing the resources available in their classrooms. As P04 (Elementary and Middle School STEM, 6-10 years of experience) explained, "*We have a lot of multilanguage learners. There was at some point earlier in the year that, we were getting newcomers and refugees like every week...and just being able to hopefully interpret work to them. Because there's times I have in my class like four languages and I only speak English.*" Teachers emphasized how genAI helped bridge these gaps by producing accessible explanations, translated materials, and task instructions. P09 (Elementary School Classroom Teacher, 3-5 years of experience) described turning to genAI to ensure students could understand classroom resources, *"We use ChatGPT to translate documents for multilingual students. Our grade especially had a lot of newcomers that could read in Spanish, so we wanted to give them resources that they could actually understand."* Others highlighted how genAI supported vocabulary development and concept understanding. As P20 noted (High School CLDE, 11+ years of experience),

> A lot of the language supports we've talked about, especially in math, are things like sentence stems to get them started. So I prompt AI to create sentence stems for whatever topic, and it just generates them. I like visual supports too, visuals or graphics for our [multilingual students] who don't have much English at all. So I use AI to create visuals specifically for that.

4.2 Reluctance Toward Generative AI Use

4.2.1 Reluctance Due to Time Barriers. Many teachers described their lack of time as a central reason for resisting deeper engagement with genAI. Even when they acknowledged its potential benefits, they emphasized that full schedules and the effort required to learn new routines made experimentation feel burdensome. For example, P09 (Elementary School Classroom Teacher, 3-5 years of experience) explained, *"It's just like lack of time. Like we don't really get much planning time and it would be a new tool to learn, so we would have to take the time personally to learn how to use it and where to find everything."* The time consuming nature of prompting also contributed to frustration. As P02 (Elementary School Classroom Teacher, 1-2 years of experience) noted, *"If I put in a prompt and it doesn't do it, then I'll have to like sit there and like edit the prompt over and over and over again...I just move on."* Similarly, others connected these challenges directly to a sense that the effort outweighed the payoff. For example, P16 (High School Social Studies, 3-5 years of experience) described how assessment design with genAI often fell short, *"When I'm writing test questions and assessments using Gemini...for the most part no AI can read images. So when I'm trying to write a test and I have like a graph, I have to describe the graph, and typically it doesn't know what my description is exactly saying. It doesn't work for me at all...I then put a basic description down and have it write the question, then I edit the question heavily to make it actually fit what the chart is truly saying."*

4.2.2 Reluctance Due to the Stigma of "Cheating". For some teachers, reluctance to use genAI stemmed from the social and professional stigma attached to its use. Rather than being seen as a helpful resource, genAI was often perceived by students, parents, and colleagues as a form of "cheating" or taking the easy way out. Teachers described moments when this stigma surfaced in classroom interactions. P14 (Elementary and High School Substitute Teacher, 11+ years of experience) recalled, *"Every once in a while a student will come and see that I'm using ChatGPT, and they're like, 'You're cheating'"* Similarly, P10 (High School Science Teacher, 1-2 years of experience) recounted how students detected genAI involvement in their materials, *"I did one time give my students some AI video questions and I think one of them looked at that and went, 'Did you use ChatGPT to write this?'...and I was like, yeah. And she's like, 'That makes sense. It's weirdly worded.'"* Such encounters reinforced teachers' worries about being seen as cutting corners. Parent attitudes added another layer of pressure. As P02 (Elementary School Classroom Teacher, 1-2 years of experience) explained, *"We do have a couple of difficult parents that...if they knew we were using it, they would be very upset and just think that we're not supporting their kids the way they need to be supported."* For some teachers, these perceptions provoked deeper questions about the value of their expertise and their professional identity. As P20 (High School CLDE, 11+ years of experience) reflected, *"I think there's a certain aspect of it that feels like it's kind of cheating, right? Like you're in education, you should be able to...think and come up with ideas on your own...If AI's doing all this work, then what am I doing?"*

4.2.3 Reluctance Rooted in Preference for Tradition. For several teachers, established practices offered a sense of reliability and continuity, making experimentation with new tools feel undesirable. As P12 (Middle School CLDE, 11+ years of experience) explained, *"I think it's like anyone, right? You don't really like change. So sometimes it's like, why would I do something [new]...what I've been doing has been working, or it seems like it's been working, or like, [you] kind of already have the material so [you] just kind of reuse it and adjust."* Teachers also observed that some of their colleagues avoided genAI because of its unfamiliarity, preferring the certainty of existing workflows. As P20 (High School CLDE, 11+ years of experience) noted, *"We have people who are genuinely concerned and afraid of it and don't wanna adopt it, and don't want anything to do with it. They have all their plans in place and...there's no reason to do anything differently."* Some framed this preference in explicitly "old school" terms, emphasizing low-tech, hands-on teaching methods over digital experimentation. As P03 (Elementary Special Education, 11+ years of experience) shared, *"From my teaching perspective, like I'm not really using it actively...I'm pretty low tech, like old school in terms of teaching. Like, kids have whiteboards in my room, they have a dry erase marker. We write words, we read books. I have tried AI to create decodable texts, but I have not found it to be very good at that yet."*

4.2.4 Reluctance Due to Environmental Concerns. For a small subset of teachers, reluctance to embrace genAI was rooted in concerns about its environmental impact and the broader ethical costs of widespread adoption. Several described scaling back their own use after learning about the resource intensity of these systems. As P09 (Elementary School Classroom Teacher, 3-5 years of experience) explained, *"I definitely used to use it more and then I saw some stuff about how much water is used in AI and so I pulled back my use on it."* Others voiced broader ethical unease about AI's contribution to climate change. P13 (Middle School Social Studies, 11+ years of experience) reflected, *"My biggest concern is what I've seen about the carbon footprint of it and the environmental impact of it. We're already destroying the planet at a rapid rate, so like are we just accelerating that?"* Some positioned themselves as openly critical of genAI because of these issues. As P10 (High School Science Teacher, 1-2 years of experience) shared, *"I might be the most vocally against it in like my school because I'm aware of like the environmental horrors. I've told my coworkers about how much water is being used to like cool down the servers, but I haven't heard of anyone like trying to actively change administration or district minds about it."*

4.3 Navigating Boundaries in AI Use

Beyond clear cases of adoption or reluctance, many teachers described actively negotiating boundaries around their use of genAI. They framed these boundaries as necessary to preserve their professional judgment, avoid perceptions of "cheating," and ensure that students remained engaged in meaningful learning.

4.3.1 Preserving Professional Voice and Judgment. Many teachers drew boundaries around genAI use to ensure that their professional voice and judgment remained central to their work. While they welcomed genAI as a source of support, they worried that over-reliance on AI-generated content could make their teaching feel impersonal, generic, or detached from students' needs. Several teachers emphasized that using genAI without critical review was unacceptable. As

P07 (Middle School Science/Social Studies, 3-5 years of experience) explained,

> If you're just saying, 'Make me a lesson plan on this,' and you don't go through it, and you just do it – that's not okay. It's help, it's support, it's taking some of the load off our back. It's to make us better educators not just rely on it. If you're too reliant and you're just spitting it out there, it's gonna hurt our kids.

Teachers also highlighted the importance of reviewing and adapting outputs to reflect their own judgment. As P16 (High School Social Studies, 3-5 years of experience) put it, *"It is a great way to start writing a test or giving feedback to students, but you need to go back in and edit, make sure that it's actually aligned to what you want the student to work on, and then grade the writing yourself. That's my framing: it's a starting point."* Others described feeling uneasy when genAI outputs sounded generic, inauthentic, or inconsistent with their own communication style. For example, P20 (High School CLDE, 11+ years of experience) recounted noticing how her principal's tone shifted after incorporating genAI into school communications, *"I will never forget the moment where I was like, he's using AI because you could tell that his communication had changed."* In response to similar concerns about sounding inauthentic, P12 (Middle School CLDE, 11+ years of experience) shared, *"I [take] whatever it generates and then just review it, because at the end of the day, you still want it to sound like you. And you still want it to be approachable."*

4.3.2 Negotiating Trust in AI Collaboration. Many teachers described a process of careful decision-making shaped by concerns about the reliability of genAI. Several pointed to factual errors as a key reason for caution, particularly in subjects that demand precision. P13 (Middle School Social Studies, 11+ years of experience) reflected, *"We've all seen and heard ways that ChatGPT can be wrong about, especially in social studies. Like lots of wrong dates, wrong, you know what I mean?... It is not necessarily a trusted source, it's just a majority source."* Others emphasized the need for vigilant fact-checking to guard against misinformation. P21 explained, *"Even AI can get fooled with fake news... for me nowadays, it's almost a hundred percent fact check before I post anything."* Similarly, teachers extended their caution to worries about bias and the potential for genAI to spread harmful or politically skewed information. As P17 (Middle School Science, 11+ years of experience) noted, *"Just thinking of our political climate, like if everything that it spewed out was just like wrong and not real science... that scares the crap outta me."* P17 further reflected that these concerns were not abstract, noting that students already bring misinformation into the classroom. They explained, *"You're already dealing with that in the classroom sometimes. Like, oh, my family says this. And it's like, okay, hey, this is science. We deal with scientific facts only."* This according to P17 made it especially important to teach critical habits of verification, *"You can't blindly trust AI. So instilling that into kids early on, 'cause as a 44-year-old new to it, I was like, oh you can't, oh okay duh. I should know that, but I didn't."*

4.3.3 Protecting Student Data Privacy. Teachers also described drawing boundaries around the use of genAI due to concerns about privacy and data security. Even when they saw potential benefits, many hesitated to input sensitive student information or use platforms they felt were not transparent about data practices. For example, P07 (Middle School Science/Social Studies, 3-5 years of experience) described being meticulous about redacting personal details before pasting student work into genAI tools,

> There have been a few times where I may be copying, like student work over into AI for it to help me grade. And in those situations I have to be very careful that I'm purposely only pasting the content of the assignment and not a name or personal information or even drawings the kid did...Because of that I can't just like scan the document and upload it. Sometimes I would rather just grade myself, because usually grading is the only time that I have to pay attention to student information or student data. Other than that, I try to avoid talking about anything confidential and just leave it strictly to curriculum when I'm talking to AI.

For teachers working in sensitive contexts, the stakes felt even higher. P11 (High School CLDE, 11+ years of experience) explained how they leveraged genAI to support students' Individualized Education Program (IEP), which provides accommodations for students with special needs, while avoiding the use of identifiable data. *"I attend IEP meetings very frequently, and we provide test data in reports we create. I don't put in personally identifying information, but I'll enter the scores into Gemini and ask, 'What are some strengths of these scores? What are are some areas to work on for these scores?' It doesn't have the kid's name or anything attached to it, but it will tell me like, oh, the reading shows this trend."* At the institutional level, concerns about compliance with student privacy laws further shaped teachers' decisions. P04 (Elementary and Middle School STEM, 6-10 years of experience) noted how district protocols limited which tools could be used, *"A lot of [admins] are like, what are the privacy concerns? BPS is really starting to crack down — if a website doesn't have the insurance or the protocol set in place, we're not allowed to use them for sign-in with Google. I know there's a lot of admin that are really concerned about [this], so they're like, let's stick to the curriculum we're already using."*

4.3.4 Boundaries for Student Exposure and Responsible Use. Teachers noted the need to be intentional about how, if at all, they introduced genAI into student learning. This negotiation was shaped by the dual goals of empowering students to explore new tools while preventing over-reliance or misuse. As P07 (Middle School Science/Social Studies, 3-5 years of experience) explained,

> Usually I start with, what am I measuring? If I'm measuring their ultimate learning on one skill, I'm not gonna allow it. But if I'm measuring growth, AI is okay. As long as we are working on growth, AI can help you grow. But once we get to mastery time, you need to be able to show me that you can do it without that support. That way I know they're not relying on it for like the final results. Those are my two big separators.

For teachers working in special education, boundaries often centered on balancing support with skill development. P19 reflected

(Elementary Special Education, 11+ years of experience), "*They use speech-to-text already, so why not take it to the next level and say, 'This is the idea I want to get across. How can I word this?' I don't think it's not teaching them; I think it's teaching them a tool that will be widely available as they get older. They do need to learn conventions of English, but you can do both.*" Others emphasized teaching students to think critically about their use of genAI. For example, P03 (Elementary Special Education, 11+ years of experience) described how they coached their fourth-graders to reflect on authorship,

> I tell my students, I don't care if you use it. What I wanna know is that you thought about what it was producing and why. You can't just say, "Write me this response to this text," because that's not your ideas. I care what your ideas are. Now, if you need help with how to say it, you can say, "Help me say this in a better way." Cool, I love that. I'm super explicit with my fourth graders on how to use AI, because a lot of my kids can't write, they can't read. And they'd be using AI anyway.

4.4 Conditions for Sustainable AI Integration

In reflecting on their experiences with genAI, many teachers emphasized that their individuals efforts could only go so far without systemic supports. They highlighted gaps in institutional policies and guidance, professional development opportunities, and clear expectations for students that shaped how and how well genAI could be used in their district. At the same time, they voiced concerns about what might be lost if integration proceeded without attention to the human and relational dimensions of teaching. Together, these reflections outlined conditions they saw as essential for the responsible and sustainable use of genAI in schools.

4.4.1 Clear District Policies and Guidance. Teachers repeatedly emphasized that effective genAI integration depended on clear, consistent guidance from their districts. Many felt uncertain about the rules that governed their use of genAI, which left them wary of experimenting too freely. As P22 (Elementary Classroom Teacher, 11+ years of experience) explained,

> I definitely think knowledge of how it can be used for each district would be nice as far as what the district rules are and how teachers can implement it. Because I know there are different districts, different states that kind of have their own take on it...Just knowing those rules and regulations would definitely be helpful and everybody would feel a little bit safer in using those things.

In the absence of such clarity, some teachers described taking their own precautions to remain professional and protected. As P03 (Elementary Special Education, 11+ years of experience) put it, *"I'm using my school account for a reason. Like if the district ever wanted to say, 'I need to look at what you've been doing,' I could literally pull up my school account and say, 'Here's everything I've ever done.' I'm pretty intentional about that. I think people need to know how to protect themselves to be professional."* For others, the lack of guidance raised questions about ethics, particularly around plagiarism and authenticity. P19 reflected (Elementary Special Education, 11+ years of experience) reflected,

> Teachers [sometimes think] that [AI use] is some sort of plagiarism...I think getting clear on what is ethical, what is allowed and what isn't, and really defining: Is AI plagiarism or not? Where are those boundaries? Where are those lines? Because there really is not a lot of clarity in terms of AI. It's more of just a 'go explore it and use this in a way that might help you,' which is great for some people and not so great for others who need more boundaries and guidance.

This need for clarity extended to the approval and vetting of tools. For example, P17 (Middle School Science, 11+ years of experience) suggested, *"They started off giving us a program [Magic School]. So I think they should have a list of approved ones they want us using for stuff in the classroom."* Similarly, P21 (Middle and High School Literacy, 11+ years of experience) described the confusion that arose when tools appeared without sufficient communication, noting, *"When Magic School AI first came out, I wasn't sure it was legitimate. I wasn't sure if it was something that was fake or, some company trying to sell me something. Being a little more open as to what they're buying and what are the benefits of it would help."*

4.4.2 The Need for Professional Development. Participants described the current landscape as confusing and uneven, with little guidance on how to use genAI in ways that were pedagogically sound. Several emphasized the importance of structured training led by educators who understood classroom realities. As P04 (Elementary and Middle School STEM, 6-10 years of experience) explained, *"They should have people that are teachers that understand the teaching process and how to integrate it. That way there's more buy-in, because I think there's still that fear of the unknown with some of our more veteran teachers."* Others stressed the need for clear and accessible entry points to reduce hesitation. P07 (Middle School Science/Social Studies, 3-5 years of experience) suggested, *"A good one-pager detailing when AI is useful, how it can help teachers, and when it might be too much or not appropriate for students...just to get educators started and allow them that familiarity, so it's not such a scary thing."* Similarly, P19 reflected (Elementary Special Education, 11+ years of experience) pointed to both practical and ethical dimensions of training, *"Something I think would help is examples of prompts for different purposes, and I think ethics training on using AI, it's just so new that people don't know what is right and wrong."* Teachers also emphasized that without targeted professional development, many colleagues would continue to hold back from using genAI. P16 (High School Social Studies, 3-5 years of experience) described how limited understanding fueled fear and resistance, underscoring why training felt urgent,

> The number one reason people don't want to use AI is because they don't understand it. Districts and schools need to provide accessible and detailed training about what genAI actually is, what it does, and how it works. A lot of people are just worried, "Oh my gosh, it's going to be like the Terminator and it's going to be so bad." But we're nowhere near that level of AI. People don't understand the nuances that many different

> types of AI exist out there. So that's the number one thing that districts and schools need to do.

4.4.3 Building Critical AI Competencies in Students. Teachers highlighted that preparing students to navigate a world with genAI is an essential condition for sustainable integration. They argued that school districts making decisions top down and restricting access or avoiding the topic would leave students unprepared for the tools that will shape their futures. As P20 (High School CLDE, 11+ years of experience) put it, "*I don't think we should just put a hard, fast rule like absolutely no AI, we're not using it, we're blocking anything. AI is the wave of the future. If we say we're gonna make them college and career ready, we need to teach them the tools, but we need to teach them the ethics behind it as well, so they can make good decisions.*" Several teachers noted that the absence of structured guidance had already led to concerning patterns of use. For example, P07 (Middle School Science/Social Studies, 3-5 years of experience) described one student whose dependence on genAI had become disruptive,

> I have one student who is probably single handedly keeping ChatGPT in business, because she is glued to it unhealthily. She's not using it for school, she's just creating a story every day, all day. And if we block her, she throws an absolute tantrum.

To counter these risks, participants stressed that genAI literacy should not be treated as optional or left to chance. They argued for explicit lessons that move beyond technical use to include reflection on ethics and authorship. For example, P08 noted, *"We should really be encouraging kids to challenge what they read, what they listen to, what they hear."* In the absence of district-wide frameworks, some teachers created their own entry points for genAI literacy. P04 (Elementary and Middle School STEM, 6-10 years of experience) recounted,

> I did a little mini lesson on AI and found a website that you have to click on, which one is artwork is created by human and which is not. And then we just shared out scores, and then it led into a conversation of who owns the artwork. It really kind of opened their eyes because prior to that, they're like, let me do this with [AI]. Let me have it answer my questions for me. It's kind of cool when you get a middle schooler to think like a little more outside of their own personal bubble.

These teacher-led efforts underscored a broader need that without structured curricula and district guidance, students' exposure to genAI literacy remains inconsistent and dependent on individual teacher initiative.

4.4.4 Preserving the Relational Dimensions of Learning. Teachers argued that for genAI adoption to be sustainable, it must not erode the human relationships that make learning meaningful. They stressed that authentic connection, trust, and opportunities for social learning remain central to education, even as digital tools expand. As P13 (Middle School Social Studies, 11+ years of experience) explained,

> A machine can give you information, but most students we know are not able to get information from something that's just printed out for them and put it into their heads. You need a relationship. Some kids can do online school or read a book and teach themselves, but that's like 2%. Most kids need a social environment to do it.

Participants cautioned that if schools leaned too heavily on genAI, they risked undermining the very qualities that sustain students' growth. P06 (High School Media Teacher, 11+ years of experience) reflected, *"Worst case is schools commit to almost embracing it too much, and it takes away what makes school special – the connections and people. If we move more online, we lose that personal aspect of learning."* Others noted that the challenge was not whether to use genAI, but how to balance it with intentional opportunities for human connection. As P03 (Elementary Special Education, 11+ years of experience) put it, *"One of the major negative things I've seen with increasing technology is that kids really crave personal connection. Since COVID, we've realized the necessity of human connection and how important it is to use technology intentionally to create it."* Together, these accounts suggest that for genAI to be integrated sustainably, it must serve as a tool that supports, rather than replaces, the relational and social dimensions of learning.

5 DISCUSSION

5.1 Navigating Tensions in Generative AI Integration

Prior work on educational technology integration highlights that teachers' adoption processes are rarely linear and are shaped by ongoing negotiations among their pedagogical values, institutional expectations, and classroom realities [5, 113, 115]. Guided by TRM [83] and a sociotechnical lens, our study examined how teachers made sense of and integrated genAI in their classroom practice. Our findings reveal that genAI amplifies these negotiation processes by introducing interpretive work that requires teachers to continuously assess system capabilities, evaluate contextual appropriateness, and reconcile genAI outputs with their instructional objectives. Through our analysis, we identify two interconnected tensions that fundamentally shape teachers' genAI integration processes.

5.1.1 Navigating the Tension between Relief and Displacement. Teachers in our study approached genAI with curiosity and a sense of possibility, often drawn to its potential to reduce time-intensive tasks and expand their instructional repertoire. For many teachers, experimenting with genAI became a way to explore new forms of differentiated learning and creative lesson design. At the same time, teachers emphasized that using genAI effectively involved crafting precise prompts, reviewing outputs critically, and adapting results to meet student's diverse needs. This ongoing interpretive work reflects what researchers in HAI describe as the negotiated nature of working alongside AI systems where people continually assess system outputs, calibrate trust, and reshape workflows as part of collaborative sensemaking [49, 67, 152, 154]. While often overlooked in broader narratives about technological efficiency, teachers framed this hidden labor as central to their professional identity – a form of evaluative practice to ensure that genAI aligned with their pedagogical values and intentions. Nolan et al. [65] characterize this kind of interpretive labor [8, 148] as a form of professional expertise, highlighting how teachers' careful oversight is essential for the responsible use of genAI in classrooms. Likewise,

Xie et al. [153] and Mah et al. [102] show how teachers rely on flexible, context-sensitive heuristics, rather than fixed protocols, to integrate emerging tools.

This evaluative work also extended to protecting the relational core of learning. Teachers valued genAI when it created space for their relationships with students to flourish [52, 90]. For example, by supporting multilingual communication with students or reducing administrative burdens to allow more sustained attention to students' learning and socio-emotional needs. At the same time, teachers worried about losing opportunities for authentic connection with students, referencing AI tools as signals of a new educational model where technological systems mediate learning [62]. These concerns echo longstanding research on the centrality of relational dynamics in teaching [60, 150]. Simon and Johnson [128], for example, demonstrate that the quality of teachers' social interactions with students and peers is the strongest predictor of retention in high-poverty schools. Similarly, Ball [11] argues that the power of teaching lies in its deeply social nature, where meaning is co-constructed rather than delivered. TRM [83] helps make sense of these negotiations, highlighting how teachers assess both possibilities and constraints of new technologies in light of their pedagogical commitments. Additionally, our findings also extend prior scholarship on how technologies reconfigure, rather than replace, teachers' professional practices [84, 142].

5.1.2 Navigating the Tension between Mediating Student Use and Building Teacher Expertise. A second tension emerging from our findings concerns teachers' dual roles as mediators of genAI for their students while also navigating these systems as novice users. In the absence of consistent district-wide frameworks, teachers had to decide when, how, and why genAI should be used while simultaneously figuring out its capabilities, limitations, and risks for themselves. This preparedness gap made decisions about AI integration highly localized and shaped by individual classroom conditions. Participants also noted that AI literacy supports for students were largely absent, leaving teachers with few guidelines for helping students evaluate or responsibly work with AI-generated outputs. In response, some teachers created their own activities to help students interrogate genAI's limitations, authorship, and biases, echoing broader calls in HCI and education research to integrate AI literacy into classrooms [25, 38, 144, 151]. Others, however, carried misconceptions about genAI or avoided using it altogether, resulting in inconsistent practices within the same district.

These inconsistencies were further amplified by uneven institutional resources and supports. Although all teachers worked within the same district, opportunities to prepare for AI integration varied considerably across schools. Some teachers were familiar with salary-advancement courses and professional development sessions that offered time and incentive to experiment, while others were unaware of or lacked access to these supports. Prior research on educational technologies has documented how new innovations often magnify existing disparities rather than resolve them [113, 116, 138]. Our findings extend this work by showing how genAI can produce within-district inequities when implementation depends on individual teacher initiative and school-level resources. Without coordinated investment in teacher capacity-building and AI literacy curricula, districts risk deepening disparities in students' opportunities to critically and responsibly engage with genAI [97, 144].

5.2 A Sociotechnical Lens on Generative AI Integration

The two tensions we identify — between relief and displacement, and between mediating student use and developing teacher expertise — illustrate that teachers' work with genAI cannot be understood within the boundaries of individual classrooms alone. Teachers' practices emerged at the intersection of multiple, interconnected layers, where individual identities, peer networks, institutional structures, and broader cultural narratives all shaped how genAI integration unfolded [76, 89, 92]. Through the TRM [83] lens, we see how these layers interact, helping us place our findings in dialogue with prior work.

5.2.1 Individual Layer: Boundary-Setting and Relational Pedagogy. Teachers engaged in sophisticated boundary-setting practices that preserved their professional autonomy while leveraging technological efficiency. This integration work involved developing new competencies around prompt crafting and output evaluation that reshaped rather than replaced core pedagogical skills [17, 51]. Such dynamics echo prior research showing how educators reinterpret technological innovations to fit professional norms rather than adopt them wholesale [125]. Additionally, teachers' emphasis on maintaining authentic relationships with students while preventing burnout suggests that integration was also motivated by protecting relational forms of pedagogy [11, 128].

5.2.2 Social Layer: Peer Networks as Interpretive Communities. Teachers' individual practices were deeply entangled with the social contexts in which they were situated. Peer networks and online communities played an important role in mediating experimentation, offering strategies, resources, and validation when official guidance was absent. This resonates with prior studies documenting how informal communities of practice often become critical infrastructures for educational technology adoption [53, 54, 73]. Yet this grassroots legitimation was fragile. Teachers also navigated skepticism from students, parents, and even other educators who questioned whether using genAI compromised authenticity or professionalism [39, 61]. These mixed dynamics positioned peer networks not simply as information-sharing channels but as interpretive communities where meaning was negotiated and professional legitimacy was continuously managed [83].

5.2.3 Institutional Layer: Fragmented Policies and Uneven Access. District endorsement lowered barriers by signaling permission to experiment, but the absence of clear implementation guidelines left teachers to make highly individualized decisions. This unevenness echoes longstanding critiques of edtech integration, where innovations often exacerbate rather than mitigate disparities in resources and support [116, 138]. Teachers with access to professional development opportunities or strong peer networks were better positioned to explore genAI's potential, while others avoided it altogether due to uncertainty or lack of support. This reliance on individual initiative reflects a broader structural challenge in which without coordinated frameworks, integration risks becoming

uneven and unsustainable, particularly for educators working in resource-constrained contexts [115].

5.2.4 Sectoral Layer: Cultural Logics and Ethical Concerns. Finally, teachers' negotiations unfolded within broader cultural narratives about technology and innovation [37]. Several participants described wanting to "keep up" and experiment with new tools out of curiosity and a sense of professional growth, echoing prior accounts of teachers' professional identities being shaped by cultural logics of innovation and technological enthusiasm [86, 146]. Yet these aspirations often collided with efficiency-first design assumptions embedded in many genAI tools, a mismatch that reflects the enduring tension between industrial logics of optimization and relational models of pedagogy [125]. Teachers' environmental concerns also connect local classroom practice to wider ethical debates about the sustainability of emerging technologies [44, 64], extending prior critiques of digital education's environmental footprint into the domain of genAI [127].

5.3 Implications for the Design of Generative AI Tools in K–12 Classrooms

5.3.1 Designing with Stakeholders from the Start. Teachers in our study emphasized that their ability to make productive use of genAI was influenced not only by the tool's technical affordances but by intersecting individual, peer, institutional, and cultural factors. This aligns with longstanding sociotechnical insights in HCI, which show that even highly capable technologies will not succeed if they are developed independently of the people and institutional conditions that ultimately shape their use [2, 106, 109, 130, 133]. Therefore, consistent with participatory design research that calls for involving stakeholders early and throughout the design lifecycle [48, 61, 72, 123], designers of genAI-enabled educational tools should engage teachers, students, families, and school leaders and administrators as co-constructors of the problem space. Early engagement can surface misalignments between system assumptions and on-the-ground realities [62, 132, 133], reveal hidden forms of labor that tools may inadvertently increase [14, 55, 108], and clarify where genAI might meaningfully augment teachers' existing practices [67]. Designing with stakeholders in this way can help ensure that AI systems are grounded not only in pedagogical goals but also in the everyday constraints and values that guide classroom work, increasing the likelihood that they will be usable, trustworthy, and contextually appropriate.

5.3.2 Designing for Transparency to Support Teachers' Evaluative and Adaptive Work. Our findings show that teachers negotiate trust in AI collaboration through deliberative processes such as cross-checking outputs, comparing multiple sources, and evaluating whether AI-generated content aligns with disciplinary standards. Building on scholarship in human-AI collaboration [14, 93, 119, 145, 155], we argue that genAI systems for teachers should prioritize transparency and make outputs easier to interrogate, adapt, and integrate into classroom practice [40, 134]. To support this evaluative work, genAI tools can offer transparency features that indicate the reliability of each output [30–32] and flag where additional human review is warranted. Research on uncertainty visualization [19, 27, 41, 88, 110] demonstrates that well-designed visual markers can help users focus on areas requiring deeper scrutiny. Building on this idea, genAI tools could incorporate validity markers such as color-coded confidence levels (for example, green for high confidence or orange for uncertain claims), uncertainty flags (such as a small warning icon next to dates, statistics, or curricular content that the model is unsure about), or brief prompts that encourage teachers to double-check an output (for example, "Consider verifying this fact" or "Try comparing this with another source") to streamline and support the evaluative processes teachers already carry out. While these measures can improve transparency of general-purpose commercial products, truly supporting teachers' needs may also require, as previously noted by [62], affording more agency in the creation of AI-based tools themselves, positioning teachers both as experts on their own work and designers capable of composing the tool that best suits their needs.

5.3.3 Designing Multi-Level, Embedded Supports for AI Literacy. Teachers in our study emphasized the need for concise, practical guidance to help build foundational AI literacy for both students and educators. To address this need, designers could embed lightweight, just-in-time AI literacy supports directly into the interactions teachers and students have with genAI tools. Drawing on work in explainable AI [33, 46, 69, 112], these supports might include brief, non-technical explanations that surface why the system generated a particular suggestion or highlight broad patterns in the AI model's decision-making. At the same time, teachers in our study varied widely in their understanding and comfort with AI, from those seeking basic orientation to those wanting deeper insight into how systems behave [21, 96, 143]. To accommodate this diversity, genAI tools could provide multiple entry points into AI literacy, allowing teachers to engage at a level that feels appropriate. Rather than relying on a single, standalone "AI literacy training," systems can offer layered supports. For example, beginners might encounter short cues that explain model behavior, while a more experienced user could open an optional panel that dives deeper into AI literacy concepts such as where model predictions come from, what kinds of errors are common, or how data sources shape outputs. Embedding these entry points into routine interactions can help both students and teachers build AI literacy organically.

6 LIMITATIONS

Our study recruited K–12 teachers from a single public school district in the United States. While BPS includes a wide range of instructional settings and student populations, all participants were drawn from within a single district context. As such, the perspectives captured in this study may not reflect the experiences of educators in districts with different resource levels, governance structures, or approaches to genAI integration. All interviews were conducted remotely via Zoom. While this approach allowed for scheduling flexibility, it may have limited opportunities to observe contextual cues or develop the informal rapport often facilitated through in-person interactions. Though the findings are not intended to be generalizable, they offer timely insight into how teachers are navigating genAI in practice within a large public school system. As schools continue to adopt and regulate genAI tools, further research is needed to explore how broader institutional, cultural,

policy, and design contexts influence adoption across a wider range of educational settings.

7 CONCLUSION

Our analysis offers a teacher-centered account of how genAI is being taken up in everyday school contexts. First, teachers welcomed genAI's potential to ease bureaucratic and repetitive tasks, particularly amid burnout and chronic time scarcity. Second, reluctance to adopt genAI stemmed from limited time to learn new tools, fear of stigma, comfort with established routines, and concerns about environmental impact. Third, teachers actively negotiated boundaries around genAI use, deciding when it supported their instructional goals and when it risked undermining their professional judgment or students' learning. They treated genAI as a starting point that required editing, verification, and oversight, underscoring how responsible use is intertwined with their identities and commitments as educators. Finally, teachers described conditions they see as essential for sustainable genAI integration, including clear district policies, accessible professional development, and practices that safeguard the relational dimensions of teaching. These reflections collectively emphasize that meaningful integration cannot rely on individual effort alone but requires systemic support. Together, these insights position teachers as discerning agents whose values, constraints, and expertise will shape genAI's role in schools. Future research could extend this work across diverse settings and through longitudinal, participatory approaches to ensure that genAI design and integration reflects the realities of classroom practice.

ACKNOWLEDGMENTS

This work was supported by the Spencer Foundation Vision Grant - 202400145. It is also supported under the AI Research Institutes program by the National Science Foundation and the Institute of Education Sciences, U.S. Department of Education, through Award #DRL-2229873 - AI Institute for Transforming Education for Children with Speech and Language Processing Challenges (or National AI Institute for Exceptional Education). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation, the Institute of Education Sciences, or the U.S. Department of Education.

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A INTERVIEW PROTOCOL

Below is the interview protocol used to gather insights from teachers about their experiences with generative AI in their instructional practice.

Section 1: Background.

- Can you briefly tell me about your role and how long you have been in this position?
- Since you entered the field of education what are the biggest trends and changes you have seen?

Section 2: AI Use.

- I know your school district has been an early adopter of Magic School AI. How were you introduced to it? What did that process look like, and how did you find it?
- We're also looking into how different AI tools are being used across the country. So we're curious, are there any other AI tools you've been using in your role, e.g., ChatGPT?
- How often do you use AI tools in your work? Would you say it's something you use daily, a few times a week, once in a while, or not really at all?
- Can you walk me through a typical day or week where you use [insert AI tools] in your role?
  - What has been the most useful application of AI in your work? Can you describe a moment when it made a significant difference?
- Can you describe any trends you've noticed in AI adoption within your school or district?
  - Are there particular subject areas, grade levels, or roles where AI use is more common?
  - Among the school faculty and staff, what factors seem to encourage AI adoption?
  - What about educators or administrators who actively resist using AI? What reasons do they give?
- Based on your experiences with AI so far and what you've seen in your school/district, what would you say AI is best for when it comes to supporting your work as a teacher?
  - Are there ever times when you feel unsure if you should use AI or not?
  - In what sorts of scenarios would you say it's NOT okay for teachers to use AI?
  - How do you make the decision about whether it's okay to use AI or not in a certain situation?
- What kinds of professional development or support have been available to help teachers integrate AI into their practice?
  - Have there been ongoing conversations, either through formal PD or informal peer discussions, about how to make the most of it in the classroom?
- Have students expressed any expectations or preferences about how AI should or shouldn't be used by teachers?
- What about parents/families? What do they know about / think about how AI should or shouldn't be used by teachers? students?
- Do you feel that AI has influenced your pedagogical approach to teaching and learning?
  - How, if at all, do you think it might influence your work as a teacher going forward?

Section 3: Opportunities and Challenges.

- Can you recall a time when [insert AI tools] didn't work as expected? What happened, and how did you address the challenge?
- More broadly, what kinds of concerns do you have about AI, either in your role or based on what you've seen happening in schools?
- Have there been any safety, privacy, ethical concerns related to AI use in your work? Can you share an instance where these concerns had to be managed?

Section 4: District and School Policies.

- Can you describe any ongoing discussions or initiatives related to a district-wide AI policy on responsible AI use?
- How does your school vet and choose AI tools? Does your school have a process for piloting tools before full implementation?

Section 5: Future Considerations.

- What additional support or resources would help schools successfully implement generative AI?
- How do you see AI shaping education over the next five years?
- What do you think are the best and worst-case scenarios for AI's impact on teaching and learning?
- Is there anything I didn't ask or that we didn't discuss that you'd like to share about your thoughts and experiences related to AI in education?

Table 2: Examples of Codes and Subcodes

Code	Subcode	Example Coding
Adoption Orientation	*Critical*	*"If we're encouraging students to use AI they'll become lazy."*
	Conditional	*"I stopped using it for unit planning but like making resources and differentiation, it's great for."*
	Embracing	*"I've started using it more and more, I live on ChatGPT."*
AI Resistance	*Preference for Tradition*	*"Why would I do something that like, I, like what I've been doing has been working."*
	Mistrust in AI	*"I'm never gonna just put something and copy and paste."*
	Stigma towards AI	*"I've heard people saying things like this isn't rigorous enough."*
	Time Barriers	*"It's just like lack of time. Like we don't really get much planning time."*
AI Benefits	*Time Saving*	*"AI is writing the same thing I would write, but it only takes me like 20 seconds versus hours."*
	Burnout Prevention	*"It was taking away some of the cognitive load that I was doing as a teacher."*
	Salary Advancement	*"There's been multiple opportunities for salary advancement to complete courses at no charge."*
	Extra Support for Students	*"Kids could throw their own writing through AI and hey, here's some feedback."*
	Expansion of Curriculum	*"I've used it to get ideas for unit planning and lesson planning and it's been pretty helpful."*
	Teacher Learning	*"It's instructing kids on how to use Adobe Photoshop. So a lot of it's me learning about some of these things because it's all, it's brand new for me too."*
AI Concerns	*Plagiarism*	*"Kids just like cheating to, you know, I wrote this essay and no, you did it."*
	Over Reliance	*"It's a slippery slope where once they open up the ability to use ai, then they're gonna start using it for everything."*
	Environment Impact	*"I'm aware of like the environmental horrors."*
	Erosion of Academic Standards	*"If I like use AI for video questions, I won't fully know what it asks and then I'm reading through it to my class and I'm like, that's a horrible question."*
	Misinformation	*"I've definitely seen examples of, like I said, like history and other facts being wrong."*
	Stigma	*"The district did the push for it. So then I was like, oh, good. They want us using it, so I won't get in trouble for using it."*
	Fear of Misuse	*"I worry about yeah, them using it for bullying or for like, just in a negative way."*
	Loss of human connections	*"Instead of having that conversation with [friends], I mean, they're on their screens a lot."*

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Code	Subcode	Example Coding
Applications of AI	*Communicating Objectives*	*"If I'm having a hard time figuring out what the simplest objective would be for it, I would use ChatGPT."*
	Brainstorming	*"I use it to during the week to like brainstorm for the next week."*
	Conflict Resolution	*"I know that's not appropriate. And so AI kind of like gave me different suggestions."*
	Differentiated Learning	*"I can like make an article that's written for a high schooler, adopt it to a third grade level."*
	Family Communication	*"Parents who are extremely emotional, AI is able to bring down the temperature and use words that are soothing."*
	Lesson Planning	*"I can get my learning target and I can give that to Gemini and it'll kind of spit out a structure for how I can run the class."*
	Learning Differences	*"I was using it specifically to help me come up with behavior intervention plans."*
	Multilingual Learners	*"We use ChatGPT to translate documents and stuff for multilingual students."*
	Formative Assessment	*"I create like a formative assessment and use it to help me make those kinds of things."*
Teacher Background	*Usage Frequency*	*"I would use AI like two or three times a week."*
	AI Tools	*"I use canva. I use ChatGPT."*
	Teaching Experience	*"I have been a teacher since 2009."*
Tensions	*Student Empowerment vs Misuse*	*"It's the fear of plagiarism cause just cheating and not developing the skills to do it."*
	Willingness to adapt vs. preference for tradition	*"We have people who are genuinely, concerned and afraid of it and don't wanna adopt it."*
Decision-Making	*Teacher AI Collaboration*	*"I don't always use what it spits out. Like, you still have to understand your, and know your content."*
	Teaching as Relational, Judgement Based	*"A machine can give you information, but most students we know are not able to get information from like, that's just printed out for them and put it into their heads. Right? Yeah. You need a relationship."*
Miscellaneous	*District Policy*	*"They have sent out guidelines in terms of like not using student names or like putting all of this identifying information into AI."*
	Educational Trends	*"We've transitioned from paper assessments into computer assessment."*
	Future AI Use	*"AI would take care of a lot of these really mundane things. 'cause you know, most of the teacher's time is not spent on what they really want to do."*
	Grade Levels/Subject Areas	*"I do social studies and science and I didn't use it in science with my kids at all."*

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Code	Subcode	Example Coding
	Professional Development	*"I think what the district is doing is letting teachers choose their own, like for like half the PD day they can choose their own."*