Research Project One

Title: Generative AI Professional Learning Study

During the 2024–2025 school year, STEM Collegiate undertook an internal research project to examine how a structured series of professional learning sessions on the ethical use of generative AI (GenAI) would influence teachers' knowledge, skills, comfort, and day-to-day use of these tools in their professional practice. The overarching goal was to determine whether three focused PD sessions over the year could increase teachers' confidence and ease in using GenAI (e.g., ChatGPT, MagicSchool, Co-Pilot, Gemini, etc.,) while also deepening their understanding of ethical considerations and limitations.

Methodology

All 19 teachers on staff completed an initial baseline survey in August 2024 during a scheduled non-instructional day prior to the return of students after summer break. Two follow-up surveys were administered after school on staff meeting days in November 2024 and May 2025; due to coaching responsibilities, approximately 15 teachers completed each of these follow-up surveys.

At each time point (August & November 2024, May 2025), teachers completed a short, anonymous online survey (Microsoft Forms) with largely identical questions, using four-point Likert scales. Core questions asked teachers to rate:

- Their current knowledge of GenAI as it applies to teaching
- Their comfort integrating GenAI into their teaching practice
- How frequently they use GenAI tools in their work
- Their skill level using GenAI for planning, assessment, and classroom activities
- Their knowledge of ethical considerations
- Their comfort with students using GenAI to support learning
- The importance of administrative support for GenAI
- Their support for the school investing in paid GenAI tools

The August 2024 and November 2024 surveys also included a question about interest in further PD related to using Generative Artificial Intelligence, and the May survey concluded with an open-ended question about other AI tools the school should consider purchasing.

Professional learning intervention

The survey series was embedded in a three-part PD sequence that were designed and led by the Executive Director of Research:

1. Session 1 (August): Intro to GenAI, basic functionality, examples of teacher use, and an overview of ethical use, privacy, and bias.
2. Session 2 (November): Deeper applications for unit/lesson planning, assessment, differentiation, and workflow efficiencies, with explicit attention to ethical guardrails, data privacy, and transparency to students.
3. Session 3 (Spring): Advanced use-cases, prompt design, case studies of ethical dilemmas, and collaborative sharing of classroom applications.

After the baseline results were shared with the principal, the school provided paid monthly ChatGPT accounts for teachers, grouped by subject area, to ensure access to a robust GenAI tool between sessions.

Key Findings

1. Growth in Knowledge and Skill

Across the year, teachers reported a clear upward trend in both their knowledge of GenAI and their skill using it for professional tasks.

- Knowledge of GenAI.
    - At baseline (August), about 58% of teachers rated their knowledge as moderate or extensive, with over 40% describing it as minimal or non-existent.
    - By November, over 70% reported moderate or extensive knowledge.
    - By June, this increased further to 80% of respondents reporting moderate or extensive knowledge, and very few still identifying as beginners.

- Skill in using GenAI for planning, assessment, and activities.
    - In August, about 37% of teachers rated their skill as intermediate or advanced; most saw themselves as beginners.
    - By November, this grew modestly to about 47%.
    - By June, 80% of teachers now rated their skill as intermediate or advanced, with only a small minority reporting “basic” or “no skill.”

These results suggest that the PD series, combined with access to paid GenAI tools, successfully shifted teachers from tentative, beginner users toward more confident, competent practitioners.

2. Increased Frequency of Use in Professional Practice

Teachers' reported frequency of GenAI use also changed substantially over the year.

- At baseline, just over a quarter (~26%) of teachers said they used GenAI frequently (weekly or more), and a majority (about 53%) said they never or rarely used it.
- By November, nearly half (~47%) reported frequent weekly use, and the proportion who never or rarely used GenAI dropped to about 20%.
- By May, over half (~53%) reported frequent weekly use, and the share of never/rarely users remained low at about 20%.

In short, GenAI moved from being a rarely used or experimental tool for most teachers to a regular part of their professional workflow for a majority of staff over the course of the year.

3. Ethical Understanding Deepened, Not Just Enthusiasm

A key objective of the PD was not merely to increase use, but to strengthen ethical literacy and critical awareness.

- Knowledge of ethical considerations.
    - In August, just over 50% (~53%) of teachers felt they had moderate or extensive knowledge of the ethical issues involved in using GenAI (e.g., bias, privacy, academic integrity).
    - By November, that proportion edged up to about 60%.
    - By May 2025, nearly all teachers (~93%) rated their ethical knowledge as moderate or extensive, with a fifth describing it as extensive.

This pattern suggests that the PD series was particularly effective in helping teachers understand not just how to use GenAI, but how to use it responsibly, which is central to STEM Collegiate's emphasis on ethical innovation.

4. Comfort Integrating GenAI vs. Comfort with Student Use

Teachers became markedly more comfortable using GenAI themselves, but their comfort with student use evolved in a more nuanced way.

- *Comfort integrating GenAI into teaching.*
    - In August, about 63% of teachers described themselves as somewhat or very comfortable integrating GenAI into their practice.
    - By November, this rose to almost 87%.
    - By May 2025, over 93% reported being somewhat or very comfortable, and "not comfortable" responses essentially disappeared.

- *Comfort with students using GenAI.*
    - Baseline comfort with student use was relatively low: only about 32% were moderately or very comfortable allowing students to use GenAI to support assignments; over a third were "not comfortable at all."
    - By November, comfort increased, with about 47% now reporting moderate or high comfort and a drop in "not comfortable at all."
    - By May, about 33% reported being moderately or very comfortable, a small increase relative to baseline but lower than November.

This suggests that as STEM Collegiate teachers gained more sophisticated understanding of GenAI's capabilities and risks, their enthusiasm for teacher use increased sharply, whereas their views on student use became more cautious and nuanced. Rather than embracing student use uncritically, many teachers appear to be weighing concerns around equity, plagiarism, and skill development as their ethical understanding deepens.

5. Leadership Support and Investment in Tools

The study also highlighted the importance of administrative support and access to appropriate tools.

- Importance of admin support.
    - In August, about 63% of teachers said it was moderately or very important that school administration support and encourage GenAI as an approved tool.
    - By November and June, this rose and remained steady at about 87%, indicating growing recognition that ethical and effective GenAI use requires clear leadership, policies, and support.

- Support for paid GenAI tools.
    - At baseline, about 47% of teachers said administration should definitely invest in paid GenAI subscriptions, with others in the “maybe/likely” range.
    - By November, after experiencing initial PD and some use, over 90% expressed strong support for investment (almost all choosing “definitely”), a pattern that held in June.

In the May 2025 open-ended question about additional tools, teachers mentioned products such as Magic School AI, Canva Pro/Premium, Grammar support tools (e.g., Grammarly), slide deck generators (e.g., Gamma), plagiarism checkers, and specialized 3D/creative tools. This indicates that teachers are increasingly able to discriminate between tools and identify specific AI-infused platforms that would meaningfully support their work and student learning.

Implications

This three-point survey series, embedded in a structured PD program, provides strong internal evidence that:

- Teacher knowledge and skill with GenAI can grow substantially over a single school year when supported by coherent, sustained professional learning and access to tools.
- Teachers can become regular users of GenAI in their professional work (planning, assessment, differentiation) in ways aligned with the school’s innovation and STEM mandate.
- Ethical understanding has deepened alongside usage, suggesting that PD was successful in avoiding a “hype-only” adoption model and instead fostering critical, responsible use.
- Teachers are endorsing GenAI as a legitimate part of their professional toolkit while remaining appropriately cautious about unsupervised or poorly structured student use, signalling the need for clear policies, student guidance, and assignment design that anticipates GenAI involvement.

This work directly supports STEM Collegiate’s charter commitments around innovation in teaching, ethical use of emerging technologies, and building staff capacity in STEM fields.

Recommendations

a) **Sustain and extend GenAI PD.**
Continue offering annual refreshers and advanced sessions for returning staff, and build a GenAI onboarding module for new teachers so that all staff share a baseline of knowledge, ethical understanding, and access.

b) **Develop clear guidelines for student use.**
Building on teachers' growing ethical awareness, co-construct school-level guidelines and assignment design principles for student use of GenAI (e.g., when it is allowed, how it must be acknowledged, and how tasks may need to be redesigned).

c) **Leverage teacher expertise.**
Encourage teachers who have developed deeper expertise (intermediate and advanced users) to lead peer-sharing sessions, model exemplar prompts and assignments, and support colleagues in their departments.

d) **Align tool purchases with identified needs.**
Use the June open-ended responses to guide decisions about which paid tools (e.g., Magic School, Canva Pro, grammar tools, presentation generators) best align with teacher needs and student learning goals.

e) **Monitor impact on planning and workload.**
In future years, consider adding items that track how GenAI use affects planning time, assessment workload, and differentiation, to document how ethical adoption of GenAI supports teacher well-being and instructional quality.

Conclusion

Overall, this year-long GenAI professional learning project demonstrates that intentional, ethically anchored PD, paired with appropriate tools, can significantly increase teachers' knowledge, skills, and use of GenAI in their professional practice. The results position STEM Collegiate as a school that not only embraces innovation but does so in a way that is thoughtful, research-informed, and aligned with its responsibility to model ethical technology use in K–12 education.