

From Instructors to Thinking Facilitators: Developing teachers to Scaffold Emotional Intelligence-enhanced Critical Adaptive Thinking in the GenAI Era

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Abstract: Teachers play a critical role in scaffolding students' adaptive critical thinking, yet many may remain underprepared for this in both AI-integrated and non-AI-integrated classrooms. This paper presents a three-stage, GenAI-empowered Professional Development (PD) design within a Singapore Professional Learning Community, grounded in a refined Adaptive Critical Thinking Framework and Socratic questioning. Integrating Transcribe, M-Powering Teachers, and ClaudeAI, the study explores teachers' current facilitation practices and how AI can develop their scaffolding competencies, with the aim of elevating GenAI-empowered teacher professional development.

Keywords: adaptive critical thinking, Generative AI, Professional Development

1. Introduction

In recent years, we have witnessed the rapid development of Generative AI (GenAI) technologies and its adoption in education across varying disciplines and school levels (e.g., Yusuf et al., 2024). Characterized by the unique affordances of accessibility, personalization, automation, and interactivity (Wang et al. 2024), GenAI is reshaping the educational landscape, providing new possibilities for content augmentation, personalized learning paths, virtual labs, and simulations (Sandhu et al., 2024). Learning with GenAI has become a new norm in students' life. A typical scenario, for example, is content creation and co-writing with GenAI, such as generating NotebookLM slides from students' provided prompts.

Interestingly, some researchers have shown that GenAI facilitates the development of thinking skills, such as critical thinking (Laak &Aru, 2024), adaptive thinking and its application (e.g., Sandhu et al., 2024). Several other researchers, however, have cautioned about the risk of lower critical thinking due to the use of GenAI (Gerlich, 2025). Jose et al (2025), for example, suggested a “cognitive paradox of AI in education”. They argued that while AI offloads some mundane tasks, when students rely too heavily on AI-generated answers, they may bypass critical thinking, problem-solving, and reasoning processes that are critical for their learning. To mitigate the issue, Jose et al (2025) highlighted the importance of incorporating reflection, AI-free session and discussion for active mental engagement.

Jose et al (2025) emphasized the importance of scaffolding. Similarly, Lehmann et al (2025) showed that while more than half the students agreed that AI support critical thinking, the effect of AI, however, occurs only when scaffolding is present. Without it, there is a risk of overt technology dependence.

Teachers play a significant role in scaffolding thinking. Dochia (2025) linked it to teachers' role and highlighted a change of role from knowledge transmitter (or instructor) to learning/thinking facilitator. However, from our observations, teachers often feel unsure in scaffolding and facilitating critical and adaptive thinking. Their hesitation

could stem from several barriers, including cultural barriers (e.g., embracing dominant culture as the norm for critical thinking with misaligned conception of own culture or values in Zhao, 2020) and teacher-related barriers (e.g., conflicting views about critical thinking in Bezanilla et al., 2019). Emotional intelligence is another element not to be neglected. The recent article by Palma-Luengo et al. (2025) suggested that emotional intelligence is an underlying mechanism for the development of critical thinking and that teachers should develop and promote critical thinking and emotional intelligence concurrently. Teachers, however, often lack the training in emotional intelligence needed to recognize and assess their students' emotional intelligence (Brackett et al., 2010). Finally, regarding scaffolding thinking in the GenAI era, as reported by Traga Philippakos & Rocconi (2025), teachers mainly use GenAI for efficiency rather than partnering with AI in teaching. Without an embodied use of GenAI to develop their own thinking skills, and with existing concerns and sometimes fear about GenAI technologies, it is challenging for them to scaffold students' thinking skills.

Our professional development project, therefore, aims to serve two purposes. It aims to develop teachers' understanding of current facilitation practices and introduce them to effective ways of facilitating thinking. It also explores ways to support teachers in developing competencies in facilitating the development of critical adaptive thinking, through the use of AI to transcribe lessons, process transcripts, encourage reflection, and simulate classroom dialogues. Through the project, we aim to develop the teacher forces in Singapore to scaffold adaptive critical thinking in their classrooms.

2. Two-tier emotional intelligence-enhanced adaptive critical thinking framework

For the purpose of our study, we refer to the adaptive critical thinking framework (Ey, et al., 2021) to guide the development of teacher competencies in facilitating critical adaptive thinking. Ey et al (2021) defined critical adaptive thinking as “reasonable and reflective thinking about ill-defined issues using incomplete information, focused on deciding what to accept versus what to question, or what to do” (p. 2). The framework is a combination of thinking skills and disposition, i.e., habits of thought as they believe skills alone are insufficient for adaptive critical thinking. There are two reasons that we adopt this framework. It emphasizes ill-defined problems, making it suitable for today's learning with the emergence of new issues and new solutions. It also extends the conventional focus of critical thinking on analytical and evaluation skills to reflection in action, aligned with the growth mindset we are advocating for teachers and students.

To further enhance the development of adaptive critical thinking and address the lack of emotional intelligence training highlighted in the literature (e.g., Palma-Luengo et al., 2025), we drew on Brackett (2019) to explore emotional intelligence as a key lever in accessing and developing adaptive critical thinking. As shown in Figure 1, the model is a two-tier design with Tier 1, an Emotional Intelligence Foundation workshop and Tier 2, emotional intelligence woven with adaptive critical thinking processes. As shown in Figure 1, there are five key components in Tier 1 Emotional Intelligence workshop, including Recognizing, Understanding, Labelling, Expressing, and Regulating emotions.

The emotional intelligence elements are further integrated into Tier 2, adaptive critical thinking processes. These processes are 1) open-mindedness about one's own assumptions and gradually proceeds to 2) application to new complex scenarios with system thinking, 3) monitoring and responding to thinking traps like bias, and 4) gathering information for new understandings. This is followed by the 5) filtering of data by questioning one's own perspectives and worldview, 6) analyzing claims and evidence with rigor, and 7) sense-making and transforming thinking by reflection on action.

Emotional intelligence is woven in varying degrees of both extent and explicitness, depending on the nature of the process. We categorize the degree as “essential”, “important”, “moderate” and “light”. Take the first process of staying open-minded about one's own assumptions as an example, we have considered emotional intelligence as “essential” because it is not merely a cognitive act, but an emotional one. It requires the awareness and regulation of the discomfort

that arises when our existing beliefs are challenged, and the courage to sit with the possibility that we may be wrong. This is where emotional intelligence becomes pivotal: it enables individuals to recognize the fear, defensiveness, or loss of certainty that can surface in moments of change, and to choose curiosity over self-protection. Without this capacity, individuals often cling to familiar interpretations, not because they are accurate, but because they feel safe. As a result, the very fear of being wrong becomes a key stumbling block to adaptation, preventing the flexible rethinking needed to navigate fast changing and uncertain environments. Similarly, in the fifth process of questioning one's own worldview, emotional intelligence is "essential" because it requires students to be aware of their emotions, able to communicate them, and to regulate them. For certain processes, such as Process 6, analyzing claims and evidence, students may only do a regular check-in of emotions, and thus it is deemed as "light".

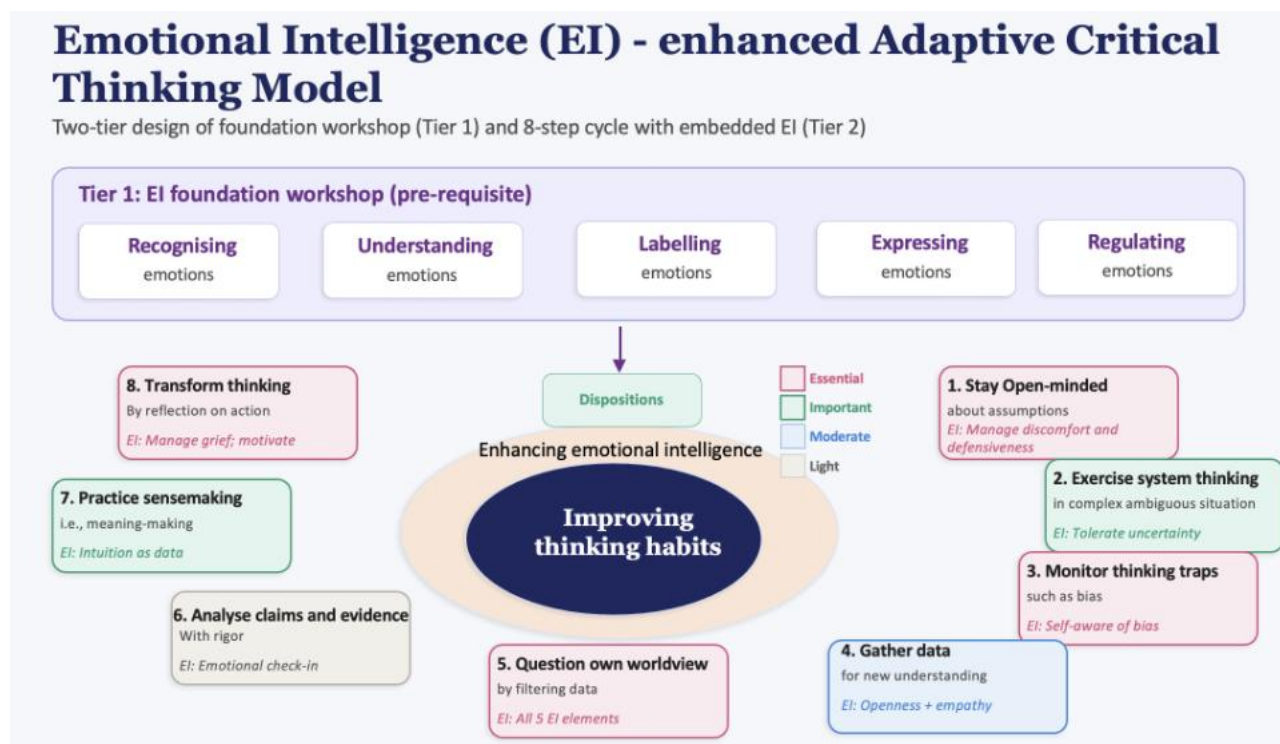


Figure 1 Two-tier emotional intelligence-enhanced adaptive critical thinking model

In addition, we will draw on Socratic Questions to model and guide teachers' facilitation of adaptive critical thinking. For example, questions such as "Are we favoring this idea because we..." and "What is the blind spot in our current way of thinking?" can be asked as probes to facilitate the process of questioning assumptions in the first process of open-mindedness. Similar sets of questions will be set for the other seven steps.

3. Sequential Process Design and use of AI

The setting of this study is a Professional Learning Community (PLC) in Singapore. PLC is a collaborative, school-based learning activity in which teachers conduct collective inquiry to improve teaching and learning. For this study, we intend to adopt a three-stage design. We intend to incorporate GenAI for Stage 1 and Stage 2. GenAI allow us to facilitate the analysis of teachers' current practice and discourse. Moreover, as the ultimate aim of developing students 'adaptive critical thinking in the AI-empowered learning, it is necessary to set the PD setting as AI-enabled and empowered. It also allows teachers to experience AI firsthand and develop their insights into how GenAI may enhance thinking.

Stage 1 aims to enable the teacher participants to understand their facilitation practice and styles. We plan to follow up with the participating teachers and conduct lesson observations to capture the classroom learning and teacher talk.

We will also conduct interviews with them to better understand their perceived role in developing their learners' adaptive critical thinking, and to identify some existing learning designs, teacher talk, and teacher-student talk that can develop their learners' thinking skills. Upon the completion of Stage 1, we will have built the teacher cases for further development.

Stage 2 is structured professional development at the individual level. Using Figure 1 and Socratic questions as a guide, along with the information gathered in Stage 1 regarding the current facilitating practice and style, we will also provide simulated scenarios for teachers to practice facilitating and review the practice and dialogues with the teachers to identify ways to develop. Teacher reflection is highlighted in both Stage 1 and Stage 2. Reflection logs will be recreated and reviewed in the community to build up the teachers.

We will use Transcribe (<https://www.transcribe.gov.sg>), an AI-powered transcription tool for the class audios and videos we will gather. Transcribe can handle dozens of languages and is completely free to use. It is also able to create simple summaries of the lesson. In particular, we will pass the transcripts of their lessons through an AI bot that has been trained to look out for both instances of adaptive responses on the teacher's part, as well as missed opportunities, to allow the interview to surface unseen fears around adapting to unexpected responses from students. Moreover, to strengthen teacher reflection, we will use "M-powering Teachers", an AI-driven, machine-learning-based platform for teachers' professional development. The tool is able to analyze and generate a report on talk distribution, talk length, and talk moments summary (including uptake, reasoning, questioning, focusing question). It can also visually present the talk moves in the episode and provide personalized feedback to teachers, making coaching more effective and data driven.

For Stage 2, we also plan to use ClaudeAI to generate simulated scenarios for teachers to practice facilitating adaptive critical thinking. ClaudeAI allows us to feed in the framework prompt (Figure 1) and the Socratic questions (Table 1). Figure 2 shows a sample simulated classroom space for the training where teachers may select practice mode (with hints and feedback) and dialogue mode to practice the facilitation of thinking skills.

Table 1. *AI tools for the project.*

	AI tools	AI Function	Rationale of use
Stage 1	Transcribe	Transcription	Efficiency
	AI bot	Analyzing practice	Effective tools for analysis
	M-Powering Teachers	and discourse patterns	and teachers' self-reflection
Stage 2	ClaudeAI	Building simulated scenarios for teacher development	Customized simulation

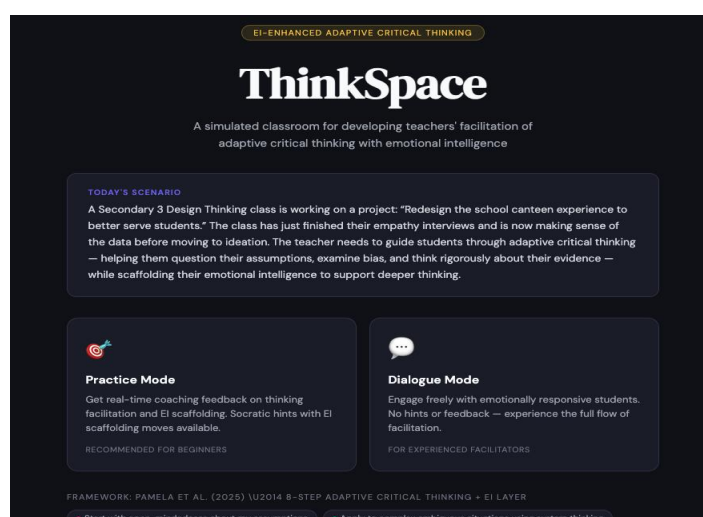


Figure 2A *simulated classroom for the facilitation of adaptive critical thinking*

Stage 3 is professional development at the community level. We will arrange face-to-face sharing sessions within and across PLC communities. Collective learning is effective for professional development. Note that there will be some overlap between Stage 2 and Stage 3, particularly within the PCL in the form of informal group sharing.

4. Timeline

The PLC is an ongoing project. We intend to start with 2 teachers. We will select from teachers who are keen to sharpen their facilitation skills. Two observations of a one-hour lesson will be conducted in April 2026. Key episodes will be transcribed and analyzed using Transcribe, AI Bot, and M-powering Teachers. Meetings will be held and discussions arranged. Training on the ThinkSpace will be arranged in May 2026. That will allow us to analyze the design and report our preliminary findings in June. For the second half of 2026, we will try out the PD model with more teachers, and the community sharing (Stage 3) will be arranged. We will ensure all ethical considerations are addressed in the process.

5. Conclusion

This Professional Development study addresses the need to develop students' adaptive critical thinking skills. It highlights the importance of on-the-job development for teachers and proposes a three-stage, GenAI-empowered design to develop facilitating skills in a Professional Learning Community in Singapore. Its design builds on the current PLC practice of teacher observation and community discussion, informed by the emotional intelligence studies, adaptive critical thinking research and elevated with emerging GenAI technologies for teacher development. In the long run, we aim to implement more iterative cycles and, from there, develop design principles for Gen-AI empowered PD training on facilitating emotional intelligence-enhanced adaptive critical thinking. A limitation is that the simulated classroom, i.e., ThinkSpace (Figure 2), is text-based and may limit the learning experience. Nevertheless, this study serves as an exploratory investigation into how we, as teacher trainers, may use technology to enhance our practices in developing teachers in facilitating and scaffolding thinking and initiate more such studies in the future.

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