

Conceptualizing, Investigating, and Cultivating Teachers' Generative Artificial Intelligence Competency

Generative artificial intelligence (GenAI) offers tremendous potential for teachers' professional practice, yet existing studies consistently report significant challenges in teachers' GenAI integration, such as minimal integration between GenAI and pedagogy and ignoring ethical concerns. These challenges are closely tied to teachers' GenAI competency, meaning the knowledge, skills, and attitudes required to understand and effectively leverage GenAI for teaching and professional development. Despite the growing importance of GenAI in education, there is currently no framework outlining essential GenAI competencies for teachers. Constructing such a framework and developing a targeted professional development program to cultivate these competencies is therefore a matter of urgency. This research project aims to address this gap through a three-phase design. Phase ONE aims to formulate a teachers' GenAI competency framework. We will comprehensively review and analyze existing global and local research and documents on teachers' GenAI integration. Experienced Hong Kong teachers will be interviewed to investigate their perspectives and practices regarding GenAI integration. These data will inform the development of a context-relevant teachers' GenAI competency framework, laying the groundwork for the second phase of the study. Phase TWO seeks to develop an instrument to assess Hong Kong teachers' GenAI competency. The instrument will be developed through a systematic process, beginning with initial item development based on the framework generated in Phase One. This will be followed by an expert-panel review and a pilot study with at least 300 in-service teachers to ensure the instrument's validity and reliability. Phase THREE will focus on developing and evaluating a professional development program for teachers' GenAI competency. Informed by the framework generated in Phase One, the program will employ a flipped professional development model and consist of five modules delivered over 15 weeks. A randomized controlled trial involving 250 teachers will be conducted to assess the program's effectiveness. Three waves of surveys using the instrument developed in Phase Two, as well as teacher interviews, shared practices, and reflective journals, will be analyzed to evaluate the program's efficacy. In summary, this project addresses a significant research gap in teachers' use of AI, outlining a teachers' GenAI competency framework and providing a solid theoretical foundation for future research. The developed instrument and the professional program can serve as benchmarks for similar initiatives globally.