

Investigating Epistemic Cognition Through Educators' Peer Observation in Applied Sciences

This study investigates educator epistemic cognition through a year-long peer observation program conducted from April 2024 to March 2025 within the School of Applied Science at Nanyang Polytechnic, Singapore. Employing the Apt-AIR framework (Aims, Epistemic Ideals, and Reliable Processes), the research explores shifts in educators' beliefs regarding knowledge and pedagogy. A mixed-methods approach was employed, incorporating qualitative interviews (n=4), quantitative surveys (n=13), and an analysis of 33 peer observation records. Quantitative results indicate a high degree of program efficacy, with participants reporting improved student interaction and the successful adoption of new instructional strategies.

Qualitative analysis based on the interviews, mapped to the Apt-AIR dimensions, revealed significant growth across three primary areas. In terms of Aims, the program helped educators move beyond simply delivering content to prioritizing authentic learning. By using observation as a 'mirror,' they were able to address hidden gaps in their teaching and better integrate real-life examples into their lessons. Their Ideals for effective teaching shifted from simple syllabus coverage toward fostering open-mindedness and active student engagement. Finally, in terms of Reliable Processes, educators moved beyond fixed routines toward adaptive instruction, such as leveraging digital tools for live drawing of chemical structure and reconfiguring laboratory spaces to enhance knowledge construction.

While the findings show that iterative observation cycles build a transparent, inquiry-based environment, participants noted logistical challenges, including scheduling and the necessity of relevant peer pairing. These results suggest a structured peer-to-peer feedback is a vital catalyst for refining professional epistemic cognition in higher education.

Keywords: Peer Observation, Professional Development, Reflective Practice, Higher Education.