

# Action Research in schools

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# My experience

- **Assistant Professor** of STEM education, CUHK
- **Associate Director**, Centre of School-university Partnership
- **Associate Director**, Centre of learning science and technology
- Member, **Steering Committee on Strategic Development of Information Technology in Education**.
- Judges, various local and international STEM competitions, and teaching awards
- **Top 2 % most-cited scientist in 2021-2023**
- Associate editor, 4 international journals
- Gifted Education Programmes, HKAGE and HKUST
- EDB curriculums committee /HKEAA ICT exam setter
- Consultant, Mathematics textbook, Pearson

# Today

- Why research?
- What is Action Research?
- How to start?
- Where to share?

# Research is

Too “theory”

Too off grounded

Annoying...

Nothing to do with me?

Fixed VS Growth mindset

Same VS Change in teaching and learning

Know-it-all vs Learn-it-all (ChatGPT)

# Evidence-based teaching

# Benefits

- Evidence-based good practices
- Rigorous method
- Objective measures
- Teacher professional standards
- Local → international recognition
- **Share your achievement**

**Changing Teaching - Changing Learning**

# Types of Scientific Research

- **Categorized by purpose**
  - Basic Research, Applied Research
  - Evaluation Research, Research and Development (R&D)
  - **Action Research**
- **Categorized by method**
  - Quantitative
    - Descriptive research, Correlational research
    - Causal-comparative research, Experimental research, Single-subject research
  - Qualitative
    - Narrative research, Ethnographic research
- **Categorized by time**
  - Cross-sectional research, Longitudinal research



In schools, action research refers to **a wide variety of evaluative, investigative, and analytical research methods** designed to **diagnose problems or weaknesses**—whether organizational, academic, or instructional—and help educators develop **practical solutions** to address them quickly and efficiently

# Area of focus for your Action Research

- learning and teaching
- one's own practice
- something within your locus of control
- something you feel passionate about
- something you would like to change or improve
- school leaderships
- curriculum development

# Qualitative VS Quantitative Research

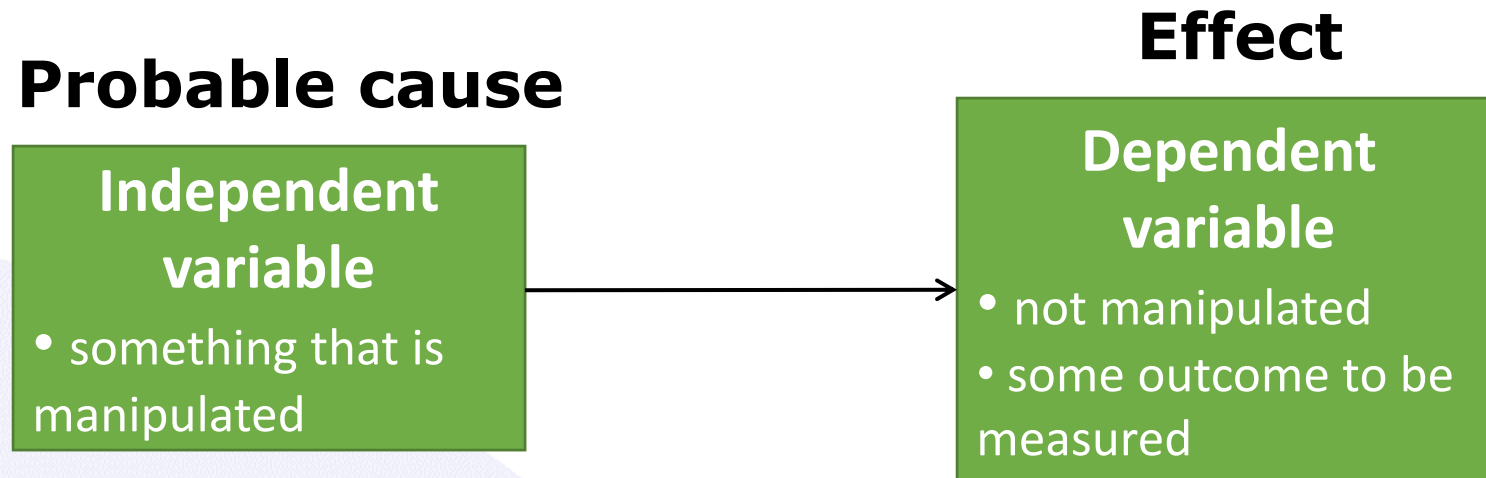
<b>Qualitative</b>	<b>Quantitative</b>
Develops hypotheses	Tests hypotheses
Does not seek to control the contexts	Seeks to control the contexts
Researcher interacts with participants	Researcher does not interact with participants
Involves a smaller sample size	Involves a large number of subjects / participants for results to be statistically significant
Assumes individuality	Assumes that contexts are stable, uniform and controllable
Interpretation of data	Data analyses rely on statistical procedures

# Correlational Research

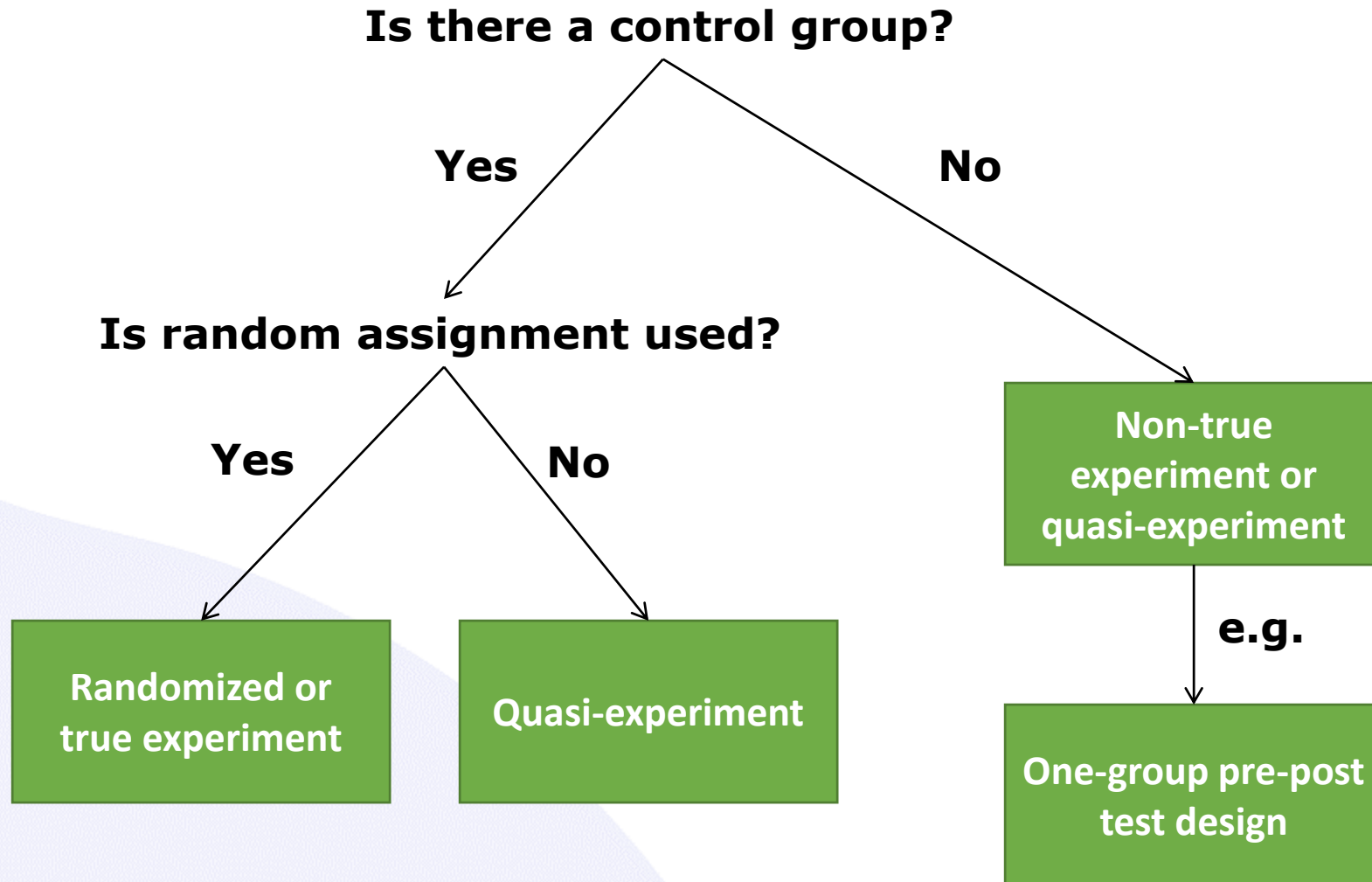
- Correlational research attempts to determine whether and to what extent, a relationship exists between two or more numerical variables
- A researcher uses the correlation coefficient to report the research
- Some examples:
  - The relationship between intelligence and computer use
  - The use of an aptitude test to predict computer use in a science class
  - The use of a mathematic test to predict STEM performance

# Experimental research

- You test an **activity** or **intervention** [independent variable] to see if it affects an **outcome** [dependent variable]



# Experimental research



# Format of Good Research Articles (APA7)

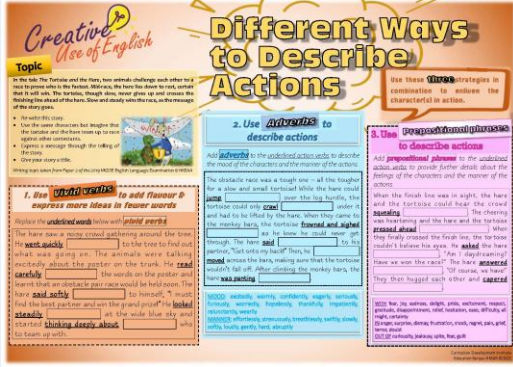
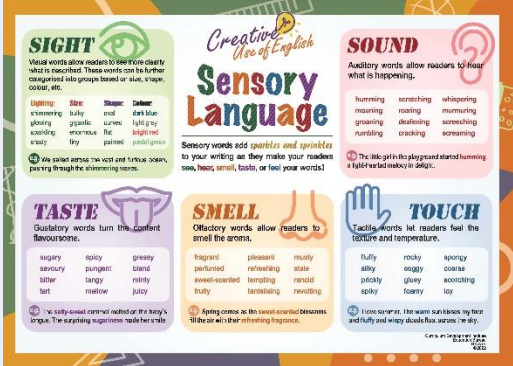
- Abstract
- Introduction
  - Your motivation / local / international issues
- Literature Review
  - Definition of terms
  - Related studies
- This study and method
  - **Research questions**
  - **Methods**
  - Materials, procedure
- Results / Findings
- Discussion (Significance of the study - how might the inquiry improve my teaching)
- References

# Steps to do Action Research

1. Identify issues
2. Look for ideas (literature)
3. Identify the Research Question
4. Research action plan
5. Collect and analyze data
6. Discussions and suggestions



# Example 1a (experimental)

Step	Action
Identify issues	Not sure if creativity writing is effective
Look for ideas (literature)	Reading papers / EDB suggestions <div style="display: flex; justify-content: space-around; margin-top: 20px;">   </div>

What do previous studies tell?


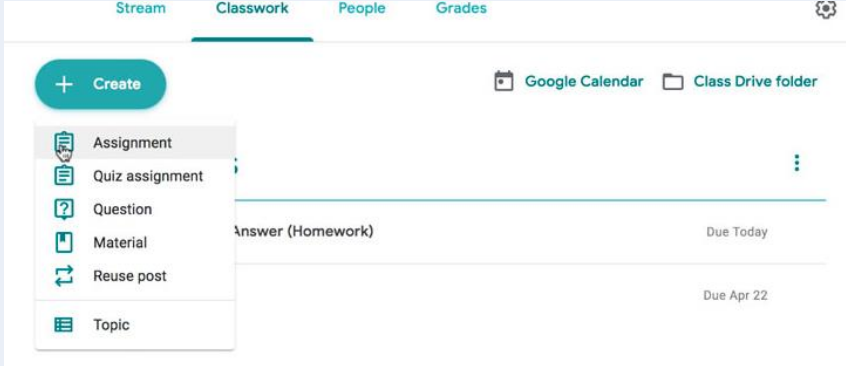
## Example 1b (experimental)

Step	Action
Identify the Research Question	RQ1: Does sensory language improve creative use of English? RQ2: Does sensory language enhance learning interest? RQ3: How does sensory language improve the learning?
Research action plan	Learning: Creating worksheet RQ1: Pre-test and post-test RQ2: Questionnaire RQ3: Interview & learning journal

# Example 1c (experimental)

Step	Action
Collect and analyze data	<ul style="list-style-type: none"><li>• Examine a non-sensory language (business as usual) teaching</li><li>• Followed by sensory language instruction</li><li>• 1 week learning period</li><li>• Pre-test and post-test (improvement)</li><li>• Post-questionnaire</li><li>• Interview (Sampling)</li><li>• T-tests</li></ul>
Discussions and suggestions	<p>The key messages to readers (leaders, schools)</p> <p>Try to explain your case by comparing your results to existing literature</p>

# Example 2a (experimental)

Step	Action
Identify issues	Is LMS good for self-regulated learning?
Look for ideas (literature)	How to design LMS?   What do previous studies tell? What is self-regulated learning? (five steps) What is gamification?

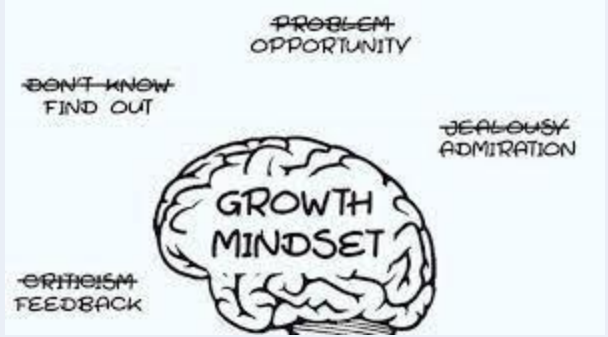
## Example 2b (experimental)

Step	Action
Identify the Research Question	RQ1: Does gamification improve self-regulated learning? RQ2: Does gamification improve student engagement? RQ3: How do games improve the self-regulated learning?
Research action plan	Learning: creating games using wordwalls RQ1 & RQ2: Questionnaire / observation RQ3: Use five steps of self-regulated learning to interview <b>What is student engagement?</b>

## Example 2c (experimental)

Step	Action
Collect and analyze data	<ul style="list-style-type: none"><li>• Design two LMS (e.g., google classrooms)</li><li>• 1 week self-regulated learning period</li><li>• Pre and post-questionnaire</li><li>• Observation form</li><li>• Interview (Sampling)</li><li>• T-tests</li></ul>
Discussions and suggestions	<p>The key messages to readers (leaders, schools)</p> <p>Try to explain your case by comparing your results to existing literature</p>

# Example 3a (whole school)

Step	Action
Identify issues	Growth mindset for whole schools
Look for ideas (literature)	<p>What is growth mindset ?</p>  <p>Questioning, feedback or worksheet?</p>

## Example 3b (whole school)



Step	Action
Identify the Research Question	RQ1: Does growth mindset based feedback motivate students with different learning abilities? RQ2: How does the feedback enhance student motivation?
Research action plan	Sampling – 2 classes in each form (high and low performance) Create feedback sheet Workshops for all the teachers RQ1: Questionnaire / observation RQ2: Interview / video <b>What is motivation?</b>



## Example 3c (whole school)

Step	Action
Collect and analyze data	<ul style="list-style-type: none"><li>• Video record classroom teaching</li><li>• Pre and post-questionnaire</li><li>• Observation form</li><li>• Interview (Sampling – gender, learning performance and etc)</li></ul>
Discussions and suggestions	<p>The key messages to readers (leaders, schools)</p> <p>Try to explain your case by comparing your results to existing literature.</p>

# Example 4a (longitudinal study)

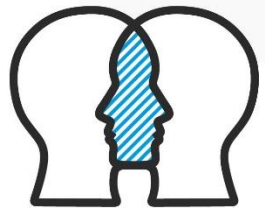
Step	Action
Identify issues	The impact of project-based learning
Look for ideas (literature)	<p data-bbox="784 539 1745 606">What is project-based learning?</p> <div data-bbox="810 682 1411 1013"><p>The diagram illustrates the Design Thinking process as a continuous loop. It is titled "DESIGN THINKING" and features a central infinity symbol. The steps are: Empathize (Understanding people), Define (Figuring out the problem), Ideate (Generating your ideas), Test (Refining the product), and Prototype (Creation and experimentation). Each step is accompanied by a small icon.</p></div> <div data-bbox="1796 554 2247 999"><p>The diagram shows a circular process for Project Based Learning (PBL). The center contains the text "PBL PROJECT BASED LEARNING". Surrounding this are seven segments: Driving Question or Challenge, Need to Know, Inquiry &amp; Innovation, 21st Century Skills, Student Voice &amp; Choice, Feedback &amp; Revision, and Publicly Presented Product.</p></div> <p data-bbox="784 1071 1235 1220">How long ? When to do it?</p>

## Example 4b (longitudinal study)

Step	Action
Identify the Research Question	RQ1: Does design thinking improve creativity, communication and collaborative skills ? RQ2: How does the design thinking enhance the three skills?
Research action plan	Sampling – form 1 Period (6 months) Create work sheet using design thinking Workshops for all the teachers RQ1: Questionnaire / observation / presentation (at 6 points) RQ2: Interview (3 points)

questionnaire

Delay test



Empathize



Define



Ideate



Prototype



Test



interview



## Example 4c (longitudinal study)

Step	Action
Collect and analyze data	<ul style="list-style-type: none"><li>• Worksheet</li><li>• Student presentation</li><li>• Pre and post-questionnaire</li><li>• Observation form</li><li>• Interview</li></ul>
Discussions and suggestions	<p>The key messages to readers (leaders, schools)</p> <p>Try to explain your case by comparing your results to existing literature.</p>

# Framing research questions (souls)

- It takes time
- It may involve a lot of exploration through wonderings
- The research cycle **continues** with new question as well as possible answers

Reading, sharing and attending seminars  
are the key!!

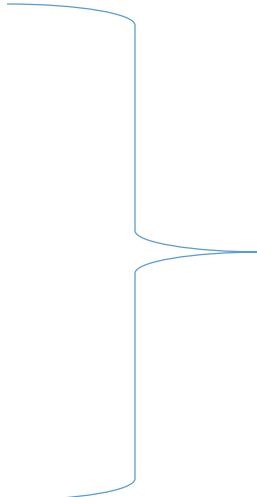
Tip: Don't rush to state a question so your research can begin.  
Figuring out the question is an important part of the research.

# How to find and read journal papers

- Let's look at how we read the following two papers
- **Chiu, T. K. F.**, Moorhouse, B. L., Chai, C. S, & Ismailov M. (2023). Teacher support and student motivation to learn with Artificial Intelligence (AI) chatbot, *Interactive Learning Environments*, *Advanced online publication*, <https://doi.org/10.1080/10494820.2023.2172044> (IF: 4.97 / Q1)
- **Chiu, T. K. F.** (2022). School learning support for teacher technology integration from a Self-Determination Theory perspective. *Educational Technology Research and Development*. *Advanced online publication*, <https://doi.org/10.1007/s11423-022-10096-x> (IF: 5.58 / Q1)
- Google Scholar is good, but.... Try this one.
- <https://www.scimagojr.com/journalrank.php>

# Where to start

- Get to know some journals
- Get new teaching ideas
- Try the ideas in your classrooms
- Go to some local conferences
- Get feedback
- Revise and submit a full paper to local / international conferences and an international journal

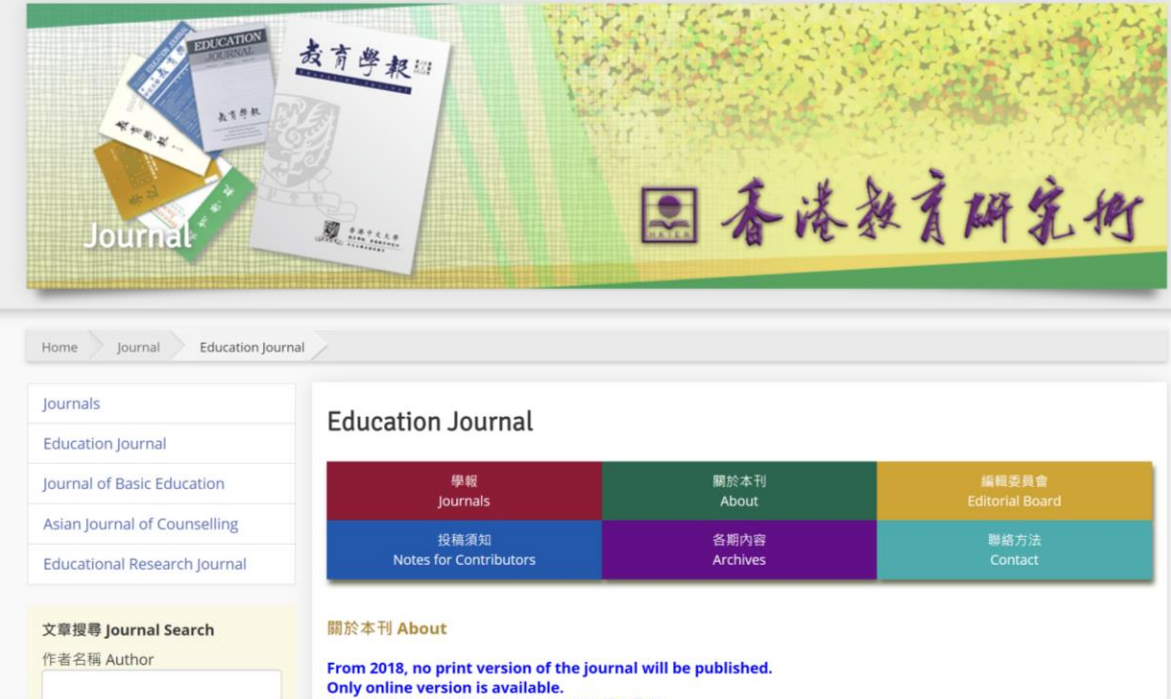


Work with  
some  
experienced  
researchers



# Conferences and Journal – Practitioners’ track

- 全球華人計算機教育應用大會（Global Chinese Conference on Computers in Education，GCCCE）
- International Conference on Learning and Teaching (ICLT), The Education University of Hong Kong, Hong Kong



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- Asian Journal of Counselling
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關於本刊 About

From 2018, no print version of the journal will be published. Only online version is available.

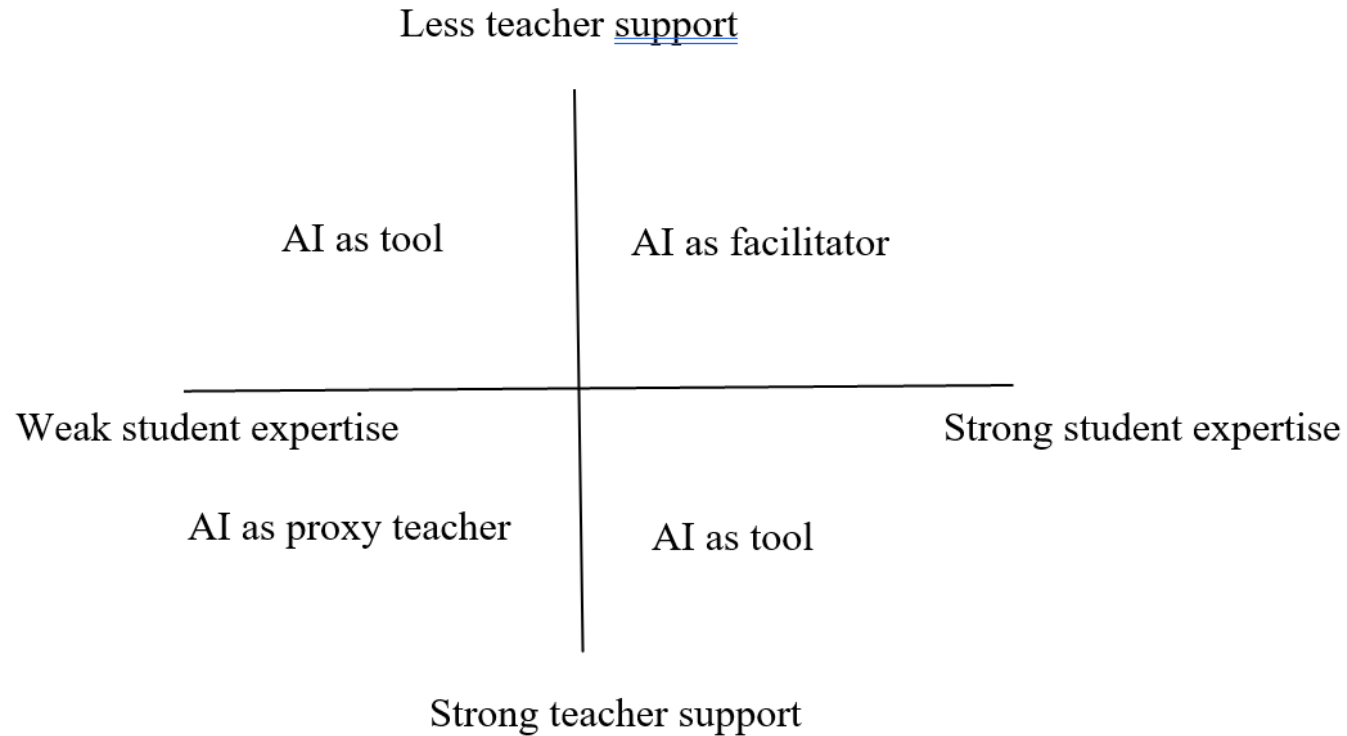
## Other venues

- Expected November- December, 2025  
At Chinese University of Hong Kong
- Professional development sharing

# Topics

- Self-regulated learning
- AI in education
- Positive education
- Digital learning
- Formative assessment
- Interest and identity (STEM)
- Interdisciplinary teaching
- School leaderships

# our achievement



Chiu, T. K. F., Moorhouse, B. L., Chai, C. S., & Ismailov, M. (2023). Teacher support and student motivation to learn with Artificial Intelligence (AI) based chatbot. *Interactive Learning Environments*, Advanced online publication. <https://doi.org/10.1080/10494820.2023.2172044>



# Thank You

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