

# Classification of Educational Research

2025



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# What to cover...

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1. Classification of Research
2. Practical Educational Research
3. Sample Research Topics
4. Research project characteristics
5. Q&A and Challenges



# 1. Classification of Research

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- 1.1 Science: Scientific & Social Science
- 1.2 Goal: Basic/Pure & Applied Research
- 1.3 Information Analysis:  
Quantitative & Qualitative
- 1.4 Research Methodology
  - Historical
  - Descriptive
  - Quasi-Experimental
  - Experimental



## 1.1 Scientific & Social Science Research

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### 1. Scientific Research

- Biomedical research
- ICT, engineering, ...

### 2. Social Science Research

- Social Science & Humanities
- Education



## 1.2 Goal-Based Classification

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1. Basic Research → Cause factors
2. Applied Research → Focus on development, invention, experimentation, and examination of the influence of development
  - Research & Development \*\*
  - Action Research



## 1.3 Classified by Information Analysis

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### 1. Quantitative Research

- Most scientific research
- Statistics

### 2. Qualitative Research

- Most social science research
- Content analysis, Grounded theory,...



## 1.4 Classified by Research Methodology

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### A. Experimental Research

- Randomized control

### B. Quasi-Experimental Research

- Non-randomized control

### C. Non-Experimental Research

- Explorative Research



## A. Experimental Research

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### Randomized Controlled-Trial (RCT) Design \*\*

1. Controlled factors and random sampling
2. Two groups: Exp. Gr. and Control Gr.
3. Observation before the experiment  
(Observation: O1)
4. Experimental Intervention (Ex)
5. Observation after the intervention (O2)





# A-1. Exp. Research (Type 1)

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→ 2 Gr. X 2 Observations (O)

Randomized: O1	Ex	O2	Exp. Gr.
Randomized: O3		O4	Ctrl. Gr.

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Randomized: O1	Ex1	O2	Exp1. Gr.
Randomized: O3	Ex2	O4	Exp2./Ctrl. Gr.

$$D1 = O2 - O1$$

$$D2 = O4 - O3$$

$$\text{Diff.} = D1 - D2$$

## A-2. Exp. Research (Type 2)

→ 2-3 Gr. X 1 Observation (O) [e.g. vaccination]

Randomized:	Ex	O1	Exp. Gr.
Randomized:		O2	Ctrl. Gr.
Diff.	=	O1 - O2	

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Randomized:	Ex1	O1	Exp1. Gr.
Randomized:	Ex2	O2	Exp2. Gr.
Randomized:		O3	Ctrl. Gr.
D1	=	O1 - O3	
D2	=	O2 - O3	
Diff.	=	D1 - D2	



## B. Quasi-Experimental Design

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1. Not focusing on having an experimental group, but focusing on intervention.
2. Non-randomized



## B-1. Quasi-Exp. Research (Type 1)

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- 1 group, measure 1 Observation (O)
  - It has many weaknesses because there is no Control group and external factor control
- Therefore, it is not popularly used, but it can be used with secondary data analysis.

Ex            O1            Exp. Gr.



## B-2. Quasi-Exp. Research (Type 2)

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→ 1 group, measured 2 Observations (O)

There are some weaknesses because there is no Control group and external factor control.

→ Nonrandomized Pretest – Posttest Design

O1            Ex            O2            Exp. Gr.

Diff. = O2 – O1



## B-3. Quasi-Exp. Research (Type 3)

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- 2 groups, measure 2 Observations (O) \*\*
- Very popular because there is a Control group
- Nonrandomized Pretest – Posttest Controlled Group Design

O1	Ex	O2	Exp. Gr.
O3		O4	Ctrl. Gr.
D1	= O2 – O1		
D2	= O4 – O3		
Diff.	= D1 – D2		



## C. Non-Experimental Research

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- Explorative Study → Difficult to publish
- Aim to describe, explore current status
- Open-ended research questions
- What are – the characteristics, constituents, validity..., Make no comparisons
- 3 Types:
  1. Descriptive or survey
  2. Psychometric
  3. Qualitative



# Questions:

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Q1: What is your research question?

Q2: How do you design your research?





## 2. Practical Educational Research

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- Educational research is a research process to seek knowledge and guidelines for use in developing the quality of education.
  1. Policy: Policy planning, analysis, monitoring, risk management, change management



## 2. Practical Educational Research

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### 2. Practice

- Focus on OLE educational concepts
- Focus on transferring technology to practice
- Focus on developing educational innovations or new ideas for use in practice



## 2. Practical Educational Research (2)

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1. Curriculum
2. Learning media
3. Teaching methods
4. Measurement and evaluation
5. Development of teachers or support personnel



## 3. Sample Research Topics

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- Research and Development...Online Courses/Subjects...
- Need Assessment Research, such as online courses, short-term courses
- Study of the state and problems of teaching management... (Curriculum...Subjects...Content...)
- Study of the effects of teaching management in PBL/Project-based/Team-based/Flipped Classroom/...on...subjects...
- Development of the educational quality assurance system



## 3. Sample Research Topics (2)

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- R&D of teaching management models
- Monitoring and analyzing the effectiveness of teaching management in subjects...
- Application of 5G technology with IoT for teaching management in subjects...
- Development of support personnel to help teach subjects...
- Development of question banks in subjects...
- ...



## 4. Research Project Characteristics

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- 1) Curriculum development
- 2) Development of teachers or support personnel
- 3) Development of teaching formats and methods
- 4) Development of examination methods and question banks
- 5) Development of teaching and assessment of ethics and morality of students and/or teachers
- 6) Curriculum evaluation



## 4. Research Project Characteristics (2)

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- 7) Student learning assessment
- 8) Graduate quality assessment
- 9) Promotion and development of physical and mental health of students and/or teachers
- 10) Educational quality assurance
- 11) Development of educational support systems
- 12) ...



## 5. Q&A and Challenges

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- Questions & Answers
  
- A journey of a thousand miles begins with a single step

千里之行，始于足下





# Educational Research samples

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- **Research and Development of CAIBuilder: an Innovative Authoring Tool for Creating E-Courseware Easily**

Siriraj Med J. Volume 57, Number 6, 2005  
(Formerly: Siriraj Hosp Gaz)

<http://www.smj.si.mahidol.ac.th/sirirajmedj/index.php/smj/article/view/870/843>



# How We Teach: Generalizable Education Research

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- Visual event-related potential studies supporting the validity of VARK learning styles' visual and read/write learners.

Sarawin Thepsatitporn and Chailerd Pichitpornchai.  
*Advances Physiology Education*. 40: 206–212, 2016.

# About the speaker



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