

國立清華大學課程大綱

【 尊重智慧財產權，請使用合法教科書，不得非法影印！ 】

課程名稱	中文：研究方法-量化研究		必/選修	必修
	英文：Quantitative Research Methods		課程類別	院核心
開課單位	竹師教育學院	特殊教育學系	開課年級/學期(上、下)	112 下
學分數	3		上課時數	3
先修課程	無			

課程概述：

This course aims to provide an introduction to quantitative research designs in the field of education. The first set of sessions provides the background and framework for understanding the reasoning behind different research designs. The second sessions focus on various types of quantitative research methods and the data analyses that are appropriate for these designs. When completing this course, students will be able to understand and evaluate educational research. Students will also identify reasonable and practical issues in education for their thesis project topics. This course will be taught in English.

注意:本課程將根據修課人數調整學生報告時程，故保留課綱修改之彈性。
由於正式課程開始於第一堂課，故學生若缺席第一堂課者恕無法加簽。

課程內容：

Date	Topic	Readings	Assignment Due
1 (2/19)	Introduction to Educational Research 1. Research Design: Purpose and Principals 2. Research Ethics	Ch 1-2	
2 (2/26)	How to select and define a research problem? (Invite speaker) Search and locate literature	Ch 3-4	
3 (3/4)	How to evaluate a study 1 Introduction of different variables	Ch 23	Abstract
4 (3/11)	How to evaluate a study 2 1. Internal and Statistical Conclusion Validity 2. Construct and External Validity		
5 (3/18)	How to select a sample and collect data? How to select measurements?	Ch 6 Ch 7	Introductory Statement &

			Background
6 (3/25)	How to write a research proposal?	Ch 5	
7 (4/1)	Mid-term Exam		
8 (4/8)	Descriptive & Exploratory Research 1: Survey Research and Analysis	Ch 8	
9 (4/15)	Literature research & discussion: Survey Research and Analysis	Assigned articles	Student presentation
10 (4/22)	Descriptive & Exploratory Research 2: Correlational Research and Analysis	Ch 9	Research Problem & Rationale
11 (4/29)	Literature research & discussion: Correlational Research and Analysis	Assigned articles	Student presentation
12 (5/6)	Causal-Comparative Research & Analysis Experimental Research & Analysis	Ch 10	Data Collection Plan
13 (5/13)	Literature research & discussion: Causal-Comparative Research and Analysis Experimental Research and Analysis	Assigned articles	Student presentation
14 (5/20)	Single-Subject Research and Analysis	Ch 12	Data Analysis Plan
15 (5/27)	Literature research & discussion: Single-Subject Research and Analysis	Assigned articles	Student presentation
16 (6/3)	Review and Integration of Course Content		Whole proposal

教學方式：

Lecture 40%; class discussion: 40%; oral presentation on literature evaluation: 20%

評量方式：

1. Class Attendance and Participation (10%).

- a. Student attendance and class participation are the basic requirements in this course. Students are expected to attend EVERY class on time. If there are any emergencies or reasonable reasons for absence, students should email Prof. Wong with an explanation. Not informed absence will lead to a grade decrease in class participation (5 for each absence).
- b. If you are not able to attend any classes because you are going to attend any academic conferences or presentations, please inform Prof. Wong ahead of time (two weeks before your presentation). We will arrange a time for you to practice your presentation at class. If you are not going to present, please submit a two-page single space written reflection to Prof. Wong one week after the class. Then attending academic conferences or presentations will not be considered as an absence.
- c. Students are expected to read the required materials and be prepared for classes.
- d. Actively participating in class discussions is particularly critical for learning the central concepts and skills for this course. In lectures, asking questions, responding to the lecturer, and perspective sharing demonstrate students' understanding of class contents and clinical applications.
- e. In the literature research & discussion classes, students should read the assigned articles and

rate the studies based on the literature evaluation form BEFORE class. Students should also actively participate in class discussions when their peers lead the conversation about the research quality of the assigned study.

2. Mid-term exam (10%) Due: 4/1

Being absent without informing Prof. Wong before the exam is not acceptable. Being late for more than 15 minutes will not be able to participate in the exam. No make-up exam is allowed if students are late or absent without a good reason or not informing Prof. Wong ahead of time.

3. Abstract (5%) Due: 3/4

Write a 1-to-2-page paper to explain your developing research aims and research questions (Single Space, Times New Roman). On that page, you will (1) provide a brief background of the study, (2) identify the gaps between the current education practice or research, (3) describe the research aims and research questions, and (4) state the importance or significance of the study. Please upload your assignment online to the e-Learn system: <https://elearn.nthu.edu.tw> before the class starts.

4. Introductory Statement & Background (10%) Due: 3/18

Write a 2-3 page paper to describe the ideas and reasoning on why you think the proposed research aims are important and worth studying (Single Space, Times New Roman). Clearly demonstrate that there is a need and/or sufficient scientific evidence to support your research. Cite relevant literature to support your points, including data from relevant studies, if applicable. Please upload your assignment online to the e-Learn system: <https://elearn.nthu.edu.tw> before the class starts.

5. Research Problem & Rationale (10%) Due: 4/22

Write a 1-1.5 page paper to discuss the research problem or issue and explain why the proposed approach is appropriate to address the research problem. Explain the significance and/or innovation of the proposed project in the field of education. Please upload your assignment online to the e-Learn system: <https://elearn.nthu.edu.tw> before the class starts.

6. Data Collection Plan (10%) Due: 5/6

Write a 1-3 page paper to detail the overall strategy and methodology to be used to accomplish the aims. Describe the proposed methods for sampling, collection, including appropriate controls, in sufficient detail for analysis. Discuss how these methods are systematic, rigorous and appropriate to address the research question. Include details on the recruitment, inclusion/exclusion criteria and/or stratification of subjects. Address any human subject protection considerations. Please upload your assignment online to the e-Learn system: <https://elearn.nthu.edu.tw> before the class starts.

7. Data Analysis Plan (10%) Due: 5/20

Write a 0.5-1 page paper to describe the data analysis plan for the research proposed. Discuss how these methods are appropriate to the proposed approach. Describe how the analyses are systematic, rigorous and appropriate to address the research question. Please upload your assignment online to the e-Learn system: <https://elearn.nthu.edu.tw> before the class starts.

8. Whole proposal (25%) Due: 6/3

For your final project, you will submit a revised Project Proposal, incorporating the feedback received from your student colleagues and from Prof. Wong. The proposal will include: abstract (1-page), introductory statement & background (2-3 pages), research problem & rationale (1-1.5 pages), data collection plan (1-3 pages), and data analysis plan (0.5-1 pages). The number of the

whole proposal should be less than 10 pages. Please upload your assignment online to the e-Learn system: <https://elearn.nthu.edu.tw> before the class starts.

9. Oral presentation on literature evaluation (10%)

Every student will select one research design topic and find a published article in the education field that adopted the associated research design to review. One week before the presentation, you will send the article to your peers for them to review and fill in a literature evaluation form. In the presentation, you will briefly introduce the research to your peers (20 minutes) and lead the class discussion to identify the strengths and weaknesses of the study design using the evaluation form (20 minutes).

Note.

1. The professor accepts assignments wrote in either Chinese or English. However, your oral presentation should be in English.
2. Literature should be cited in APA format.
3. All assignments must be submitted on time. Late assignments will be accepted only in extremely unusual circumstances, on a case-by-case basis, and only with pre-arranged permission. Should an unusual and unforeseen circumstance arise that may interfere with the completion of the final project on time, contact Prof. Wong promptly so that your request for special accommodations can be considered. Late projects submitted without prior permission to do so will not be accepted.

為達學習成效，授課教師對本教學大綱保留修改的彈性。有任何建議也歡迎學生及時提出討論。

基於透明與負責任的原則，本課程鼓勵學生利用 AI 進行協作或互學，以提升本門課產出品質。根據本校公布之「大學教育場域 AI 協作、共學與素養培養指引」，本門課程採取有條件開放，說明如下

- 學生須於課堂作業或報告中的「標題頁註腳」或「引用文獻後」簡要說明如何使用生成式 AI 進行議題發想、文句潤飾或結構參考等使用方式。若經查核使用卻無在作業或報告中標明，教師、學校或相關單位有權重新針對作業或報告重新評分或不予計分。
- 本門課授課教材或學習資料若有引用自生成式 AI，教師也將在投影片或口頭標注。
- 修讀本課程之學生於選課時視為同意以上倫理聲明。

教科書及參考書目：

1. Mills, G. E. & Gay, L. R. (2019). Educational research: Competencies for analysis and application (12th ed.). Upper Saddle River, NJ: Pearson. ISBN 9780132613170
2. 王文科、王智弘 (2020)：教育研究法(19 版)。台北：五南。
3. 葉重新 (2017)：教育研究法 (第三版)。台北：心理。