



**FACULTY OF APPLIED SCIENCES**  
**DOCTOR OF PHILOSOPHY IN COMPUTER APPLIED TECHNOLOGY**  
**LEARNING MODULE OUTLINE**

Academic Year	2025/2026	Semester	1
Module Code	PETI8121		
Learning Module	Research Methodology and Ethics		
Pre-requisite(s)	Nil		
Medium of Instruction	English		
Credits	3	Contact Hours	45
Instructor	Janet Zhang Shuhan	Email	shuhan@mpu.edu.mo
Office	P331, PEARL JUBILEE, TAIPA	Office Phone	83998676

**MODULE DESCRIPTION**

This module introduces students to research methods, with emphasis on critical understanding of a variety of approaches to conduct empirical research. Students will also be expected to be aware of multiple stages of a research process from development and justification of research problem, to review of relevant literature, formulation of an appropriate research design, implementation of data collection, and report of results based on suitable data analysis approaches.

**MODULE INTENDED LEARNING OUTCOMES (ILOS)**

On completion of this learning module, students will be able to:

M1.	Develop knowledge in identifying research gaps and proposing problem statement (AHEP4-M4)
M2.	Develop skills in conceptualizing an empirical study (AHEP4-M1, AHEP4-16)
M3.	Develop basic skills in analyzing qualitative and quantitative data (AHEP4-M1)
M4.	Understand ethics and integrity in conducting educational research (AHEP4-M7)

These ILOs aims to enable students to attain the following Programme Intended Learning Outcomes (PILOs):

PILOs	M 1	M 2	M 3	M 4
P1. Understand methodologies in conducting research in the field of EdTech	✓	✓	✓	✓
P2. Understand knowledge and in-depth understanding of a wide range of learning technologies				
P3. Acquire essential knowledge and hands-on experience of analysis, assessment and solutions of EdTech related issues				



P4.	Acquire essential knowledge and application of EdTech-related methodologies in both online and offline learning environments				
P5.	Initiate original research in EdTech related fields, both individually and collaboratively in a team		✓		✓
P6.	Plan, design, execute and manage a scholarly research project	✓	✓	✓	✓
P7.	Critically evaluate an advanced issue in EdTech related fields				
P8.	Communicate research findings, both orally to diverse audiences and in writing through publishing research papers of scholarly values		✓	✓	
P9.	Gather and disseminate knowledge at the postgraduate level and beyond				
P10.	Demonstrate advanced knowledge, competence and research capability in learning technologies and innovation		✓		
P11.	Illustrate a global vision on knowledge advancement and dissemination				
P12.	To demonstrate professional integrity and the spirit of challenge				✓
P13.	To advocate professionalism in workplaces and the society at-large				✓
P14.	To communicate professionally and effectively both in speaking and in writing		✓		

#### MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage	Content Hours
1-2	1. Introduction	6
	1.1. Research topic	
	1.2. Problem statement and research questions	
3	2. Literature review	3
4-7	3. Research design	12
	3.1. Systematic review & meta-analysis	
	3.2. Experimental research	
	3.3. Case study	
	3.4. Design-based research	
	3.5. Longitudinal research	
8-11	4. Data collection and data analysis	12
	4.1. Qualitative content analysis	
	4.2. Statistical data analysis	
	4.3. Correlation and regression	
	4.4. Factor analysis	



	4.5. Structural equation modeling	
12	Research integrity and ethics	3

### TEACHING AND LEARNING ACTIVITIES

In this learning module, students will work towards attaining the ILOs through the following teaching and learning activities:

Teaching and Learning Activities	M1	M2	M3	M4
T1. Lectures and tutorials	✓	✓	✓	✓
T2. Group discussion	✓	✓	✓	✓

### ATTENDANCE

Attendance requirements are governed by the Academic Regulations Governing Doctoral Degree Programmes of the Macao Polytechnic University. Students who do not meet the attendance requirements for the learning module shall be awarded an 'F' grade.

### ASSESSMENT

In this learning module, students are required to complete the following assessment activities:

Assessment Activities	Weighting (%)	AHEP4 LOs	ILOs to be Assessed
A1. Mini-conference presentation	20	AHEP4-M1, AHEP4-M4	M1, M2, M3, M4
A2. Group questionnaire design	20	AHEP4-16	M2, M4
A3. Data analysis practice	20	AHEP4-M1	M3
A4. Research proposal	40	AHEP4-M1, AHEP4-M4, AHEP4-M7	M1, M2, M3, M4

The assessment will be conducted following the University's Assessment Strategy (see [www.mpu.edu.mo/teaching\\_learning/en/assessment\\_strategy.php](http://www.mpu.edu.mo/teaching_learning/en/assessment_strategy.php)). Passing this learning module indicates that students will have attained the ILOs of this learning module and thus acquired its credits.

### REQUIRED READINGS

Lecture notes and slides.

### REFERENCES

#### Recommended readings:

- Gay, L. R., Mills, G. E., & Airasian, P. (2006). *Educational Research: Competencies for Analysis and Applications*. Upper Saddle River, N.J.: Pearson/Merrill Prentice Hall
- Ravid, R. (2000). *Practical statistics for educators*. (2nd ed). New York, N.Y.: University Press of America, Inc.



### Some useful references:

- Anderson, L.W. & Burns, R.B. (1989). *Research in Classrooms: the study of teachers, teaching and instruction*. Oxford: Pergamon Press.
- Berg, B.L. (1995). *Qualitative Research Methods for the social sciences*, 2<sup>nd</sup> edition. Boston: Allyn & Bacon.
- Blaxter, L., Hughes, D. & Tight, M. (2001). *How to research*. (2<sup>nd</sup> ed). Buckingham: Open University Press.
- Bogdan, R. C., & Biklen, S. K. (1992). *Qualitative research for education: an introduction to theory and methods*. (2<sup>nd</sup> ed). Needham Heights, M.A.: Allyn and Bacon.
- Cohen, L., Manion, L. & Morrison, K. (2000). *Research methods in education*. (5<sup>th</sup> ed). New York, N.Y.: Routledge Falmer.
- Gall, J. P., Gall, M. D., & Borg, W. R. (1999). *Applying Educational Research: a practical guide* (4th ed.). New York: Longman.
- Carr, W. & Kemmis, S. (1994). *Becoming Critical. Education, Knowledge and Action Research*. Geelong, Victoria: Deakin University Press.
- Creswell, J. (1997). *Qualitative Inquiry and Research Design*. Newbury Park, California: Sage Publications.
- Denzin, N.K. & Lincoln, Y.S. (2000). *Handbook of Qualitative Research*. Thousand Oaks, California: Sage Publications.
- Hitchcock, G. & Hughes, D. (1995). *Research and the Teacher. A Qualitative Introduction to School-Based Research*. (2<sup>nd</sup> ed). New York: Routledge.
- Krathwohl, D.R. (1998). *Methods of educational and social research: an integrated approach*. (2<sup>nd</sup> ed). New York: Longman.
- Locke, L. F., Silverman, S. J., & Spirduso, W. W. (2004). *Reading and understanding research*. (2<sup>nd</sup> ed). Thousand Oaks: Sage Publications.
- Madsen, D. (1992). *Successful dissertations and theses: a guide to graduate student research from proposal to completion*. (2<sup>nd</sup> ed). San Francisco: Joseey-Bass.
- Maxwell, J.A. (1996). *Qualitative Research Design: An Interactive Approach*. London: Sage.
- Van Maanen, J., Dabbs, J. M. & Faulkner, R.R. (1982). *Varieties of Qualitative Research*. London: Sage.

### STUDENT FEEDBACK

At the end of every semester, students are invited to provide feedback on the learning module and the teaching arrangement through questionnaires. Your feedback is valuable for instructors to enhance the module and its delivery for future students. The instructor and programme coordinators will consider all feedback and respond with actions formally in the annual programme review.

### ACADEMIC INTEGRITY

The Macao Polytechnic University requires students to have full commitment to academic integrity when engaging in research and academic activities. Violations of academic integrity, which include but are not limited to plagiarism, collusion, fabrication or falsification, repeated use of assignments and cheating in examinations, are considered as serious academic offenses and may lead to disciplinary actions. Students should read the relevant regulations and guidelines in the Student Handbook which is distributed upon the admission into the University, a copy of which can also be found at [www.mpu.edu.mo/student\\_handbook/](http://www.mpu.edu.mo/student_handbook/).