FACULTY OF APPLIED SCIENCES
DOCTOR OF PHILOSOPHY IN EDUCATIONAL TECHNOLOGY AND INNOVATION
LEARNING MODULE OUTLINE

Academic Year	2023/2024	Semester	1
Module Code	PETI8123		
Learning Module	Innovations in Technology and Education		
Pre-requisite(s)	Nil		
Medium of Instruction	English		
Credits	3	Contact Hours	45
Instructor	Patrick Pang	Email	patrickpang@mpu.edu.mo
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MODULE DESCRIPTION

The module aims to share and explain various educational technologies that can be implemented in formal classroom instruction and informal learning outside of schools, including Learning Management Systems, MOOCs, Learning Analytics, Artificial Intelligence, Virtual Reality, and Augmented Reality. Moreover, guided by theories and practices, this module identifies and explains the effective and less effective features in the design, use and evaluation of learning technologies.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

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

M1.	Apply instructional design models and cutting-edge learning technologies to the development of learning experiences.
M2.	Design, select, modify, pilot, and evaluate digital technologies and learning management systems to support learning.
M3.	Design and revise an implementation process or mechanism in the context of online, offline and blended learning.
M4.	Apply data mining techniques to the design and evaluation of learning experiences.

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

PILOs	M1	M2	M3	M4
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	1. Introduction	3
	1.1 Brief History of Educational Technologies	
	1.2 Interaction Design and Educational Innovations	
	1.3 Python Introduction	
2	2. Interaction Design Basics	3
	2.1 Cognition	
	2.2 Python Basics	
3	2.3 Design Principles	6
	2.4 Working with numpy and pandas	
4-6	3. Needs Analysis	9
	3.1 Requirements	
	3.2 Interviews	
	3.3 Exploratory Data Analysis	

	3.4 Contextual Inquiry	
	3.5 Personas	
	3.6 Clustering	
7-8	4. Prototyping	6
	4.1 Low Fidelity Prototyping	
	4.2 High Fidelity Prototyping	
	4.3 Prediction	
9-12	5. Evaluation of Technologies	12
	5.1 Planning an evaluation	
	5.2 Expert-based evaluation	
	5.3 Web Crawling	
	5.4 Heuristic evaluation	
	5.5 Cognitive walkthroughs	
	5.6 Natural Language Processing (NLP) Basics	
	5.7 Usability testing	
	5.8 Experiments	
	5.9 Regular Expressions	
	5.10 TAM, UTAUT Models	
	5.11 Word-based Analysis, Word Cloud Visualisations and Word Networks	
13-14	6. Social and Persuasive Computing	3
15	7. Chinese NLP (Optional)	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. Project		✓	✓	✓
T3. Online 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 (%)	ILOs to be Assessed
A1. Online discussion 1	30	M1, M2, M3
A2. Online discussion 2	30	M1, M2, M3
A3. Project presentation	40	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). 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

Reference book(s)

1. Hamilton, B. (2022). *Integrating technology in the classroom: Tools to meet the needs of every student*. International Society for Technology in Education.
2. Selwyn, N. (2016). *Education and technology: Key issues and debates*. Bloomsbury Publishing.
3. Roblyer, M., & Doering, A. H. (2007). *Integrating educational technology into teaching*. USA: Pearson, 2007.

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/.