Development of Learning Management Activities Integrating Artificial Intelligence Technology and Design Thinking to Enhance Innovation Capability and Learning Engagement of Eighth Grade Students

Research Background

Innovation Development Ability
A crucial 21st-century skill, representing the capacity to think, create, design.

Learning Engagement
The level of learners' engagement in behavioral, emotional, and cognitive aspects.

Design Thinking
The five-step thinking process that focuses on understanding users and solving problems creatively.

Artificial Intelligence
A system that simulates human intelligence, such as ChatGPT, which can communicate and analyze data.

Research Objectives

01 To develop learning activities integrating artificial intelligence (AI) technology with the design thinking process to ensure quality, suitability, and effectiveness in accordance with the 80/80 criterion.

02 To examine students' progress scores from the learning activity worksheets in the Applied Technology 2 course.

03 To compare students' learning achievement before and after participating in the learning activities that integrate AI technology with the design thinking process.

04 To study students' innovation development abilities in the Applied Technology 2 course after participating in the learning activities integrating AI technology with the design thinking process.

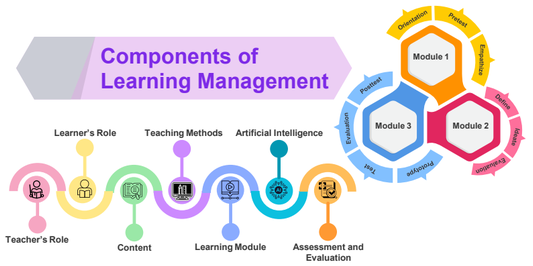
05 To investigate students' learning engagement in the Applied Technology 2 course.

Methodology

Participants
The sample group for this research was selected through simple random sampling using a lottery method, consisting of 40 students from of Eighth Grade Students

Research Instruments
- **Semi-Structured Expert Interview**
- **Lesson Plan**
- **Learning Module**
- **Learning Engagement Scale**
- **Achievement Test**
- **Innovation Development Ability Assessment Form**

Data Analysis
- Percentage
- Mean
- Standard Deviation
- t-test (Independent/Paired)



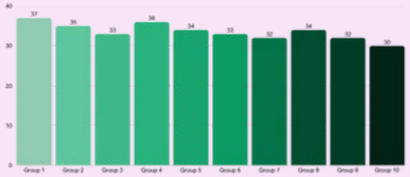
Results

Part 1: The developed instructional activities were rated at **the highest level of appropriateness** (M = 4.67, SD = 0.49) and demonstrated an **effectiveness index** of E_1/E_2 = 92.42/91.25, exceeding the set criterion

Part 2: The average progress score from six assessments (total score = 30) was 27.73 points, or 92.43%, indicating continuous improvement in students' learning performance

Part 3: The students' learning achievement after the learning activities (M = 18.38, SD = 1.26) was significantly higher than before the learning activities (M = 10.25, SD = 1.62), with a statistically significant difference at the .05 level.

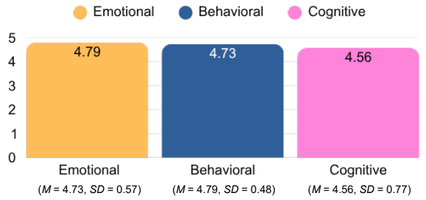
Part 4: Students' innovation development ability in the Applied Technology 2 course.



The students demonstrated a good level of innovation development ability, with an average group score of 33.50 out of 40

Part 5: Students' learning engagement in the Applied Technology 2 course.

The level of students' learning engagement in the Applied Technology 2 course was at the highest level (M = 4.69, SD = 0.65)



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