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Exploring the Applicability of Flipped Micro-Modules in Empowering Postgraduate Students for Self-Directed Learning: A Pilot Study

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BACKGROUND

Rationale

Self-directed learning (SDL) is crucial for engineering students' development, vital for professional growth and lifelong learning¹.

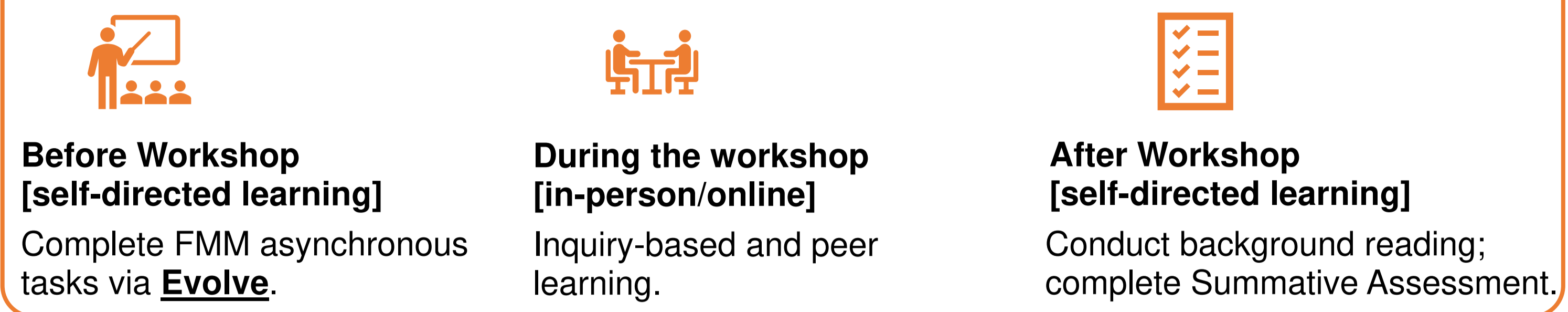
Challenges:

- Traditional methods, criticized for monotony, hinder effective SDL².
- Experience with diverse postgraduate students, highlights challenges, for those unfamiliar, unprepared, or unmotivated for SDL³.

Solution:

- Flipped micro-modules (FMM):** microlearning with short focused learning units designed for the flipped classroom model⁴

Framework for Flipped Micro-modules



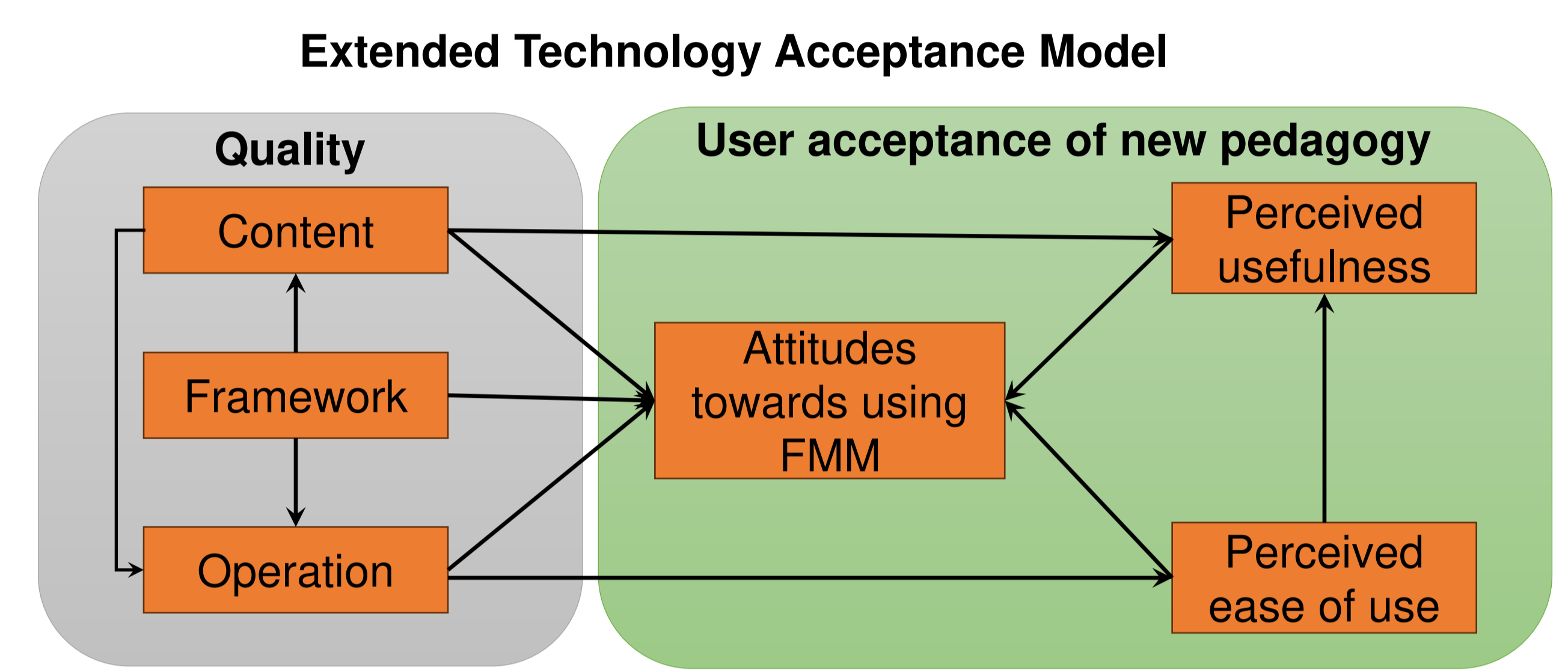
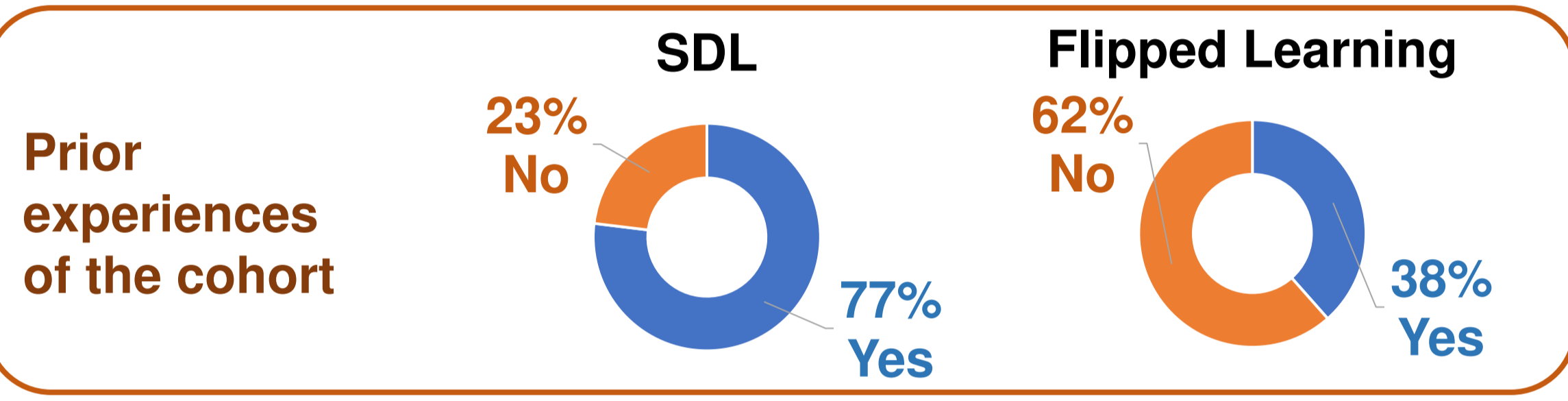
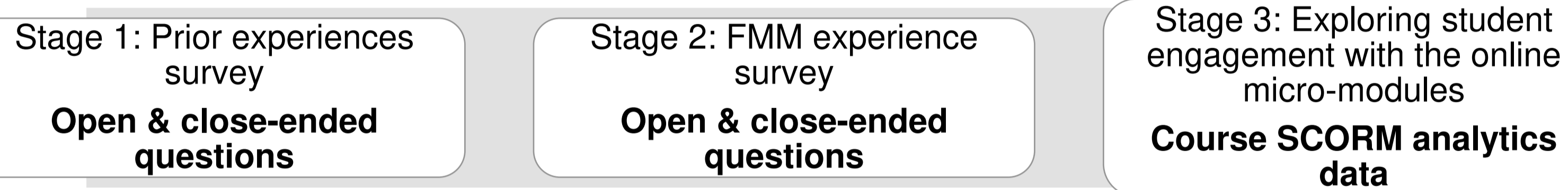
Research Questions

- RQ1 - Is the use of FMM a suitable approach for fostering SDL among postgraduate students?
- RQ2 - What are the benefits and challenges of using FMM to enhance engagement in SDL for postgraduate students?

METHODOLOGY

Sample: N = 13 (9 – male, 4 – female), all students enrolled for CIVE5331M – Construction Technology module, from UK, India, Ecuador, China, Albania, etc.

Data analysis: Extended technology acceptance model (Ex-TAM)³. Descriptive and thematic analysis, visualization, performance metrics from SCORM data



FINDINGS

RQ1 – Applicability of FMM for fostering SDL

Student's evaluation of the FMM from Ex-TAM

Quality of FMM

92%

of students express satisfaction with FMM content and its operation.

81%

of students express satisfaction with the structure and framework of FMM.

User acceptance of FMM

78%

of students affirm FMM's effectiveness and contribution to their academic goals.

82%

of students express satisfaction with FMM's ease of use.

Intention to use FMM in the future

100%

of students express interest in applying FMM across modules and

recommend it for SDL

"The consistent structure in all the micromodules was helpful for easy navigation."

RQ2 – Benefits, Challenges to enhance student engagement

Student Engagement

Online

- All students attempted
- Overall 70% > completion
- ~80% scored in assessments
- Limited peer interactions

In-person

- Full attendance
- Active participation
- Valuable contributions to peer discussions.

Benefits

- Enhanced student satisfaction

ALL

students express confidence in applying FMM-learned concepts to real-world scenarios.

- Enhanced inclusivity over traditional flipped classrooms.

82%

of students highlighted the flexibility in learning

- Enhances student control over learning

"It helped me to structure my independent learning journey."

Challenges

For educators

- Front-loading workload
- Challenges in access and expertise for E-Authoring Tools
- Keeping quality consistent across different microlearning activities

For students

- Need for guidance with unfamiliar tools
- Technical challenges in accessing asynchronous material

CONCLUSIONS

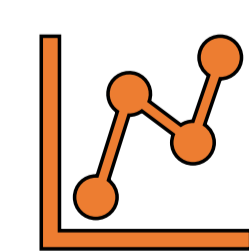
Have challenges been addressed?

Before Staying motivated, and time-management were challenging

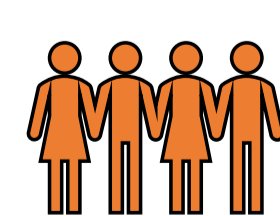
With FMM 78% found FMM maintained motivation; 84% credited it for time management

"I can acquire knowledge in a short period of time and be more confident in the classroom"

Limitations



Small sample Size



Lack of Control Group

Implications for future practice

For educators

Use contextualization and scaffolding techniques with thorough planning

Collaborate with digital education team for tech support

Establish micro-module repositories for homogenization and efficient course delivery

For students

Adopt a "study buddy approach" for collaboration during asynchronous tasks

Create a comprehensive student guide for E-authoring tools

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