

# ***Augmenting the Learning Experience***

*The A L E X Implementation Framework for Higher Business Education: From Affordances to Implementation*

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# Academic Challenges



# What is the project all about

Practice-based thematic PhD in inclusive design and **creative technology innovation**

Investigates and measures the effectiveness and impact of novel, innovative AR enhanced curriculum design on higher education business students' learning experience

- Motivation, Engagement, Knowledge Acquisition and Retention

Key authors/publications

- Mayer's (2020) Science of Instruction (SoI) and Multimedia Learning
- Koehler & Mishra's (2009) Technological, Pedagogical, and Technology Knowledge (TPACK) Framework

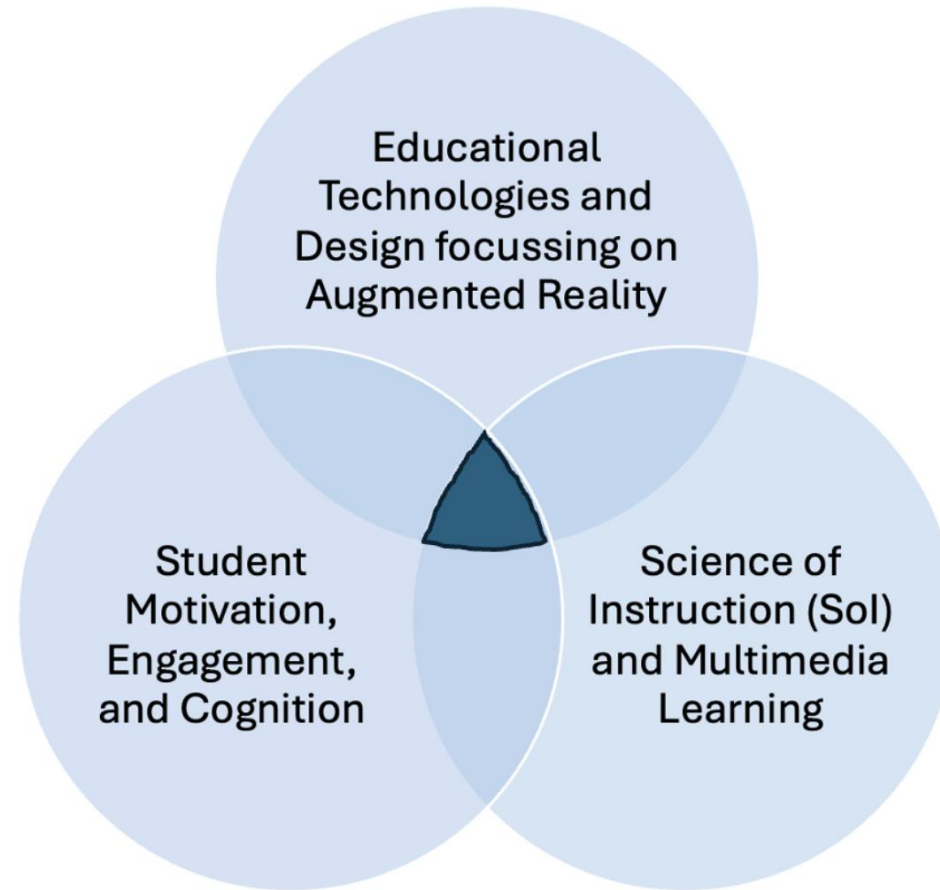
Mixed methods research approach sampling, measuring, and analysing data from UG business degree programmes

- Intrinsic Motivation Inventory (IMI), National Survey of Student Engagement (NSSE), module assessment components

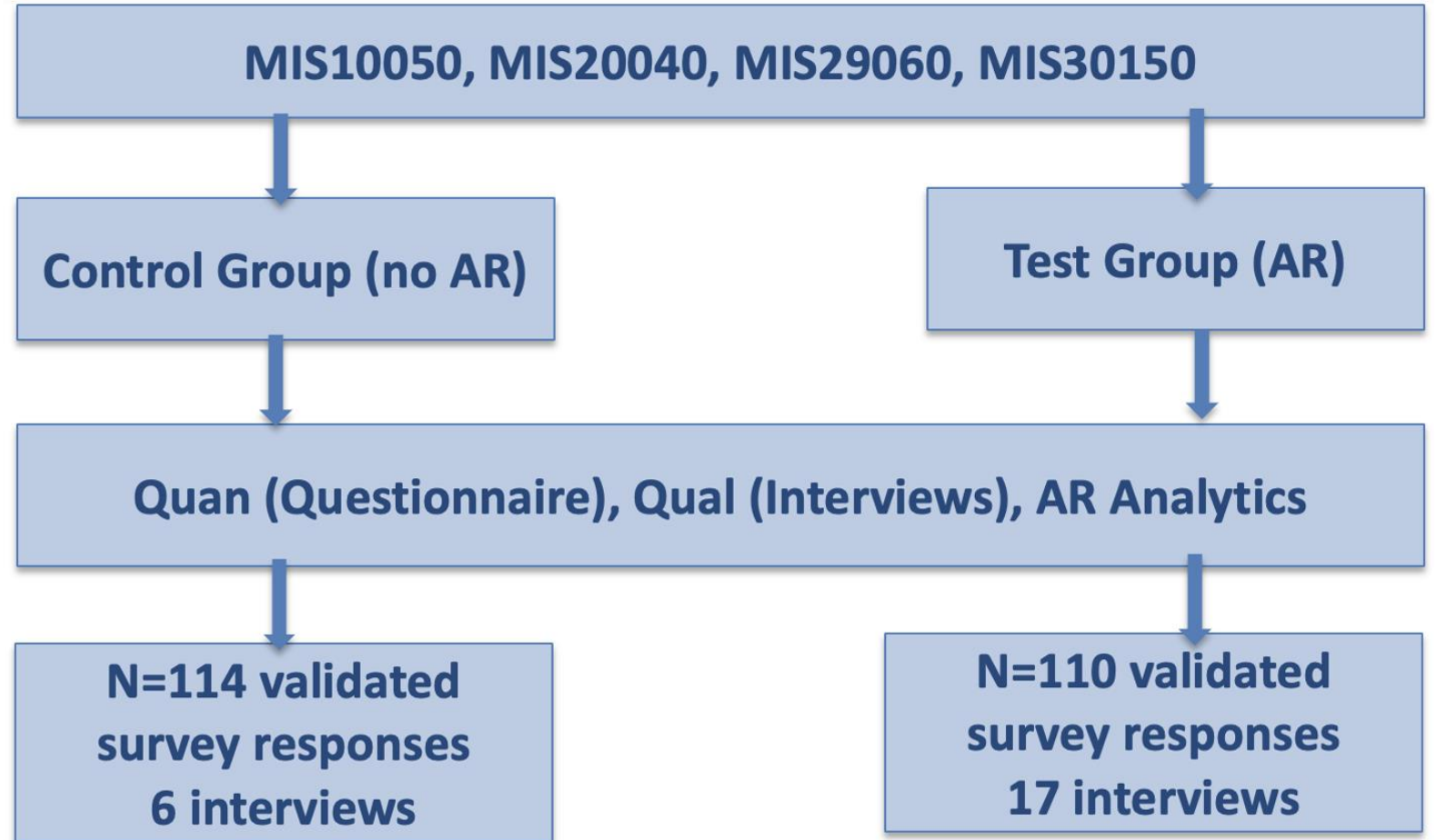
Research findings provide sufficient empirical evidence deeming this thesis' proposed novel learning approach utilising AR-enhanced learning experiences as educationally significant enabling the learner to engage with curriculum material in a much more meaningful way.

Consequently, this thesis makes an original and substantial contribution to literature by introducing an empirically proven, educationally significant, best practice AR Learning Experience (ALEX) implementation framework and associated toolkit for higher business education.

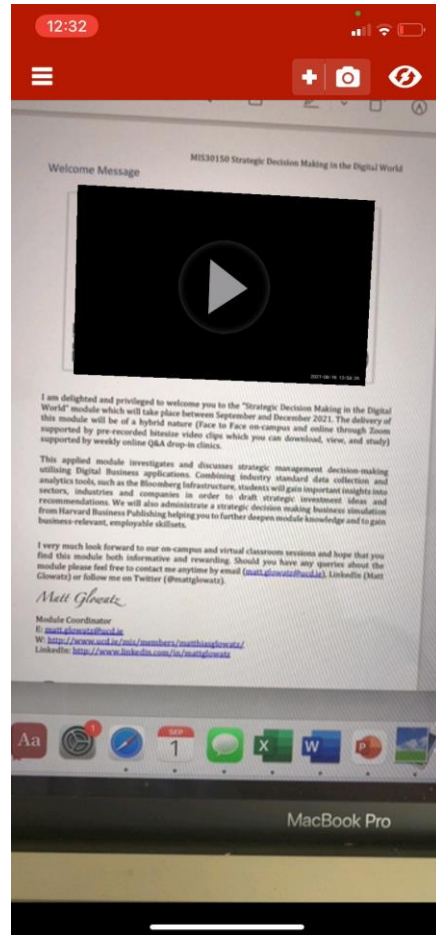
# Knowledge Fields



# Research Site (University College Dublin, Ireland)



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# Effect Size $d > .40$ can be regarded as educationally significant

H1: AR learning experiences **enhance overall learning experience**

- Educationally significant (**large effect size,  $d > .40$** )
- Higher levels of module satisfaction among test group participants

H2: AR learning experiences have a **positive impact on students' motivation**

- Educationally significant (**large effect size size,  $d > .40$** )
- Motivated to become more knowledgeable and perform well in the module/course

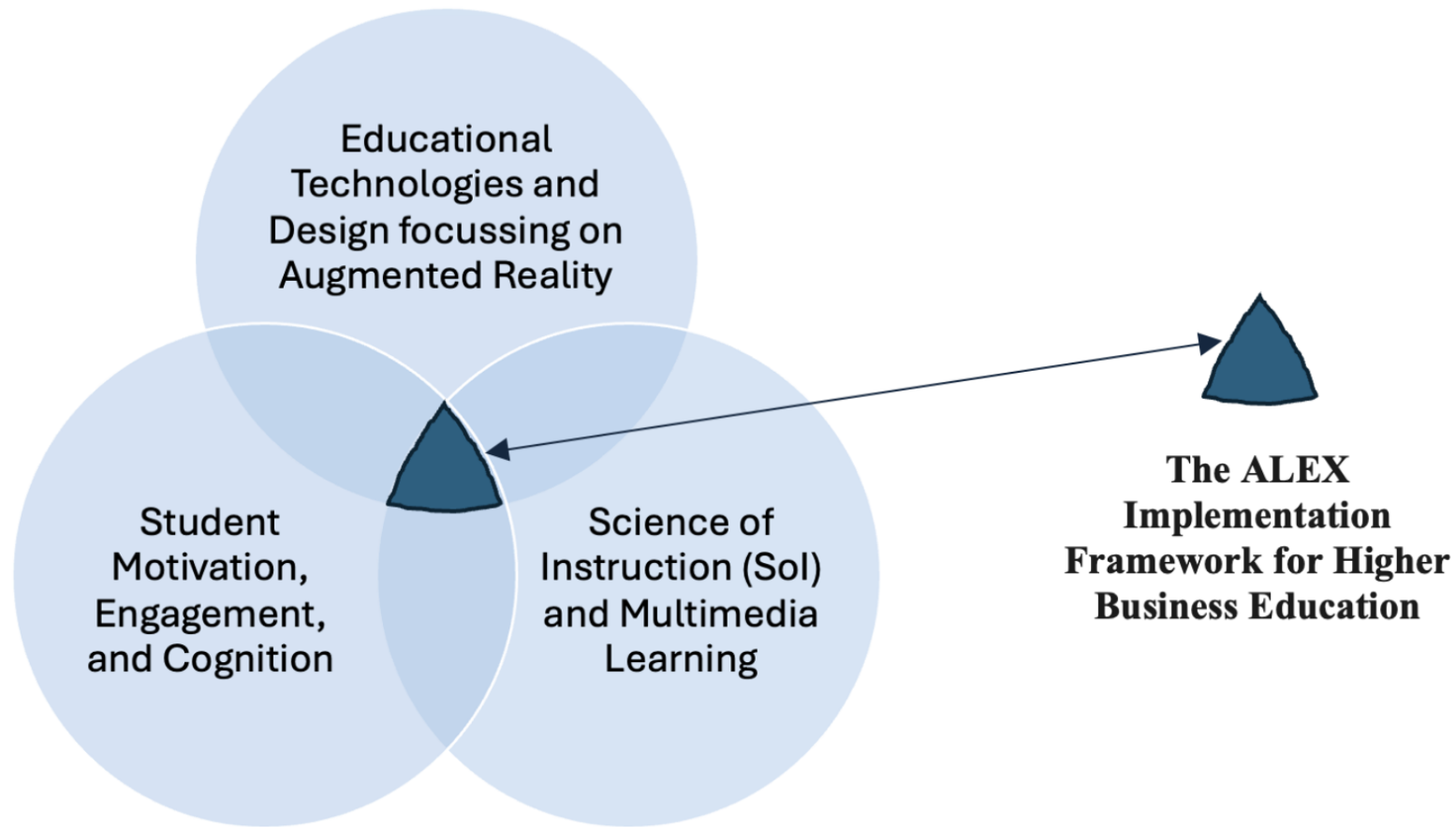
H3: AR learning experiences have a **positive impact on students' engagement**

- Educationally significant (**large effect size size,  $d > .40$** )
- Positive impact on students' desire to engage with module-related learning tasks

H4: AR learning experiences have a **positive impact on students' knowledge acquisition and retention**

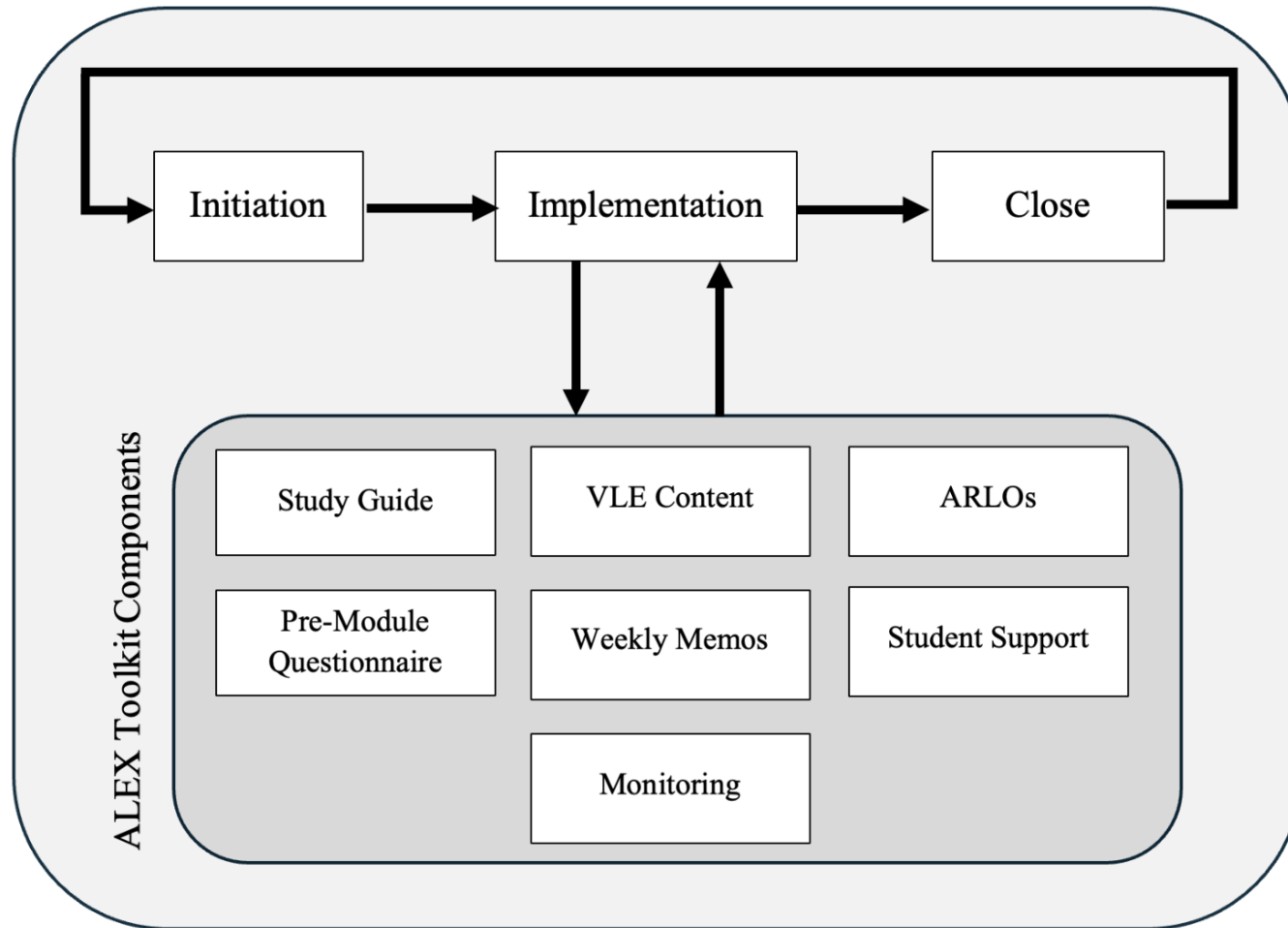
- Educationally significant for knowledge acquisition (**large effect size,  $D > .40$** ), however, not educationally significant for knowledge retention (**low effect size size,  $d < .40$** )
- Improved knowledge acquisition levels, however, NO significant changes in knowledge retention (measured as module assessment grades)

# Knowledge Fields and Contribution



Consequently, this research makes an **original and substantial contribution** to knowledge in the domain of learning and education by introducing an **empirically proven, educationally significant, best practice AR Learning Experience (ALEX)** implementation framework and associated toolkit for higher business education.

# ALEX Framework and Toolkit Components



ARLO Design Guidelines



## Augmented Reality Learning Objects (ARLO)

### Design and Implementation Guidelines

Contact Matt ([matt.glowatz@ucd.ie](mailto:matt.glowatz@ucd.ie)) whenever you require any further help or advice.



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