Simulated mock trials in virtual reality: a framework to guide the future of legal education
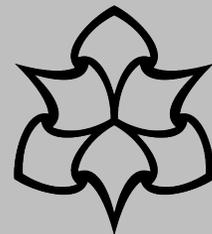
Justin Cho
Timothy Jung
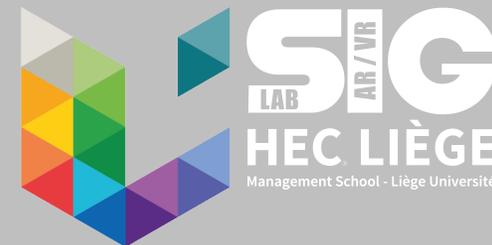Mandy tom Dieck
Elodie Etienne
Michaël Schyns
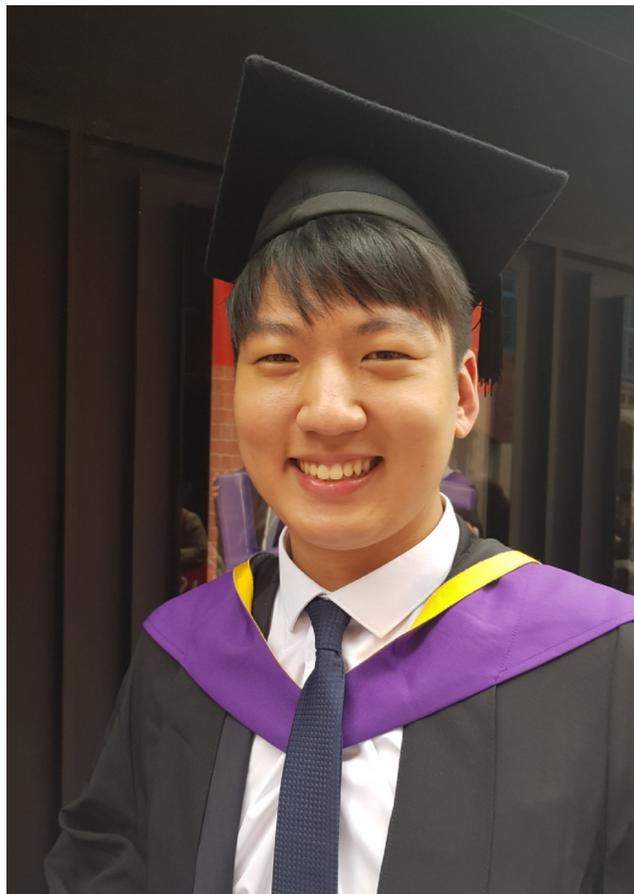
Manchester Metropolitan University

SIG LAB AR/VR HEC LIÈGE Management School - Liège Université

10th International XR–Metaverse Conference – Maastricht

About me

Ex-law student

Tech lover

PhD student

Literature review

VR has potential in legal education

	Legal simulation	VR education
Similar learning outcomes *(e.g. practical skills, substantive knowledge)*	Coplan (2016); Howieson and Rogers (2018)	Pedram et al. (2024); Kadri et al. (2024)
Similar learning tasks *(e.g. experiential learning, contextualised learning)*	McWilliam et al. (2018); Rankin (2022)	Pedram et al. (2024); Raposo et al. (2023)
Immersion *(to overcome legal simulation limits)*	Moffet et al. (2017)	Crockatt et al. (2023)
Design flexibility *(e.g. reflection mechanism)*	Bean (2022)	Alvarez et al. (2023)
Cognitive load?	Freudenberg and Mortimore (2019)	Fromm et al. (2024)
Resource intensive?	Munin and Efron (2018)	Laine et al. (2024)

Individual differences are important but neglected

- Law context – case studies are more effective for active learners
  (Freudenberg and Mortimore, 2019)

- VR context – Females experience higher cognitive load in VR than males
  (Jian and Abu Bakar, 2024)

- Extensive learning style criticisms
  (Pashler et al., 2008; Kirschner, 2017)

What's the gap?

Lack of empirical studies on VR in legal education

- A few studies exist
  (McFaul and FitzGerald, 2020; Van Dongen, 2024; Dogan et al., 2024)

- No holistic understanding of VR that explores learning, technological suitability, and individual differences

Lack of empirical studies on individual differences with a focus beyond learning effectiveness

- Criticisms of learning styles
  (Pashler, 2008; Kirschner, 2017)

- Other potential of learning styles
  (Alaka, 2011; Sneddon, 2024)

Improper use of learning theories

- Important to use solid pedagogical foundations
  (Radianti et al., 2020; McFaul and FitzGerald, 2020)

- Current learning theories are not suitable for immersive education contexts
  (Hamilton et al., 2021)

A theoretical starting point
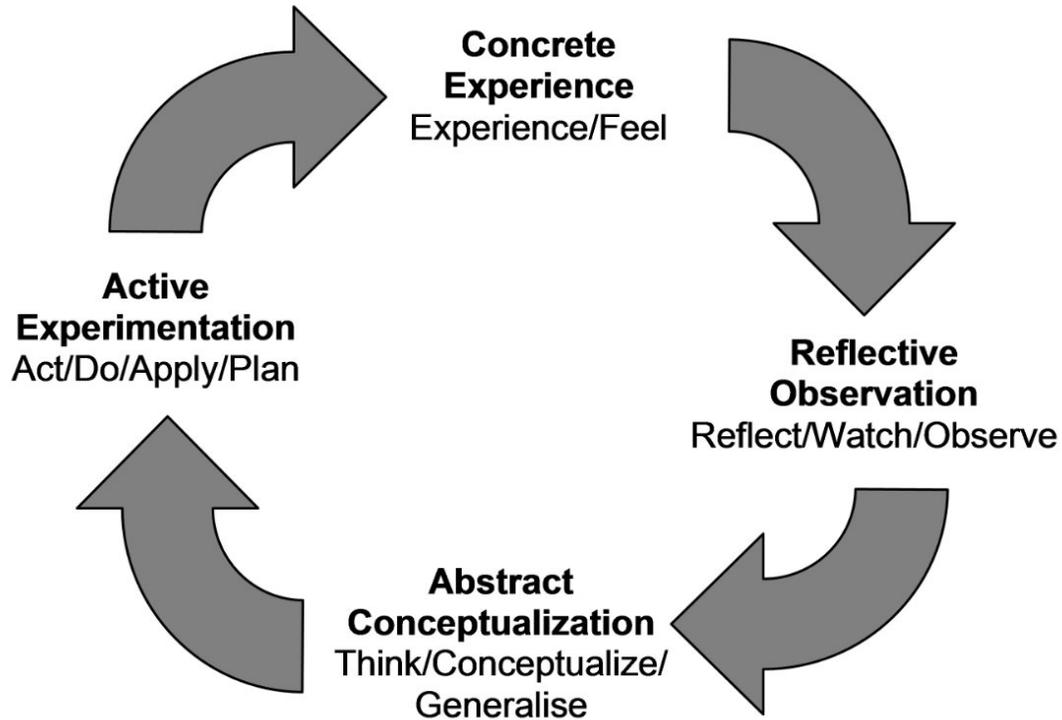
Kolb's Experiential Learning Cycle (1984)
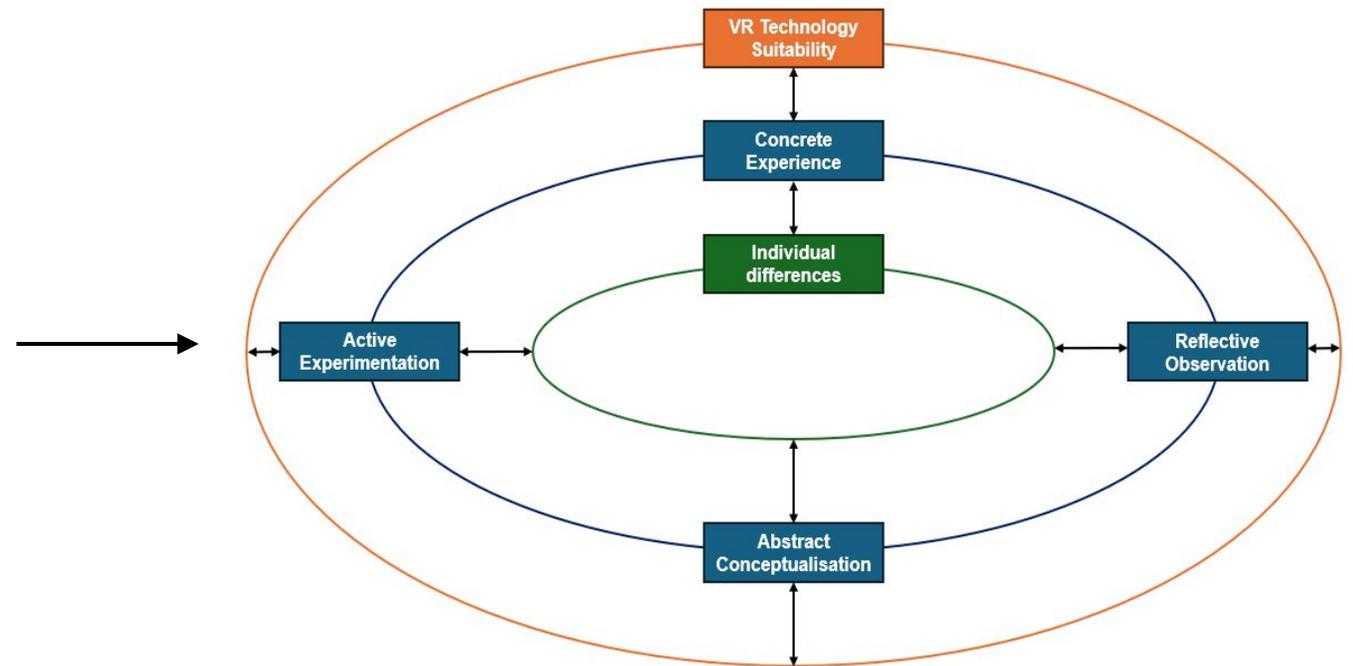
VR Higher Education Experiential Learning (VRHEEL) Framework

Environment design

1st version – Mozilla Hubs
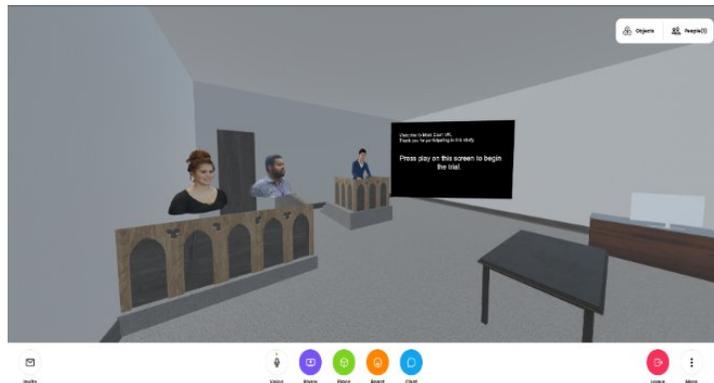
Some changes needed…

- Lack of immersion hinders legal simulation
  (Waters, 2016)

- Visual and auditory fidelity influence task performance and transfer of skills in virtual learning environments
  (Ragan et al., 2015)

A trip to HEC Liège

Environment design

2nd (better) version – Unity 3D

Welcome in CourtRoom,

The judge will ask you to present your arguments in 5 minutes. A timer is available on your watch. When the judge finishes his sentence, the timer will start.

If you exceed this time, the judge will interrupt you. Press the red button on the desk if your presentation is finished before the time limit.

Press "Start" to start the experience.

Start
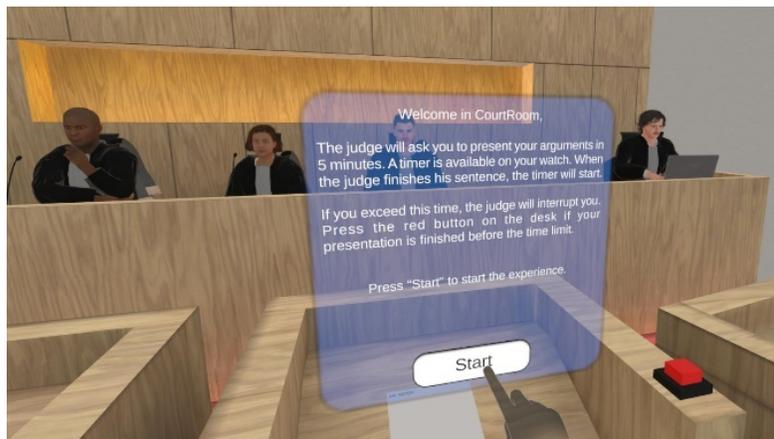
Methodology

- 4 case studies at 4 UK universities

- 33 interviews, observations, learning style questionnaires

- Within-case analysis + Cross-case synthesis

Virtual Reality Mooting Framework

Individual differences

Individual differences in the learning experience
- Facilitation of learning styles
- Role of prior experiences
- Personalised learning
- Learning styles and learning outcomes

Learning experience

Practical learning and skills development
- Skills development
- Practical application of knowledge

Feedback and reflection
- Self-reflection
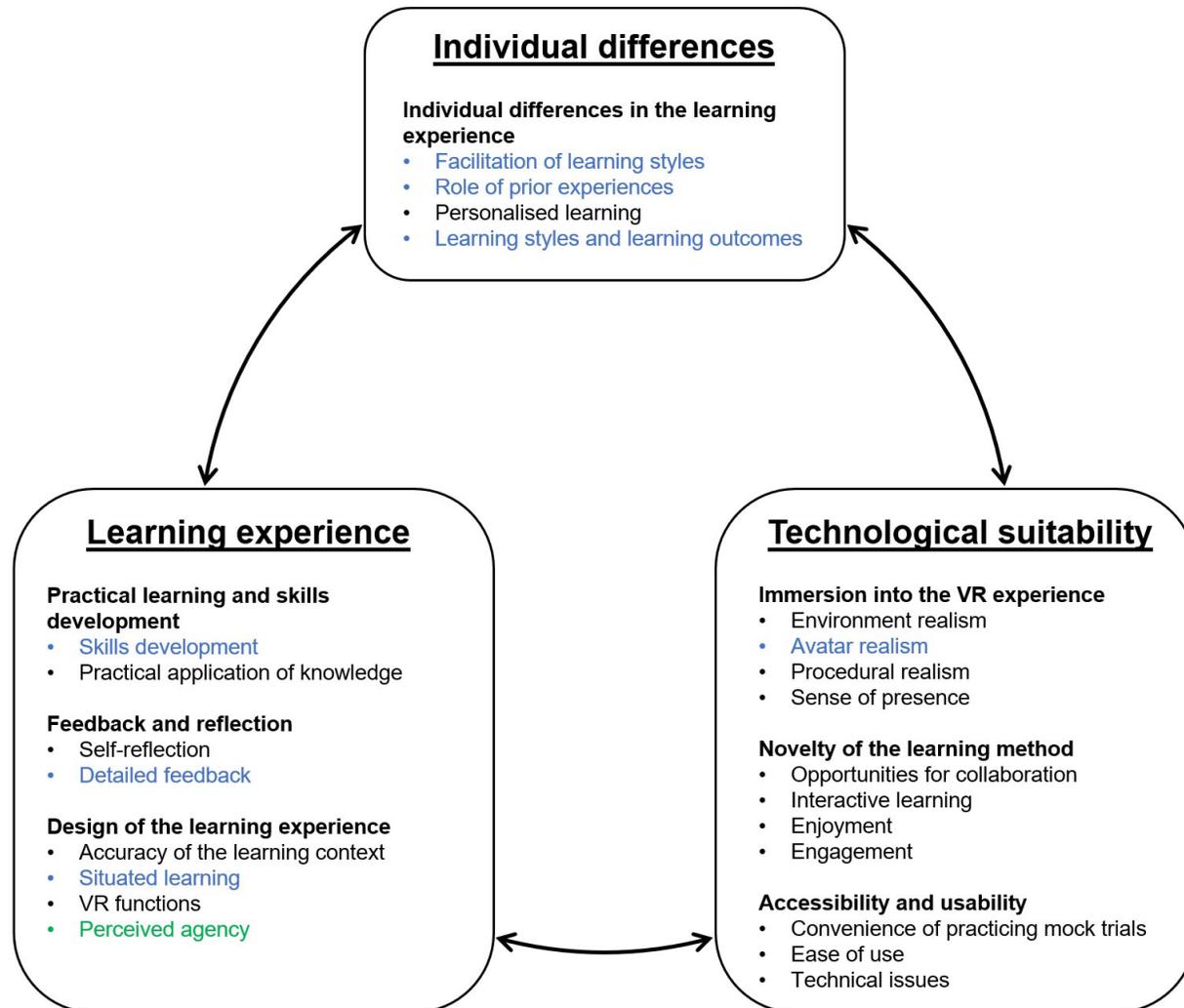- Detailed feedback

Design of the learning experience
- Accuracy of the learning context
- Situated learning
- VR functions
- Perceived agency

Technological suitability

Immersion into the VR experience
- Environment realism
- Avatar realism
- Procedural realism
- Sense of presence

Novelty of the learning method
- Opportunities for collaboration
- Interactive learning
- Enjoyment
- Engagement

Accessibility and usability
- Convenience of practicing mock trials
- Ease of use
- Technical issues

Some key findings	Explanation
Perceived agency	Agency of avatars impacts learning effectiveness
Situated learning	"Dressing the part"
Detailed feedback	Possibility of visual reflection
Skills development	VR only useful for certain skills
Avatar realism	No impact on learning effectiveness
Facilitation of learning styles	Not suited for all learning styles
Role of prior experiences	No link between prior experiences with VR and ease of use
Learning styles and learning outcomes	No correlation between self-reported learning styles and Kolb's LSI. VR can be used to help students identify their weaknesses in learning

Conclusions

Some key takeaways:

1. Learning theories are outdated – VR learning is much more complex

2. Personalised learning – how do we make this a reality?

3. Technology is no longer a medium – deeply integrated into the learning experience

4. VR can be an effective tool for mock trials (if properly designed)
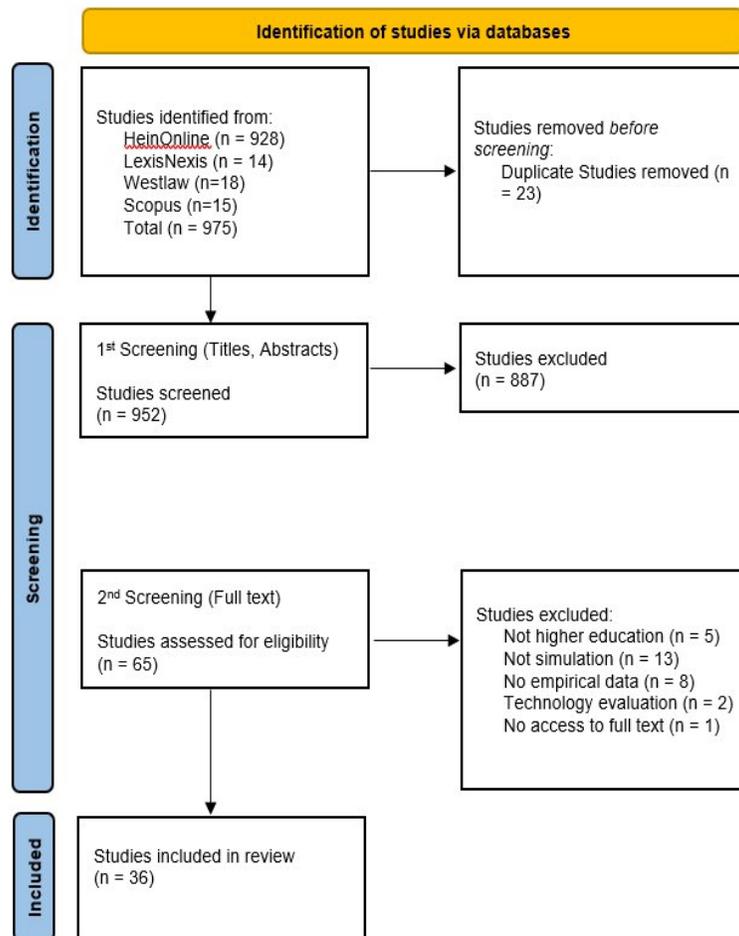
Thank you!

Justin Cho : Justin.cho@mmu.ac.uk

Justin Cho
PhD Student in Immersive Education,
Lecturer in Extended Reality and Metaverse

Literature review
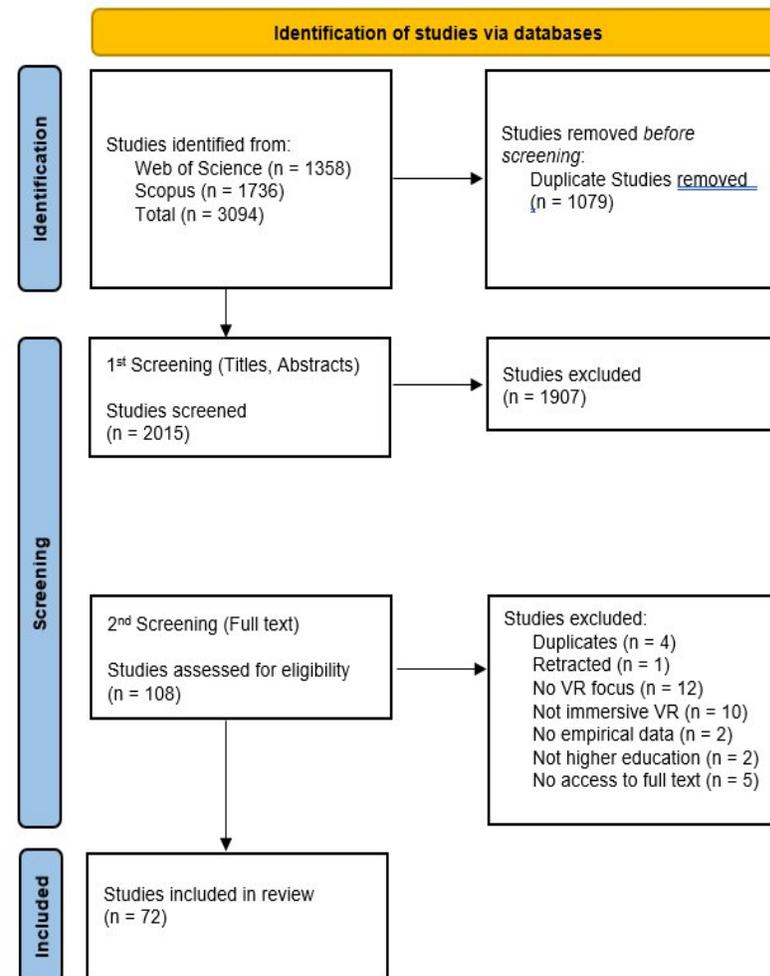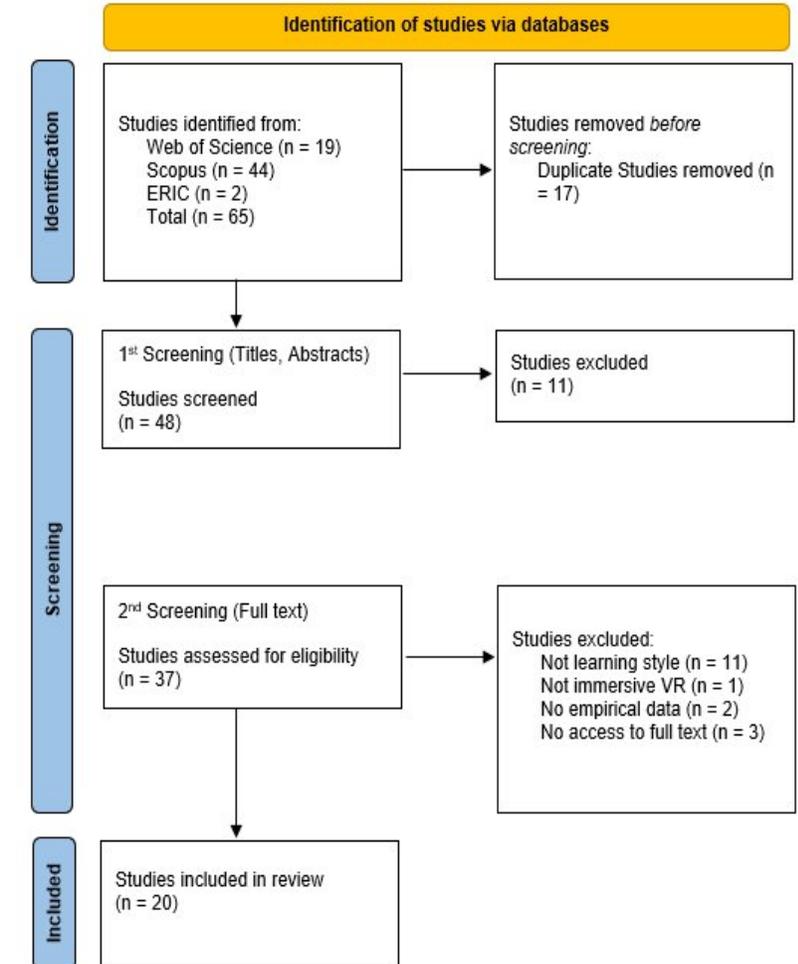

Simulation in legal education

Identification of studies via databases

Identification

Studies identified from:
HeinOnline (n = 928)
LexisNexis (n = 14)
Westlaw (n=18)
Scopus (n=15)
Total (n = 975)

→ Studies removed *before screening*:
Duplicate Studies removed (n = 23)

Screening

1st Screening (Titles, Abstracts)
Studies screened (n = 952)

→ Studies excluded (n = 887)

2nd Screening (Full text)
Studies assessed for eligibility (n = 65)

→ Studies excluded:
Not higher education (n = 5)
Not simulation (n = 13)
No empirical data (n = 8)
Technology evaluation (n = 2)
No access to full text (n = 1)

Included

Studies included in review (n = 36)

VR in higher education

Identification of studies via databases

Identification

Studies identified from:
Web of Science (n = 1358)
Scopus (n = 1736)
Total (n = 3094)

→ Studies removed *before screening*:
Duplicate Studies removed (n = 1079)

Screening

1st Screening (Titles, Abstracts)
Studies screened (n = 2015)

→ Studies excluded (n = 1907)

2nd Screening (Full text)
Studies assessed for eligibility (n = 108)

→ Studies excluded:
Duplicates (n = 4)
Retracted (n = 1)
No VR focus (n = 12)
Not immersive VR (n = 10)
No empirical data (n = 2)
Not higher education (n = 2)
No access to full text (n = 5)

Included

Studies included in review (n = 72)

Learning styles in VR education

Identification of studies via databases

Identification

Studies identified from:
Web of Science (n = 19)
Scopus (n = 44)
ERIC (n = 2)
Total (n = 65)

→ Studies removed *before screening*:
Duplicate Studies removed (n = 17)

Screening

1st Screening (Titles, Abstracts)
Studies screened (n = 48)

→ Studies excluded (n = 11)

2nd Screening (Full text)
Studies assessed for eligibility (n = 37)

→ Studies excluded:
Not learning style (n = 11)
Not immersive VR (n = 1)
No empirical data (n = 2)
No access to full text (n = 3)

Included

Studies included in review (n = 20)

Formulating the study design

- General thoughts… I want to make an impact!
  - Design?
  - Effectiveness?
  - Why is it effective? For whom?

- Research questions
  - How does VR impact the legal simulation learning experience?
  - Is VR suitable for this?
  - What role do individual differences play in this context?

Within-case analysis

	MMU	BPP	UoS	EHU
Courses offered	• Undergraduate • Postgraduate • Professional	• Postgraduate • Professional	• Undergraduate • Postgraduate	• Undergraduate • Postgraduate • Professional
Exposure to mock trials	• Active mooting society • Physical mock courtroom • Internal and external competitions	• Many physical mock courtrooms • Internal and external competitions • Mentoring from legal professional	• Active mooting society • Internal and external competitions • Involvement of professionals in competitions	• Physical mock courtroom • Internal and external competitions
Use of technology	• Module on use of technology in law	• Courses on use of technology in legal practice	• Various modules on use of technology in law	• Module on use of technology in law
Thematic trends	• Opportunities to practice • Improvement of skills through repetition and reflection	• Accuracy of the experience – procedure • Transferability of skills • Practical difficulties of organising mock trials	• Student engagement and enjoyment • Gamification • VR suitability for different types of students	• Realism and accuracy of setting • Reflection to improve for future mock trials • Individual differences

Conclusions

Why is this relevant?

<u>Gaps in research</u>

<u>Contributions</u>

1. Lack of empirical studies on VR in legal education

   → • Adds to literature in this context through empirical investigation
   • Proposes the VRMF to guide the use of VR in mock trial contexts

2. Lack of empirical studies on individual differences with a focus beyond learning effectiveness

   → • Explores the significance of individual differences on factors beyond learning outcomes
   • Identifies the potential of VR to help students adopt other styles of learning

3. Improper use of learning theories

   → • Proposes VR HHEEL as a pedagogical foundation to design and implement VR in legal education