

Scoping Review of Acting in Social VR for Immersive Learning

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SCOPING REVIEW OF ACTING IN SOCIAL VR FOR IMMERSIVE LEARNING

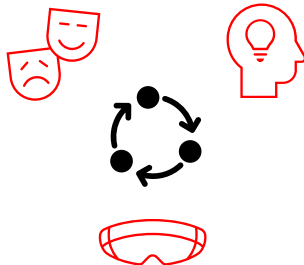
Agenda

- I Motivation & Background
- I Methodology
- I Results
 - I Immersive Learning Perspective
 - I Acting Perspective
- I Discussion
- I Next Steps

MOTIVATION & BACKGROUND

Motivation

Bridging the gap
between art and
education to address
current social
challenges



- | Assumption: Learning effect can be increased by using **role-playing as a major element**.
 - | Room for **creativity** given to user and **improvisational** acting in character in designed dramatic situation
- | Research question
 - | “What is the current state of research of immersive learning applications in social VR which include acting or role-playing as a major element?”
- | Secondary objective
 - | Inform design decisions for the experiment

APPENDIX

Background: Immersive Learning & Acting

I Immersive Learning

- I Learning by interacting with the environment in a computer-generated immersive simulation (Makransky & Petersen 2021)
- I Learning by doing for high risky or socially sensitive tasks

I Social VR

- I Communicate, interact and collaborate with each other (Wölfel 2023)
- I Social presence enables co-production of meaning (Kocur et al., 2020)

I Suspension of disbelief

- I Users' attitude against representation in virtual environment
- I Engagement (Laurel 2014)

I Perspective taking in role-playing games

- I Understand a situation from another point of view
- I Increase empathy, reduce prejudice (Jin et al. 2023)

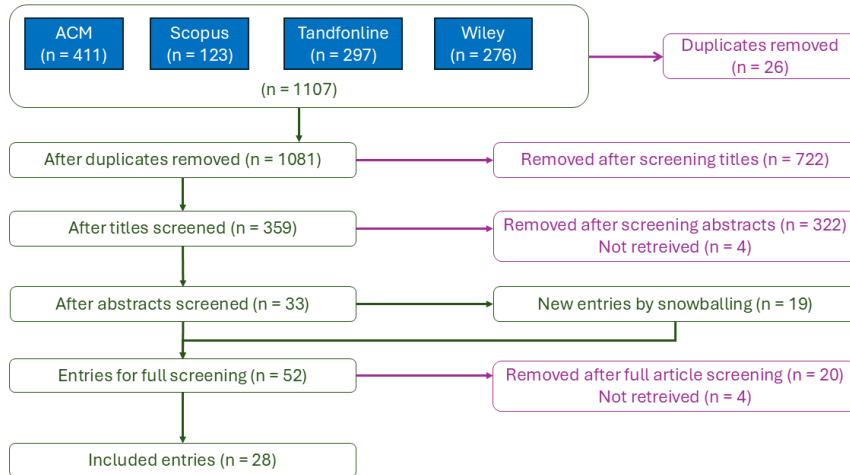
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Methodology

- I Information Sources and Search Strategy
- I Inclusion & Exclusion Criteria
- I Selection of Studies
- I Data Extraction

METHODOLOGY

Selection of Studies & Data Extraction



I Domain

I Type of acting or role-playing ➡

I Role of virtual agents

I Educational task

I Theoretical framework

I Evaluation of prototype ➡

critical
appraisal

critical
appraisal

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Results

Narrative
synthesis
(Rodgers, 2009)



- | 28 papers found (5 of them are conceptual)
- | 4 out of 23 papers match the requirements
 - | Have major focus on role-playing
 - | Include an evaluation
- | Significant research gap
- | Though satisfactory basis to derive design decisions
 - | 23 papers including prototypes analysed



RESULTS

Immersive Learning Perspective

- | **Situated learning theory (SLT)** (Brown, Collins, Duguid 1989)
 - | Language learning tasks
 - | Learning is most effective when it happens in an original social context.
 - | CAMIL is also referred.
- | **Social cognitive theory** (Bandura 1986)
 - | Healthcare and therapy related tasks
 - | Skills and self-efficacy: “Competent functioning requires both skills and self-beliefs of efficacy to use them effectively.”
- | **Intergroup contact theory (ICT)** (Allport 1954)
 - | social skills related tasks
 - | reducing prejudice, fostering empathy, altering personal views against outgroup members
 - | Positive collaboration under premium circumstances will reduce the prejudice against outgroup members.

RESULTS

Acting Perspective I

I Role-playing for **educational and artistic experience**

- I Focus on the notion of “liminality” when performing in social VR (Hughes 2024)
- I VR - Theater: Using real actors as facilitators and involving an audience (Berezina-Blackburn 2018; Tsoupikova, 2024)
- I Not merely act within an educational context, but also act in a specific character (Barberia 2018; Berezina-Blackburn 2018; Hughes 2024; Jin et al. 2023)

I **Empathy and perspective taking** in social skills training

- I Perspective of a disadvantaged person (Jin et al. 2023)
- I Lifecycle paradigm for role-playing (Barberia 2018)
- I Role-exchange strategy in gameplay (Radakulan & Sedláček 2023)

ACTING PERSPECTIVE I

E.g.: Educational and Artistic Experience



Figure 1. Participants interact as a team before the audience in the Orchard scene during the Hummingbird performance (Tsoupikova 2024).

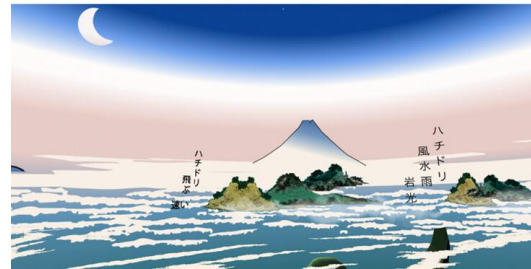


Figure 2. Hummingbird scenes Orchard (top) and Statue (bottom) (Tsoupikova 2024)

ACTING PERSPECTIVE I

E.g.: Life-Cycle Paradigm of Role-playing

Figure 3. The virtual humanoid bodies and their evolution (Barberia 2018)

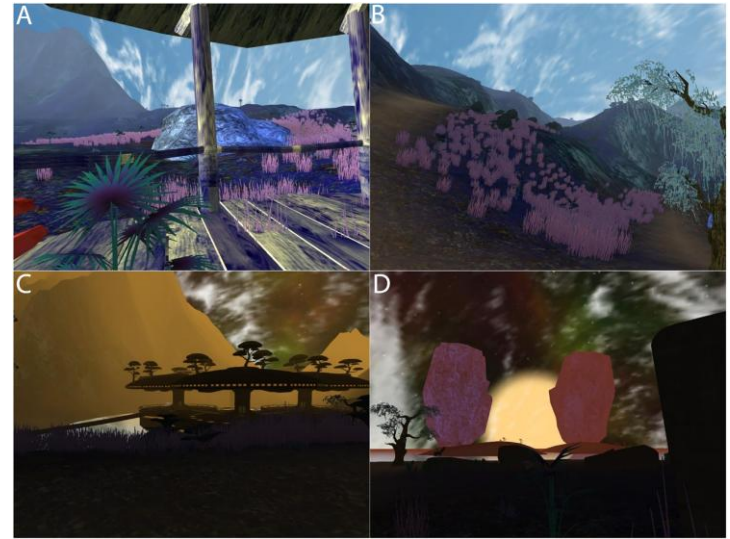


Figure 4. The Island environment (Barberia 2018)

RESULTS

Acting Perspective II

- I **Task-oriented** approach in hands-on training
 - I Functionally set roles
 - I officers – sailors (Bjørn et al. 2024)
 - I crane operators - ground support (Larsen et al. 2024)
 - I actionist and strategist (Jiang et al. 2024)
 - I Interdependence of roles
 - I Comparison between collaboration and competition
- I Role of **virtual agents**
 - I Open ended improvisational scenarios with prompted LLM-powered agents
 - I Single prompt solution (Li et al. 2025)
 - I Multiple prompted LLMs for multiple levels of tasks (Pan et al. 2025)

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Discussion

| Problematics

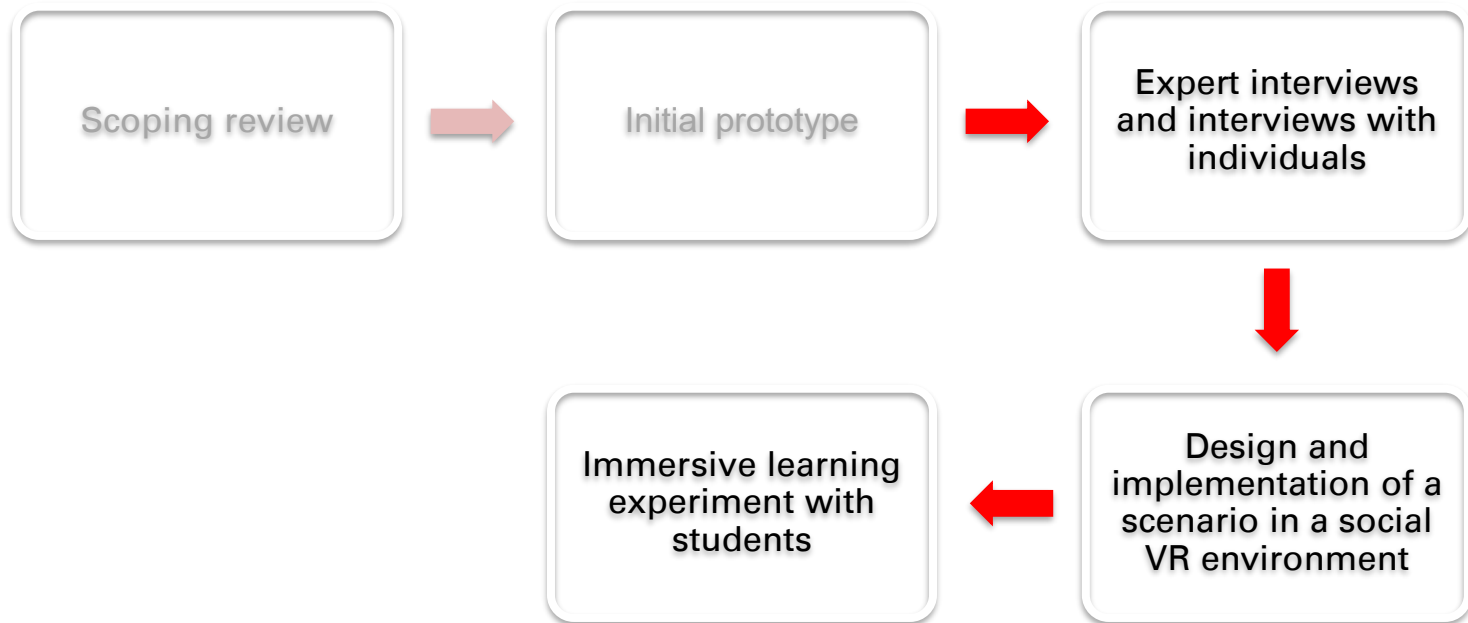
- | Role-playing **not** as improvisational acting in character in a designed dramatic situation. **Rather**, user completes learning task while assuming social role within limited context.
- | Papers do **not** include long-term evaluations or behavioral analysis

| Takeaways

- | **Educational frameworks** of SLT and ICT and concept of **perspective taking**
- | **Behavioral analysis** and **long-term evaluation**
- | **Role-exchange** technique
- | Create multiple roles **interdependently**
- | Give user enough room for **reflection**
- | Prompting and using **LLM-powered virtual agents**
- | Use **theatrical traditions**

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Next Steps - I



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Next Steps II



Figure 5. Example picture from the existing state of the role-playing scenario (Own Source, screenshot from the initial prototype)



Figure 6. AI-agents prompted as a) Agent from Data Center (Right) and b) Fast food cook (Left) (Own Source, screenshot of the initial prototype)

Vielen Dank für Ihre Aufmerksamkeit!



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APPENDIX

Methodology: Information Sources and Search Strategy

- I Scoping review extension of PRISMA (Tricco et al., 2018)
- I Scientific validation and reproducibility
 - I Scientific databases and peer reviewed papers:
 - I **ACM, Scopus, Wiley** (Gusenbauer & Haddaway, 2020)
 - I **Taylor & Francis Online** for theatre and performance studies
 - I Peer reviewed papers
- I Search strategy is a modified Population, Phenomena of Interest, Context (PICo) framework (Munn et al., 2018)

Format (PICo)	Terms
Population	multiuser OR multi-user OR "multi user" OR multiplayer OR mehrspieler OR multi-player OR cooper* OR collab* OR kooper* OR kollab* OR social OR sozial*
Phenomena of Interest 1	learn* OR lern* OR educat* OR bild*
Phenomena of Interest 2	role-playing OR "role playing" OR acting OR theater OR theatre OR schauspiel* OR handeln
Context	"virtual reality" OR "virtuelle realität" OR virtual-reality OR immersive OR XR

Figure 1. Search string used

APPENDIX

Methodology: Inclusion / Exclusion Criteria

I HMD-Based VR, XR applications including VR	→	I Desktop VR, augmented reality (AR) and mixed reality (MR) applications
I Social interaction in social VR learning apps, papers dealing with virtual agents	→	I Apps with no social interaction, Human-robot interaction
I Learning task should be given	→	I Games, art or entertainment
I Role-playing or acting, gamification		I Film production, gamification without role-playing
I Papers focusing on a developed application, conceptual / design papers	→	I Literature reviews excluded but used for snowballing
I Published after 2013		
I English or German.		

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