

Towards a Shared Frame for AR Learning and Instruction

Practical and Theoretical Considerations

Moving AR research beyond “*does AR work?*” toward **how, for whom, and under what conditions** it supports learning.

How we collected the data

Community workshop @ iLRN 2025

with practitioners & researchers - game designers, educators, and computer & education scientists.



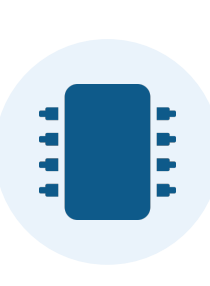
N = 24
participants

4
groups

1.5 h
per session

- Two runs (June 2025):** online in FrameVR (n = 7) + co-located in Chicago (three groups, n = 6, 5, 6).
- 45-min group work** on: (1) anticipated AR tech innovations, (2) frameworks used for AR.
- Share & cluster:** groups presented outcomes; two authors clustered notes into recurring themes.

What we found



1. Anticipated AR technologies

Performance & devices

Ultra-precise tracking (≈1 mm), more powerful & affordable AR glasses, haptic feedback to drive broad adoption.

Artificially Intelligent AR (AI-AR)

AI avatars & conversational tutors in AR glasses. AR should enrich and not replace teaching.



2. Scattered frameworks used for AR

Many different theories applied (CTML, CLT, CAMIL) but **few AR-specific theories and no shared approach** → the gap this poster addresses.

AR-specific frameworks in focus - concrete foundations for the compass



Multimedia learning

CTML · CLT · CATLM

Mayer, 2021; Sweller et al., 1998; Moreno, 2006
→ perception & processing multiple representations



Motivational design

ARCS (attention, relevance, confidence, satisfaction)
Keller, 2010
→ designing for motivation



Immersive learning

CAMIL (presence & agency) · EFIL (educational context)
Makransky & Petersen, 2021; Dengel & Mögdefrau, 2018
→ must be adapted to AR

AR-specific



ARcis Krüger, Palzer, & Bodemer

Three AR characteristics: contextuality · interactivity · spatiality

L-Tech Triad for AR Kozlova & Hofer

Learner-centred ATI view linking outcomes, affordances, traits & design.

ARI immersion Georgiou & Kyza

Graded immersion: engagement → engrossment → total immersion.



Help us build the Conceptual Compass

Grab a post-it and add your idea below. Use the matching colour for your topic - where should AR learning & instruction head next?

Add your post-it anywhere

Post-it colour key:



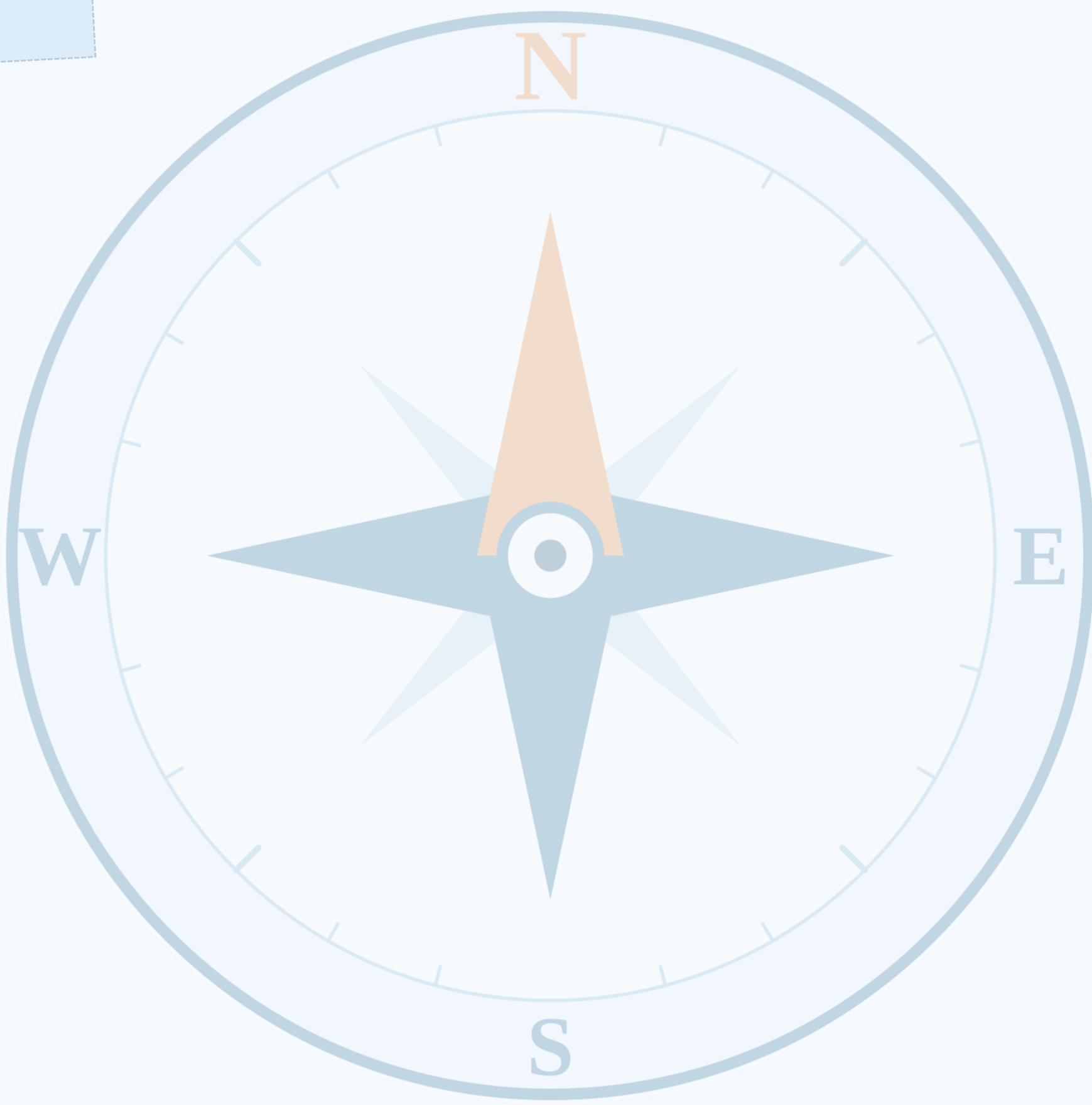
Frameworks & theories



Tech innovations



Open / your ideas



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