GreenTouch: Co-Creating XR Micro-Interventions for Last-Mile Climate Resilience in Occupational Therapy

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Abstract

Climate change is increasingly experienced as local, health-relevant disruption, yet "last mile" adoption barriers often prevent resilience measures from translating into everyday routines, especially in vulnerable groups. GreenTouch implements planetary health in occupational therapy with the help of low-barrier XR minigames, that enable occupational therapists to integrate climate competence into practice and support clients in rehearsing feasible micro-adaptations to strengthen self-efficacy. We report our interdisciplinary co-creation process and outline key HCI challenges for building therapy-embedded climate resilience tools, including ethical design under power asymmetries, transfer beyond the headset, and representative scenarios without deficit framing.

Keywords

climate resilience, planetary health, occupational therapy, vulnerable users, extended reality, co-creation

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1 Introduction

Climate change is a growing health risk, with local impacts such as heat stress, degraded air quality, extreme weather, and flooding that can limit everyday functioning and participation [8]. Health professionals are increasingly encouraged to account for climate-related risks in routine care [2], e.g., since 2024 the Austrian legal regulation for the medical-technical professions explicitly anchors climate competence in their scope of practice.

Occupational therapy (OT) supports participation in meaningful everyday activities across home, work, and community contexts [4]. As climate change brings noticeable impacts on everyday activities and quality of life, OT is well positioned to translate climate-related health knowledge and adaptation strategies into feasible, individualized strategies under real-world constraints [5]. We therefore focus on OT as a promising yet underexplored path to climate adaptation and resilience, especially for vulnerable groups, enabling them to implement feasible micro-adaptations in their everyday lives and environment. However, OT still lacks practice-ready materials that operationalize climate competence in client-centered teaching and implementable routines in the clinical context.

GreenTouch addresses this gap by developing Extended Reality (XR) scenarios that make climate change concepts tangible and easy to integrate into OT practice and training [5]. XR is promising for this purpose because it makes the connections between climate and health experiential and enables safe, situation-specific practice of routines and adaptations to strengthen self-efficacy [1].

2 Methods

GreenTouch develops XR scenarios that support climate competence in OT and evaluates their usability, feasibility, and applicability in practice. Methodologically, we follow a dual-track approach: (1) *top-down*, we conducted a structured literature review and expert interviews to prepare and evidence-ground the scenario space, informing key themes, coping actions, and evaluation considerations; and (2) *bottom-up*, we iteratively co-create and refine practice-grounded XR scenarios with stakeholders in practice (OTs, clients, students, and consortium stakeholders) to ensure relevance, feasibility, and fit under real-world constraints.

The scenarios are subsequently implemented as a research prototype and evaluated with a broad group including OTs from different fields, OT students, clients, and additional stakeholders from other health-related disciplines. Comparative studies with social pedagogy and climate communication or climate education experts are also planned.

3 Co-Creation Process

The XR scenarios are developed in a co-creation process spanning five workshops (June 2025 to March 2026). Each workshop includes OTs, OT clients and OT students, consortium researchers selected for complementary expertise, and a dramaturge to support scenario building. Across workshops, group sizes typically ranged from 13

CHI 2026 Workshop Designing for "Last Mile" Climate Resilience with Communities, Barcelona, Spain
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to 22 participants, with structured facilitation to support balanced participation.

Workshop 1 elicited narratives about climate-induced changes in living environments using LEGO® Serious Play. A central theme that emerged was heat, particularly in small city apartments, described as a major challenge leading to restricted daily routines, reduced well-being, and even reduced social activity.

Workshop 2 then clustered and prioritized themes and translated them into initial action options, with a clear need identified for stronger awareness of coping strategies that foster self-empowerment and strengthen perceived agency in day-to-day decision making.

Workshops 3 to 5 refined these options into XR-suitable scenarios with concrete interaction and feedback concepts, resulting in key design requirements such as therapist-visible mixed reality as a reality anchor and controller-free hand interaction to reduce onboarding barriers [3, 6].

4 Considerations for Co-Creation with Vulnerable Groups on Climate Resilience

Co-creating climate resilience tools with vulnerable or health-affected groups requires more than standard participatory methods: climate topics can elicit anxiety, grief, or helplessness, while therapy contexts introduce power asymmetries, duty-of-care obligations, and safeguarding responsibilities. In our project setting, we therefore treat the following as core design and process requirements.

Tension between client burden and systemic action. Climate resilience requires both structural and individual change, but vulnerable clients should not be overburdened or blamed. We therefore treat OT as a trusted translation channel implemented through OT education and routine practice, translating broader goals into feasible micro-adaptations within clients' constraints.

Data minimization, privacy, and dignity. Vulnerable clients may share sensitive health and housing information. We minimize data collection, avoid recording identifiable narratives unless necessary, and transparently communicate what is stored, for how long, and who has access.

Interdisciplinary co-creation on equal footing. Co-creation across XR, OT, climate change experts, clients, and students requires plain language, shared representations, and strong facilitation. A psychologically safe atmosphere and explicit practices to reduce power asymmetries are essential so participants can raise concerns and contribute on equal footing [7].

Iterative design for vulnerable groups. Accessibility, cognitive load, and interaction complexity are first-order constraints when designing XR scenarios for vulnerable groups. These constraints are addressed through iterative prototyping, progressive disclosure, and interaction/content design that especially aims for a low cognitive load.

Transfer beyond XR. We intend the XR minigames as tools designed to provide sustainable benefits to the users; yet the impact of XR scenarios on real-world changes depends on embedding of XR into the overall therapeutic setting, especially structured briefing and debriefing (e.g., therapist-guided reflection), and the usage of additional tangible materials (e.g., cards/checklists) that support the transfer from virtual environments into real-world routines.

Representation without stereotyping. Scenarios must reflect lived constraints (e.g., small apartments, limited income, caregiving duties) without stigmatizing users. We iteratively review language, visuals, and "success" criteria with participants to avoid deficit framings and to respect diverse coping strategies.

5 Conclusion

GreenTouch develops low-barrier XR minigames that enable OTs to integrate climate competence into practice and support clients in rehearsing feasible micro-adaptations to climate-related everyday challenges. Our workshop contribution is an agenda on participatory delivery, ethical design with vulnerable groups, deployability in real workflows, and evidence for transfer beyond the XR session.

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References

[1] Noor AlQallaf, Satyam Bhatti, Rachael Suett, Sherif G. Aly, Ahmed S. G. Khalil, and Rami Ghannam. 2022. Visualizing Climate Change Using Extended Reality: A Review. In *Proc. 29th IEEE Int. Conf. Electronics, Circuits and Systems (ICECS)*. IEEE, Glasgow, UK, 822–825. doi:10.1109/ICECS202256217.2022.9970808

[2] Global Consortium on Climate and Health Education. 2023. *Climate & Health Core Concepts for Health Professionals.* Columbia University Mailman School of Public Health. https://www.publichealth.columbia.edu/research/centers/global-consortium-climate-health-education/core-competencies

[3] Jeonghyeon Kim, Jung-Hoon Ahn, and Youngwon Kim. 2025. Immersive Interaction for Inclusive Virtual Reality Navigation: Enhancing Accessibility for Socially Underprivileged Users. *Electronics* 14, 5 (2025), 1046. doi:10.3390/electronics14051046

[4] Republik Österreich. 2024. Bundesgesetz über die gehobenen medizinisch-therapeutisch-diagnostischen Gesundheitsberufe (MTD-Gesetz 2024 – MTDG) sowie Änderung des Rezeptpflichtgesetzes, des Apothekengesetzes und des Medizinische Assistenzberufe-Gesetzes. Bundesgesetzblatt für die Republik Österreich, Teil I Nr. 100/2024. https://www.ris.bka.gv.at/Dokumente/BgblAuth/BGBLA_2024_I_100/BGBLA_2024_I_100.html 8. Abschnitt, § 25 Z 1.

[5] Alexander Rind, Rita Weber-Stallecker, Stefan Killian, Christine Spevak-Grossi, Hannes Schweiger, Barbara Prinz-Buchberger, and Sophie Westfahl. 2026. GreenTouch: Co-Kreation eines Extended Reality (XR)-Prototypen zur Vermittlung von Klimakompetenzen in der Ergotherapie. In *Proc. Forschungsforum der österreichischen Fachhochschulen.* CAMPUS 02 Fachhochschule der Wirtschaft, Graz, Austria. To appear.

[6] Ephraim Schott, Tony Jan Zoeppig, Pramoch Viriyathomrongul, Anton Benjamin Lammert, and Bernd Froehlich. 2025. VR Onboarding Procedures for Multiple Collocated Users: See-Through Tutorials and Group Transitions. In *Proc. IEEE Int. Symp. Mixed and Augmented Reality (ISMAR).* IEEE, 315–325. doi:10.1109/ISMAR67309.2025.00043

[7] Martijn Wiarda, Kalli Giannelos, Stefanie Schuerz, Bernard Reber, and Neelke Doorn. 2023. Ethics Framework and Guidelines: A Guide for Research Funding Organizations Implementing Participatory Activities. doi:10.5281/zenodo.8089673

[8] World Health Organization. 2023. *Climate change.* https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health