Leveraging Virtual Reality
to Enhance Diversity and Inclusion training at Google

Elie Bursztein
elieb@google.com
Google
USA

Karla Brown
kjtb@google.com
Google
USA

Patrick Gage Kelley
patrickgage@acm.org
Google
USA

Leonie Sanderson
leonie@peopletechrevolution.com.au
Equal Reality
Australia

ABSTRACT

Virtual reality (VR) has emerged as a promising educational training method, offering a more engaging and immersive experience than traditional approaches. In this case study, we explore its effectiveness for diversity, equity, and inclusion (DEI) training, with a focus on how VR can help participants better understand and appreciate different perspectives. We describe the design and development of a VR training application that aims to raise awareness about unconscious biases and promote more inclusive behaviors in the workplace. We report initial findings based on the feedback of Google employees who took our training and found that VR appears to be an effective way to enhance DEI training. In particular, participants reported that VR training helped them better recognize biases and how to effectively respond to them. However, our findings also highlight some challenges with VR-based DEI training, which we discuss in terms of future research directions.

CCS CONCEPTS

• **Human-centered computing** → **Virtual reality**; *HCI design and evaluation methods*; • **Applied computing** → **Interactive learning environments**.

KEYWORDS

virtual reality, diversity, equity, inclusion, DEI training, interactive learning, workplace

1 INTRODUCTION

Diversity, equity and inclusion (DEI) training is a cornerstone of creating a welcoming and inclusive workplace. However, traditional DEI training methods, such as lectures and online training modules, are often considered to be ineffective [3, 12]. While there are multiple reasons why those trainings do not yield the desired improvements to workplaces a key factor is the training participants' ability to effectively engage with the training materials.

In recent years, Virtual Reality (VR) has emerged as a new and potentially more engaging way to deliver training compared to traditional training approaches [9, 10, 13–15, 20, 25]. Specifically, VR training can provide participants with an immersive experience, including feeling that they are physically present in the simulated environment [8, 26, 28]. One study by Herrera et al. has shown that virtual reality trainings can help build empathy, with long term effects, and in a more efficacious way than traditional tasks and desktop computer tasks [18]. While some have posited the value in DEI trainings conducted in virtual reality (e.g., [11, 16]), Mason's thesis explored two initial tests of virtual reality based DEI trainings focused on impacts to affective empathy and found promising initial results [23, 24]. We build on all of this work, turning our attention to the design of the scenarios, the training sessions, and an eye towards limitations in the current state of VR.

We do this by conducting an initial exploration with employees of our own company to explore if and how VR can enhance DEI training – with a focus on how having multiple first person points of view of a difficult situation can help participants better understand and appreciate different perspectives.

Our contribution is twofold: 1) the creation of a VR application and four DEI training scenarios. 2) Preliminary findings on the effectiveness and limitations of VR DEI training based on an initial set of testing (section 2.3) and training (section 4) sessions carried out at Google.

Our initial findings suggest that VR is a promising direction for raising awareness about unconscious biases [22] and making workplaces more inclusive [6] with participants finding the VR training to be more immersive and engaging than Google's standard DEI training (Section 4.1). They also reported that they felt that the VR helped them better understand biases that they may have been unaware of and how to respond appropriately to them. Another key insight confirmed by our initial testing is that having a collective

Elie Bursztein, Karla Brown, Patrick Gage Kelley, and Leonie Sanderson

debrief session following the VR experience is critical to the success of the training (Section 2.3). On the other hand, our findings also highlight current shortcomings that should be addressed in future versions include changes to allow more open speech in the debrief session, giving more agency to the trainees, and increasing the visual fidelity of the environments and characters to enhance immersion (Section 5).

2 TRAINING DESIGN

We designed the VR application and its four scenarios using an iterative design approach. A group of 13 employees involved in Google's Diversity, Equity, and Inclusion (DEI) program in partnership with a third party vendor specialized in VR training were involved with the development of our DEI VR program. The VR application uses the Unity engine [17] and offers four original scenarios, detailed in section 3, that highlight a set of scenarios designed to raise diversity and inclusion concerns to help Googlers better understand the subtle nuances behind those difficult situations and how to address them when they are encountered. For accessibility purposes, the application was also made available as a desktop version that can be controlled with the keyboard and mouse.

2.1 Training Design Philosophy

We intentionally designed the VR-app to create immersive scenarios, allowing trainees to experience each scenario through the eyes of two protagonists. Each scenario can optionally be experienced multiple times, to better appreciate how a change of perspective affects perception and influence trainees own experience of the situation. Each of the four scenarios follows this design and always offers the trainees to option to experience the situation from one perspective after the other.

The second key design decision regarding the training sessions was to leave the discussion about what can be done about a given situation to a live discussion between trainees and facilitators instead of building it into the VR application. This is why the training is meant to be performed in small groups of at most 10 trainees in the presence of a facilitator. In-person training is also useful as many trainees are not familiar with VR headsets and need help getting started (see Section 2.3).

We sought to make the training as immersive and realistic as possible: First each scenario is based on real incidents that were informed and synthesized from experiences had or witnessed by the design group. Second, we ensured that the actors shared identity characteristics with the protagonists, so their voices and dialog would sound real. Third the locations (e.g., meeting rooms and office spaces as showcased in figure 1) and in simulation apps (e.g., video call system) are based on real corporate offices and products (e.g., Google Meet) so the environment is as believable, and as familiar, as possible to avoid the suspension of disbelief effect [7].

2.2 Scenario Development

The four scenarios used during the training were developed between 2021 and 2023 by a group of 13 Google volunteers involved in Google DEI activities in partnership with a VR studio. Each

scenario was developed iteratively following the three phase process summarized below. Due to the sensitive nature of the topics discussed, the design sessions were not recorded.

Initial Framing for Behavior Change. The initial design phase focuses on selecting which behaviors the training aimed at changing. Participating Googlers were prompted to find which behaviors to target by answering the following questions in a group setting:

- What are the key bias(es) or behavior(s) you would like to explore in a VR scenario?
- What would someone learn by going through the experience?

Participants offered a wide range of topics they thought would be worthwhile to explore from cultural differences, food shaming, preconceived notions, being stereotyped, everyday microaggressions [27] and unconscious biases [22] triggered by perceived gender, nationality, religion and other identity characteristics. The vast majority of the participants wanted the training to help people recognize microaggressions and unconscious biases. They were also very hopeful the training would help them learn how to respond and address issues as they occurred, and give them skills and practice to help them build the confidence to do so.

Drawing from experience. During the second phase, Googlers were asked to silently reflect on their experience and recall when someone acted with bias or committed a microaggression towards them or others. Each session participant was then asked to share the incident they recalled. Googlers were instructed to specify any words, language, or phrases used during this event to inform the language used in the scenario design. The prompting questions used during that phase included:

- When this experience occurred, how did you react and respond?
- If there were others present, how did they react and respond?
- How could others have reacted or responded better?
- What are the key takeaways you'd like others to get from understanding this experience?

Defining the setting and characters. The goal of this third phase was to describe the environments where the incidents in the first two phases took place, so they could be implemented by the VR development team. During this phase, the geography (country, town), specific location (meeting room, hallway), visual appearance (wall color, carpet color, laptop brand, apps) and environmental features (noise, light, time of day) of each scenario were flushed out. Similarly each protagonist used in the scenario including their perceived gender, appearance, backstory, and personality traits were decided. At the end of this phase, the scenario was conceptualized as a storyboard in slide decks that were shared and refined with the group before being implemented by the VR studio.

2.3 Quality Assurance

The final development phase was dedicated to polish the experience through QA testing sessions. Overall we carried out 7 sessions involving 20 volunteer testers. Besides asking them to report bugs with the VR application, we sent them an optional anonymous post session survey to evaluate the training effectiveness and the
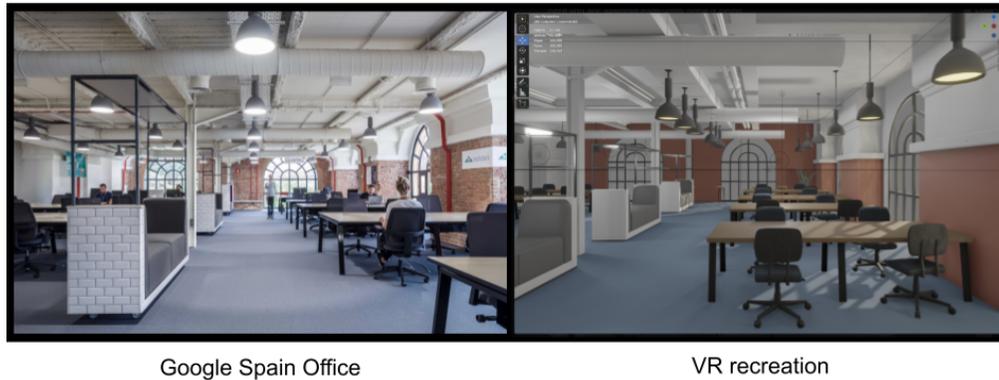
Figure 1: To avoid the suspension of disbelief effect and increase realism, the training locations directly mimic Google offices

importance of the post VR experience discussion. 11 testers (55%) filled it out.

2.3.1 Noteworthy bugs. Testers reported over 100 problems through the course of the 7 testing sessions. Those problems were prioritized and fixed by the team with the help of the VR studio, through an iterative design process, between sessions. Beside expected software bugs and nits reports, a few bug reports emerged as noteworthy:

- Participants complained that hearing others was detrimental to the experience during the VR training portion. We addressed this issue by supplying headphones in future training sessions.
- Many participants experienced difficulty with using the VR headsets including complaints about the headsets being too heavy, and potentially not comfortable or usable by people with glasses. We addressed this issue by creating a playbook for facilitators that listed common issues and solutions.
- Most participants were very sensitive to the fidelity of the simulation, with a significant fraction of the bugs reported being about visual glitches or simulation oddities. Those reports included a character's teeth being distracting in an early version, hands not being realistic enough, the fact that one of the protagonists takes a meeting from a common room which is unusual, and the inability to find a character mentioned in a dialogue. We improved the fidelity and addressed concerns where we could and given the current software limitations.
- Some testers reported that the debrief section could be potentially hampered with some unwilling to speak freely, due to fear of retaliation or be judged; in particular they were concerned about being misunderstood when discussing sensitive, difficult topics. As discussed later in future work 5, we plan to experiment with alternative debrief sessions, such as virtual-world sessions where participants are anonymous avatars to see if people report a reduction in self-censoring or an increase in comfort with the debrief.
- Our testing participants were sensitive to the fact we didn't use, due to the VR engine limitations, high-fidelity characters. In particular, one tester noted that characters lack of proper body language was immersion breaking: T6: *"in one*

scenario the avatar said something wrong and she was like 'I'm sorry,' but she has no facial expression showing she is sorry... it actually trigger my emotion like 'you don't seem to be sorry at all'"

Testing Survey results. 10 out of 11 (91%) of the testers responded "Yes" when asked *"Did the scenarios you experienced in VR feel real to you?"* - the remaining one, R9, felt it was not different from video training. Similarly all participants, except R9, found that the VR format effective at creating an empathic response. 11 out of 11 of our testers were positive that this form of training will integrate well within Google DEI training options. Those results gave us confidence that our VR training would help Googlers and strengthen our DEI trainings.

When asking if testers felt this type of scenario could happen at Google, we got a more nuanced set of responses with 6 testers agreeing this could happen, and 5 (45%) being uncertain but no testers reporting the test scenarios as unlikely. This split is partially explained by the unlikeliness to have a single tester exposed to all the situations described in the scenarios.

Last but not least we asked testers about the importance of the post VR session group discussion. The vast majority of the testers 9 out of 11 (82%) found this session useful or very useful. In the additional feedback open-ended question a tester even reporting it was the most important part of the training: *"Without the discussion component, [this training] doesn't have any more value than past [styles of] DEI training"*. This feedback supports the hypothesis that having a post session is critical to the success of VR DEI training and we made sure to allocate 25 minutes to it during every training session performed as discussed in section 4.

3 SCENARIO DESIGN

3.1 Scenario workflow

Each scenario begins with a startup screen where trainees have the choice to either get information on how to use the training or to jump into the scenario (e.g., after they have completed their first scenario).

Then the virtual guide introduces the situation and the character the trainee will inhabit during the scenario. During this phase, the trainee has the opportunity to observe the protagonist and control

Elie Bursztein, Karla Brown, Patrick Gage Kelley, and Leonie Sanderson

Figure 2: Screen captures showing the interfaces trainees experience at different stages of the VR training.

their body as it is reflected in "a mirror" as visible in figure 2. Optionally, in specific scenarios, the virtual guide explains how to interact with the environment. For example, the participant might have to click on the controller (or mouse if they use the desktop version) when they spot a bias as visible in figure 2.

Next the participant experiences the scenario as the first character while it unfolds. During that part, the participant is free to move the character's head to observe its surroundings while the scene takes place but can't move around. This restriction is in place partially to avoid motion sickness and avoid the participant being distracted while the action takes place.

A reflection interlude follows the first immersion with an optional metric report, such as the number of biases reported as visible in figure 2 if relevant.

The participant then delves back into the same situation but from the perspective of another character. A final summary debrief by the virtual guide concludes the scenario before the participant returns to the home screen where they can choose another scenario or exit.

3.2 Participant agency

In each scenario, participants have the opportunity to respond to the situation in three distinct ways:

- Call it out: The character will put the person who made the inappropriate remark on the spot and highlight the issue in a very overt way.
- Call it in: The character will attempt to dispel the misconception by pointing out that it is wrong, highlighting the quality/expertise of the person the remark was directed towards.
- Ignore it: The character will stay silent.

3.3 Scenario details

Each of the four scenarios developed for the training takes place in different office settings with a range of diverse characters (as illustrated in figure 3) and distinct concepts and learning objectives. Here is a summary of each scenario:

Scenario A – Making assumptions.

- Synopsis: During an initial video conference call with a new partner team for a new project, the person leading the meeting is making assumptions about team members' technical expertise solely based on their appearances and presentation. Those assumptions are wrong and the trainee is asked to

navigate the situation in a way that supports their colleague while maintaining a good relationship with the other team.
- Perspectives: The trainee first experiences the scenario as Whitney, the female tech lead who is assumed to be "less technical." Then, in the second part, the trainee experiences the scenario as Omar, a senior software engineer in the team, that can potentially interject to support Whitney.
- Settings: A conference room with a person from another team joining over a video conference.
- DEI Concepts: Ageism, sexism, role hierarchy, power dynamics, and assumptions.
- Learning Objectives: This scenario highlights the importance of being able to recognize and respond to bias in the moment.

Scenario B – Everyday Diversity.

- Synopsis: A character overhears two distinct office conversations. In the first conversation a colleague is a victim of tokenism [21]. In the second, a colleague is being dismissive of others' differences including their food requirements driven by religious and cultural needs, as well as their preferred pronouns.
- Perspectives: The trainee experiences the first part as Mandy, an American white female, and the 2nd part as Hassan from Bangalore, India. In both cases the trainee is a bystander and has the opportunity to interject in the conversation.
- Settings: A hallway outside of a conference room in a U.S. Google office (part A), and later at an off-site (part B).
- DEI Concepts: Racism, stereotyping, sexism, representation, tokenism, and diversity.
- Learning Objectives: This scenario helps trainees recognize problematic conversations and allows them to step in, in a tactful manner, that highlights the issue.

Scenario C – Performance and Feedback.

- Synopsis: This scenario explores the complexity of the power dynamic between managers and their reports in the context of performance feedback through the lens of a female report who has moved to the country she's now working in, asking to be put in charge of a project and having to fight preconceptions and biased comparisons to other colleagues.
- Perspective: The trainee experiences the first part as Magda, a female software engineer from Poland working out of Dublin. In the second part, the trainee experiences the discussion from the point of view of Michael, Magda's manager, who is working out of a Google London office.

Figure 3: Screenshots of the four scenarios developed for the training.

- Settings: 1 to 1 meeting through video conferencing from a Dublin home office meeting room and a Google London conference room.
- DEI Concepts: performance and feedback, stereotyping, power dynamics, unconscious biases.
- Learning objectives: Being able to recognize unconscious biases during performance conversations, to notice and reduce preconceived expectations based on those biases.

Scenario D – In Group / Out Group.

- Synopsis: In this scenario a new team member is joining a distributed team and this is their first meeting. The scenario revolves around assumptions about locations and culture, including assuming everyone has the same cultural frame (in this case: US pop culture).
- Perspective: The trainee experiences the first part as Marco, the team's newest software engineer, who was raised in Argentina and is now working from a Google office in Spain. In the second part, the trainee experiences the same meeting through the eyes of Karen, the US-based senior lead of the team, and the person who introduces Marco to the rest of the team.
- Settings: Google Madrid Office with remote video conferencing.
- DEI Concepts: Inclusion, stereotype.
- Learning objectives: Ensure that everyone feels included in the group regardless of their origin, location, or length of time being on the team.

4 TRAINING SESSIONS

After completing the testing phase, we ran our first set of training sessions in September 2023. This section describe our experience training our first cohort of Google employees and early learnings.

Participants. The participants were recruited by extending invitations to 32 members of the Google security team's senior staff to participate in an optional DEI training session. At the time of writing 26 Googlers accepted the invitation and took the training. 23 of them opted to use the provided Quest 2 headsets to perform it in VR and 3 opted to use the desktop version. The participants did not receive incentives.

Facilitators. Our facilitators were volunteers recruited from across Google DEI initiatives. We prepared our facilitators through a multi-step process, first having them complete a Google instructor-led training that focuses on leading inclusive training and events. Then they had to complete our VR training themselves. Next, our core team taught them how to prepare and maintain the VR equipment used for the training. Finally, facilitators needed to complete a short online training module, which also gave them access to a playbook of common facilitator questions and issues. We developed this online module and the playbook to prepare for potential future scaling of the training based on the initial completed training experiences.

Training Protocol. Each training session lasted about 90 minutes. The training began with the facilitator explaining the goal of the training and informing the participants that they would be asked to fill out an optional questionnaire to help improve the training. This was followed by a quick demonstration of how to use the Oculus Quest 2 headset and its controllers (15 minutes). The participants were then asked to perform the training at their own pace for about 45 minutes, which was enough time for most trainees, based on the initial pilot testing. Finally the training ended with the debrief discussion, which ran for 20-25 minutes.

Participants were asked to begin the training with scenario 1, and then suggested to complete scenarios 3 and 4. About half of participants optionally decided to also complete scenario 2. Following best practices, participants were instructed that they had the opportunity to replay each scenario as much as they wanted, skip a scenario, or stop the training at any time. Anecdotally we observed that half of the participants did take the optional scenario 2 based on the debrief discussions, we also note that some participants mentioned replaying the scenarios to experience alternative ways to respond.[1]

4.1 Preliminary findings

At the onset of the training participants were asked to fill out an optional, anonymous survey that we sent by email after the training. Overall 7 (30%) of them opted to return it. Here is the summary of their feedback.

Overall experience. All of the participants who filled out the survey felt this training was a very satisfying or satisfying experience with a 4.7/5 (94%) average satisfaction. Participants largely (7/8) reported the training was very useful or useful to better understand DEI issues and how to resolve them with a 4.1/5 (82%) average agreement. Similarly, all but one felt the VR training was better or significantly better than traditional DEI trainings, with 4.1/5 (82%) average agreement. Likert questions response histograms are shown in full in figure 4.

---

[1]We do not have detailed information on the actions participants took in the VR system (e.g., which scenarios they completed, as which characters), as we decided to not perform any logging to increase participant freedom in exploring the scenarios.

Elie Bursztein, Karla Brown, Patrick Gage Kelley, and Leonie Sanderson
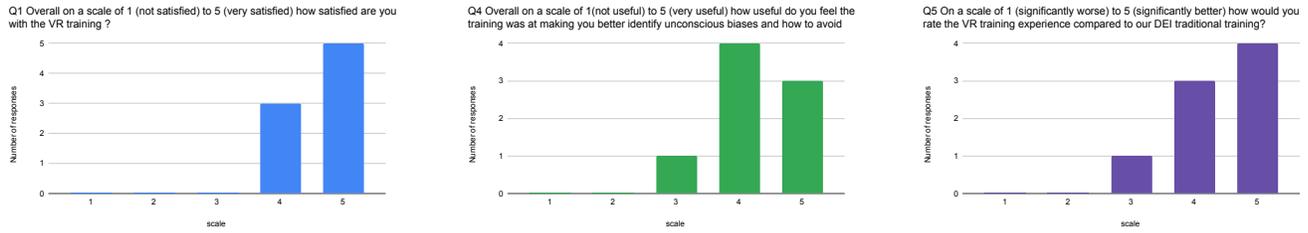

Figure 4: Post training survey histograms for three questions: Overall satisfaction with the training, usefulness towards identifying unconscious biases, and preference for VR compared to traditional DEI trainings.

Positives aspects. The open-ended survey responses show that participants thought our VR training improved upon traditional trainings in two key ways:

(1) Increased understanding: Participants felt that the training made the issues more real and helped them understand the issues from the multiple, other perspectives than their own – R1: *"microaggressions felt more real"* — R8: *"Opportunity to experience microaggressions from the perspective of a member of a historically underrepresented group"* — R2: *"It was immersive and attention grabbing in a way that previous trainings have not been."* — R5: *"The change of point-of-view was a good and realistic experience, enabling seeing the same scene from different points-of-view physically, which helps to tune the mind to the different personal experiences"* — R7: *"Made empathy more real via experience"*. Participants also noted that being an active player in the situation, instead of a passive reader or listener helped with realism — R3: *"role changes were great. Instead of a passive participant, it felt more real."*

(2) Enjoyment: Participants reported that VR training was more enjoyable than standard trainings and that it was easier to focus. — R1: *"the time just flew by!"* — R4: *"Immersion removes the sense of time from the training. You are focused."* — R5: *"It was easier to keep attention to the scene due to the immersion ... it looked shorter and less boring to go through the training content"*

VR usability. Echoing the results of our testing phase (Section 2.3), multiple participants reported a lack of familiarity and discomfort with using a virtual reality headset – R3: *"I did not like the VR setup, but loved the 1P view of the cases a lot more"* – R2: *"VR itself, independent of training, remained uncomfortable"*. Also echoing our initial testers, participants also reported Quest 2 usability issues for people with glasses: R6: *"Not too glasses people friendly even with the spacer"*

Areas of improvement. Participants' feedback on what could be improved fell into two broad categories:

(1) Realism: Some participants expressed that the overall graphic quality was not good enough and degraded their training experience – R3: *"parts of the training where a lot of head motion and low-resolution elements (e.g., people on video) were very disorienting"*. They also expressed that the interface was laggy and scenarios had loading issues – R5: *"Some delays in loading (forest, scenarios)."* This corroborates our test users

feedback who also wanted improved realism, which they too felt was critical for a truly immersive experience (section 2.3).

(2) Lack of agency, depth of scenarios: This was the most reported limitation – with participants wanting more avenues to influence the outcome of the scenarios. For instance R2 expressed the wish *"to pick answers/influence the outcomes of the conversation"* and R8 was interested in experimenting on *"what happens if an individual pushes back on being called out for a microaggression"*.

5 DISCUSSION AND FUTURE WORK

From this initial investigation, conducting DEI trainings within virtual reality is reported to create a more effective and immersive experience. Through simulated direct interaction with scenarios, instead of traditional reading or listening, participants are more engaged and empathetic.

This opens up a path to complement or even replace standard DEI trainings with a form of training that may feel less like a chore and more like a truly meaningful experience. However, using VR is currently hampered with usability and quality concerns. We summarize five concerns that exist today as hurdles to VR adoption:

Hardware issues – Several of our testers and training participants experienced issues with the VR headsets themselves, most often discomfort due to weight or glasses, though other work has found some experience dizziness, and current models are also inaccessible to some users. Some of these issues will be addressed with improvements over time from VR hardware manufacturers, but alternative mediums for training will need to continue to be offered.

Scaling costs – Scaling VR training to a large workforce is challenging due to hardware cost, scaling tech support, remote access to technology, and training enough facilitators. One option to facilitate scaling is to move the debrief sessions to the virtual world, which as we discussed earlier may improve participation (section 2.3), and could also allow access by people in multiple offices or even by remote workers. While this would also require wider distribution of headsets, we see this as a promising line of future exploration and testing.

Fidelity, quality – While the current training shows promising results, it continues to fall short in terms of fidelity. Making the training more realistic requires a state-of-the-art game engine, the design of high fidelity environments, and

avatars that are able to portray more realistic body language, a wider range of facial expressions, and higher quality character designs [19]. Unfortunately, these improvements all have trade-offs: shifting to higher fidelity environments and characters drastically increases production costs and may restrict the trainings to only the highest-end, and also most expensive, headsets.

Scenario depth – Participants wanted more agency, more freedom of movement and engagement, more complex storylines with more conversational turns, and more options for potential actions. This is the most difficult area to improve upon as it requires multi-branching scripts where participants can react in more ways. Alternatively, very recent advances in AI [5] open the door to create unscripted, generative interactions with characters [1, 2]. However using such technologies for training purposes [4] is unproven, and would require further research and strong guardrails to meet learning objectives and not lead to unexpected or offensive responses in sensitive conversations. We plan to prototype such characters in future work to evaluate the feasibility of having them meaningfully respond to trainees with more nuanced body language, vocal tone, and facial expressions.

Novelty – Finally, a variable we couldn't control for is how much this positive feedback is due to the novelty effect versus the VR training being an intrinsically more immersive training experience. While novelty concerns may subside due to more common, normalized use of VR in many aspects of life, this may also reduce the engagement our initial testing and training participants reported in this case study.

While these concerns cannot be understated, we believe there are ways each can be mitigated through further development, testing, and research. We have shown that shifting DEI trainings into VR shows promise as a way to reinvigorate these sessions, which should lead to more inclusive, safe workplaces. Keeping that ultimate goal in mind inspires us to continue investing in understanding and improving VR DEI trainings.

ACKNOWLEDGMENTS

REFERENCES

[1] Charisma AI. [n.d.]. Charisma — Storytelling Powered by Artificial Intelligence. https://charisma.ai/.

[2] Inworld AI. 2023. Inworld – The Most Advanced Character Engine for AI NPCs. https://inworld.ai/.

[3] Rohini Anand and Mary-Frances Winters. 2008. A Retrospective View of Corporate Diversity Training From 1964 to the Present. *Academy of Management Learning & Education* 7, 3 (Sept. 2008), 356–372. https://doi.org/10.5465/amle.2008.34251673

[4] Joshua Au Yeung, Zeljko Kraljevic, Akish Luintel, Alfred Balston, Esther Idowu, Richard J Dobson, and James T Teo. 2023. AI chatbots not yet ready for clinical use. *Frontiers in Digital Health* 5 (2023), 60.

[5] Yejin Bang, Samuel Cahyawijaya, Nayeon Lee, Wenliang Dai, Dan Su, Bryan Wilie, Holy Lovenia, Ziwei Ji, Tiezheng Yu, Willy Chung, Quyet V. Do, Yan Xu, and Pascale Fung. 2023. A Multitask, Multilingual, Multimodal Evaluation of ChatGPT on Reasoning, Hallucination, and Interactivity. arXiv:cs.CL/2302.04023

[6] Kim C Brimhall and Michálle E Mor Barak. 2018. The critical role of workplace inclusion in fostering innovation, job satisfaction, and quality of care in a diverse human service organization. *Human Service Organizations: Management, Leadership & Governance* 42, 5 (2018), 474–492.

[7] Douglas Brown et al. 2012. *The suspension of disbelief in videogames*. Ph.D. Dissertation. Brunel University School of Arts PhD Theses.

[8] Ross Brown, Laurianne Sitbon, Lauren Fell, Stewart Koplick, Chris Beaumont, and Margot Brereton. 2016. Design insights into embedding virtual reality content into life skills training for people with intellectual disability. In *Proceedings of the 28th Australian Conference on Computer-Human Interaction*. 581–585.

[9] Sebastian Büttner, Henrik Mucha, Markus Funk, Thomas Kosch, Mario Aehnelt, Sebastian Robert, and Carsten Röcker. 2017. The design space of augmented and virtual reality applications for assistive environments in manufacturing: a visual approach. In *Proceedings of the 10th International Conference on PErvasive Technologies Related to Assistive Environments*. 433–440.

[10] Sebastian Büttner, Michael Prilla, and Carsten Röcker. 2020. Augmented reality training for industrial assembly work-are projection-based ar assistive systems an appropriate tool for assembly training?. In *Proceedings of the 2020 CHI conference on human factors in computing systems*. 1–12.

[11] Lauren A Collier-Spruel and Jo M Alanis. 2022. Utilizing virtual reality for diversity training may increase training transfer. *The Future of Scholarship on Diversity and Inclusion in Organizations* (2022), 323.

[12] Frank Dobbin and Alexandra Kalev. 2018. Why doesn't diversity training work? The challenge for industry and academia. *Anthropology Now* 10, 2 (2018), 48–55.

[13] Andreas Dünser, Karin Steinbügl, Hannes Kaufmann, and Judith Glück. 2006. Virtual and augmented reality as spatial ability training tools. In *Proceedings of the 7th ACM SIGCHI New Zealand chapter's international conference on Computer-human interaction: design centered HCI*. 125–132.

[14] Laura Freina and Michela Ott. 2015. A literature review on immersive virtual reality in education: state of the art and perspectives. In *The international scientific conference elearning and software for education*, Vol. 1. 10–1007.

[15] Jennifer Fromm, Jaziar Radianti, Charlotte Wehking, Stefan Stieglitz, Tim A Majchrzak, and Jan vom Brocke. 2021. More than experience?-On the unique opportunities of virtual reality to afford a holistic experiential learning cycle. *The Internet and higher education* 50 (2021), 100804.

[16] Andri Georgiadou. 2021. Equality inclusion and diversity through virtual reality. *The Palgrave Handbook of Corporate Sustainability in the Digital Era* (2021), 181–193.

[17] John K Haas. 2014. A history of the unity game engine. *Diss. Worcester Polytechnic Institute* 483, 2014 (2014), 484.

[18] Fernanda Herrera, Jeremy Bailenson, Erika Weisz, Elise Ogle, and Jamil Zaki. 2018. Building long-term empathy: A large-scale comparison of traditional and virtual reality perspective-taking. *PloS one* 13, 10 (2018), e0204494.

[19] Till Kastendieck, Daniel Huppertz, Heidi Mauersberger, and Ursula Hess. 2023. A Walk in the Park: Emotional Mimicry in Virtual Reality. (2023).

[20] Ketoma Vix Kemanji. 2020. Method for developing virtual reality applications for cognitive intensive training tasks. In *Companion Proceedings of the 12th ACM SIGCHI Symposium on Engineering Interactive Computing Systems*. 1–5.

[21] Eden B King, Michelle R Hebl, Jennifer M George, and Sharon F Matusik. 2010. Understanding tokenism: Antecedents and consequences of a psychological climate of gender inequity. *Journal of Management* 36, 2 (2010), 482–510.

[22] Jasmine R Marcelin, Dawd S Siraj, Robert Victor, Shaila Kotadia, and Yvonne A Maldonado. 2019. The impact of unconscious bias in healthcare: how to recognize and mitigate it. *The Journal of infectious diseases* 220, Supplement_2 (2019), S62–S73.

[23] Lauren Mason. 2022. *Immersive Inclusion: Diversity and Inclusion Training Using Virtual Reality*. Ph.D. Dissertation. University of Cincinnati.

[24] Lauren Mason and Donna Chrobot-Mason. 2022. Immersive Inclusion: Diversity and Inclusion Training Using Virtual Reality. In *Dismantling Bias Conference Series*, Vol. 3. 4.

[25] Michael W Norris, Kristen Spicer, and Traci Byrd. 2019. Virtual reality: the new pathway for effective safety training. *Professional Safety* 64, 06 (2019), 36–39.

[26] Jonas Schild, Sebastian Misztal, Beniamin Roth, Leonard Flock, Thomas Luiz, Dieter Lerner, Markus Herkersdorf, Konstantin Weaner, Markus Neuberaer, Andreas Franke, et al. 2018. Applying multi-user virtual reality to collaborative medical training. In *2018 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*. IEEE, 775–776.

[27] Derald Wing Sue and Lisa Spanierman. 2020. *Microaggressions in everyday life*. John Wiley & Sons.

[28] Lucia Vera, Gerardo Herrera, and Elias Vived. 2005. Virtual reality school for children with learning difficulties. In *Proceedings of the 2005 ACM SIGCHI International Conference on Advances in computer entertainment technology*. 338–341.