Horizon Worlds: A Community of Practice for Social VR Design

Wilson Chen, Jon Womack, Tan Gemicioglu

Georgia Institute of Technology

Abstract

Social virtual reality (VR) is a growing genre of online interaction. Horizon Worlds is one such social VR application developed by Meta Platforms (formerly known as Facebook Inc.) that was released to the public in December 2021. This paper explores Horizon Worlds in relation to Amy Jo Kim's principles of community design, along with frameworks from sociology and comparative studies with other social VR applications. We examine the prototypicality of Horizon Worlds as a third place as defined by Ray Oldenburg. Furthermore, we explore issues of trolling and harassment on the platform, and analyze Horizon's moderation toolkit. Finally, we argue that Horizon Worlds is a burgeoning online community with a foundational emphasis on user-generated content, and the platform is a constructionist community of practice for creators in the design of social VR experiences.

Keywords: virtual reality, social VR, online community, community of practice

Horizon Worlds: A Community of Practice for Social VR Design

In October 2021, Facebook announced a shift towards virtual and augmented reality (VR/AR) experiences in its evolving mission to bring people together. Its new operating name *Meta* reflects the company's investment into these emerging technologies for social interaction. *Horizon* is the unifying brand that Meta uses to identify its suite of VR applications, including *Horizon Workrooms* (a conferencing tool), *Horizon Venues* (an event space), and *Horizon Worlds* (a casual social space). This paper explores the design of the Horizon Worlds community.

Horizon Worlds was introduced in September 2019 (Oculus Blog, 2019). Users could sign up for the invite-only beta, which opened in 2020 and lasted until December 2021. In early December, the app was officially released to users 18 and older in the United States and Canada. As of February 2022, The combined monthly user base of Horizon Worlds and Horizon Venues reached 300,000 people, presenting a tenfold increase when compared to numbers at the time of Horizon Worlds' launch (Heath, 2022). These numbers are still small in comparison to other social VR apps such as Rec Room and VRChat, though user growth appears to be trending upward. In comparison, Rec Room reported 1,000,000 active monthly users in a 2021 report (Lugris). Although VRChat doesn't report active user numbers, Steam Charts reported an average of 21,263.5 concurrent players online at any given time for February 2022 (Steam Charts).

We spent nine weeks on the platform to understand the features and affordances of Horizon Worlds, as well as the users who have found a place within the community. This paper utilizes Amy Jo Kim's nine principles of community design (Kim, 2006), along with various perspectives from sociology and anthropology, to provide an extensive overview of the community. In addition, we present findings from field observations and interviews with six

members of the Horizon Worlds community to synthesize the social incentives and motivations surrounding interaction in Meta's virtual universe. Finally, we argue that Horizon Worlds' design tools, creative community and commission economy form a new, distinct community of practice built around the design of new places and spaces in VR.

Related Work

Online communities built around virtual worlds have decades of history, starting with early MUDs. Especially in MOOs like LambdaMOO, these worlds facilitated informal interactions to build a community of people who shaped the world around them amidst active social behavior (Curtis, 1997). These have been followed by more complex, graphical social virtual worlds such as Second Life and World of Warcraft. Graphical worlds further increased immersion and gave an embodied presence to users within the worlds they created (Bardzell & Odom, 2008).

Modern VR uses head-worn displays to give the user first-person vision in the virtual world, creating an even more immersive and embodied experience. Just as textual and graphical interfaces altered the online communities within them, VR reshapes the interactions between members of online VR communities. The emotional states experienced by users in VR are often similar to face-to-face interactions (Moustafa & Steed, 2018). VR allows users to have shared experiences that they can move in and dynamically interact with (Gunkel et al., 2018). VR can also be a mechanism of social support (Acena and Freeman, 2021) or a way of staying connected with people over long distances (Maloney et al., 2021).

Past work studying the community design of social VR platforms has comparatively investigated applications such as VRChat, AltSpaceVR and Rec Room. McVeigh-Schultz et al. (2018) compare and contrast ways in which Facebook Spaces, Rec Room, High Fidelity,

VRChat, and AltspaceVR frame, support, shape, or constrain social interaction, finding the impactful role space and places play in social VR. Jonas et al. (2019) extend their comparisons of design features to a much wider range of applications, discussing what design features and trends are successful in enhancing the design of social VR platforms. Using these studies as a point of comparison, we observe that Horizon Worlds occupies a unique position compared to other popular applications due to being fully-contained within VR.

There are also many studies that evaluate particular design elements in social VR, either across existing platforms or through controlled experiments. Various researchers have evaluated user avatars and considered how they differ in a virtual reality setting, especially due to problems of body ownership and self-presentation (Latoschik et al., 2017; Freeman and Maloney, 2021). Others have investigated verbal and nonverbal communication in social VR platforms, finding new ways in which users can engage with each other that were codified in non-VR platforms (Maloney et al., 2020). We use these to help understand the challenges of designing a social VR platform, and how it differs from non-VR online communities.

Methods

Practices drawn from ethnography were used to capture and record various social phenomena that occur in Horizon Worlds. Participant observation and semi-structured interviews were the primary ways in which data was collected. The authors collectively spent around fifty hours in Horizon Worlds between February 1 to March 29. Each author independently visited different subsets of worlds to find groups that suited their interests. This also assisted in spreading the scope of information gathering. After most experiences, the authors took field notes to recount interesting phenomena they observed.

One of the authors primarily spent their time participating in the weekly LGBTQ+ meetup and the Horizon World Tours community events. Another author primarily spent time participating in social worlds like comedy clubs, music studios, and houses. Another author focused on the Horizon Creative Community and exploring different worlds made by its members. Interview participants were chosen through purposeful sampling, in which the authors used their best judgment to determine users who would provide a high degree of insight toward the community. The authors also used additional media platforms including Facebook Groups and YouTube channels relating to Horizon as peripheral platforms for the recruitment of interesting participants.

Participants

The team interviewed six users of the Horizon Worlds community. A majority of the users interviewed were content creators, a term which encompasses the variety of roles all relating to creative endeavors in the community. While most interviewees were initially contacted in Horizon Worlds, some were reached out to via email or Facebook due to their activity on peripheral platforms. Wilson interviewed Laex05, OcuLos410, and Seqeq. Jon interviewed Papaosman01, L.T. Smiles, and another user that requested anonymity.

We note that a limitation in gathering participants was in the ephemeral nature of user interactions on the platform. Attempts at finding interviewees were hindered by the dynamics of large-group voiced interactions, a large number of overpopulated or unpopulated worlds, and an inability to have a long enough conversation to get contact info. Snowball sampling was attempted to counteract these problems, but response times were slow as messages had to be sent over other channels and the participants often had busy working schedules. Furthermore, world

visitors had a much lower chance of showing interest for an interview, while world creators were often more eager.

The remainder of this section will compose of descriptions of each participant that was interviewed.

Papaosman01. Papaosman01 is a White male in his 20s from the southeastern United States. He is a high school graduate. A few weeks prior to our interview, he quit his job working at a fast-food restaurant. At the time of our interview, he was putting in hours of effort networking, building, and designing in Horizon Worlds. About a month after our interview, he had received a commission (from the band's manager) for thousands of dollars to build a world that resembled the album cover of a famous rock band. Papaosman01 now has another job with a mailing service for benefits, but is excited about growing his business in Horizon Worlds. His worlds primarily focus on socialization and music.

L.T. Smiles. L.T. Smiles is a Black female from a metropolitan city in the United States. She became involved with Horizon Worlds after moving during the COVID-19 pandemic. She didn't expect to ever be part of the builder community on Horizon Worlds, but now actively builds worlds. Her worlds have a focus on architectural aesthetics and artwork. After returning home from her nine-to-five job, she spends most of her time socializing and building with friends on Horizon Worlds. During our interview, she took us to a world that celebrated and spread awareness of Black artists by recreating famous works and displaying them in a virtual art exhibit.

Laex05. Laex05, or just Laex, is a 27 year old entrepreneur from the Greater Seattle area who is mixed White and Native-American, and attended college without receiving a degree. Laex signed up for the invite-only beta and joined as soon as he was able to. He was initially

disappointed by the lack of activity and was largely inactive a short time afterwards. However, his discovery of the building aspects of Horizon solidified his decision to stay on the platform. Laex started his first YouTube channel after being unable to find tutorials. He recounts that "it took me about two months to learn how to make my first gun, which I can now do in five minutes!" Identifying a need to share knowledge with others, he eventually published his first tutorial. Ever since, he has been actively uploading new tutorials to his channel.

Nowadays, Laex is a significant community figure on the platform. Laex runs the weekly Horizon World Tours community event with his friend OcuLos410 (who is described in the participant profile below), of which he estimates "I think we saw about 400 people within one hour arrive at the event, which is just mind-blowing". He runs a business which comprises two YouTube channels focusing on tutorials and entertainment within Horizon Worlds, as well as a for-hire worldbuilding service. The business's website also contains an extensive wiki about building, scripting, and video making. Laex is currently working with Meta, although much of the information is non-disclosable. He states that he has "created around 400 tutorials for Meta".

OcuLos410. OcuLos410, or just OcuLos, is a 40 year old IT project manager from Maryland who is mixed White and Hispanic, and has completed trade school. OcuLos and Laex co-run the Horizon World Tours community event, and World Tours is integral to how OcuLos became involved with the Horizon community. OcuLos joined Horizon in February 2021 during the invite-only beta, and initially found his niche by acting as a guide for other new users entering the Plaza world. "Every person I see, I'm going to say hi to. I'm going to try and help them if there's not a community guide." Eventually, he states, "someone from Horizon reached out and said, 'Hey, do you want to do this as a community event?' And I said, 'Absolutely, let's

do this.’”. Aside from hosting the Horizon World Tours event, OcuLos is a frequent collaborator in community world building projects, and is also the DJ at his club venue called Club One.

Seqeq. Seqeq is a Chinese 40 year old graphic designer from Vancouver, Canada, and has a Bachelors of Arts. He is a relative newcomer, having joined Horizon Worlds around early February 20222. He spends a couple of hours on the platform each day, although he estimates that he spends about 80-90% of his time in Build Mode. For him, the ability to build is a large reason for why he keeps coming back. He describes the experience of playing on Horizon Worlds as similar to “playing virtual Lego all over again”. Seqeq also attends various creator events to learn from and collaborate with other content creators on the platform. At the time of the interview, he was working on a digital replica of a Pioneer XDJ-XZ DJ machine at the request of a DJ he met through one of those creator events.

Interviewee 6. Interviewee 6 preferred anonymity, but is a male in his 20s that graduated from high school, has no children, and speaks a native language that is not English. He primarily spends time on Horizon Worlds with friends that he already knew outside of the platform, although he has met a few new friends online. Despite speaking his native language on Horizon Worlds, he said that he’s experienced little to no negative responses or harassment. He primarily spends time in Horizon Worlds socializing and exploring new worlds and rarely spends time building. He particularly likes socializing in virtual reality over other mediums because of the realism of avatars, although the lack of legs on the avatars bothers him.

Evaluating Horizon Worlds through Community Design Principles

Amy Jo Kim outlines a series of nine “timeless” principles for building communities online (Kim, 2006). These principles act as “social scaffolding” that facilitates the process of

community growth and sustainability. We identify the following of Kim's core principles as crucial components of Horizon Worlds' community design.

- Purpose
- Gathering Places
- Profiles
- Codes of Conduct
- Cyclic Events
- Range of Roles
- Subgroups

Purpose

Audience. Officially, Meta states that Horizon Worlds is released for audiences 18 and up in the United States and Canada. Currently, the app has an ESRB rating of T for Teen. In practice, the researchers notice that a vast majority of the users in Horizon Worlds are working-age adults. Many of the worlds are suited for a more mature audience. "I wonder why there are so many clubs in Horizon", Seqeq mentions. Comedy clubs, studios, bars, and nightclubs constitute a substantial portion of the worlds on the front page.

We identify two primary archetypes of users who frequent Horizon Worlds, those being visitors and creators. These two archetypes form a symbiotic relationship in the community design of the platform - one cannot exist without the other. The visitor needs worlds to explore and places to hang out in. The creator builds worlds so that other users can visit and interact with their creations. These are not mutually exclusive - creators visit other people's worlds, and visitors have free reign to begin building as well. However, we found that many of the participants we interviewed leaned strongly in one of the two directions.

Gathering Places

Places. Worlds constitute gathering places. These gathering places are by default public, although private instances of worlds can be created by anyone. Places on Horizon Worlds are extensible - parallels can be drawn to a MOO, an early online text-based virtual reality server structure that allows its users to create features and expand the functionality of the environment. The amount of published worlds is ever-increasing as a result of the user-generated content architecture of the platform.

Worlds typically have themes that help users find communities that fit them. New places are discovered through Horizon's suggestions, search, and user invitations. Additionally, some worlds will have a number of portals that link to other worlds (often by the same creator or the creator's friends). Featured worlds and active worlds are shown first in the menu. An integrated Attend tab displays a calendar of weekly recurring gathering spaces themed around a particular interest, ranging from meditation to community showcases to car shows to support groups.

Maps. The structure of content discovery in Horizon Worlds follows a hub-and-spoke model where a central locus acts as the entry point toward a variety of different activities on the platform. When users first load into Horizon, they are placed in their Personal Space. The Personal Space is a singleplayer dashboard where one can change their avatar, view the news feed, and browse the menu. From one's Personal Space, one can access their friends list, their builds, and most prominently, community events and other worlds. The menu provides an overview of all of the different social spaces that are accessible to them, with different tabs for recommended worlds and worlds that are looking for more players, among others.

Building. Content on Horizon Worlds is first and foremost user-generated. Beyond the initial tutorials, the introductory plaza, and the occasional worlds built to host events, the vast

majority of the worlds are made by creators. A large array of tools form the builder's toolkit. *Shapes* provide the geometric primitives, and can be grouped together to form more complex objects. *Styles* enhance features of shapes, such as changing color and texture. The *Sounds* tab hosts a library of effects, music, and background noises. Finally, *Gizmos* offer a variety of more complex functions including spawn points, particles, environment, portals to other worlds. Notably, this is where the script blocks are located, which allow creators the ability to make their own custom functions.

Due to hardware limitations, the complexity of distinct places through objects, scripts, animations, geometries, and sounds limit the size of places. Each world has a resource limit, which constrains the amount of complexity that each world can have. This has a direct impact on the accessibility of the platform - on January 13, 2022, Meta made the decision to no longer support Horizon Worlds on the original Quest headset in order to better utilize the faster processing capabilities of newer generation headsets (*Updated Support for Horizon Worlds on Quest 1*, n.d.). When asked about the resource limitations, Seqeq considered that "the limitation might be a good idea. Like, look at Twitter. [...] if everybody can write an essay, then visiting worlds would be installing a game every time you visit the world." Multiple builders mentioned a hack to get around the complexity-occupancy trade-off. During building, the world should initially be set to the lowest occupancy, so that greatest amount of build complexity is afforded. Then, immediately after publishing the world, during loading, increase the occupancy of the world. Papaosman01 reported that Meta had partially patched this hack, making it more difficult, but that experienced builders could still pull it off.

Profiles

Barriers to Entry. Other popular social VR apps - VRChat, Rec Room, AltspaceVR - all have desktop versions where users can participate with a keyboard and a mouse. In contrast, Horizon Worlds requires its users to use a VR headset to access the community. Non-members cannot experience or trial the community unless they own the hardware. Moreover, the hardware is limited to exclusively Oculus devices, giving greater control to Meta over the platform.

There is some speculation that a desktop version of Horizon Worlds is being worked on, although this is being met with mixed reception. Laex states that something he's "cautious and afraid for is the desktop and mobile apps that are speculatively being worked on. The potential to have somebody coming in who doesn't feel the presence that we feel scares the heck out of me." OcuLos adds that "It's just not immersive [...] On desktop and on mobile, you're disconnected. You're not in the phone, you're not in the computer. So you're not feeling as though you're in the room with those people." Although physically owning a VR headset is a significant barrier to entry into the community, community members perceive tradeoffs in the authenticity of the experience.

Representation. In our field work on Horizon, we find that users often have the expectation that one's avatar is a representation of one's real world appearance. Approaching identity through semiotics, the avatar (the signifier) carries a relationship with the person behind the headset (the signified). The tie between the avatar and its user shapes the kind of interactions users have on the platform. Some of our participants agreed to be interviewed via video conferencing software, and their in-game avatars map convincingly to their real-world identities. "You really are yourself, and people feel connected to their avatars and their faces of their avatars", Laex stated regarding this topic. In contrast, VRChat allows users to take on the

identity of popular characters, anime models, creatures, objects - whatever character model that's rigged and imported onto the platform. "Eventually, we're going to have these avatars that don't necessarily need to be humanoid," Laex says, adding "my concern is what happens at that point? Do we start seeing online trolls in the way that we see them in VRChat where now, you're a hot dog and you're walking around and you're just being an inappropriate hot dog?".

More work would need to be conducted to empirically verify the strength of the connection between the avatar and the individual. It is not unreasonable to assume that there may be cases where individuals portray appearances that do not accurately reflect their present appearance in real-life. However, this is an area that would require further research, and we were not able to explore this in the time window of our field work.

Code of Conduct

The primary policies that apply to all of Horizon Worlds are the Facebook Community Standards and Oculus Conduct in VR policy. The Facebook Community Standards function as guidelines for curbing violence and preventing objectionable content. The Conduct in VR policy states behaviors that violate the code of conduct such as harassment and bullying, impersonation and sexual gestures. The penalty for such actions can be temporary restrictions or suspension of the account. Finally, there's an 18+ age limit and U.S. & Canada regional limit present on the platform at the moment of writing. However, many of these policies are not made obvious to users, and are only enforced when a user is reported.

Instead, many of Horizon Worlds' rules are administered at the smaller, world-specific scale. The rules are supported by social norms that haven't been formed into writing, such as not blocking other user's vision with objects and muting your microphone if you are talking to someone outside VR.

Constitution

In order to make some of their rules clearer, many worlds have opted to post their rules in a physical billboard which the user can see upon entering the world. These rules can vary in specificity but are often kept as a short list to make sure the user reads them on entry. Some examples are “Do not disrupt the sessions” or “No interrupting the person talking on the stage.” Interestingly, in some cases they try to fill in for places where the code of conduct fails, like the age restriction. Some world creators have opted to create minors-only versions of their worlds to physically separate their activity without disrupting the normal sessions. More details about the enforcement of these policies are discussed later, in the Moderation and Harassment section.

Cyclic Events

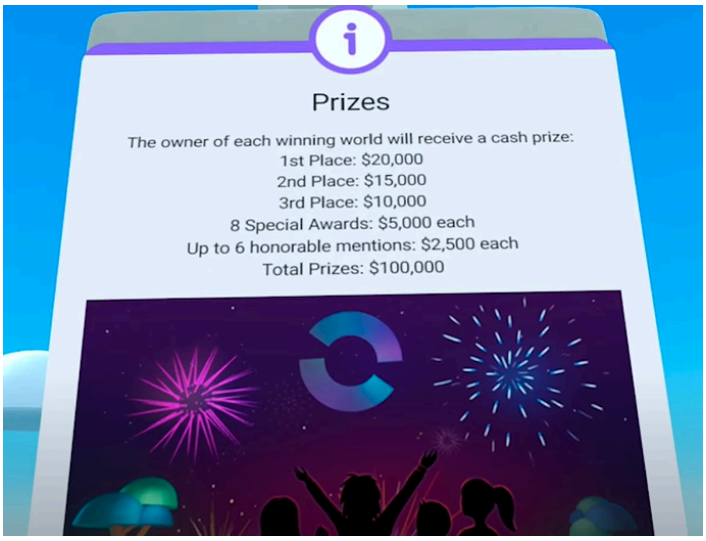
On the platform, Horizon Worlds officially recognizes community events through its Attend tab. These are weekly events which provide an entry point for visitors and regulars alike to participate in a shared activity. Users mark an event on their calendar by hovering over the banner and selecting the “Interested” overlay that appears. These reminders are integrated in the headset - the app will notify you that an event is starting soon if you’ve marked your interest in the event.

These cyclic events provide avenues for users to sustain structured, meaningful interactions. These events are directed by hosts each week, and users participate toward some goal-directed activity. The Horizon World Tours community event began unofficially through OcuLos’s efforts in acting as an unofficial tour guide for new users back during the invite-only beta. Recognizing his efforts, over time a Horizon Worlds employee reached out to OcuLos about turning this into an official community event. In the case of Horizon World Tours, regulars

interact with hosts Laex and OcuLos to talk about their latest projects and to find collaborators, while visitors come to Horizon World Tours to learn about the projects being worked on by community members and to orient themselves around. In the LGBTQ+ meetup, the host provides a safe space for members of the LGBTQ+ community to socialize with each other and provide support. In meditation events, visitors come in order to practice mindfulness with a like-minded community. In office hour events, creators interact with the Horizon team to get advice on script-writing and implementation.

Contests. Horizon Worlds has invested a $10,000,000 creator fund (Oculus Blog, 2021) to be gradually distributed in the form of contest prizes. The creator fund provides powerful cash incentives for creators, and the contests reinforce the purpose of the platform in the expression of creativity through user-generated content. These competitions are posted in the Creator Competition Hub world.

Their most recent contest is a Spring Jam with total cash prizes of $100,000. Entries are centered around a theme of spring, and worlds are requested to have the hashtag #SpringJam2022 to qualify for entry. A “Hall of Winners” monument is placed in the competition hub world to commemorate the past winners of their build jams.



Range of Roles

Newcomers learn the basics and have the opportunity to chat with Horizon Worlds employees at The Plaza. However, basic platform interactions are intuitive and require little learning - handheld controllers correspond to your digital hands, joysticks allow translation and rotation, and the headset allows looking around through head movement. Other gestures, like thumbs up, raising the roof, fist-bumping, and joining parties by putting hands in a circle are intuitive, but require learning (often from seeing others). The most difficult learning pertains to building and scripting. Most of the Regulars in Horizon Worlds attain status and recognition by creating complex worlds that are popular. Popularity on Horizon Worlds is quantified (and immediately visible) through likes and occupancy.

In addition to levels of experience, Horizon Worlds users follow Bartle's taxonomy of player types (Bartle, 1996). These different player types are directed to different worlds based on what interests them. *Achievers* are drawn to various competitions or challenges and the "Featured Worlds" section. Moreover, if an achiever becomes a creator rather than a visitor, they can earn money for their creations and become famous through the worlds they make. *Explorers* are drawn to portal hubs, where they can travel quickly between different worlds through portals, or may go "world hopping" to quickly move between these worlds. Creator explorers will make sure to put several portals into all their worlds of both their own creations and worlds they've liked. *Socializers* are drawn to house parties, night clubs, comedy clubs and studios - where the people are. These are denoted by the "Active Worlds" section, marked by how many people there are in the present instances. They also actively seek out the weekly events. *Killers* are drawn to competitive battle games, in the "Play" tab. This isolates them to a greater degree than all other player types, as there are no worlds in common with the others.

Overall, Horizon Worlds particularly incentivizes keeping explorers and socializers among visitors by making sure they are given the space and tools to do what they enjoy. This can sometimes alienate achievers and killers, but Horizon still gives them a place to do what they like, and if they wish to be more involved with the rest of the platform, to become a creator. People from each role can make worlds that appeal more to those of their role, such as socializers establishing community hubs and killers making more exciting battle games. This further increases the spatial isolation of the social roles, leading them to distinctive subgroups, united by interactions across world creators.

Subgroups

Infrastructure. Apart from the subgroups that emerge from the events hosted on Horizon's Attend tab, the Horizon Worlds platform does not have features that would directly facilitate the creation of sustainable subgroups. However, we observe that subgroups still form through membership in peripheral platforms, which we define as other online sites and communities that are formed for the purpose of supplementing activities in the primary platform. We found that Facebook Groups are strongly tied toward subgroups on Horizon, which makes sense when considering the strong degree of integration between Facebook and Horizon Worlds. As an example, the Horizon Creator Community (HCC) is a Facebook Group that contains several thousand members, created for the purpose of facilitating collaboration and learning. In the case of the weekly LGBTQ+ meetup event on Horizon Worlds, a VR LGBT Discord server acts as the peripheral platform for which subgroup activity takes place. We further find that creators like Laex05 and OcuLos410 use their YouTube channel to cultivate a community around

them.



Events. Outside of the official events displayed on the Attend tab of the Horizon Worlds menu, community members use the description boxes of their worlds along with peripheral platforms to coordinate events. During one researcher's visit to the Horizon World Tours event, they participated in the Speed Friending featured world, where users have around two minutes to interact with a stranger and make an impression on them. This event is run by the creator as well as users with a Host role, who announce from the top stage when each round is over as well as what direction to move in for the next round. Within social spaces like the Soapstone Comedy Club, anyone is free to start heading up onto the stage and perform stand-up comedy. In Papasman's Stoner Studio, events have multiple people in the recording room, a producer, and an audience. Rappers will take turns on the microphone sharing anything that is on their mind, with beats to popular songs in the background.

Research Questions

Beyond Kim's principles of community design, many important insights were discovered by the authors as more data was collected through participant observation and interviews. The authors considered the following research questions as salient points of inquiry:

1. How well does Horizon Worlds conform to the idea of a "third place"?
2. How are issues of moderation and harassment resolved within the community?
3. How does Horizon Worlds' creator community work?

Horizon Worlds as a Third Place

In *The Great Good Place*, Ray Oldenburg considers three types of places in which people spend most of their time: domestic, productive, and sociable. Ordered based on time spent, homes are "first places", workplaces are "second places", and places for pure sociability are "third places". An expanded definition of the "third place" stipulates a third place is or has: a neutral ground, a leveler, conversation as the main activity, accessible and accommodating, regulars, a low profile, a playful mood, and a home away from home. Below, each of these characteristics are examined to consider if Horizon Worlds is a third place.

Neutral Ground. Unlike first and second places, which demand time and come with obligations, a third place is free from these demands or a neutral ground. Horizon Worlds is a neutral ground. Users come and go as they please and "world hopping" is common, acceptable practice. Even world creators need not spend time in their worlds. However, there are groups, events, and worlds that stray from neutral ground. For example, one of the worlds we visited was a First Person Shooter (FPS) game with timed rounds of gameplay. This design creates a social expectation that players are to stay for the entirety of the game.

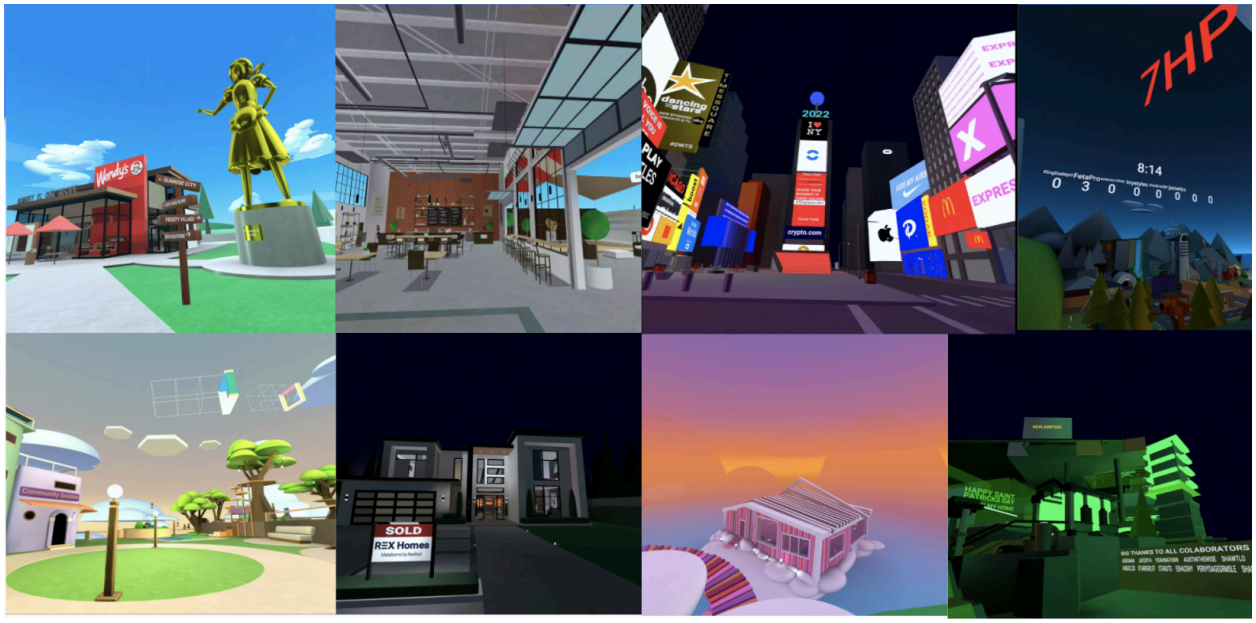
Leveler. Horizon Worlds is a leveler as many socioeconomic cues like clothing, fitness, attractiveness, and possessions, cannot be brought to Meta's virtual reality platform. Papaosman01 commented on this saying "We look at the voice, that's the only thing unique about anything in here […] and how people are treating each other." All users of Horizon Worlds have access to the same avatars and in any given world, all users are able to manipulate and interact with the same objects. However, not all worlds are public, which leaves room for extravagant private worlds. In this sense, Horizon Worlds as a platform is not a leveler, but public worlds in Horizon Worlds certainly are.

Conversation as Main Activity. The main activity of users is heavily dependent on which world the users occupy. Interestingly, builders have control over how sound travels in a world, which affects the nature of conversation. In the FPS world and Titanic world, each user could be heard anywhere on the map. While meditation focused worlds let audio travel short distances, and a comedy club world boosted the audio of whoever holds a microphone. Additionally, the design of the world helps determine the main activity of the world. Large worlds and worlds with focused activities, like studios and games, are less conducive to conversation.

Accessibility and Accommodation. For users that already have an Oculus Quest, Horizon Worlds is conveniently accessible and everything is free. User wants and needs as they pertain to Horizon Worlds are primarily entertainment, socialization, and learning. While world builders have strong motivating factors to appease their visitors, some users may struggle to find accomodation for niche interests. We offer the same advice as Bruckman did during the early days of the internet - "if, after exploring and asking around, you still can't find an online environment that suits you […] Don't give up: start your own!" (Bruckman, 1996).

Regulars. One of the natural "regulars" of any world is the world's creator. The creator of the world has the signifier "World Creator", which immediately confers social status. This status and popularity among other regulars in the world helps dictate the mood and characteristics of the world. Horizon Worlds allows users to 'bookmark' and 'like' worlds, and suggest recently visited worlds, encouraging repeat visits and the formation of regulars.

Low Profile. Third places are characterized as plain, modest, wholesome, homely, or approachable rather than grandiose, extravagant, snobby, or pretentious. From this perspective, many worlds in Horizon worlds are low profile, while others are not. The figure below shows a number of low and high profile worlds. Horizon Worlds promotes worlds that have frequent updates in the form of new objects, scripts, designs, and interactions to attract visitors to worlds. Promotion in this manner encourages creators of worlds to opt for high profile worlds. Oldenburg emphasizes the profile of a third place because a functional third place requires the space to be welcoming to all. Perhaps the digital grandiose of high profile worlds is more approachable than their physical counterparts.



Playful Mood. Banter is common and valued, as an engaging social atmosphere draws users to worlds. The gestures of thumbs up, raising the roof, and fist-bumping contribute to the playful mood of Horizon Worlds. Other than gestures and a motivation to have popular worlds, the mood of a world in Horizon is dictated by the world builder and the world's inhabitants, which leaves room for worlds that are not playful. Papaosman01 commented on the role of Horizon Worlds' realistic avatars on mood, stating that "VRChat is more for being goofy […] I don't want to have a serious conversation with SpongeBob." Because of this difference in avatars, he says "there's a lot of trolls in VRChat".

Home Away From Home. Seamon's defining traits of a home away from home are: rootedness, feelings of possession, spiritual regeneration, feelings of being at ease, and warmth. Specific worlds in Horizon Worlds have many of these characteristics. Builder's are particularly rooted to worlds that they help build, similarly to how an artist or musician may have a connection with their work. Collaborative building is a common practice, and L.T. Smiles fondly recounted about an intricate sunflower that was a critical milestone in her development as a builder and was happy to share that, despite it taking up a lot of memory, her co-builder still has it in the world. L.T. Smiles is rooted to this world. While users of Horizon Worlds do not have possessions that can travel between worlds, world creators have feelings of possession over their own worlds. L.T. Smiles didn't comment directly on spiritual regeneration, feelings of being at ease, and warmth, but she did say that during work she looks forward to coming home from work and spending the rest of the afternoon and evening on the platform. She even discusses stories from Horizon Worlds with her co-workers.

Using Rosch's prototype theory, we conclude that Horizon Worlds as an entire platform is not a prototypical third place. However, individual worlds vary in terms of prototypicality,

allowing any combination of the eight prototypical characteristics (ranging from including none of them to all of them) (Rosch, 1973).

Moderation and Harassment

Harassment in VR can be far more personal than online interactions in other forms due to the increased presence of the user within the environment. Voiced conversations, especially because of the nearly face-to-face nature of VR, can be far more hurtful. Physical interactions can feel much more realistic, where non-verbal actions can elicit strong emotional reactions. Moreover, coupled with the ephemerality of interactions within social VR platforms, there can be little consequence to the harasser as a result of their behavior. As such, social VR presents difficult problems for preventing abuse and harassment on the applications.

Blackwell et al. evaluated the harassment risks and challenges in social virtual reality, coming up with a set of recommendations for how they may be better handled in community governance (2019). We find that Horizon Worlds does not enable community-level moderation and does not follow a responsive regulatory pyramid. Instead, these problems are attempted to be solved at the platform-level through protective features and world-level by individual creators' scripted solutions.

Trolls and Harassers. Before considering the different features for moderation in Horizon Worlds, it's best to understand the forms harassment takes in VR. Trolls disrupt all activity in the world, sabotaging the interactions of everyone else until they are removed, make everyone leave or they decide to leave. This can be through voice, by shouting or other forms of noise played continuously as the troll moves around. The impacts of this are worsened if the world is set to share all voiced communication with the entire world rather than the local area. It

can also be through space and objects, as trolls can block other people's eyesight or throw objects around to disrupt whatever the residents of a world are trying to do.

Harassers attack individuals. Sometimes, the harassment is indiscriminate, as the harasser will abuse anyone near them in whatever world they join. This can be through cursing, shouting and mocking people both within conversation and without. Other times, their harassment is targeted, intentionally harming specific people or groups of people. Such harassers join worlds of communities they do not belong to or wait in social worlds to seek out vulnerable people, especially newcomers.

In targeted harassment, many of the dynamics are similar with non-VR platforms, but amplified. Gender still plays a critical role in who is targeted for harassment, remaining unchanged from earlier issues in virtual worlds (Bruckman, 1996). While Horizon Worlds does not have explicit genders in the avatar design, female-presenting or feminine avatars are targeted more often, especially when it comes to sexual harassment in both verbal and physical forms. Both verbal and physical harassment are more personal than non-VR interactions, but physical harassment can be particularly hurtful as it invades the personal space of the user.

Overall, many of our interviewees were more concerned with trolls than harassers, but both problems still remain prevalent due to a continuous influx of users and a lack of consequences for bad behavior. Different moderation tools have been put in place by both the developers and community creators but enforcement is irregular and there is a notable lack of moderation functionality at a communal multi-world scale between the entire platform and specific worlds.

Individual Protection. When a user enters Horizon Worlds for the first time, tools for protecting oneself from online bad actors are demoed in the tutorial. These include the ability to

mute and block users, which are standard tools across many social platforms that enable a user to curate their experience. Horizon also allows users to report bad actors. Horizon states that when a report is sent, the last few minutes of audio and interactions are sent to trained safety specialists for review (*What happens when I report someone in Horizon Worlds?,* n.d.). In order to track this information, Horizon states that it tracks a recording which captures a rolling log of the last few minutes of the experience, and this is communicated to players in the introduction as well. Furthermore, trained safety specialists also have the ability to remotely view the world that the incident occurred on as an observer, with the ability to take further actions including removing the user or banning them. Email confirmations are sent to the user to inform them about the status of their report. They state that this content is deleted once the reports are done being viewed by their specialists.

Apart from the standard toolkit for users to deal with bad actors, we observe two unique approaches towards individual protection implemented in Horizon through features known as Safe Zone and Personal Boundary.

The Safe Zone is a personal bubble that temporarily teleports you outside of your current world. It is accessed by opening the wrist interface on your left hand and clicking the shield icon on the top-right. Within the safe zone, users have the ability to mute, block, and report players from a discreet position. The zone itself is a black box and does not affect the activity of the instance that was left. This is a feature that is taught to users in the tutorial. The design of the system is such that users can easily retreat to it if they ever feel overwhelmed in their current social situation as well. Overall, this feature serves as an accessible point of retreat for any user who feels unwelcome or uncomfortable with their current experience, and provides them a dashboard of individual protection actions that can safeguard them from harm.

The Personal Boundary is a relatively new feature, introduced in early February 2022, that forms an invisible barrier of a four-foot diameter around avatars that other users cannot intrude upon. Attempting to walk through someone will cause forward motion to stop - this feature is meant to stop users from getting too close to you. This feature was created in response to issues of groping and sexual harassment reported by some users. At the time of announcement, a Meta spokesperson stated that this feature would be permanently active and was meant to establish norms for VR interactions (Robert, 2022).

One of our interviewees speculates that Meta's elevated status as a large company increases the level of scrutiny that they are placed under. We chose to anonymize these statements from this interviewee due to the sensitive nature of this topic. "You can't do what some of these other platforms are doing. They can't make the risky choices. They have to, like put up a four foot bubble around us because some one person got assaulted and is now making a big stink on news platforms." The addition of personal boundaries presented tradeoffs in the ability for players to interact with each other up close, but unexpected consequences arise in that "it's now a game because you bounce off of people".

In a recent March update, Horizon Worlds has responded to community feedback by making personal boundaries toggleable. By default, the boundary is still "On for everyone", but two more options are now permitted in "On for non-friends" and "Off".

World Moderation. Hosts and creators in a world have moderating privileges within their own places. The ability to mute and remove users are the primary tools that hosts can use to address bad actors. In addition, world visitors can utilize a Poll to Remove feature in order to collectively remove bad actors.

Horizon Worlds' world moderation tools were not always available, and even when they are available they do not always work. Laex describes being "in a smaller session where half the session was just kids and it was supposed to be an education session I was teaching [...] these kids were using the bubble to push me around [...] And so I was like, OK, let's go and poll to remove them. But because they were there together they were able to stop the poll to remove and basically ruined the session."

In lieu of official mute and remove functionality, Laex05 and OcuLos describe writing scripts to deal with the problem themselves. Laex states that "we made a stick that you can now click with your index trigger and [the trolls are] gone. And I was like, Yep, that's better." OcuLos410 adds that "if you're going to torture us with your toxicity and being disruptive now, now you're going to sit in a box while music is screaming at you. And at one point we had it inside of a waterfall with like 20 waterfall sound blocks that were all off key." Although Horizon Worlds' official moderation tools do not always work well, creators adapt and use their own mechanisms to enforce their communities.

Having appropriate moderation tools is especially crucial for events around more sensitive subject matters. One of the researchers attended an LGBTQ+ meetup event on a day when the event host was on break. A volunteer host took up the responsibilities for that week, but did not have host permissions. We observed many trolls pop in - one heckler asked the volunteer host for her pronouns and proceeded to thrust their pelvis towards her. Another kept asking for her Snapchat and Instagram account unsolicited. Attendees attempted to utilize the Poll to Remove feature to remove the bad actors, but the moderation tool would not work for any of us. The group was completely invaded by trolls provoking others and seeking a reaction. Eventually, event attendees agreed to each individually block the offending accounts, making it

so that their avatars no longer appeared in the world. In theory, a democratic Poll to Remove feature should empower visitors with the ability to act upon bad behavior. In practice, we observed that the feature was still buggy, and when it did work, could be abused by the party in the majority.

Horizon Worlds' Creator Community

The concept of a community of practice was coined by Lave and Wenger (1991) as a group that engages in a shared interest and gains an increasing level of competency through regular interaction with community members. We argue that Horizon Worlds' creator community can be understood through the perspective of a community of practice. World building is the primary activity, and creation is learned through doing and through observing the work of others.

Worldbuilding as a Collaborative Endeavor. "There's worlds that some of us have built on our own, and they're OK or they're good. But these worlds that we've collaborated on are just phenomenal, and it shows by the traction that it gets, the likes, the unique visitors and the fact that it stays in the "Looking for Players" where people are in it at all times." Laex05 is an evangelist about the role of collaboration in the creation process. In our interview with him, Laex continually stresses that collaboration is the crucial aspect of building that turns ideas into a success. "A lot of the worlds that we built are only possible because of collaboration," he adds. When you expand the description of any world in Horizon, you're able to see the usernames of the users who have contributed to the creation of the world.

In many of the top worlds on Horizon, multiple collaborators occupy this list. Many of these world editors are users that the researcher studying Horizon World Tours observed when attending the creator meetups hosted by Laex05 and OcuLos410. The Horizon World Tours event hosts an insider's pre-show where creators all convene to share what they've created this

week and to recruit collaborators for their projects. Many new and familiar faces are equally welcomed, and the environment is very much a supportive one. Some of the worlds featured in the World Tours hub are from creators who regularly interact with the Horizon World Tours creator community.

However, collaboration is not reserved for the world editors. The success of one of the most popular minigame worlds, Murder Village, was a direct product of user input and collaboration. As Laex states, “When we built Murder Village, every day we publish a new release, we test it with 13 people. They'd give us their feedback. We then implement it the next day. And so for two months, we did that. And now it is what it is today because of hundreds of people coming in and giving us their feedback.” World testers and typical visitors provide invaluable feedback that informs the iterative development of any given world.

Legitimate Peripheral Participation. Becoming a creator in Horizon Worlds is a process of moving from the periphery to the core. Lave and Wenger describe legitimate peripheral participation (LPP) as the process within which members begin their participation process, working toward more meaningful contributions through a constructionist learning process (1991). The Intro to Creation event world offers a great example of a community event in which newer creators at the periphery learn to build and script through the observation of mentors in a transparent, structured environment.

Visibility of mature practice is a crucial criteria that helps communities of practice succeed. Within collaborations between more experienced and less experienced creators, this is evident through the contributions of the senior mentors. For the Intro to Creation event world, the environments are specifically designed by senior creators for the express purpose of teaching newer creators how to effectively build and script in Horizon Worlds. Other events, including the

Scripting and Advanced Scripting Office Hours with the Horizon Team, allow users to learn directly from the developers of Horizon Worlds. In general, anyone is able to visit the published worlds that are created by senior builders in the community. Even without direct social interaction with these senior members, visibility of mature practice can be observed by just entering and exploring the environments made by senior members. Unlike traditional methods of producing 3D models and game assets, visibility of mature building practice simply requires an invitation to a world. In this sense, Horizon Worlds closed ecosystem of digital objects and assets encourages legitimate peripheral participation.

Monetary Incentives. Providing monetary incentives in a constructionist community adds an external motivator toward participation in the creation of worlds. We will note that this aspect of the creator community is still under-researched from our field work, and we will only be presenting the findings that we have gathered in our limited time span. These observations should help inform how monetary incentives can play a role in creator participation, but should not be taken as generalizations toward the creator community at large. Horizon Worlds directly plays a role in providing incentives for creative community participation through its $10,000,000 Creator Fund, which we have discussed in the Contests subcategory of Amy Jo Kim's community design principle of cyclic events. The remainder of this section will explore our findings about monetary incentives external to the official events hosted by Horizon Worlds.

Commission Economies. At the moment, there is currently no medium for transactions built into the Horizon Worlds application. However, we have observed a budding commission economy growing from experienced creators who want to offer their talents as a service.

On the platform, we found that these agreements can be informally arranged as part of the collaboration process. Creator Seqeq met a DJ through the Horizon World Tours event who was

looking for asset creators for an upcoming event. Seqeq volunteered his time and energy to create a model of the Pioneer XDJ-XZ DJ machine for the DJ, expecting it to be a gift. However, he recalls that the DJ later sent him a private message asking for his CashApp, implying that the DJ wished to repay him for his efforts. (Below, we have attached an image of what Seqeq's DJ machine model looks like.)



Off-platform, we observe that some creators use the freelancing site Fiverr to advertise their services. Prices vary tremendously, which could be an indicator of the novelty of such a market. The cheapest services that we could find began at $25 for smaller builds, with prices quickly skyrocketing toward several hundred dollars. "Premium" services offered by world builders can reach upwards of $1,500. At the moment, most of these services have between 1 and 6 reviews, with 2 being the median. This suggests that the market for such services is still somewhat niche, although this may change over time.

Creator Papaosman01 is also heavily involved in the commission economy. Papaosman01 has done small commissions on the order of hundreds of dollars and commissioned others to build objects, scripts, and music into his worlds. While he didn't report all of the commissions he has been involved with, he did describe in detail his most recent and high profile commission. This commission began as Papaosman01 was approached by the band

manager of Chevelle to construct a world in Horizon Worlds based on the album cover of Niratias (below).



The manager immediately sent Papaosman01 $50 as an incentive to meet again sometime in the near future and promised $2,000 for the finished world. Papaosman01 is excited about this collaboration and speculates that if it is successful he may also be able to make a world for popular rapper Travis Scott, who has some relation to the manager.

Conclusion

Based on interviews and field work, we provide an analysis of the design of Horizon Worlds - a burgeoning online community situated in virtual reality. Our discussion begins by identifying seven of Amy Jo Kim's nine "timeless" principles that heavily influence Horizon Worlds: Purpose, Gathering Places, Profiles, Codes of Conduct, Cyclic Events, Range of Roles, and Subgroups. Building off this design-centric characterization of the platform, we established research questions focused on Horizon Worlds as a "third place", moderation and harassment,

and Horizon Worlds' creator community. We find that although Horizon Worlds as a platform is not a third place, many worlds are. While Horizon Worlds' unique platform-wide protections and moderation tools sometimes fall short, the community has created world-specific fallbacks (scripts, objects, etc.) for handling trolls and harassment. Horizon Worlds has a growing creator community that operates as a community of practice with low barriers to entry and limited internal support for transactions.

Combined, these features create a picture of Horizon Worlds as a hub for a new group of social VR designers who distinctly differ from those in other VR applications due to the content creation tools being contained within the application. Community members have created spaces that appeal to their own interests, and found creative new methods for solving a wide range of problems from spatial design to community moderation. Their activities have been supported by a growing commission economy and incentives by Meta. As VR continues to grow, the promotion of communities of practice like the Horizon Creator Community will be vital in allowing VR users to develop their own spaces.

References

Acena, D., & Freeman, G. (2021). “In My Safe Space”: Social Support for LGBTQ Users in Social Virtual Reality. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems* (pp. 1–6). Association for Computing Machinery. https://doi.org/10.1145/3411763.3451673

Bardzell, S., & Odom, W. (2008). The Experience of Embodied Space in Virtual Worlds: An Ethnography of a Second Life Community. *Space and Culture*, *11*(3), 239–259. https://doi.org/10.1177/1206331208319148

Bartle, R. (1996). Hearts, clubs, diamonds, spades: Players who suit MUDs. *Journal of MUD Research*, *1*(1), 19.

Blackwell, L., Ellison, N., Elliott-Deflo, N., & Schwartz, R. (2019). Harassment in Social Virtual Reality: Challenges for Platform Governance. *Proceedings of the ACM on Human-Computer Interaction*, *3*(CSCW), 100:1-100:25. https://doi.org/10.1145/3359202

Bruckman, A. (1996). Finding one's own space in cyberspace.

Bruckman, A. (1996). Gender swapping on the Internet. *High Noon on the Electronic Frontier: Conceptual Issues in Cyberspace*, 317–326.

Curtis, P. (1997). Mudding: Social phenomena in text-based virtual realities. *Culture of the Internet*, *121*, 142.

Duffield, W. (2021, December 28). *A grope in Meta's space*. Techdirt. Retrieved April 3, 2022, from https://www.techdirt.com/2021/12/28/grope-metas-space/

Freeman, G., & Maloney, D. (2021). Body, Avatar, and Me: The Presentation and Perception of Self in Social Virtual Reality. *Proceedings of the ACM on Human-Computer Interaction*, *4*(CSCW3), 239:1-239:27. https://doi.org/10.1145/3432938

Gunkel, S., Stokking, H., Prins, M., Niamut, O., Siahaan, E., & Cesar, P. (2018). Experiencing Virtual Reality Together: Social VR Use Case Study. *Proceedings of the 2018 ACM International Conference on Interactive Experiences for TV and Online Video*, 233–238. https://doi.org/10.1145/3210825.3213566

Heath, A. (2022, February 17). *Meta's social VR Platform Horizon Hits 300,000 users*. The Verge. Retrieved March 27, 2022, from https://www.theverge.com/2022/2/17/22939297/meta-social-vr-platform-horizon-300000-users

Jonas, M., Said, S., Yu, D., Aiello, C., Furlo, N., & Zytko, D. (2019). Towards a Taxonomy of Social VR Application Design. *Extended Abstracts of the Annual Symposium on Computer-Human Interaction in Play Companion Extended Abstracts*, 437–444. https://doi.org/10.1145/3341215.3356271

Kim, A. J. (2006). Community building on the web: Secret strategies for successful online communities. Peachpit press.

Latoschik, M. E., Roth, D., Gall, D., Achenbach, J., Waltemate, T., & Botsch, M. (2017). The effect of avatar realism in immersive social virtual realities. *Proceedings of the 23rd ACM Symposium on Virtual Reality Software and Technology*, 1–10. https://doi.org/10.1145/3139131.3139156

Lave, J., Wenger, E. C. (1991). Situated Learning: Legitimate Peripheral Participation. Spain: Cambridge University Press.

Lugris, M. (2021, January 12). *Rec room now has over 1 million monthly VR users*. TheGamer. Retrieved April 3, 2022, from https://www.thegamer.com/rec-room-now-has-over-1-million-monthly-vr-users/

Maloney, D., Freeman, G., & Robb, A. (2021). Stay Connected in An Immersive World: Why Teenagers Engage in Social Virtual Reality. *Interaction Design and Children*, 69–79. https://doi.org/10.1145/3459990.3460703

McVeigh-Schultz, J., Márquez Segura, E., Merrill, N., & Isbister, K. (2018). What's It Mean to "Be Social" in VR? Mapping the Social VR Design Ecology. *Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems*, 289–294. https://doi.org/10.1145/3197391.3205451

Moustafa, F., & Steed, A. (2018). A longitudinal study of small group interaction in social virtual reality. *Proceedings of the 24th ACM Symposium on Virtual Reality Software and Technology*, 1–10. https://doi.org/10.1145/3281505.3281527

Oculus Blog. (2019, September 25). *Introducing 'facebook horizon,' a new social VR World, coming to oculus quest and the rift platform in 2020*. Oculus. Retrieved March 29, 2022, from https://www.oculus.com/blog/introducing-facebook-horizon-a-new-social-vr-world-coming-to-oculus-quest-and-the-rift-platform-in-2020/

Oculus Blog. (2021, October 7). *Expanding horizon: New funding to support creators*. Oculus. Retrieved April 3, 2022, from https://www.oculus.com/blog/expanding-horizon-new-funding-to-support-creators/

Robertson, A. (2022, February 4). *Meta is adding a 'personal boundary' to VR avatars to stop harassment*. The Verge. Retrieved April 3, 2022, from https://www.theverge.com/2022/2/4/22917722/meta-horizon-worlds-venues-metaverse-harassment-groping-personal-boundary-feature

Rosch, E. H. (1973). Natural categories. Cognitive psychology, 4(3), 328-350.

Updated support for Horizon Worlds on Quest 1. Updated support for Horizon Worlds on quest 1. (n.d.). Retrieved April 3, 2022, from https://support.oculus.com/articles/horizon/explore-horizon-worlds/horizon-worlds-quest-support

VRChat. Steam Charts. (n.d.). Retrieved April 3, 2022, from https://steamcharts.com/app/438100#48h

What happens when I report someone in Horizon Worlds? (n.d.). Retrieved April 3, 2022, from https://support.oculus.com/articles/horizon/explore-horizon-worlds/reporting-someone-in-horizon