Exploring First-Person Perspectives in Designing a Role-Playing VR Simulation for Bullying Prevention: A Focus Group Study

Oyewole Oyekoya[1]*, Jan Urbanski[2], Yaroslava Shynkar[1], Arifa Baksh[1] and Margaret Etsaghara[3]

[1]Visualization and Virtual Reality Lab, Department of Computer Science, Hunter College, City University of New York, New York City, NY, United States, [2]Safe and Humane Schools, Institute on Family and Neighborhood Life, Clemson University, Clemson, SC, United States, [3]Independent Researcher, New York, NY, United States

Bullying is a complex and abusive form of violence that has potentially serious social and mental health consequences for children and adolescents. With reference to the Olweus Bullying Circle, this project involves the development of a simulation that will allow students to view themselves in different roles played in bullying situations using a virtual reality setting. Interventions need to explore the perspective of the student who bullies and the student being bullied, as well as the bystander in order to model desirable intervention behavior. The expectation is that through role-playing, the students will explore different perspectives and learn how to respond to bullying situations. Two focus groups were conducted to allow experts to contribute to the design of the bullying prevention simulation and gather suggestions for improvements. Findings from the focus group studies suggest that to create effective bullying prevention, Virtual Reality simulations should consider focusing on role-playing, customization of the characters, environments, scenarios and a scoring/reward system.

Keywords: bullying, virtual reality, perspectives, focus group, simulation design

1 INTRODUCTION

Bullying is a complex and abusive form of violence that has potentially serious social and mental health consequences for those involved, whether as the student who bullies, the student who was bullied, or the bystanders who see or know it is happening. Bullying can take many forms, including each of the three commonly identified subtypes of aggression: physical aggression (e.g., hitting, shoving), verbal aggression (e.g., insults, threats), and relational aggression (e.g., gossip, ostracism) (Wang et al., 2009). Vanhoutte and Lang (2020) also mention that the participants in their study held various perceptions on the definition of bullying which illustrates its complexity. It can be an obstacle to learning and contributes to a negative school climate. Despite increased attention over the last decades, national surveys indicate that the percentage of students who report being bullied at school remains near 20% (Luxenberg et al., 2019; Underwood et al., 2020; Wang et al., 2020) with even higher percentages for certain subgroups of youth who may be particularly vulnerable to being bullied.

Olweus (1993) defined bullying as when someone repeatedly and intentionally conducts behaviour that is hurtful to another person who finds it difficult to defend him/herself. Students

play different roles in bullying situations. Some perpetuate the aggressive behavior (students who bully) while others are targets of abuse (students who are bullied). The majority are bystanders who witness the bullying or know it is happening. These onlookers can stand by and do nothing, encourage the bullying behavior, or intervene by helping the victim.

Olweus explained the attitudes and possible actions of the various roles in a conceptual model called the Bullying Circle (**Figure 1**). As the continuum shows, students who bully are supported by followers, supporters, and passive supporters while disengaged onlookers, possible defenders, and defenders play a bystander role. The followers stand back and wait for an opportunity to take an active part in the bullying activity; never instigating, always following another's lead. The supporter or passive bully stands by to watch but shows no direct support of the bullying behavior. The disengaged onlooker ignores the behavior while the possible defender wants to help but does not because of fear of the bully. Finally, the defender of the victim stands up for the person who is being bullied and attempts to stop the behavior.

Although bystanders comprise the largest percentage of students in a school, they do not always intervene on behalf of the victim. A study of bystander behavior found that in 80% of in-person or online peer harassment incidents, at least one bystander was present. Although bystanders usually responded to the harassment in supportive ways, including trying to make the harassed peer feel better (70%), saying they were sorry it happened (55%), telling the harasser to stop (53%), and telling an adult about what happened (43%), when they did respond by joining in the harassment (24%) or laughing (23%), it was more likely that the harassed youth would be negatively affected by the incident (Jones et al., 2015).
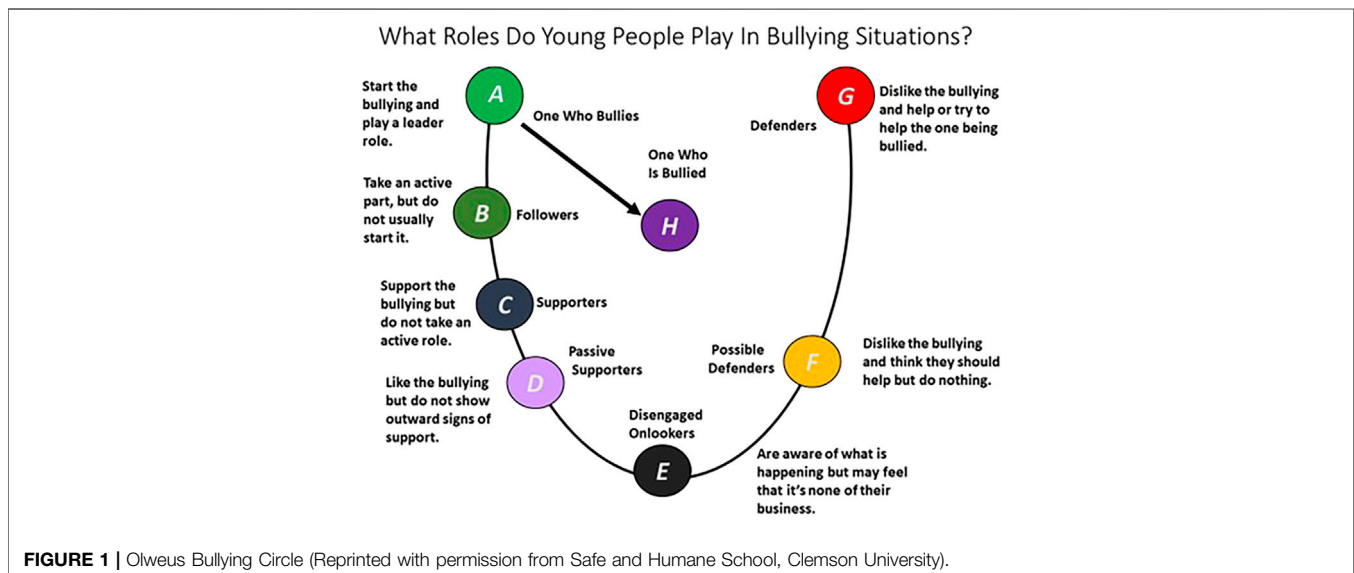
While research shows that most students do not like the bullying, feel sorry for students who are bullied, and want to intervene (Padgett and Notar, 2013; Luxenberg et al., 2019), those feelings do not always translate into action. In a 2019 report on

bullying in US schools Luxenberg et al. (2019), most students in the sample reported feeling sorry for students who are bullied. The same study found that despite high levels of empathy, many students do not help bullied students, and this number decreases in higher grades. The disparity between empathy and action indicates that students need the right tools to help them respond to bullying.

Students do not intervene for a variety of reasons. They may not know how to respond or fear they will do or say the wrong thing and make the situation worse. They may be afraid of retaliation or fear becoming the next target. A diffusion of responsibility may also come into play. If a group of people are witnessing the bullying and no one responds, bystanders feel less responsible to intervene. They may also have a lack of confidence in how their teachers or other school authorities handle incidents of bullying.

How bystanders interpret and make meaning of the bullying situation will guide their actions as to whether they intervene, stand by, or join in the bullying (Forsberg et al., 2014). Intervening in bullying situations is more likely when bystanders are aware of the distress the situation causes for the victim (Pronk et al., 2016). The researchers found that knowledge of the victims' distress predicted defender behavior. They also found that being aware of victim distress, and the costs of not intervening predicted intervention behavior.

Although current methods of teaching bullying prevention have been shown to be helpful in bystander intervention (Polanin et al., 2012), there are still ways to improve these methods and make their teaching more fun and accessible. Furthermore, it has been suggested that video games have great potential for teaching and as research tools (Griffiths, 2002). A recent meta-analysis of school-based bullying prevention programs demonstrated practical and statistically significant reductions in bullying using a bystander component (Polanin et al., 2012; De La Rue et al., 2017), supporting implementation of this approach as a strategy to reduce bullying in schools. Despite the effectiveness of

FIGURE 1 | Olweus Bullying Circle (Reprinted with permission from Safe and Humane School, Clemson University).

this approach, bystander intervention by peers is relatively infrequent with 25% or fewer of student participants in surveys reporting having intervened in bullying episodes (O'Connell et al., 1999). Furthermore, in a recent study (Henson et al., 2020), when students were faced with a situation in which they had an opportunity to intervene in some capacity to potentially prevent online victimization, approximately 29–58% attempted to intervene in some capacity, indicating bystander intervention programs are not sufficient in dealing with bullying. Borgwald and Theixos (2013) advocate a broader integrative approach to bullying programs that includes both victims of bullying and students who bully. They argue that the zero tolerance approaches are ineffective and that approaches grounded in empathy training should be adopted. Given the influence of motivation and modeling on bystander behavior, a behavioral modeling intervention that aims to teach desirable behavioral skills through observational learning may be ideal. Interventions need to explore the perspective of the student who bullies and the student being bullied, as well as the bystander in order to model desirable intervention behavior. The ability to change perspectives in Virtual Reality (VR) or Augmented Reality (AR) enables learners to experience bullying situations (and its implications) from different perspectives. However, the pros and cons of designing a bullying prevention simulation with multiple perspectives in VR/AR has not been previously investigated. This study poses these questions to bullying prevention experts.

1.1 Rationale

Bullying has been recognized as a critical problem in schools today, with long-term consequences for perpetrators, victims, and even bystanders (Rivers et al., 2009; Juvonen and Graham, 2014). Bullying prevention programs are now ubiquitous in schools because they have been shown to reduce bullying. One of such programs is the Olweus Bullying Prevention Program (OBPP), an internationally known program focused on systemic change to create a safe and positive school climate. The goals of the OBPP are to reduce existing bullying problems among students, prevent new bullying problems, and achieve better peer relations. These goals are pursued by restructuring the school environment to reduce opportunities and rewards for bullying, encouraging pro-social behaviors, and building a sense of community.

The OBPP is backed by over 35 years of research. It was first introduced by Dan Olweus, Ph.D. in 1983 as part of a nationwide campaign against bullying problems in Norway. The first implementation in the United States occurred in the mid-1990s and it has now been implemented in more than 7,000 schools across the country and more than a dozen countries around the world. The program has been noted as the most extensively studied bullying prevention program (Rivara and Menestrel, 2016) and the most effective intervention in relation to reducing bullying perpetration (Gaffney et al., 2019). OBPP research documents clear reductions in student reports of being bullied and bullying others. Positive program effects were also found for students' attitudes about bullying and their reports of others' actions to address bullying. However, there

is still room for improvement in the methods that schools employ to teach the students about what they can do in a bullying situation. Therefore, the ultimate objective of this project is to design an immersive and interactive tool to engage elementary and junior high school students in approaches that facilitate the prevention of bullying and help those who are victims of bullying. In order to achieve this ultimate objective, we need to consider expert opinions in the design and development of the simulation. As such, we conducted two focus group interviews of certified bullying prevention trainers. The findings in this research have implications for research and development of bullying prevention simulations.

1.2 Research Objectives

The main objective of this project is to investigate the efficacy of developing an immersive VR simulation experience that allows individuals to assume eight different roles in order to increase the probability of intervention in real-life scenarios. It is hypothesized that a first-person perspective of the roles will allow a virtual experience that elicits a high degree of self-identification as an active agent in the bullying scenarios. These experience dimensions, which are unique to a customized virtual-reality experience, may make the participants more aware of bullying situations and increase likelihood of intervention. Programs to increase awareness and intervention could be applied to situations beyond bullying, from harassment to sexual assault. These types of virtual education tools could be brought to schools or offices where they would allow participants to practice intervention strategies by virtually experiencing themselves as active participants in bullying situations.

To achieve the objectives of this research, we did the following:

- Developed a simulation of a bullying scenario that allows learners to switch between eight role-playing perspectives as depicted by the Olweus Bullying Circle.
- Conducted two focus group studies of bullying prevention experts to allow them to comment on the efficacy of the simulation as an educational tool in K-12 educational communities.

The following section reviews existing literature, followed by the methodology. Finally, the results are analysed and discussed extensively.

2 RELATED WORK

Research consistently shows that bullying can have adverse consequences for all those involved including health issues, impacts on mental health, and decreased academic success. Emotional and behavioral problems experienced by students who bully and students who are bullied can continue into adulthood and produce long-term negative outcomes (Olweus, 1994; Nansel et al., 2001). Children who are bullied experience more health problems and somatic disturbances. They have lower self-esteem and higher rates of depression, loneliness, anxiety, and suicidal ideation (Olweus, 1993). They can also experience

withdrawal, aggression, and feelings of rejection (Siris and Osterman, 2004).

Children who bully others are at a higher risk for substance abuse, antisocial personality disorders, and externalizing problems such as violence and delinquency leading to a higher likelihood of developing a criminal record (Olweus, 1993). Bystanders who observe bullying behavior without intervention may develop a decreased sense of individual responsibility (Olweus, 1993) or experience fear of retaliation if they get involved (U.S. Department of Education, 1998). Although not directly involved in the bullying, these students may have a heightened sense of anger, helplessness, and guilt for not taking action. Self-respect and self-confidence can be eroded when a child witnesses bullying behaviors and is unable or unwilling to respond effectively.

Bullying has negative effects on a students' academic achievements and affects learning and performance. Emotional and behavioral problems experienced by victims and students who bully may continue into adulthood and produce long-term negative outcomes (Olweus, 1994; Nansel et al., 2001). Peer exclusion leads to a decrease in classroom participation (e.g., follows teacher directions; seeks challenges; accepts responsibility for a task), which in turn leads to a decrease in achievement (Buhs et al., 2006). A variety of techniques have been used to reduce bullying, including bystander intervention (Polanin et al., 2012). However, research has shown that few individuals intervene (O'Connell et al., 1999), which could be due to who holds the authority or feels powerful in such situations as denoted in Vanhoutte and Lang (2020). Brain research tells us that learning takes place in an emotional and behavioral context with memory being linked to social and emotional situations (Elias et al., 1997). A student's sense of security and self-worth in a classroom provides the scaffolding that supports increased learning, motivation, self-discipline, realistic risk-taking, and the ability to deal effectively with mistakes (Brooks, 1999). Without a feeling of physical and emotional safety and security, students will find it difficult to move beyond fear and anxiety to explore new challenges willingly (Ekstrom et al., 1986).

Bullying is traditionally viewed as something that happens in person on a school campus. It can be direct in the form of verbal or physical bullying; it can also be indirect behavior such as spreading rumors or excluding someone from a group. Verbal bullying and rumor spreading are the most common types of bullying experienced by students (Luxenberg et al., 2019; Underwood et al., 2020; Wang et al., 2020). However, in the 21st century, the potential exists for students to be exposed to bullying at any hour and anywhere they go. While bullying used to be done within a school community, it now has the potential to reach a large audience in a short amount of time. Although cyberbullying ranks as the least common reported form of bullying (Luxenberg et al., 2019), it is unique due to the lack of auditory or visual feedback that indicates harm to another person. Since the student who is bullying does not experience the reaction of the victim, the opportunity for an empathic response for the victim is lessened allowing the person who is bullying to disassociate from the victim and the behavior. Reduced empathy can also result in bystanders joining in or siding with the student who is bullying, rather than intervening to help or support the student being bullied. As human lifestyle becomes more dependent upon the use of technology this may require intervention programs that can enable students to experience bullying situations and the impact that it can have on everyone that experiences it.

2.1 Virtual Reality Experiences and Serious Games

Serious Games (SG) are interactive games designed to go beyond the entertainment aspect of regular video games. Calvo-Morata et al. (2020) conducted a review of serious games focused on the use of video games as tools for the prevention and detection of bullying and cyberbullying. Other purposes include therapy and education, both of which attempt to change behaviors. According to Raminhos et al. (2015), the design should focus on: reinforcement, reduction, self-monitoring, suggestion, surveillance, tailoring and tunneling. In reinforcement, you give positive feedback when someone exhibits the desired behavior. Reduction focuses on removing unnecessary steps to simplify tasks. Self-monitoring "allows the user to monitor his/her behavior." Suggestion involves stepping in at the right time to offer guidance on an action. Surveillance requires others to monitor the behavior of the user of the SG. Tailoring means using information relevant to the user to intervene in their actions. Finally, tunneling is sequencing tasks to achieve, more easily, the great ultimate goal (Raminhos et al., 2015). Effective SGs have measurable goals, time constraints, rewards, and feedback on decisions. They also become more engaging with mini-games (Kolić-Vehovec et al., 2019).

The research done by Hu et al. (2016) on the design and implementation of the 3D educational games in VR demonstrates the sample of the educational game and shows the effects of autonomous learning. The authors highlight that the key in the educational game is the learning model. The most important factor to consider is the balance in making the game both educational and recreational. The level of immersion should not be the only component that the VR game is based on. The educational game implementation is supported by the hardware (VR headsets), software (Unity) and the educational game design (the tasks of the game which are to be learned by students) and defines the three processes: 3D scene presentation, intelligent interaction, experiential learning.

One challenge of designing virtual reality simulations is achieving presence, which is sometimes described as using one's entire body to interact in the game (Carter and Potter, 2016). The researchers focused on reported presence, accounts of virtual reality programs and hardware. Some virtual reality devices that establish presence are the Oculus Rift and HTC Vive headsets. These headsets strap displays to the user's head. Another method of establishing presence is the computer assisted virtual environment system (CAVE). In this system, the user "can stand in a room and interact with projections on the walls" (Carter and Potter, 2016). This allows the user to mimic being in a different environment using full body movements. The authors

cite three points that are crucial to the achievement of presence in virtual reality development. The first and second involve a continual sensory motor loop, meaning no disruptions in the virtual reality environment to make it seem unrealistic. This can be accomplished through the type of hardware used. The third depends on prolonging that sense of presence once it is established.

Multiple theories support the benefits of role playing in a representation with the technologically immersive capabilities of a VR simulation. Role-play is often included as a resource in bullying prevention efforts and can be an effective way to create awareness and generate discussion. OBPP research has shown that teachers who used role-playing in their bullying prevention work obtained larger reduction in bullying problems 1 year after introduction of the program compared to those who used role-playing to a lesser degree or not at all (Olweus and Limber, 2007).

Despite its effectiveness, teachers often omit role-play activities, possibly due to the high demand on teacher preparation time (Donohoe, 2019). Yet, students need the right tools and experiences to help them respond to bullying. The proposed simulation is a tool that will allow students to experience and learn about bystander behavior while practicing different responses to a bullying situation. Utilizing VR allows for a more real-life experience than role playing. It is also a private experience that eliminates any concern about how a response will be perceived by peers.

Using role-play helps students develop a better emotional understanding of bullying situations by providing insight into different types of bullying and the perspective of those involved. It has potential for developing empathy and an increased understanding of bullying situations (Donohoe, 2019). It also provides valuable opportunities to practice and evaluate solutions to bullying situations. Increasing empathy, having the ability to view things from another person's perspective, and knowing what to do in a bullying situation are key to bullying prevention and intervention.

Visualizing oneself or another requires cognitive empathy, which has been shown to be a predictor of bystander behavior among adolescents (Gini et al., 2008). For example, virtual-reality technology has been found to generate stronger reports of empathy with stigmatized groups than traditional paper-and-pencil visualization and writing tasks used to encourage empathetic responses (Kalyanaraman et al., 2010). In other words, the vivid sensory experiences and perspective taking provided by VR can influence responses related to affect and empathy without the greater cognitive effort and dispositional empathic tendencies required for empathetic responses in less technologically vivid perspective-taking exercises such as thought-listing or group role-playing exercises. Role-playing games have been shown to be a useful tool for therapists and teachers to reduce bullying (Bagès et al., 2020).

A study by McEvoy et al. (2016) suggests that bullying simulations in VR may potentially be a viable method for provoking empathy in students, if there is enough scenario customization and interactivity. Subjects may be able to identify bullying behaviors and overcome the insecurities of the unknown by running through a bullying scenario, and they will be able to identify bullying behaviors thereby. The ability to role-play makes VR an innovative tool to overcome the fear, lack of confidence, lack of motivation, and insecurity that prevent intervention or inaction by victims and bystanders. Furthermore, the ability to act in the role of a student who role-plays as a bully while seeing the outcome of the bullying may be an invaluable educational tool.

Multiple existing SG were explored as part of the research. A case study by Tham et al. (2018) provides guidelines on how to use VR in pedagogy. The authors shared their deployment of three low-end to high-end VR devices: Google Cardboard, Google Daydream View, and HTC Vive. Google Cardboard, a low-cost, low-fidelity, fold-out cardboard viewer, lets users turn their smartphones into VR headsets. The current version is compatible with both iOS and Android and features the ability to view the display by looking into lenses and rotating the head into any direction to see a 360-degree video. The gyroscope sensors used in the smartphone detect orientation and enable the ability to move within both real and virtual realities. There is also a button that allows participants to select items by pointing the reticle and clicking at the same time. The authors conducted studies to check the efficiency of the three VR devices. As for Google Cardboard, the results stated that VR immersion improved the understanding of the material better than text sources, and participation in the scenes gave students the ability to have an initial vision of future situations. This way, even by using the low-cost VR system, they would be able to educate the children better than traditional text materials in how to handle bullying and prevent it.

Work by Sapouna et al. (2010) involved a virtual bullying scenario game that collected the responses that the students gave the victim in efforts to help the victim cope with the bullying. The type of bullying was different for the male and female victims; bullying for the male was more physical whereas bullying for the female was more emotional. The study included students who interacted with the software for 30 min per week for 3 weeks (the intervention group) and other students who did not use the software (the control group). The victims in the game had an artificial intelligence that reflected their self-efficacy beliefs throughout the program based on the coping strategies that the students suggested. The results showed that the use of the program significantly increased the likelihood of baseline victims (those students who were bullied or were prone to being bullied) to escape victimization and showed no negative effects for virtual bullying prevention efforts.

The educational game, "VR Address Cyberbullying" has the first person point of view and a limited character controller that enables only a few steps at certain scenes. The game portrays bullying of a young girl at school by two other girls and shifts into showing the online bullying at home. It includes a panel of adults at the end explaining what teachers, police officers and parents can do to help to prevent bullying. The audio conveys fear, crying, and teasing. At the same time, there is no way to escape the scenario, nor to work on a way to handle bullying.

In the SG "StopBully," players could assess their emotional state after each level. The assessment scale, based on the Self-Assessment Manikin (SAM), ranged from displeased to pleased

on the opposing end of the spectrum (Raminhos et al., 2015). A level of "StopBully" can be only passed when the player makes the right decision. An important aspect of "StopBully" is that the creators chose not to include a bully profile, meaning students were unable to play from the perspective of a student who bullies. The creators of "StopBully" also developed a score system based on the number of friends, amount of courage, and number of invitations the players had. The decision the player makes in the bullying scenario negatively or positively affects the current and final scores. The game is designed for children from 10 to 12 years old. To measure the participants' involvement in bullying, the authors used the Olweus Bullying Questionnaire and concluded that the solution had potential as a tool in bullying prevention.

Another project that uses virtual bullying situations is PBS's "AIM Buddy Project" (Bowers et al., 2016). In this project, the students are asked to identify what kind of bullying, if any, they saw in one of the animated stories shown to them. It also encourages students to buddy up and engage in discussions about pro-social topics including empathy, honesty, forgiveness, generosity, and learning from others. Initial research showed that the program was well received by teachers and students and also showed an increase in self-reported empathy and tolerance by the students.

2.2 Focus Group Approach

The focus group method was used to obtain a critical evaluation and understanding of how bullying programs are managed and possible approaches to integrating digital tools and environments. The focus group study collected knowledge based on several designed questions posed to experts/specialists that have worked as certified bullying prevention trainers at various schools and organizations around the world. Focus groups have been used in prior research to examine teachers' perceptions of student aggressors and victims (Rosen et al., 2017). Teachers were able to recognize many of the same risk factors for aggression and victimization identified in prior studies, which relied largely on peer and self-reports. Focus group interviews have also been touted as an underused, although advantageous method to evaluate and understand game play experiences (Poels et al., 2007; Eklund, 2015). In determining the number of focus groups necessary for this research study, we followed the finding of Guest et al. (2017), which found that 80% of all themes were discoverable within two to three focus groups. We concluded that two focus groups of experienced bullying prevention trainers were sufficient to identify design recommendations that will be useful for developing a bullying prevention simulation.

3 MATERIALS AND METHODS

The ultimate purpose of our proposed simulation is to educate primary and secondary school students on how to recognize bullying and identify the different roles students may play in a bullying situation. The increase in remote online learning due to the global pandemic reinforces the need to look for new ways for students to communicate with their peers, parents, and educators and emphasizes the need to deliver bullying prevention programming that can be easily accessible from mobile devices to prepare youth to resolve conflicts in both real and virtual lives.

3.1 Participants

The purpose of the focus group was to obtain contributors' understanding, feeling, response and perception of the simulation with the goal in mind, which is to determine the roles students play in bully situations. In order to gather input about simulation development from people in the field, two focus groups were conducted with 15 practitioners who were recruited from an international cadre of Olweus Bullying Prevention Program trainers. Participant's had an average of 7.2 years and a median of 7 years of experience with the program, with individual experience ranging from 1 year to 15 years. All were familiar with the Olweus Bullying Circle. Eight additional practitioners signed up to participate but did not attend either focus group.

Input from these focus group participants is valuable given that they provide training and consultation to schools implementing the program, thus have a firsthand knowledge of the need for a virtual reality simulation and the capacity of schools in adopting it. They have knowledge about bullying and experience using the Olweus Bullying Circle in role play situations. Most OBPP Trainers have a minimum of a bachelor's degree and work in schools or community organizations serving youth.

OBPP Trainers participate in a 40-h Trainer Certification Course where they are given current research-based information to provide a level of expertise in the field of bullying prevention. They gain an in-depth understanding of the OBPP and how to help schools implement the program with fidelity. Training is followed by 2 years of consultation with an Olweus Technical Assistance Consultant, an experienced and highly effective OBPP Trainer who is fully certified in the model and has extensive familiarity with and understanding of the Olweus training process as well as program materials, training tools, and bullying prevention resources. OBPP Trainers also participate in ongoing professional development through bullying prevention webinars and communities of practice, and they have opportunities to network with other professionals in the field. Following participation in the certification course, a certified OBPP Trainer supports a school-based leadership team throughout program planning and implementation. The OBPP Trainer conducts committee training and consults with the school for a minimum of 12 months to help troubleshoot challenge areas and provide ongoing assistance in the implementation of program components.

The first focus group was conducted on December 8, 2020 with 11 (female) participants from across the U.S and one participant from Mexico. The second was held on December 11, 2020 with 4 (2 males, 2 females) participants from the U.S., Germany, and Lithuania. The last author facilitated the both focus groups, with the first author serving as the role of silent observer. Both focus group sessions were approximately 1 h duration.

FIGURE 2 | Positioning of students at the beginning of the simulation.
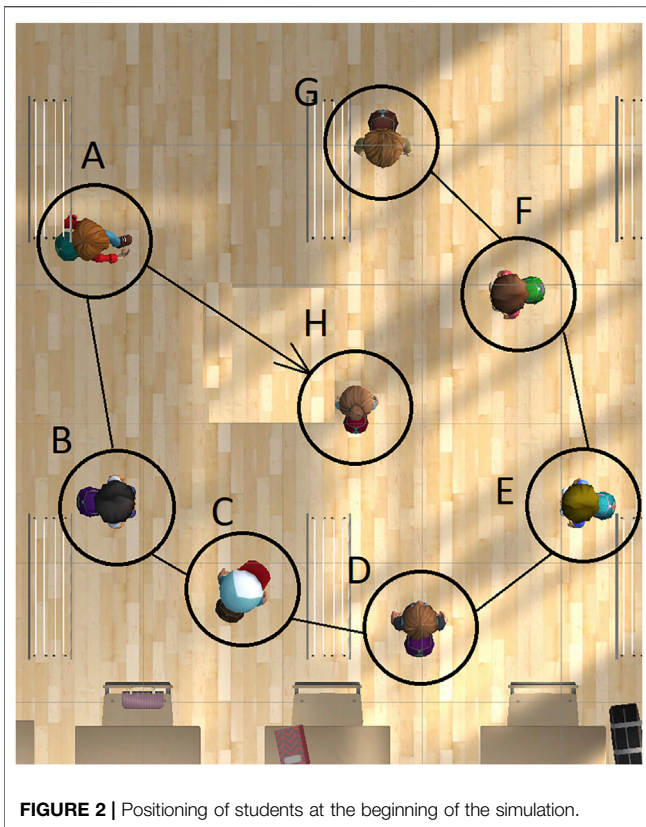
3.2 Materials

To achieve our stated objectives, we developed settings and characters that would resonate with students and enable them to connect with one of the roles from the Olweus Bullying Circle. With reference to **Figure 1**, the roles in the bullying circle are emphasized through the layout of the environment, arrangement of the characters and positioning of the visuals and audio. The simulation is designed to closely match a typical bullying scenario in the real world. To appeal to the young audience, we used virtual reality as the medium to provide complete immersion into bullying scenes and examine the behavior of all the participants. The simulation was developed using the Unity 3D game engine. The main advantage of using Unity 3D is that the potential simulation can be transferred into the format that makes it accessible via a browser using WebGL, as well as *via* smartphones using Google Cardboard VR, a mobile VR device. The characters were chosen to appeal to a younger audience. For our research, we tried multiple scenarios that would evolve around the locations of the most frequent places of bullying. The scenario selection was based on research showing that students are generally bullied in public places, such as the playground or athletic fields, lunchroom, hallways or stairwells, and in class (Luxenberg et al., 2019). The classroom scene was selected since it is common in all school settings. The decision to use the Google Cardboard VR is influenced by the search for low-cost hardware that sets up VR experience at home during remote learning. In the simulation prototype, the participants experienced the bullying scene in an automated

timeline from the perspectives of all eight roles in the Olweus Bullying Circle. Afterwards, participants are able to move the characters within the scene using a first-person view. The scene starts with portraying the bullying circle and eight students that are gathered together (**Figure 2**). The positioning and arrangement of the characters in the classroom also serve as spatial cues. Spatial orientation occurs when attention is drawn to the specific location based on who is speaking or simply when the learner reorients their attention after switching perspectives in the simulation.

The scene (**Figures 3A–H**) shows the perspectives of every student in the Olweus Bullying Circle and enables the participants to control the body of each character to achieve full presence and connection with the narrative. The circle starts with showing the perspective of the student who is bullied and the audio that conveys his/her thoughts on the upcoming conflict. The participants cannot move the character away as avoiding the conflict rarely helps in a real life. The audio conveys fear of the main character in the form of the inner monologue. Since verbal bullying is the most common form of bullying, and audio in VR ensures a higher level of immersion, we set up 3D sound using audio files to give voice to every character. Moreover, background 3D sound was created to mimic the experience of a loud school break.

The upper left corner (see **Figures 3A–H**) provides the perspective being shown to remind the focus group participants of the roles in the Olweus Bullying Circle. Meanwhile, the student who bullies, Student A, comes up to the victim, Student H. Once we have observed the perspective of the student that represents the role of H (character being bullied) according to the Olweus Bullying Circle, we are briefly introduced to the perspective of the character that bullies (Student A). Student A is facing the student that is being bullied and the audio conveys typical wordings that are associated with the roles in the bullying circle.

- H: Oh no! Here they come! I really hope they can just leave me alone today!
- A: Well, look at what we have here. You are so ugly, you can't even get out of my way.
- B: Ha ha ha. What a loser!
- C: There they go again. Not my problem. I am just glad it isn't me.
- D: Ha! That was interesting!
- E: (merely observes the scene)
- F: Why won't they leave her alone? I don't know what I can do about it though...
- G: He shouldn't be so mean to her! I'm going to get help!

The complete scenario script is provided in **Supplementary Materials**.

Perspective control is automated during the first 2 min of starting the simulation. This was achieved using an audio timeline that was created on the basis of delays. In other words, the speech from each character was automatically triggered after a select number of seconds had elapsed. The idea is to create a pause between each character's perspective to

FIGURE 3 | Perspectives of the students.
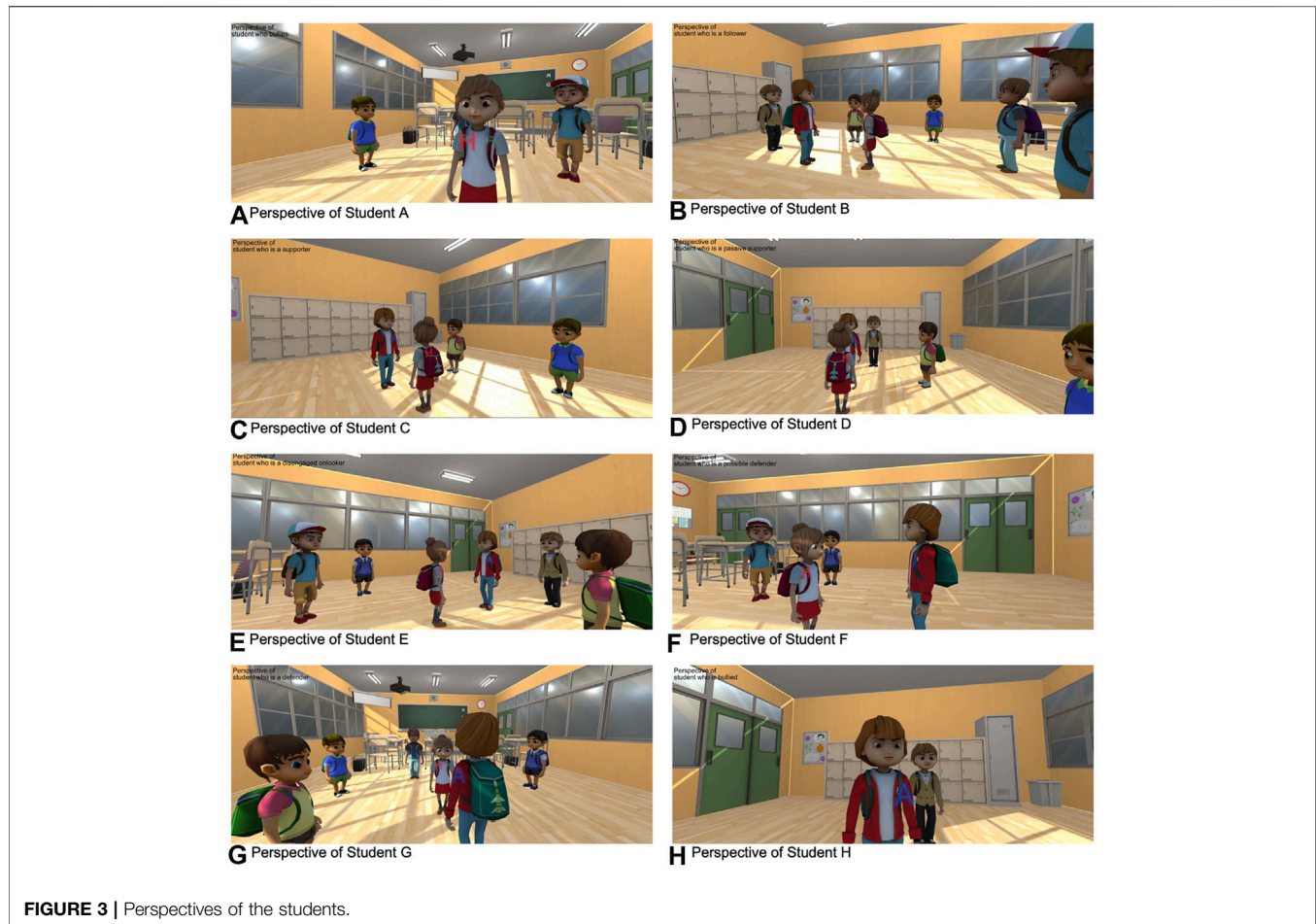
give the learner time to process what is happening. Once the simulation leaves that audio's timeframe, the audio cannot be replayed. While this detracts from the learner's agency, it efficiently lays out an audio timeline that does not rely on the participants for direction.

Figures 3A–H show the perspectives of the scene that enables every participant of the circle to speak up and take action. Once the customized scene ends at the perspective of Student A, the participant is able to explore the setting and characters by switching between perspectives by pressing the letter that corresponds to the character that plays the role in the bullying circle.

In addition to implementing the camera control, we developed an independent character controller that works similarly to the way the cameras are organized. Besides synchronizing the first 2 min of the simulation where the participant experiences the scene from the point of view of every role in the bullying, we designed a separate character controller that allows participants to pick the characters they wish to control. This way, it is possible to experiment with the first and third person controller, as well as the first and third person perspectives and the accompanying audio.

3.3 Procedures and Measures

The focus group meetings were conducted on the Zoom videoconferencing platform and audio and video input was recorded with permission for analysis. Archibald et al. (2019) found Zoom to be a viable tool for collection of qualitative data because of its relative ease of use, cost-effectiveness, data management features, and security options.

The focus groups were structured into three phases: i) introductory phase; ii) demonstration phase; and iii) group discussion phase. After the initial introduction by the moderator (last author), participants were asked to introduce themselves and shared a brief statement about their interest in using VR simulations for bullying prevention. This was followed by a demonstration of the simulation and its relationship to the Olweus Bullying Circle. Participants were informed that the target for the simulation are K-12 students. The group discussion phase was designed to gather information in regard to the roles portrayed in the simulation as well as its setting and features. Focus group participants referred to the simulation as a game so it has been described in this section as such. In order to structure the group discussion, seven open-ended questions were posed to each group with a set time limit for discussions:

TABLE 1 | List of codes.

Category	Code	Count	%Codes
Game	Concern	12	10.8
Game	Format	14	12.6
Game	Purpose	11	9.9
Game	Suggestions	21	18.9
Characters	Roles	11	9.9
Characters	Characteristics	12	10.8
Scenario	Setting	23	20.7
Scenario	Type of Bullying	7	6.3

1. Does the OBPP bullying circle represent all roles in the bullying situations that you are aware of? Are there others that should be considered? (3 min)
2. Are there any ethical or safety concerns in having students participate in the game from the perspective of a student who bullies? If so, what are they? (7 min)
3. Is the bullying scenario a realistic representation of bullying situations that youths experience? Think about words (script), expressions and behaviors of the student who is being bullied, the student who is bullying and the bystanders who may be present. (10 min)
4. Is the classroom environment a realistic representation? Think about where such bullying situations occur, types of people present or not present when the situation occurs. What should be added or changed? (10 min)
5. Are the characters a true representation of the situation i.e., the students' perceptions (looks and attitude) of the students in the various roles (student who bullies, student being bullied, bystanders)? (10 min)
6. Are there specific features that should be part of the game to make it more appealing? (5 min)
7. Would you like to share any more useful information? Do you foresee any problems or concerns when using this game? Can you identify any trends in the use of virtual reality games in education? (5 min)

4 RESULTS

Video and audio transcript of each focus group were reviewed, and a thematic analysis conducted with assistance from QDA Miner software. Thematic analysis is a method for identifying and interpreting repeated patterns and themes within data. It is a theoretically flexible approach to analyzing qualitative data that can produce an insightful analysis to answer research questions (Braun and Clarke, 2006). Patterns are identified through the process of data familiarization, data coding, and theme development. Thematic analysis is a good approach to use when gathering information about people's views, opinions, and experiences from transcripts.

The Zoom audio transcripts were checked against the video recording for accuracy. Corrections were made to reflect participants' input verbatim. Comments posted in the chat box were added to the transcripts. After thorough review of the transcripts, eight codes were established to categorize the data:

TABLE 2 | List of themes.

Codes	Theme
Format	Features
Setting, Types of Bullying	Environment
Roles, Characteristics	Characters
Concerns, Suggestions, Purpose	Considerations

purpose, format, concerns, perspective, roles, characteristics, setting, and suggestions. Perspective was later removed as it did not come up in analysis.

Transcripts were coded to identify overarching themes. Saturation in themes was determined to be reached after two focus groups because similar themes and patterns were raised in both groups. Setting came up most frequently (20.7%) followed by suggestions (18.9%). See **Table 1** for a list of codes and frequencies.

Codes were reviewed to identify patterns and then collated into four themes: Features, Environment, Characters, and Considerations. **Table 2** lists the theme configuration.

Features is the technical design of the simulation and includes the format, how it is played, and instructions. When asked about features, respondents shared the importance of having instructions that explain the bullying circle and a way for participants to process the experience. The ability for students to customize the simulation was mentioned nine times. Respondents stated it would enhance buy in and engagement.

- *Ways for the students to have creative input, they would find it very engaging and perhaps more enticing to play*
- *Customize the experience as well as their own avatars*
- *Participants creating script, the word, or the scenarios, they will be more likely to embrace the game and play multiple times.*
- *Like allowing participants to pick their characteristics i.e. Gender, grade, age, appearance, etc.*

Environment describes the scenarios that the participants will experience as part of the simulation. It includes comments related to the location, age appropriateness, and appearance of the scene. Several different locations were suggested including the classroom, hallway, locker room, gym class, cafeteria, playground, bus, and bus stop. Having a variety of scenes was mentioned 14 times. The importance of having an age-appropriate scene, one that is not static, was also a point of agreement.

- *Interesting to see other scenarios so the kids can relate to; bullying can happen everywhere.*
- *A variety of situations will likely be more engaging for the students*
- *A variety would be great including the transition between locations*
- *Students are typically not just standing around; maybe adding some activities like sitting or reading a book*

The Characters theme includes the appearance of the avatars and the roles they play. Respondents agreed that the roles

depicted in the Olweus Bullying Circle sufficiently identifies all roles in a bullying situation but did stress that these roles are fluid. The role a student plays may depend on the situation and the adults present so there should be an opportunity for participants to see the different perspectives. There was agreement that having an option that included an adult being present would be beneficial. There was also consensus on the need for facial expressions and the ability to customize your avatar.

- *Characters should have an ageless quality*
- *If they're invested in their own character and then they, you know, they may want to put themselves into this game more often*
- *Add expression to the characters*
- *If you can capture the expression of emotion on the participant, on the members faces, I think that would be very helpful especially for our younger students and students that bully. Creating empathy is difficult to do because they don't recognize those facial expressions and tie them to emotion. So, if you could do that and make that very explicit, even maybe making that a task in the game could be valuable.*

Considerations are things the researchers and developers should take into account as development continues. It includes comments related to the purpose and goals of the simulation, concerns, and suggestions related to how the simulation is experienced. Respondents agreed that the simulation would be a useful tool for both prevention and intervention, noting that it would not be a replacement but an additional tool in a bullying prevention program.

Suggestions included having instructions and guiding questions along with the simulation. Respondents agreed that in addition to customization options, adding a scoring or point system and having levels to the simulation would be positive additions. One person suggested social score points that would give learners added benefits when they reached a certain level. The idea of replaying the scene to focus on the bullying situations was also discussed.

When asked about any concerns, having students act in the role of bully or person bullied was discussed. The possibility of evoking feelings from their own past and experiencing bullying in the context of the simulation if being used inappropriately were mentioned. Having a fabricated person who bullies and a person being bullied was suggested to keep those roles neutral. Randomly assigning roles at the beginning of the simulation was also suggested. Other concerns related to being able to tell who was speaking and which perspective you were seeing. One suggestion was to be able to push on the character to see the role and the description. Adult familiarity with Virtual Reality and the capacity of schools in using virtual reality simulations were also concerns.

- *Shine a light on the characters that you wanted to look at in the actual bullying scenario*

- *When you have all the other stuff going on in the classroom, it (bullying) could easily be missed. Show that and then sort of extrapolate, you could sort of take out or zoom in on the bullying scenario. Show what was happening with all the movement - like a microscope look at it*
- *At some points, they were never a person who engaged in bullying and so it was very uncomfortable for them to take on that role, but it did lead them to think in new directions about how they might have ended up in that role*
- *Have to be careful and sensitive to whatever group you're working with, and what their position is in their real social context*
- *Adult facilitators might avoid using if they are uncomfortable with VR*

Overall, focus group respondents were very positive about the potential of the VR simulation. They offered valuable insight and suggestions to make it user friendly for schools and engaging for students.

5 DISCUSSION

This paper takes a qualitative and exploratory approach in investigating how bullying prevention experts perceive a bullying prevention simulation with multiple perspectives and suggestions of how students would use it to respond to bullying situations. The focus group approved the design of the current simulation and determined that future simulation should contain environment features and actions that resonate with today's young audience in order to provide interactivity and engagement. The findings from the study suggest factors that researchers and developers should consider when building future bullying prevention simulations in VR. This study emphasizes the importance of developing fun and engaging bullying prevention simulations that aim to evoke empathy and influence attitudes and behaviors. Specifically, researchers seeking to create effective bullying prevention simulations should consider focusing on role-playing, customization of the characters, environments, scenarios and scoring/reward system. The findings and recommendations of an ideal bullying prevention simulation can be summarized as follows:

- In a role-playing simulation, there has to be clarity on the roles being played and the ability to easily identify other characters within the scenarios.
- Learners should be able to customize the characteristics of their virtual character or avatar i.e., gender, grade, age, appearance, etc.
- Learners should be able to customize the experience i.e., scripts, words and scenarios.
- Learners should be able to customize the environment e.g., classroom, hallway, locker room, etc.
- Learners should be able to score points based on the ability to make the appropriate decisions in a bullying scenario.

5.1 Significance of VR Technology

In VR theory, the concepts of immersion and presence in virtual environments have been used to assess the user's engagement in VR (immersion) and the sense of being fully present in a virtual place (presence). Slater and Wilbur (1997) define immersion as the extent to which a VR system and application can deliver reality to humans that is extensive, matching, surrounding, vivid, interactive and plot-informing. On the other hand, presence is a sense of "being there" inside a virtual environment. Presence induced by immersion can be considered an illusion of a non-existent reality. Hence, it is paramount that a future application should consider the level of immersion and presence that is afforded to the learner when experiencing a bullying simulation.

The use of VR in this study focuses on creating a valuable, educational experience. It offers a re-creation of real-life experiences of a bullying scenario while limiting some of the confounding variables that are present in physical interactions. In other words, VR provides a controlled and safe environment for learners to explore the varying perspectives of the Olweus Bullying Circle. The ability to view multiple first-person perspectives is one of the major benefits of using VR. This advantage is reinforced by the finding of the study related to being able to tell who was speaking and which perspective you were seeing. Attention can be allocated based on visual and auditory spatial cues. Spatialized audio using headphones provides a sense of where sounds are coming from in the 3D environment. The 3D positions of the eight roles in VR is also representative of real-life bullying scenarios. Learners can more easily discern the position of others in VR than with other technologies, such as holding a mobile or fixed display. Incorporation of audio feedback will be a significant part of a future simulation. For example, when the perpetrator virtually kicks or hits another character, the intensity of these kicks will be demonstrated in the audio through the learner's 3D headphones. Learners will be able to experience the consequences more obviously than in real life. Kicking someone doesn't bring any empathy points whereas hitting someone hard brings a loss of an amount of empathy points. Locomotion can be achieved through teleportation, through the learner fixating at a location they'd like to move to, then initiating the teleportation action through a click. They are transitioned to that location through interpolated motion tuned to maintain player comfort. Consequently, the inclusion of 3D spatialized audio and feedback is crucial in creating a more immersive experience by delivering reality through technology that is extensive, matching, surrounding, vivid and interactive.

Although future simulation will be built to enable deployment onto several VR and AR devices, the crucial choice of deploying to Android or iOS devices will be maintained. This will enable deployment onto smartphones that are readily affordable and ubiquitous to students. Using their smartphone, the simulation can be deployed to VR on Cardboard or AR on smartphones. Furthermore, the younger generation has seen the prominence of popular apps (like GoogleEarth VR, Rec Room, Roller Coaster VR Theme Park, Snapchat and Pokemon GO) that managed to stand out from thousands of other applications because of the virtual, augmented and mixed reality techniques integrated into

these applications. Therefore, it follows that incorporating immersive technology into learning can motivate students and create a richer learning environment. Hence, it can also be a powerful tool in addressing social problems such as bullying and aggression *via* a medium that is influential with the current generation.

5.2 Role-Playing Simulations

A crucial finding of the focus group is the importance of clarifying roles being played and the ability to easily identify other characters within the scenarios in a role-playing simulation. This finding relates to the plot or storyline, a dimension of immersion that is concerned with the extent to which there is a self-contained plot in which the learner can act. Role play provides insight into the different types of bullying and what roles students might take in each situation. The activity can help students develop a better understanding of how participants feel in bullying situations and what motivates their actions. Role play also provides a valuable opportunity to practice and evaluate solutions to bullying situations. However, there are challenges with using role play as part of a comprehensive bullying prevention program. Some students may feel anxious or nervous about performing in front of the class. Role-play with an audience can become an opportunity to make fun of students who are bullied or make light of those who bully others. Although providing students with skills to address a bullying situation, role-play is often an optional prevention strategy. When left to the discretion of teachers, time constraints, curriculum overload, and unfamiliarity with drama type activities can lead to avoidance of the practice.

The use of VR to role-play addresses these challenges and can be a strong learning experience. It offers a controlled scenario over student created or acted role-plays. It has less demand on teacher time and removes the audience, eliminating potential for further victimization of others. Focus group participants noted cautions when assigning characters for role play, including the importance of keeping roles neutral. VR offers the potential of having an avatar in the roles of the student who bullies and the student being bullied. This can avoid any issues with assigning roles.

Understanding the emotional aspects of bullying helps students see the need to intervene and helps build empathy. Perspective taking while being immersed in a VR environment affects dispositions, attitudes, and behaviors (Ahn et al., 2013). Students can experience all roles in a bullying situation *via* VR and take the perspective of others in a way that is not possible with traditional role play situations.

5.3 Avatar Representation

Another important finding is that participants recommended that learners should be able to customize the characteristics of their virtual character or avatar i.e., gender, grade, age, appearance, etc. In VR theory, self-embodiment is the perception that users have a body within the virtual environment. In first-person perspectives, users tend to have no virtual bodies associated with them. The user is a disembodied viewpoint in space. The virtual camera is

placed at the eye/head level of the represented avatar. Hence, it can still be possible for the user to see a virtual body representation of their own personal body. In this study, the learner's ability to switch viewpoints means that the learner can see how the person being bullied, the person bullying or bystanders are represented before changing perspectives. The ability to role-play also allows learners to challenge assumptions and stereotypes of what a person who bullies or is a victim of bullying looks like. In VR, research has shown that one can perceive oneself as a cartoon character or someone of a different gender or race, and the experience can be effective for teaching empathy by "walking in someone else's shoes" to reduce negative stereotype of older people (Yee and Bailenson, 2006) and can reduce racial bias (Peck et al., 2013).

Evoking empathy requires that learners are able to view multiple perspectives, see the emotions conveyed by the avatars and understand the implications of decision making in order to effectively address bullying situations. It is important for VR simulations to consider all perspectives in bullying situations but this must be approached with caution. The focus group study suggests that the representation of the person who bullies and the victim of bullying must be neutral. Therefore, avatar customization and personalization would be useful features in designing a bullying simulation.

5.4 Plot and Storyline

The plot, an important dimension of immersion, deals with presenting a story-line that is self-contained. This relates to the finding of being able to customize the experience and environment. In the current prototype, the learner views the scenario and experiences each role in the bullying circle without interacting. In future simulation, there will be single-player and multiplayer modes. A sample implementation will involve learners being set on a mission to save the victim or similar quests. In the single-player mode, the learner is randomly assigned to a role in the Olweus Bullying Circle and will be able to make choices based on the role being played. The learner's response will determine the score or social points earned. The predefined response options are based on typical actions of the various roles in a bullying situation. For example, actions include: i) grabbing a backpack out of a student's hand; ii) laughing and joining in the bullying; iii) watching without doing anything; iv) speaking out; or v) going for help. As metrics, the simulation will track whether the learner decides to get help, or move up closer to Student A and Student H to prevent bullying (evaluation of the desire to cooperate). A questionnaire will be provided at the end of the simulation to confirm whether the user was able to identify the characters and determine possible solutions to the scenario.

Another recommended feature will be for the learner to interact with the scenario in a role of choice or randomly assigned role. As the scene unfolds, the learner will be able to make decisions about their response. Their actions will define the Bullying Circle role being played and the decision(s) the learner makes will negatively or positively affect the score. For example, ignoring the bullying would result in no points gained; pushing someone would result in a loss of points, telling an adult about the

bullying would result in a point gain. The predefined scenarios in the single-player mode will be obvious bullying situations. On the other hand, the multiplayer mode will enable the learners to conduct real-time role-playing activities with friends or adult facilitators who have experienced dealing with bullying situations, allowing the learner to customize the experience. Since the multiplayer mode is not a set of predefined actions, the responses of the learners may vary due to their perception of what they classify as bullying. Being able to role-play scenarios that they did not classify as bullying should result in training and improvement of learners' cognitive empathy skills. This extra layer of difficulty also helps to bring more clarity into the significance of the roles in the bullying circles and addresses a key finding of the focus group.

Researchers and developers should also allow switching between different environments or levels, such as the cafeteria or playground, thus addressing the finding that learners should be able to customize their environment. Learners will be transported into another scene when they have finished the quest in each level, where a similar version of the Olweus Bullying Circle scenario will be enacted. Scores and accomplishments will be maintained while learners switch between scenes. In doing this, researchers and developers must maintain the sense of place illusion, being in a stable spatial place, and plausibility illusion, that the scenario being depicted is actually occurring (Slater, 2009). In future versions, after completing a scenario, students will participate in a lesson about bullying behavior including the roles played in a bullying situation, feelings involved, social norms related to bystander response based on research on how youth respond in a bullying situation, and ways to help the student who is being bullied.

5.5 Rewards and Points

Rewards and points are central to the interactivity dimension of immersion, since it measures the extent to which the learner can influence the unfolding of plots and storylines. The intention of the simulation is to provide a quality level of engagement and to sustain a high level of interest and attention of the learner. Hence, future research and development should incorporate a feeling of achievement for the learner when a situation has been managed well and gives the learner something to look forward to in terms of collecting rewards. As it is important for this tool to address various perspectives, another objective is to allow learners to be heroes both for themselves and for others. We recommend that researchers and developers implement a reward system, which is triggered when the learner makes a positive decision (such as reporting bullying to an adult). Learners can be awarded empathy or social points depending on decisions made. Consistent choice of correct actions and decisions (such as reporting bullying to a teacher) will result in rewards such as coins or toys. Rewards can be monetary, symbolic (stars and crystals), super-heroic actions or unlocking additional advanced features. These rewards emphasize the learner's power, and the abilities that they will gain as the rewards increase. Furthermore, rewards will provide opportunities for metamorphosis of characters; making it possible for the character to perform amazing super-heroic actions. Certain features will have to be unlocked through the learner amassing enough rewards for the feature.

The focus group participants agreed that the simulation would be a useful tool for both prevention and intervention. As such, the inclusion of a superhero makes people, especially children, fantasize about being powerful, helpful and invincible. These figures tend to be presented subliminally in games, advertising, television programs, and festivities. Schools have been encouraging special dress up days whereby students are allowed to wear and present their favorite character and it is perceived as fun but educational. Furthermore, superhero therapy offers an effective, easy-to-learn, scientific research approach that remains fun for the user (Fradkin, 2017). Therefore it makes sense to incorporate this approach as a model in the future design of bullying simulation.

6 CONCLUSION

Providing a more accessible way to assist in the teaching of bullying prevention and intervention in schools is a necessary step towards creating a safer environment for children and youth around the world. We chose to create a VR simulation for various reasons, including easy access to resources to run the simulation, portability for ease of use and the ease of switching roles/perspectives. Another justification for creating an educational simulation is that role-playing has been shown to be a successful method for teaching, and we employ that method in the simulation without the possible discomfort associated with real-life role-playing among the other students and the teacher. Our findings are consistent with (Bagès et al., 2020) who found that role-playing video games can be a useful tool for therapists and teachers for improving empathetic skills and reducing school bullying among adolescents. They also concluded that three role-playing game sessions based on empathy are sufficient for psycho-therapeutic purposes, giving us an indication of how practitioners could employ our proposed tool. As such, we conclude that a role-playing VR simulation will be helpful in the prevention of bullying and a valuable addition to a comprehensive bullying prevention program, in order to have a maximum positive impact on the mental health of young people.

6.1 Limitations and Future Work

Despite the interesting results, we must consider the limitations of this study. One limitation is the lack of inclusion of students or those who have personal experiences of bullying, as it would provide a

more comprehensive review of this research and validate the designs further. Future work is planned to this effect. Secondly, the simulation deployed was limited in functionality. Future versions of the simulation will focus on giving learners the ability to customize their avatars/characters, environment and scenarios. Future plans include further development of the VR simulation and deployment to several local schools for studies involving students. Based on the responses we collected from the focus group study, incorporating additional scenes and scenarios would make the simulation more enjoyable and engaging for students. Extending the options that the learner can have throughout the simulation will also contribute to a better overall experience, further adding to the justification for creating such a simulation.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**. Further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

All authors contributed to the introduction and related work sections. JU conducted the analysis of the focus groups and contributed to the results section. OO moderated the focus group sessions. YS and AB implemented the game design. ME and OO contributed to the discussions sections. ME and AB contributed to the future work section.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frvir.2021.672003/full#supplementary-material

REFERENCES

Ahn, S. J., Le, A. M. T., and Bailenson, J. (2013). The Effect of Embodied Experiences on Self-Other Merging, Attitude, and Helping Behavior. *Media Psychol.* 16, 7–38. doi:10.1080/15213269.2012.755877

Archibald, M. M., Ambagtsheer, R. C., Casey, M. G., and Lawless, M. (2019). Using Zoom Videoconferencing for Qualitative Data Collection: Perceptions and Experiences of Researchers and Participants. *Int. J. Qual. Methods* 18, 1609406919874596. doi:10.1177/1609406919874596

Bagès, C., Hoareau, N., and Guerrien, A. (2020). Play to Reduce Bullying! Role-Playing Games Are a Useful Tool for Therapists and Teachers. *J. Res. Child. Edu.* 0, 1–11. doi:10.1080/02568543.2020.1810834

Borgwald, K., and Theixos, H. (2013). Bullying the Bully: Why Zero-Tolerance Policies Get a Failing Grade. *Social Influence* 8, 149–160. doi:10.1080/15534510.2012.724030

Bowers, E. P., Hilliard, L. J., Batanova, M., Stacey, D. C., Tirrell, J. M., Wartella, K., et al. (2016). The arthur Interactive media Study: Initial Findings from a Cross-Age Peer Mentoring and Digital media-based Character Development Program. *Jyd* 10, 46–63. doi:10.5195/jyd.2015.7

Braun, V., and Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qual. Res. Psychol.* 3, 77–101. doi:10.1191/1478088706qp063oa

Brooks, R. (1999). "Creating a Positive School Climate: Strategies for Fostering Self-Esteem, Motivation and Resilience," in *Educating Minds and Hearts: Social Emotional Learning and the Passage into Adolescence.* Editor J. Cohen, 158–170.

Buhs, E. S., Ladd, G. W., and Herald, S. L. (2006). Peer Exclusion and Victimization: Processes that Mediate the Relation between Peer Group Rejection and Children's Classroom Engagement and Achievement?. *J. Educ. Psychol.* 98, 1–13. doi:10.1037/0022-0663.98.1.1

Calvo-Morata, A., Alonso-Fernández, C., Freire, M., Martínez-Ortiz, I., and Fernández-Manjón, B. (2020). Serious Games to Prevent and Detect Bullying and Cyberbullying: A Systematic Serious Games and Literature Review. *Comput. Edu.* 157, 103958. doi:10.1016/j.compedu.2020.103958

Carter, L., and Potter, L. E. (2016). "Designing Games for Presence in Consumer Virtual Reality," in Proceedings of the 2016 ACM SIGMIS Conference on Computers and People Research (ACM), 141–148. doi:10.1145/2890602.2890626

De La Rue, L., Polanin, J. R., Espelage, D. L., and Pigott, T. D. (2017). A Meta-Analysis of School-Based Interventions Aimed to Prevent or Reduce Violence in Teen Dating Relationships. *Rev. Educ. Res.* 87, 7–34. doi:10.3102/0034654316632061

Donohoe, P. (2019). Teachers Using Role-Play to Prevent Bullying. *Int. J. bullying Prev.* 1, 1–16. doi:10.1007/s42380-019-00036-4

Eklund, L. (2015). *Focus Group Interviews as a Way to Evaluate and Understand Game Play Experiences.*

Ekstrom, R. B., Goertz, M. E., Pollack, J. M., and Rock, D. A. (1986). Who Drops Out of High School and Why? Findings from a National Study. *Teach. Coll. Rec.* 87, 356–373.

Elias, M. J., Zins, J. E., Weissberg, R. P., Frey, K. S., Greenberg, M. T., Haynes, N. M., et al. (1997). *Promoting Social and Emotional Learning.* Alexandria, VA: Guidelines for educators (Ascd).

Forsberg, C., Thornberg, R., and Samuelsson, M. (2014). Bystanders to Bullying: Fourth- to Seventh-Grade Students' Perspectives on Their Reactions. *Res. Pap. Edu.* 29, 557–576. doi:10.1080/02671522.2013.878375

Fradkin, C. (2017). Janina Scarlet: Superhero Therapy: A Hero's Journey through Acceptance and Commitment Therapy. *J. Youth Adolescence* 46, 1629–1632. doi:10.1007/s10964-017-0658-8

Gaffney, H., Farrington, D. P., and Ttofi, M. M. (2019). Examining the Effectiveness of School-Bullying Intervention Programs Globally: a Meta-Analysis. *Int. J. Bullying Prev.* 1, 14–31. doi:10.1007/s42380-019-0007-4

Gini, G., Albiero, P., Benelli, B., and Altoè, G. (2008). Determinants of Adolescents' Active Defending and Passive Bystanding Behavior in Bullying. *J. adolescence* 31, 93–105. doi:10.1016/j.adolescence.2007.05.002

Griffiths, M. D. (2002). The Educational Benefits of Videogames. *Edu. Health* 20, 47–51.

Guest, G., Namey, E., and McKenna, K. (2017). How many Focus Groups Are Enough? Building an Evidence Base for Nonprobability Sample Sizes. *Field methods* 29, 3–22. doi:10.1177/1525822x16639015

Henson, B., Fisher, B. S., and Reyns, B. W. (2020). There Is Virtually No Excuse: The Frequency and Predictors of College Students' Bystander Intervention Behaviors Directed at Online Victimization. *Violence Against Women* 26, 505–527. PMID: 30940014. doi:10.1177/1077801219835050

Hu, X., Su, R., and He, L. (2016). "The Design and Implementation of the 3d Educational Game Based on Vr Headsets," in 2016 International Symposium on Educational Technology (ISET) (IEEE), 53–56. doi:10.1109/iset.2016.15

Jones, L. M., Mitchell, K. J., and Turner, H. A. (2015). Victim Reports of Bystander Reactions to In-Person and Online Peer Harassment: A National Survey of Adolescents. *J. Youth Adolescence* 44, 2308–2320. doi:10.1007/s10964-015-0342-9

Juvonen, J., and Graham, S. (2014). Bullying in Schools: The Power of Bullies and the Plight of Victims. *Annu. Rev. Psychol.* 65, 159–185. doi:10.1146/annurev-psych-010213-115030

Kalyanaraman, S., Penn, D. L., Ivory, J. D., and Judge, A. (2010). The Virtual Doppelganger. *J. nervous Ment. Dis.* 198, 437–443. doi:10.1097/nmd.0b013e3181e07d66

Kolić-Vehovec, S., Smojver-Ažić, S., Martinac Dorčić, T., and Rončević Zubković, B. (2019). "Evaluation of a Serious Game for Changing Students' Behaviour in Bullying Situation: A Multi-Method Approach," in *Book of Abstracts, XVI European congress of Psychology*, 1567.

Luxenberg, H., Limber, S. P., and Olweus, D. (2019). *Bullying in Us Schools: 2019 Status Report.* Center City, MN: Hazelden Foundation.

McEvoy, K. A., Oyekoya, O., Ivory, A. H., and Ivory, J. D. (2016). "Through the Eyes of a Bystander: The Promise and Challenges of Vr as a Bullying Prevention Tool," in *2016 IEEE Virtual Reality (VR)* (IEEE), 229–230. doi:10.1109/vr.2016.7504737

Nansel, T. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., and Scheidt, P. (2001). Bullying Behaviors Among US Youth. *Jama* 285, 2094–2100. doi:10.1001/jama.285.16.2094

O'Connell, P., Pepler, D., and Craig, W. (1999). Peer Involvement in Bullying: Insights and Challenges for Intervention. *J. adolescence* 22, 437–452.

Olweus, D. (1993). *Bullying at School.*

Olweus, D. (1994). Bullying at School: Basic Facts and Effects of a School Based Intervention Program. *J. Child. Psychol. Psychiat* 35, 1171–1190. doi:10.1111/j.1469-7610.1994.tb01229.x

Olweus, D., and Limber, S. P. (2007). *Olweus Bullying Prevention Program.* Center City, MN: Teacher guide (Hazelden).

Padgett, S., and E. Notar, C. (2013). Bystanders Are the Key to Stopping Bullying. *ujer* 1, 33–41. doi:10.13189/ujer.2013.010201

Peck, T. C., Seinfeld, S., Aglioti, S. M., and Slater, M. (2013). Putting Yourself in the Skin of a Black Avatar Reduces Implicit Racial Bias. *Conscious. Cogn.* 22, 779–787. doi:10.1016/j.concog.2013.04.016

Poels, K., De Kort, Y., and Ijsselsteijn, W. (2007). "" it Is Always a Lot of Fun!" Exploring Dimensions of Digital Game Experience Using Focus Group Methodology," in Proceedings of the 2007 Conference on Future Play (IEEE), 83–89.

Polanin, J. R., Espelage, D. L., and Pigott, T. D. (2012). A Meta-Analysis of School-Based Bullying Prevention Programs' Effects on Bystander Intervention Behavior. *Sch. Psychol. Rev.* 41, 47–65. doi:10.1080/02796015.2012.12087375

Pronk, J., Olthof, T., and Goossens, F. A. (2016). Factors Influencing Interventions on Behalf of Victims of Bullying. *The J. Early Adolescence* 36, 267–291. doi:10.1177/0272431614562836

Raminhos, C., Cláudio, A. P., Carmo, M. B., Carvalhosa, S., de Jesus Candeias, M., and Gaspar, A. (2015). "A Serious Game-Based Solution to Prevent Bullying," in Proceedings of the 13th International Conference on Advances in Mobile Computing and Multimedia (New York, NY, USA: Association for Computing Machinery), 63–72. doi:10.1145/2837126.2837135

Rivara, F., and Menestrel, S. L. (2016). *Preventing Bullying through Science, Policy, and Practice.* Washington, DC: National Academies Press.

Rivers, I., Poteat, V. P., Noret, N., and Ashurst, N. (2009). Observing Bullying at School: The Mental Health Implications of Witness Status. *Sch. Psychol. Q.* 24, 211–223. doi:10.1037/a0018164

Rosen, L. H., Scott, S. R., and DeOrnellas, K. (2017). Teachers' Perceptions of Bullying: A Focus Group Approach. *J. Sch. violence* 16, 119–139. doi:10.1080/15388220.2015.1124340

Sapouna, M., Wolke, D., Vannini, N., Watson, S., Woods, S., Schneider, W., et al. (2010). Virtual Learning Intervention to Reduce Bullying Victimization in Primary School: a Controlled Trial. *J. Child Psychol. Psychiatry* 51, 104–112. doi:10.1111/j.1469-7610.2009.02137.x

Siris, K., and Osterman, K. (2004). Interrupting the Cycle of Bullying and Victimization in the Elementary Classroom. *Phi Delta Kappan* 86, 288–291. doi:10.1177/003172170408600409

Slater, M. (2009). Place Illusion and Plausibility Can lead to Realistic Behaviour in Immersive Virtual Environments. *Phil. Trans. R. Soc. B* 364, 3549–3557. doi:10.1098/rstb.2009.0138

Slater, M., and Wilbur, S. (1997). A Framework for Immersive Virtual Environments (Five): Speculations on the Role of Presence in Virtual Environments. *Presence: Teleoperators & Virtual Environments* 6, 603–616. doi:10.1162/pres.1997.6.6.603

Tham, J., Duin, A. H., Gee, L., Ernst, N., Abdelqader, B., and McGrath, M. (2018). Understanding Virtual Reality: Presence, Embodiment, and Professional Practice. *IEEE Trans. Profess. Commun.* 61, 178–195. doi:10.1109/tpc.2018.2804238

Underwood, J. M., Brener, N., Thornton, J., Harris, W. A., Bryan, L. N., Shanklin, S. L., et al. (2020). Overview and Methods for the Youth Risk Behavior Surveillance System - United States, 2019. *MMWR Suppl.* 69, 1–10. doi:10.15585/mmwr.su6901a1

U.S. Department of Education (1998). *Preventing Bullying: A Manual for Schools and Communities.* Washington DC: Department of Education.

Vanhoutte, K. K., and Lang, M. (2020). *Bullying and the Abuse of Power.* Boston, MA: BRILL.

Wang, J., Iannotti, R. J., and Nansel, T. R. (2009). School Bullying Among Adolescents in the united states: Physical, Verbal, Relational, and Cyber. *J. Adolesc. Health* 45, 368–375. doi:10.1016/j.jadohealth.2009.03.021

Wang, K., Chen, Y., Zhang, J., and Oudekerk, B. A. (2020). *Indicators of School Crime and Safety: 2019. Nces 2020-063/ncj 254485*. Washington, DC: National Center for Education Statistics.

Yee, N., and Bailenson, J. N. (2006). Walk a Mile in Digital Shoes: The Impact of Embodied Perspective-Taking on the Reduction of Negative Stereotyping in Immersive Virtual Environments. *Proc. PRESENCE* 24, 26.