

Invite Only VR: A Vaping Prevention Game

An Evidence-Based VR Game for Health and Behavior Change

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Figure 1: Players must resist peer pressure to vape in a variety of settings, including in a school classroom.

ABSTRACT

Invite Only VR: A Vaping Prevention Game is a virtual reality (VR) videogame intervention focused on e-cigarette prevention in teens. To our knowledge, Invite Only VR is the first theory-driven e-cigarette prevention game to be developed for a VR platform, making it unique among the limited pool of existing e-cigarette intervention programs for adolescents. Invite Only VR capitalizes on the use of VR by delivering an intervention that arms teens to deal with peer-pressure situations surrounding e-cigarettes. VR is especially well-suited to this type of intervention because VR facilitates greater social presence, the subjective experience of being present with a “real” person, than other forms of technology. Invite Only VR not only simulates the presence of plausible peers, but it also uses voice recognition software throughout the game to allow

the player to practice refusing peers in real time using their own voice. The game was developed with input from 4 focus groups comprised of 5 adolescents each to create a game narrative and situations that would feel authentic to the target audience. This careful background research ensured that the virtual characters would behave in the manner expected by players and use the appropriate colloquialisms when speaking about e-cigarettes. The intervention is currently being evaluated in a non-randomized cluster trial with 285 middle school students. Preliminary feasibility testing conducted on a prototype of the game indicates that playing Invite Only VR increases player e-cigarette knowledge and perceptions of e-cigarette harm. Moreover, teens who played the game reported a lower likelihood of experimenting with e-cigarettes in the future. In this initial evaluation, 83% of players agreed that they enjoyed playing the game and 78% said they would tell their friends to play, suggesting that Invite Only VR is an engaging way to convey the dangers of e-cigarettes to youth.

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SIGGRAPH '20 Talks, August 17, 2020, Virtual Event, USA

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ACM ISBN 978-1-4503-7971-7/20/08.

<https://doi.org/10.1145/3388767.3407355>

CCS CONCEPTS

• Applied computing → Interactive learning environments; Education.

KEYWORDS

virtual reality, education, e-cigarettes, serious games, health behavior

ACM Reference Format:

Veronica U. Weser and Kimberly D. Hieftje. 2020. Invite Only VR: A Vaping Prevention Game: An Evidence-Based VR Game for Health and Behavior Change. In *Special Interest Group on Computer Graphics and Interactive Techniques Conference Talks (SIGGRAPH '20 Talks)*, August 17, 2020. ACM, New York, NY, USA, 2 pages. <https://doi.org/10.1145/3388767.3407355>

1 EXTENDED ABSTRACT

According to the US Department of Health and Human Services, the use of electronic cigarettes (e-cigarettes) has skyrocketed among youth in the last decade, causing increasing public health concerns about a new generation of nicotine-dependent youth. According to the National Youth Tobacco Survey, the fraction of high-school students who reported using e-cigarettes jumped from 12% in 2017 to 28% in 2019 [Wang et al. 2019]. The rise in e-cigarette use among youth galvanized the development of Invite Only VR, an evidence-based prevention and cessation programs that would appeal to young people.

Invite Only VR: A Vaping Prevention Game is an interactive VR game with a compelling narrative about characters faced with peer-pressure scenarios surrounding vaping. The game was designed using feedback from focus groups with teens to ensure that the story and gameplay would feel authentic to the lived experience of teens who encounter peer-pressure to experiment with e-cigarettes [Camenga et al. 2018].

The “by-teens, for-teens” principle for Invite Only VR also informed the selection of the educational content for the game, as many of our participants were unaware that the “vapor” from an e-cigarette is an aerosol that can contain several harmful substances, including nicotine, lead, volatile organic compounds, and cancer-causing agents. Indeed, in one national survey of high-school students, nearly 80% of the respondents perceived “no great risk of harm from regular use of e-cigarettes” [Johnston et al. 2019], suggesting that these kinds of misperceptions are ubiquitous among youth.

One of the activities in the game is therefore the “Knowledge Power,” in which the player corrects misinformation stated by the virtual characters in the game, as in Figure 1. One of the greatest strengths of Invite Only VR is that it makes use of voice recognition software so that the player must use their own voice to progress through the narrative of the game. This allows the player to practice correcting virtual peers with the aim of facilitating the transfer of this activity to the player’s everyday life. If a teen who plays Invite Only VR corrects his or her peers, it can help to mitigate the spread of misinformation that spurs the current youth vaping epidemic.

Invite Only VR is unique in that it is the first theory-driven health and behavior change game to be developed for a VR platform. VR is especially well-suited to provide teens practice dealing with peer-pressure situations because VR facilitates the feeling of social presence. Social presence is the subjective experience of being present with a “real” person. If players feel like they are interacting with real people, then they will be that much more likely to take the



Figure 2: The player uses their own voice to respond to virtual characters. The player selects a response from several different options and then reads aloud the scripted response to practice talking to peers about the dangers of e-cigarettes and refusing offers to vape.

skills of peer refusal practiced in the game and apply them to real-life situations in which they experience peer-pressure, including the pressure to vape e-cigarettes.

ACKNOWLEDGMENTS

Development of Invite Only VR: A Vaping Prevention Game was supported by a grant from Oculus. We would like to thank all the adolescents, teachers, and focus group participants who contributed to the development of this project. We also must thank the students, schools personnel and staff, and administrators who allowed us to visit their buildings to inspire our environments and record our ambisonic audio.

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