



UNIVERSITY OF SAN FRANCISCO

CHANGE THE WORLD FROM HERE

**VR for Social Impact:
Integrating Virtual Reality into the Nonprofit Space**

by

Jiefang Shen

jiefangshen@gmail.com

Capstone Research Report Submitted in Partial Fulfillment
of the Requirements for the
Master of Nonprofit Administration Degree
in the School of Management
directed by Dr. Marco Tavanti

San Francisco, California

Spring 2021

Abstract

Three-dimensional virtual environments have been at the forefront of the advancement of technology. With the evolution of society and recent events, virtual reality (VR) is now at a new peak in its untapped potential. The coronavirus pandemic's call for physical distancing has made virtuality a necessity. New developments in VR have made the platform more accessible than ever before. This study explores the place of virtual reality in the nonprofit space. A review of literature indicates evidence for the effective use of VR across all major parts of nonprofits. Primary research is conducted via expert interviews from various perspectives. Interviews were conducted with nonprofit leaders both using and not using VR, as well as a VR content creator. Thematic analysis is used to find various challenges and perspectives regarding the use of VR in the nonprofit space. In conjunction to the literature, partnership co-creation models are developed as research implications and recommendations. Models are presented that both connect to literature reviews, as well as address primary research findings. As shown in the primary model, nonprofits should seek partnerships with VR content creator and funders. Together, the three co-creators can build a VR program that can fulfill more than the sum of its parts.

Keywords: nonprofit, virtual reality, vr, partnerships, co-creation

Acknowledgments

Thank you Professor Marco Tavanti for being so patient with me through this process.

Thank you Professor Richard Waters for helping me become a better researcher.

Thank you to the interviewees for being open to sharing their thoughts and experiences with me.

Thanks to the Pacific Crest Trail, my mother, and Dr. Emmanuel Mignot, for the life and journeys that occurred alongside this degree.

Table of Contents

List of Tables	vii
List of Figures	viii
Section 1. Introduction.....	1
Statement of the Problem.....	1
Statement of the Purpose	3
Section 2. Literature Review.....	4
VR Background	4
VR as an Object	5
Presence	5
Immersion	6
Empathy	8
VR as an Application	9
VR as a Method	14
Research Questions.....	18
Section 3. Methods and Approaches.....	19
Participants.....	19
Materials	21
Section 4. Data Analysis	23
Results	24
Research Questions.....	26
Section 5. Implications and Recommendations	28
Cross Sector Co-Creation Partnership	28
Distribution of Skills.....	30
Notable Supplemental Recommendation.....	32
Section 6. Conclusion	33
Discussion.....	33

Conclusion	33
References.....	35
Appendix A. Likely Range of Immersive Virtual Environments	39
Appendix B. Basic Criteria for Evaluating VR Platforms and Software.....	41
Appendix C. A two-tiered process of immersion	42
Appendix D. Empathic Appraisal and Response	43
Appendix E. The impact of medium.....	44
Appendix F. CIMO-logic framework for business-nonprofit engagement in SOL.....	45
Author’s Bio.....	46

List of Tables and Figures

Table 1. List of Interviewees	19
Table 2. Organizations by Category	23
Table 3. Thematic Analysis	24

List of Figures

Figure 1. Martec's Law	2
Figure 2. The Trinity Partnership Co-Creation Model	29
Figure 3. Themes and Challenges	30
Figure 4. Media Outlets	32

Section 1. Introduction

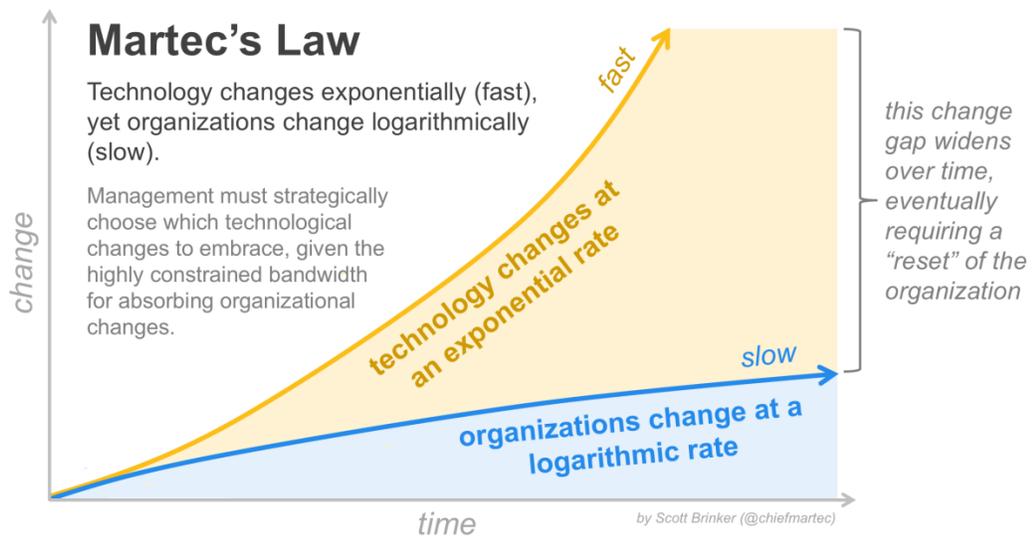
The growth of technology is rapidly increasing in modern civilization. One of the more recent trends in the technology industry has been the development of various types of virtual environments. According to the latest estimates by the Tankovska, published September 2020, markets for both Augmented Reality (AR) and Virtual Reality (VR) are forecasted to continue growing worldwide. The global market for AR and VR was estimated at 12.1 billion US dollars in 2018, and is forecasted to expand to an estimate of 18.8 billion US dollars by the end of 2020 (Tankovska, 2020). Similarly, Prescient & Strategic Intelligence (2018) released a report that estimates for the AR and VR market to reach \$94.4 billion US dollars globally by 2023.

Data also shows that is growth in the AR and VR market is not only evident for its traditional market of gamers. For example, “AR consumption is being used across numerous industries such as healthcare, public safety, gas, and oil” (Alsop, 2020). In addition, by 2023, the estimated usage for industry will be three-times greater than consumers (Alsop, 2020). This push for more innovative ways of utilizing virtual technology opens up potential and opportunities for the nonprofit sector.

Statement of Problem

With technology constantly pushing the boundaries, nonprofits should embrace the changes and possibilities in technology. The rate of technological advancement also calls for organizations to have a high capacity for adapting to these changes. Chief marketing technologist Scott Brinker (2016) dubbed the term “Martec’s Law”, which observes how technology changes at an exponential rate, but organizations change logarithmically (Figure 1).

Figure 1. Martec's Law



Technological innovation grows and evolves increasingly fast in modern society. Organizations cannot keep up with these changes, gradually falling behind. It is recommended for organizations to strategically adopt and integrate appropriate technological advances, in order to continue to adapt and grow.

The urgency for nonprofits to adopt virtual technology is further emphasized by current events. The current coronavirus pandemic limits physical contact, which interrupts the social interactions necessary for nonprofits. This has led to both an increase in the level of need in the community, and a decrease in functionality and efficiency of nonprofit organizations. A recent global survey conducted by the Charities Aid Foundation of America (CAF America) found that one in three organizations could close in the next year due to the coronavirus crisis (CAF America, 2020). Many sectors are seeking new ways of connecting and interacting with their stakeholders and community. CAF America (2020) also found this to be true for the nonprofit sector, stating that almost two-thirds of the organizations surveyed found new ways to engage with donors. A virtual environment such as VR is one technological solution with much potential.

There is growth in the use of technology in the nonprofit sector. Many nonprofit groups such as the National Council of Nonprofits, Bridgespan, and TechSoup all have created online

resource pages to help nonprofits through the coronavirus crisis. However, there is a lack of access to innovative technological solutions such as VR. VR projects created for social impact exists, but are quite exclusive to VR content creator groups. A better understanding of the perceptions and potential of the usage of VR in nonprofit organizations needs to be reached.

Statement of Purpose

The purpose of this study is to analyze perspectives and the challenges that nonprofits have on the use of VR technology. Perspectives will include nonprofit leaders who are currently using VR, who are not currently using VR, and a VR content creator. By exploring perspectives and challenges, society will gain a better understanding of whether there is interest and value in utilizing VR for social impact. Nonprofits that may be interested will be better informed in integrating VR into their work. VR content creators will gain more insight and methods for design. Funders could expand their impact and connect to their purpose in a different way. Furthermore, this could create more social impact that benefits society as a collective. This study anticipates on seeking potential ways of effectively and efficiently integrating VR into the nonprofit sector.

Section 2. Literature Review

This paper explores the integration of virtual reality in the nonprofit space. The literature review will first introduce and set the background for virtual reality as a form of media. Then, the literature review will survey virtual reality through three different levels: VR as an object, VR as an application, and VR as a method. These three themes will be discussed through literature in relation to the nonprofit and social impact space. This will further explore both the existing and future of the use of virtual reality in the nonprofit sector, in the context of creating more social impact through more innovative and effective ways.

VR Background

Jaron Lanier first coined the term “virtual reality” (Lanier & Biocca, 1992, p. 150). Lanier, and other VR pioneers alike, understood the boundless potentials of the medium that they created. In the interview done by Frank Biocca (1992), Lanier gives his forecasts on the future of virtual reality technology. When asked about the diffusion of virtual reality technology, Lanier predicted that a range various systems would be accessible to different populations. It would begin with low-end systems for the everyday people, connected to gaming systems. Then, higher-end systems will be diffused on platforms such as the Macintosh (now Apple) (Lanier & Biocca, 1992).

The three-level structure for breaking down the utilization and integration VR was modeled after the article *Virtual Reality – A Survival Guide for the Social Scientist* by Fox, Arena, and Bailenson (2009). The article uses this structure to provide a 19-page overview of virtual reality in the field of social science. A survey of relevant research shows that social scientists agree in that “the utility of virtual reality for social science is inherent in the nature of the technology” (Fox et al., 2009, p. 96). In addition, transition to the eventual adoption of the technology will be inevitable (Fox et al, 2009, p. 97). This study concludes by addressing the

two hindrances that lay between the use of VR and social science. The first is the perceived technological barrier – social scientists lack the background and literacy in virtual technology (Fox, 2009, p. 106). The second is the perceived cost barrier – social sciences are deterred by the high cost and low accessibility of virtual technology (Fox, 2009, p. 106). The authors attempt to remove these two hindrances and encourage the exploration of virtual technology, but only lightly dismiss them without much support or solutions.

VR as an Object

This section will discuss virtual reality as an object, or an entity with characteristics that can be perceived by the senses. The literature will explore these characteristics, focusing these ways that VR affects human sensory and perception. Many common themes and phenomenon in these conditions of perception have been researched and accepted within the VR space. Specifically, commonly identified characteristics of VR relevant to the nonprofit space will be examined. The majority of literature in this section will explore the main sub-themes of: presence, immersion, and empathy.

Presence. In Steuer's (1995) book chapter on Defining Virtual Reality: Dimensions of Determining Telepresence, he points out that the focus of virtual reality often skews towards the technological frame of reference in modern culture, as creators of the medium are currently highly focused on the development of technological hardware. Definitions of VR technology under this perspective aligns with the common notion that the core of VR lies in the advanced electronically simulated environments, and the use of headsets and/or hand controllers to access these environments (Steuer, 1995, p. 44). Contiguous to this perspective, the human experience aspect of virtual reality is equally critical in defining and applying the technology. Steuer (1995) claims that "the key to defining virtual reality in terms of human experience rather than technological hardware is the concept of presence" (p. 45). It is important to address that while "presence" is the natural sense of being in an environment, "telepresence" is any mediated sense of being in an environment (Steuer, 1995, p. 45). The two factors that mediate telepresence are vividness and interactivity (Steuer, 1995, p. 49). Vividness refers to the richness of the medium

(Steuer, 1995, p. 51), while interactivity refers to the malleability of the medium (Steuer, 1995, p. 54). More progressive and advanced media will continue to enhance the ability for humans to experience telepresence, especially in virtual realities (Steuer, 1995, p. 61).

The concept of presence has been a highly accepted but debated subject in the virtual reality space (McRoberts, 2017, p. 101). In the article “Are we there yet? Media content and sense of presence in non-fiction virtual reality”, McRoberts (2017) explores the sense of presence specifically in non-fiction VR, which “can be distinguished from other forms of VR by trying to engage audiences with real world stories, where sense of presence is intended to offer audiences opportunities for empathic engagement and social transformation” (McRoberts, 2017, p. 101). The sense of presence in virtual reality is so crucial to the core of the media form, because it is what allows the audience to have the unique and subjective human experience (McRoberts, 2017, p. 101). In non-fiction storytelling, VR allows people to experience perspectives different from their own, and learn how humans can respond differently to challenges and circumstances (McRoberts, 2017, p. 105). McRoberts (2017) lays out four relevant media content variables: immersion, positionality of user, interactivity, and narrative agency. Scholars and VR content creators alike are considering these – and more – for more holistic understandings of the sense of presence. McRoberts also concludes by pointing out the importance of fully realizing the potential of the virtual reality medium, and how carefully and creatively constructed content can engage individuals cognitively and emotionally, in unprecedented ways. This would bring opportunities for both, awareness on social issues and human transformation (McRoberts, 2017, p. 114).

Immersion. Biocca and Delaney (1995) introduce virtual reality technology by mentioning that it comes in many shapes and sizes. VR systems are as versatile and ever-changing as any other modern technology that we are familiar with, such as computers. Of the various types of virtual reality technology, the authors focus on the most immersive type of system that existed at the time – where “users wear displays that fully immerse a number of the senses in computer generated stimuli. The stereoscopic head-mounted displays (HMD) is a distinctive feature of such systems” (Biocca & Delaney, 1995, p. 68). The word “immersion” here refers to the extent to which a participant’s sensory is captivated and blocked from the physical world. The chapter

dives into the sensory immersion aspect of virtual reality systems by detailing the various available inputs and outputs, broken into subsections by the mode of sensory, such as visual and tactile. A table for the range of immersive virtual environments was created, specifying characteristics of immersion on three levels: low, mid, and high (See Appendix A). Each of the levels is further described with various factors, allowing a comprehensive and holistic analysis of immersion. These factors are based on the VR system criterion listed, including diffusability and cost (See Appendix B). Diffusability is the likelihood that a system can be widely used and adopted by users such as businesses and individuals. This is influenced by factors such as: hardware compatibility, software compatibility, tool integration, and user friendliness (Biocca & Delaney, 1995, p. 112).

The study by Donghee Shin (2018) explored the immersive storytelling aspect of virtual reality technology. Storytelling through VR is effective, because it is a good medium for “stimulating emotions that will influence action” (Shin, 2018, p. 63). The experiment conducted was based on a 2 x 2 design, with a total of 200 participants. Similar to many studies conducted in the VR space, the experimental design was separated by difference in level of immersion, with the two conditions being VR head mount display (HMD) and regular flat-screen television. This was crossed by the condition of high empathy and low empathy, which were traits determined by an empathy score from an administered questionnaire. All participants viewed the same video, *The Displaced*, which is a story created by the New York Times. This video was selected because “it touched on highly empathetic issues and was widely accepted and acclaimed” (Shin, 2018, p. 66). Both a pretest and posttest were conducted, including fifteen items on the various factors of: presence, flow, empathy, embodiment, and engagement. Results found that the various self-report individual traits correlates with how strongly they immerse in VR (See Appendix C). Therefore, it could be inferred that “the processes by which users experience quality, presence, and flow determine how they will empathize with and embody VR stories” (Shin, 2018, p. 64). The author discusses the implications of this conclusion, which includes a two-tier model of immersion. This model breaks down VR immersion into the two ends of user experience and quality of experience.

Empathy. The purpose of Kandaurova and Lee’s (2018) study was to investigate the effects of VR on empathy and a few other factors on charitable giving, in the social marketing context. Previous research has shown that VR has the potential to change the way that people perceive and comprehend the real world. Specifically, through empathy, people can gain sensitivity and perspective to how others think and feel (Kandaurova & Lee, 2018, p. 2). Psychologists have shown that the empathic process allows humans to experience the emotional state of another, which empowers the observers’ desire to help others. The authors explored this through three different experiments. The first of these three studies directly examined empathy, specifically “whether VR leads to higher levels of empathy and responsibility, and whether empathy mediates the relationship between VR and responsibility” (Kandaurova & Lee, 2018, p. 4). Participants consisted of 85 undergraduate university students. The experiment was set up with two conditions, virtual reality and virtual media (VM), and participants were randomly selected for one of the two. In the VR condition, participants watched a video through the Oculus Rift headset system. This system is built for an immersive, 3D and 360-degree virtual experience. In the VM condition, participants watched the video through a 14-inch screen laptop, and were only allowed to control volume. All participants watched the video “Global Citizen” by VR content creator RYOT, who traveled around the world and documented social and climate issues. The video was created to encourage everyday citizens to take action on such issues. Following the video, participants were asked to complete a questionnaire that assessed both empathy and responsibility. Quantitative analyses of the experiment showed significant differences for both empathy and responsibility between the VR and VM groups (Kandaurova & Lee, 2018, p. 4). Results showed that empathy does increase empathy and responsibility (Kandaurova & Lee, 2018, p. 5). Empathy also fully mediates the relationship between VR and responsibility (Kandaurova & Lee, 2018, p. 5). The other two studies that were conducted as part of this study showed an increased intention to donate money and volunteer time ((Kandaurova & Lee, 2018, p. 8).

In the paper “Empathy in Social Agents”, Paiva looks at three cases of 3D graphic tools that were created to increase empathy among humans. These tools include social characters, which would both visually and intellectually interact with users. The paper aims to explore these

tools as social agents, which calls for an analysis of empathy. Empathy is defined by the author as “the capability of perceiving and reacting to another’s emotional state” (Paiva, 2011, p. 65). In considering the empathic process, Paiva breaks it down into a set of constructs, including: the observer (or empathizer), the subject, the event/event cue, the emotion, and the situation/context. One of the factors that mediate the empathic process is the ability to identify ourselves with others. This identification process is crucial in the adoption of situations, behaviors, emotions, and other such perspectives. This leads to the two ways that we most commonly look at social agents in the VR setting. The first and most straight forward, is with the user as the empathizer. The second is with the user as the subject, which is the one that created agents are empathizing towards (Paiva, 2011, p. 67). Although most of the VR space utilizes the previous two models to stimulate empathy, it is possible to create scenarios where the user does not take the role of either the observer or the subject. The proposed process model aims do so by establishing concrete models for the creation of empathic social agents (See Appendix D). The model was used and evaluated in a small scenario, and results showed that the social “agents with empathy were perceived as more caring and likeable” (Paiva, 2011, p. 68).

VR as an Application

This section will discuss virtual reality as an application, being put into practice for social good. Existing applications of VR with a particular focus on social good or social impact will be examined. Literature will explore cases with targeted functions relevant to the social sector, as well as examples with social impact focused objectives. The majority of literature in this section will survey the range of existing real world applications. Some cases have already been implemented and evaluated for impact. Others are theoretical applications that have been researched and tested to yield impact.

When the VR market was just newly emerging, Biocca and Levy (1993) predicted that the final destination of VR would be as a communications medium. This book chapter on VR applications for communications explores ways that VR could be used for traditional domains of entertainment, through which human communication could be improved. Potentials in various ways of storytelling are discussed, including the use of dramatic narratives and generating

emotional responses. The immersive and interactive power of VR could allow users to experience and live through stories from a first-person perspective, through various different perspectives. The authors also points out some issues with this outlook, as classic theories of narratives relies heavily on control over characters, but as the main character is shifted to the individual user, this becomes difficult to control. In discussion of VR applications in communications for journalism at the level of telepresence, mass medium characteristics are suggested for maximum impact (Biocca & Levy, 1993, p. 135).

The authors of the paper “Nonprofit Fundraising with Virtual Reality” were interested in exploring the use of VR in nonprofit fundraising, particularly due to the rapid increase of nonprofits and fundraising competition around the world (Yoo & Drumwright, 2018, p. 12). Social presence as described in the Social Presence Theory is also similar to the sense of presence typically described in conjunction to VR experiences, which is predicted to prompt empathy, and mediate donation intention (Yoo & Drumwright, 2018, p. 14-16). Recent fundraising trends that encourage introspection upon the donor also further align with the immersive and interactive nature of communicating through the VR platform (Yoo & Drumwright, 2018, p. 12). A study was conducted that examined the utilization of VR as a digital fundraising tool. Yoo and Drumwright were interested in the differences between the two mediums of VR and regular 2D media, and their effects on perceived vividness, perceived interactivity, social presence, and donation intention. All participants watched a video of the Syrian refugee camp created by UNICEF Korea. Half of the participants viewed the video via a tablet, for a 2D 360-degree VR experience. The other half of the participants viewed the video via a 3D head-mounted display (HMD), with a mounted phone. Results were measured with Likert-type scales, which used behavioral intention and social presence survey items adopted from relevant previous research. Results showed significant differences between the 3D VR and 2D Tablet in all four of the previous mentioned factors (See Appendix E). The 3D head-mounted display (HMD) had a significant effect on perceived vividness and interactivity, the two factors that mediate telepresence. The 3D HMD also demonstrated significant positive effects on donation intention (Yoo & Drumwright, 2018, p. 19). In addition, social presence was higher in the 3D HMD condition than the 2D Tablet condition, and was also the mediator between the type

of device and donation intention. This study's "findings indicated that social presence – the sense of being there with other people, interacting with them, and empathizing with their plight ... closes the social and psychological distance" between donors and beneficiaries (Yoo & Drumwright, 2018, p. 21).

The use of virtual reality systems to study media message effectiveness seems promising and appropriate for its needs (Borawska et al., 2018, p. 1620). Social campaigns can usually be used as a tool for creating and promoting positive social change (Borawska, Borawski, & Łatuszyńska, 2018, p. 1616). However, there have not been many proven ways of testing the social campaigns' different channels of media for effectiveness (Borawska et al., 2018, p. 1616). The conducted literature review showed that VR allows fully interactive and adaptive controls for experimentation, and is appropriate for the presentation of media messaging due to its multimodal integration of different channels of sensory and perception (Borawska, et al., 2018, p. 1623). It was also found that media messaging "experiments conducted with the use of VR can be more efficient than classic experiments, both in terms of quality and quantity" (Borawska, et al., 2018, p. 1623). An experiment for a social campaign promoting safe driving is used as an example in the study. The experiment was designed to examine whether the results aligned with what is suggested in literature, which is a curvilinear model between the intensity of negative emotions in the media, and its effectiveness of advertising (Borawska et al., 2018, p. 1621). It was recommended to be conducted in future studies.

VR environments are being used to support more ways and channels of creating engaging and interactive educational experiences. Eschenbrenner, Nah, and Siau (2008) surveyed relevant literature and assessed the impact that virtual reality technology and environments currently have on education. The paper identified the application, benefits, and issues of the utilization of VR in education through the literature review. One of the greatest benefits of integrating VR into education is the capacity of being able to both replicate environments and create new environments for individuals to interact with (Eschenbrenner, Nah, & Siau, 2008, p. 95). Previous studies have shown benefits of virtual environments, including the opportunity to "experiment without concern for 'real-world repercussions' and being able to 'learn by doing'" (Eschenbrenner et al., 2008, p. 95). Thus, a table was created that charted examples of

educational applications in 3D VR environments for higher education, which was divided into: 1. Replicating reality, 2. Developing novel space, and 3. Replicating reality and developing novel space. Issues that were considered included technological issues, which include the capacity for hardware; the costs of equipment, which is a common concern for any technological implementation; and user adoption, which comes from a lack of experience in the learners. Last but not least, opportunities were derived from the VR world's existing capabilities and experiences (Eschenbrenner et al., 2008, 103). Taken from previous literature and applied into application to 3D virtual world environments, the integration of VR affords the following: Collaboration and cooperative activities allow connections between people; environment allows viewing creations from multiple perspectives; creating simulations allow opportunities to understand entire dynamic relationships (Eschenbrenner et al., 2008, p. 104). In the process of applications, the paper suggests to take into account for: "proper training and orientation, appropriate strategies for integration, and criteria for determining value-added activities" (Eschenbrenner et al., 2008, p. 106).

The mission for Rosenberg, Baughman, and Bailenson's study was to examine the use of VR and likeliness to engage in prosocial behavior (Rosenberg, Baughman, & Bailenson, 2013). The study analyzed the effects of virtual superpowers on individuals' likeliness to engage in prosocial behavior. The ideation of the study originated from recent studies of how playing prosocial video games on platforms such as console games and computer games, "can enhance empathy, and immersive virtual reality appears to be at least equally suited to understanding and promoting empathy" (Rosenberg, Baughman, & Bailenson, 2013, p. 2). Studies have also been done showing higher likeliness in exercising after individuals viewed themselves exercising in virtual reality (Rosenberg et al., 2013, p. 2). The authors created a classic 2x2 design experiment, where individuals were immersed in virtual reality, with either the superpower ability of flight, or flight as the passenger of a helicopter. This was crossed with an assigned activity of either to helping find a diabetic child in need of insulin, or touring a virtual city. Following the virtual reality activity, the experimenter purposely, but seemingly knocks over a cup of pens by accident, which by design is an opportunity for participants to react by helping the experimenter pick up the pens. The participants then took a group of surveys to conclude the experiment. It

was predicted that those who were given the superpower of flight, and those who were tasked with helping the diabetic child, were more likely to help pick up the pens. Results showed a significant difference in how long it took individuals to react and help, with the superpower flying participants helping more quickly than the helicopter participants (Rosenberg et al., 2013, p. 7). Flyers also picked up significantly more pens than helicopter riders (Rosenberg et al., 2013, p. 7). However, there was no significant effect of different task type on helpful behavior (Rosenberg et al., 2013, p. 8).

De la Peña's research team explored the use of VR immersive journalism. Immersive journalism is a form of media that has been explored to allow first-person experience of news stories and events. The fundamental idea is that through utilizing immersive journalism, participants will experience "unprecedented access to the sights and sounds, and possibly feelings and emotions that accompany the news" (De la Peña et al., 2010, p. 291). The group of researchers designed a fully immersive virtual reality scenario that simulated recent news of detainees held at Guantanamo Bay Prison. The experience used avatars set in a pose similar to reported stress positions of detainees, which was first viewed from a third person perspective, then moved to first person perspective. This shift is important due to research that shows the tendency for people to respond to virtual environments and situations as if they were real, which surprisingly happens even when the level of realism in visual appearance is heavily reduced (De la Peña et al., 2010, p. 293). Audio was also included that simulate interrogation in the next cell. Due to ethical and psychological concerns, experiments were not used in this study. Participants were recruited with full knowledge and warning of an unpleasant experience, and freedom to stop whenever needed. Head movement tracking HMD and heart rate monitors were used. Post-experiment, researchers interviewed participants, which revealed how "first-person perspective within the virtual body, plus the correlated head movements and the correlated breathing, might lead to a sense of ownership over the virtual body" (De la Peña et al., 2010, p. 297-298). The researchers conclude that the use of immersive journalism offers a profoundly different and otherwise unachievable way for individuals to experience and understand current news and events (De la Peña et al., 2010, p. 300).

The purpose of Behm-Morawitz, Pennell, and Speno's (2016) study was to examine the potential of using virtual racial embodiment to reduce racial bias against minority groups. Previous research generally supports the use of digital gaming applications (apps) for reducing bias (Behm-Morawitz, Pennell, & Speno, 2016, p. 396). Various studies have shown that interactions with virtual reality avatars, or virtual embodiment, can influence behavior and perceptions in real life (Behm-Morawitz et al., 2016, p. 396). The researchers conducted a lab experiment to test the short-term effects of virtual racial embodiment through virtual avatar gameplay. Players were instructed to create either a Black avatar or White avatar that matched their sex, and use this avatar to play "The Sims Social" for 30 minutes. This game allows players freeplay that simulates activities in everyday life, using the avatar that they have created. The game play time is followed by online "survey questions that asked about self-presence, avatar liking, game performance, game experience, political orientation, and race-related beliefs" (Behm-Morawitz et al., 2016, p. 406). The Massey and Martin NIS Skin Color Scale was used to prime race, and also to measure both the player's own skin color and their avatar's skin color (Behm-Morawitz et al., 2016, p. 406). The factor for race related beliefs was measured with Likert scale that asked participants to indicate levels of representation of characteristic, chosen to reflect common negative stereotypes of African Americans (Behm-Morawitz et al., 2016, p. 407). The factor for race-related policy beliefs was also measured with Likert scales, which asked participants how much they agreed with items regarding policies, including pro-minority policies. The results of the study showed that "creating and embodying a Black avatar produced more favorable belief about African American men, but not African American women, and greater support for 'pro-minority' policies in comparison to creating and playing a White avatar" (Behm-Morawitz et al., 2016, p. 396). The research suggests that digital games with such design can allow people to have physical and interactive perspective-taking experiences, and provides an immersive approach to prejudice reduction (Behm-Morawitz et al., 2016, p. 414).

VR as a Method

This section will discuss virtual reality as a method, examining ways of integrating VR into the nonprofit space. A survey of existing nonprofit VR projects found similarities in outsourced

content creators and a structure of partnerships. Literature will identify and explore benefits of the existing method of partnerships between VR content creators and organizations founded on social causes. Systematic and established methods and effects for developing applications for both business and social impact are examined. The reviewed literature is also focused to delve in and investigate the previously mentioned challenges (Fox, 2009) that lay between virtual technology and the social sector.

In a 2000 article on creating value through the intersection of businesses and the social sector, authors Sagawa and Segal talk about how this model can reshape the way that communities approach social challenges. More recently, there has been evidence of the model being more than a temporary trend, and becoming a paradigm that benefits both parties (Sagawa & Segal, 2000, p. 105). Some previous traditional barriers exist that usually prevent collaboration across sectors. Traditionally, the for-profit and nonprofit sectors only interacted with one another on a monetary basis. Nonprofits only saw their counterparts as potential funding sources that helped diversify revenue. While private “businesses expect all partners to provide value, social sector organizations frequently expect businesses to help them further their social mission without benefiting themselves” (Sagawa & Segal, 2000, p. 111). Something that sets the foundation for collaboration is that over the last few decades, the for-profit and nonprofit sectors now face common challenges in the general economic and social issues in the United States (Sagawa & Segal, 2000, p. 106). Technology has changed both the business and nonprofit environment, opening opportunities in investment and growth. For nonprofits, technology has been able to increase access and services. Although, the challenge of the high costs of tech keeps nonprofits from being affected as much as their private sector counterparts. This calls for strategies that involve forming alliances, which has a positive potential for both sectors. The challenge now is that the two sectors form alliances with different approaches (Sagawa & Segal, 2000, p. 108). The three challenges that the authors set for the private sector are: be about something larger, nurture and sustain social sector partners, and show and tell (sharing information and transparency) (Sagawa & Segal, 2000, p. 116). The three challenges for the nonprofits are: involve others meaningfully in what you do, specialize but don’t compartmentalize, and be a visionary organization (Sagawa & Segal, 2000, p. 118). The article

concludes by inviting the reader to be proactive in breaking down traditional barriers and creating connections between sectors (Sagawa & Segal, 2000, p. 120).

In the article by Watson, Wilson, and Macdonald breaks down “Business-Nonprofit Engagement in Sustainability-Oriented Innovation: What Works for Whom and Why?” (2018). Sustainability-oriented innovation (SOI) is a term used describe new and creative designs that are holistic, in that the objective of these innovations “involves changing products, processes, organizations and wider systems to deliver environmental, social and economic value” (Watson, Wilson, & Macdonald, 2018, p. 1) . The authors in this study explore partnerships where SOIs engage both businesses and nonprofits. Five case studies were considered, examined, and analyzed. A total of 30 interviews were conducted, which were supplemented with the analysis of public information. (Watson et al, 2018, p. 3) Findings from the research were organized into a context-intervention-mechanism-outcome (CIMO)-logic framework. This framework is broken down into three sections: “the stakeholder engagement interventions (“what”) that facilitates value outcomes (“works”) via different mechanisms (“and why”), depending on the context in which the engagement takes place (broadly, “for whom”) (Watson et al, 2018, p. 3). Two types of value creation systems that were observed to work best were: when partners exchanged resources, and when resources were recombined to create new value (Watson et al, 2018, p. 4). The complexity of the logic framework was not translated well into the simple chart (See Appendix F).

Researchers Austin and Seitanidi propose a total of four components of a partnership framework in their two-part article: “Collaborative Value Creation (CVC): A Review of Partnering Between Nonprofits and Businesses” (2012). The purpose of the review is to identify and develop the most effective ways for nonprofits and business to co-create economic, social, and environmental value. The four resulting CVC components provide new language and ways for assessing value co-creation.

1. CVC Component 1: The Value Creation Spectrum introduces terms four varying types of value. The spectrum ranges from sole creation to co-creation: associational value,

transferred resource value, interaction value, and synergistic value (Austin & Seitanidi, 2012, p. 730).

2. CVC Component 2: The Collaboration Stages shows varying types of collaborative relationships. The continuum ranges between four stages, from basic to advanced: philanthropic, transactional, integrative, and transformational (Austin & Seitanidi, 2012, p. 743).
3. CVC Component 3: The Partnership Processes breaks down the collaborative partnerships into the two general stages of: Partnership Formation and Selection, and Partnership Implementation, which includes design and operations, as well as institutionalization. Each of these stages are built off of the previous two CVC Components, with implication that partnerships and value creation increases in value, as collaboration moves towards the synergistic and transformational stages (Austin & Seitanidi, 2012, p. 931).
4. CVC Component 4: The Collaboration Outcomes are examined and reevaluated in partnerships. Cost and benefits in nonprofit-business partnerships need to shift from the mindset of solely social partnerships to also strategic partnerships. In addition, “reconfiguring the meaning of financial value by incorporating social and environmental value is of critical importance” as well (Austin & Seitanidi, 2012, p. 944).

Traditionally, business-nonprofit partnerships are understood as donor-beneficiary relationships. In the article “Business-Nonprofit Partnerships: Do Their Effects Extend Beyond the Charitable Donor-Recipient Model?”, researchers Sanzo, Alvarez, Rey, and Garcia (2015) explores beyond the common perception of this types of partnerships. Data was collected across a sample of 325 Spanish foundations, randomly selected from the global census of 9,050 Spanish foundations (Sanzo et al, 2015, p. 390). Empirical research was conducted via emailed questionnaires, each completed by a leader from the selected foundations. Survey indicators were based on literature found in fields of relationship marketing and business-nonprofit partnerships (Sanzo et al, 2015, p. 390). Findings showed support for stable relationships based on the following variables of: greater perceived value, communication, lower conflict, trust, and

commitment (Sanzo et al, 2015, p. 392). Results suggest that in order to engage in high level partnerships that includes social innovations, nonprofits need to go beyond the typical money-based partnerships. Business-nonprofit partnerships need to involve both parties through means of “specialized resources and capabilities that help the partners improve knowledge sharing” (Sanzo et al, 2015, p. 393).

Research Questions

In the survey of literature, VR technology has shown to possess characteristics with potential for social good. Examining existing examples and case studies have also show existing potential. However, nonprofits have still been behind for-profits in the use of VR. This may be due to a lack of interest or financial support. Further exploration will be conducted through the following three research questions,

1. What is the current perspective and views on the use of VR?
2. What are reasons why nonprofits do not use VR?
3. What are effective and strategic ways of adopting the use of VR in nonprofits?

Section 3. Methods and Approaches

Participants

Primary data was collected utilizing the qualitative method of expert interviews for this study. A total of six people were interviewed for this study. All interviewees were contacted personally by the primary investigator, and showed interest in the topic. All agreed to be interviewed for the purpose of the paper. Interviewees were initially planned to be only nonprofits with current projects utilizing virtual reality. However, upon further consideration, another set of interviewees were added in order to include nonprofits with no projects utilizing virtual reality. Five interviewees were nonprofit leaders – three currently working with VR, and two not currently working VR. All nonprofit leaders provided information based on their organization, which provided a wide range broad spectrum sample of nonprofit types. A virtual reality media content creator was also interviewed, for insights from the content creators’ perspective. All have consented to their responses being used for the purpose of this project.

This record of interviewees includes basic information relevant to the study. The list is compiled in chronological time of contact, irrelevant to the results of the study.

Table 1. List of Interviewees

Interviewee	Title	Organization	VR usage
Brandon Graves	Associate Athletics Director, Development	University of San Francisco, Athletics	Using VR
David Knego	Executive Director	Curry Senior Center	Using VR
Toby Shorts	Senior Center Director	Curry Senior Center	Using VR

Julie Flygare	President, CEO	Project Sleep	Not using VR
Frank McCune	Senior Operations Manager	City Year Miami	Not using VR
Davis Shafer	Founder	VRESENCE	Content Creator

The following this a short background for each of the interviewees in relation to the research,

- Brandon Graves works with athletics fundraising at the University of San Francisco. The University’s facilities department currently provides VR resources to new capital campaigns, which includes the new basketball gym. The VR content is currently being used to showcase interactive architectural renderings of the completed new gym.
- David Knego works as the Executive Director at the Curry Senior Center. The center’s mission is to provide wellness, dignity, and independence for seniors. They serve seniors in vulnerable, low income, and homeless populations in San Francisco.
- Toby Shorts works as the Senior Center Director at the Curry Senior Center. The center partners with Zendesk to bring VR to seniors. This program is an entertainment activity for the seniors, allowing them to use technology to travel to different locations across the world.
- Julie Flygare works in advocating for awareness in sleep health and disorders at Project Sleep. The nonprofit pushes their mission through events, participating in campaigns, and providing scholarships to students.
- Frank McCune works in operations at City Year Miami. This AmeriCorps program harnesses the power of young people to help under-served schools across the nation reduce drop-out rates.
- Davis Shafer creates 360-degree VR content focusing on multi-cultural experiences.

Materials

All interviews were conducted in a semi-structured approach. This approach was selected due to the nature of this research project. It allows the researcher to have control over the general topic, while also maintaining the freedom of expression for the participants. This encourages the participants to provide more quality and in-depth thoughts. The resulting data from semi-structured interviews are also more accurate and reliable.

One interview was conducted in person, while the remaining four were conducted through audio phone call. The interview conducted in person was for one of the two nonprofits currently utilizing VR. It allowed the researcher to explore a hands-on approach research, and see how VR can be used in a professional setting for nonprofits and their stakeholders. Gaining an understanding of the situation and systems that the interviewee worked with led to better data collection and data analysis.

A framework of interview questions was designed with the intention of exploring the potential of adopting virtual reality in the nonprofit space. Questions were designed specifically for this study. Each category of interviewees was asked to answer different questions. The general framework of interview questions is as follows,

1. Nonprofit leaders who are currently using VR
 - i. Tell me about your projects. Are there any that has created social impact?
 - ii. How do you foresee it being used in the nonprofit sector? Would it depend on difference in type of organization?
 - iii. What are some challenges you have faced while using VR? Challenges you foresee for the sector?
2. Nonprofit leaders not currently using VR
 - i. How do you foresee it being used? (Why would you use it?)
 - ii. What are some challenges you foresee?
 - iii. What would prevent you from using it? (Why wouldn't you use it? Why are you not using it?)
3. VR Content Creator

- i. Tell me about your projects. Are there any that has created social impact?
- ii. How is VR currently being used in the nonprofit space? How do you foresee it being used in the nonprofit space?
- iii. What are some challenges for the integration of VR in the nonprofit space?

Interviews generally lasted an averaged 30-45 minutes. Notes highlighting key conversation points were taken during the interview, as well as after the interview. Time was set aside for further reflection of data after each interview. Reflective memos were created after each interview, including any identified key themes, surprising and unexpected responses that arose. These memos also included the general direction of interviews, and any significant insights and conversation points. After all interviews were conducted, all of the data is reviewed, analyzed, and key themes were synthesized and coded.

Section 4. Data Analysis

Collected data and data analysis are presented in the same chapter. Your data should be presented in their analytical format with the elaborated tables, charts and illustrations.

This is an example of a table in APA style (see Table 1).

Interviews were organized into three categories for thematic analysis – using VR, not using VR, and VR content creator. Two of the “using VR” interviewees – David Knego and Toby Shorts – both interviewed with the perspective of the VR being used at Curry Senior Center. As the interview results did not conflict, but complemented each other, the responses were synthesized for the purpose of the thematic analysis. This leaves one set of results for each organization interviewed. The following chart is a breakdown of organizations by category.

Table 2. Organizations by Category

Category	Total	Organizations	Interviewees
Using VR	2	University of San Francisco, Athletics	Brandon Graves
		Curry Senior Center	David Knego, Toby Shorts
Not using VR	2	Project Sleep	Julie Flygare
		City Year Miami	Frank McCune
VR Content Creator	1	VRESENCE	Davis Shafer

These categories will allow further data analysis, and a clearer understanding of each perspective. Being able to account for the differences in these three main categories will help further understanding of the results.

Results

The data collected was analyzed by using thematic analysis. This is a qualitative research method commonly used for analyzing semi-structured interviews. Thematic analysis goes through a process of examining the data multiple times, with a goal of identifying patterns that show up across the dataset. While keeping the main research questions in mind, each review of the data results in new levels of understandings. Thus, each review of the data brings forward new insight and repeating key themes.

There are several ways to physically go through and document this progress. This thematic analysis was organized visually mainly through the use of charts created with post-it notes. First, I familiarized myself with the raw data by reviewing the transcriptions and notes. Then, I read the raw data several more times, extracting repeating patterns, and coding them. Coding is the process of taking important parts of data, and using in short and meaningful terms to describe them. Groups of similar codes were then created into themes. The examining, coding, and identifying are repeated in order to fully and wholly representative set of themes. Finished themes were finally reviewed to make sure they are each purposeful and do not overlap. The following is a final set of themes identified through this thematic analysis,

Table 3. Thematic Analysis

Theme	Using VR	Not using VR	VR Content Creator	Total
1. Metrics	1	1	1	3
2. Funding	2	2	1	5
3. Technical Skill	2	2	1	5

4. Versatile Hardware	1	0	1	2
5. Customized Content	2	1	1	4
6. Access	1	1	1	3
7. Potential	2	2	1	5
8. Initial Hurdle	2	1	0	3

The following is each of the themes explained,

1. Metrics: Data analysis, or data driven work.
2. Funding: Nonprofit funding is limited. A VR project may not be priority, or may be too big of an investment to come out of the regular budget.
3. Technical Skill: No one in house at a nonprofit has the technical skill. Hiring someone with the technical skill in house is too costly. Hiring 3rd party VR content creating firms is mentioned.
4. Versatile Hardware: VR can be used across many different platforms. Compatibility, software that can be used with different devices during different occasions, and for different populations.
5. Customized Content: Software and content that is customized to the nonprofit's needs.
6. Access: Access to equipment. Nonprofits have to have gear and equipment appropriate for the content created. If content is created for certain target audiences, those populations need to have access to equipment as well.
7. Potential: Expressed general ideas and possibilities of utilizing VR in the nonprofit space, including but not limited to: content for different populations, different uses, and examples observed from existing projects. Mostly also accompanied with excitement and curiosity.
8. Initial Hurdle: Initially, using VR in the nonprofit is perceived as too far-fetched or intimidating. Nonprofit leader are not exactly sure where it begins or could look like in implementation.

Research Questions

In regards to current perspective and views on the use of VR, all organizations expressed a sense of potential. Like Project Sleep's Julie Flygare said, "there's just so much that it could be used for." Each of the participants brought up different uses of VR. Some mentioned potential uses that they've either heard or read about, others considered new ideas based on their own background and field of work. University of San Francisco's Brandon Graves worked with VR rendering of the new basketball stadium. He mentioned using the content mainly for donors and season ticket holders, but the possibility of also utilizing it to share momentum with potential student athletes. Both organizations currently using VR expressed a perceived initial hurdle in the use of VR. Curry Senior Center's David Knego mentioned that without Zendesk, their current program "would have seemed too far-fetched." USF's Brandon Graves also mentioned that some donors find the VR technology a little intimidating at first.

All five organizations across the different categories all identified both funding and technical skill as challenges. Nonprofit do not use VR due to both limited funding and limited skill in the area. In addition, a few also expressed an initial hurdle of general lack of knowledge and not knowing where to begin. For example, Project Sleep's Julie Flygare (not using VR) responded to the question "what would prevent you from using VR" with the single word "money" without hesitation. "Funding is limited" says Flygare. She also expresses her curiosity, but "don't even know enough about it to know what the challenges would be." Though City Year's Frank McCune (not using VR) is more familiar with the technology, similarly, he thinks "technical skill is a challenge from a logistical stand point." He also expresses that metrics would have to prove the benefits of VR for this use of funding.

For organizations currently utilizing VR, both expressed that their VR programs would not be in place without outside funding and technical support. For USF Athletics, the VR programs are funded by the school's facilities department. This hardware is a full VR set up at the university, and can also be physically set up in another space. The software content is created by a third party content creator, who stays in communication with them for updates and support. All of the customized content is available across various platforms, which allows flexibility in meetings without the full VR set up. For the Curry Senior Center, the company Zendesk partners

with the center to run the program. This is also a way for Zendesk to give back to the community. Director Toby Shorts believed in the power of partnerships, saying “you have to find partners who are willing to provide the resources.” Zendesk brings in all of the needed equipment for the monthly program. The content used is all existing content, which allow seniors virtually visit and tour locations around the world. Director Toby Shorts also expressed interest in customized content that could address special populations, such as multi-lingual and those in the LGBTQ+ community.

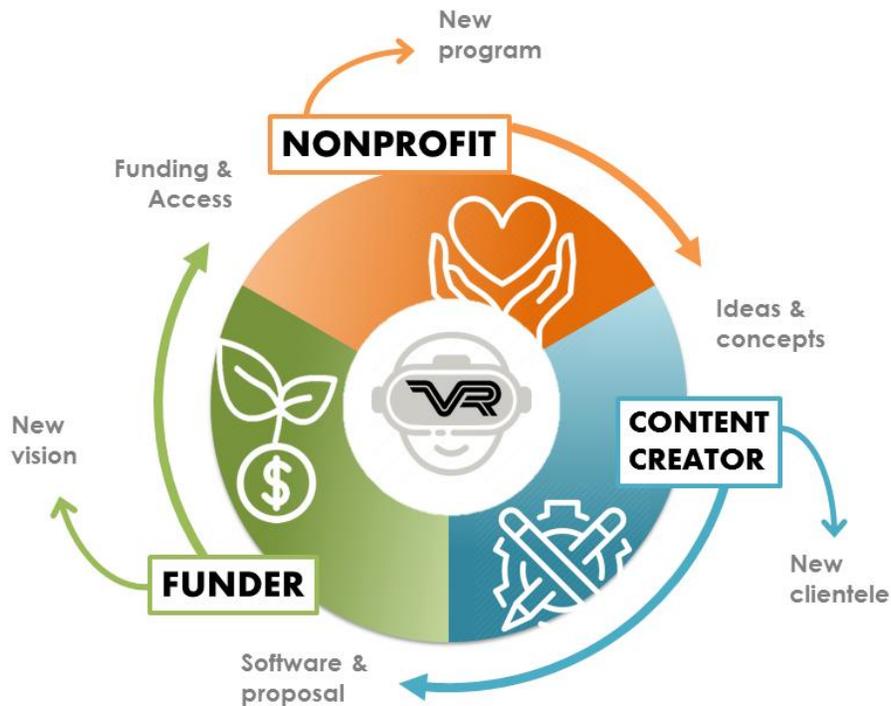
Section 5. Implications and Recommendations

As shown in the literature review and research results, many components of VR make it appropriate for use in the nonprofit space. Literature showed that the positive effects of VR are evident at all levels, through: background, object, application, and method. VR as an object enhances awareness (McRoberts, 2017), stimulates emotions (Shin, 2018), and leads to higher levels of empathy and responsibility (Kandaurova & Lee, 2018). VR as an application helps close social and psychological distance (Yoo & Drumwright, 2018) and understand dynamic relationships (Eschenbrenner et al, 2018). It also increases the likeliness for individuals to take action and engage in prosocial behavior (Rosenberg et al, 2013). VR as a method through partnerships helps create value through the intersection of the private and social sectors (Watson et al, 2018) (Austin & Seitanidi, 2012), and can reshape the way that communities approach social challenges (Sagawa & Segal, 2010).

Primary research findings showed a set of themes based on interviews exploring the potential of adopting VR into the nonprofit space. One important point of intersection between the literature review and primary research for the purpose of this paper is the two hindrances of VR in social science (Fox et al, 2009); financial funding and technical skill are the two major challenges to adopting VR in the nonprofit space. In conjunction to the implications of VR as a method through partnership, it is recommended that nonprofits collaborate with funders and VR content creators and each tackle their own areas of expertise.

1. Cross Sector Co-creation Partnership

Figure 2. The Trinity Partnership Co-creation Model



This recommended model uses the method of partnerships, as seen in both the literature and interviews. The three key co-creators are:

- Nonprofit organization
The nonprofit's expertise is in the social perspective, and knowledge of the needs of the populations they serve. Nonprofits organizations understand what needs to be addressed in the community.
- Content creator
The VR content creator's expertise is in technical skills, and knowledge of the range of VR technology and programs used in creating programs. VR content creators can use the nonprofit's ideas and concepts, and visualize them into potential VR content. Content creators understand the hardware and software that can be utilized and programmed to meet the appropriate needs.

- Funder

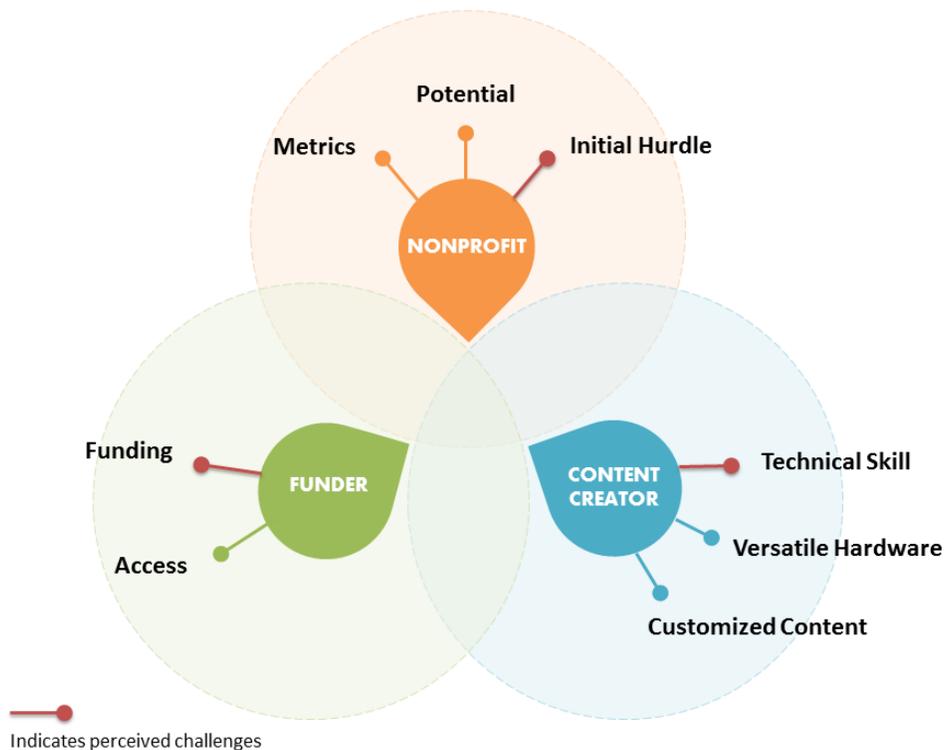
The funder’s expertise is in financial and resource capacity. Funders and philanthropists need to be engaged collaborators, involved with the decision making.

These key stakeholders make up the key factors for nonprofit VR program success.

Unlike traditional business-nonprofit partnerships, this extends beyond a donor and recipient relationship. The model is based on the value of co-creation. The co-creators of nonprofits, funders, and VR content creators, to each use their expertise and specialized resources to create new value. The center of this model represents the co-created VR program. All three parties are fully engaged and all benefit from the partnership. Though the general concept is for nonprofits to initiate based on their needs, any partner could do the same as well. As this is an all engaging cycle, there is no true designated beginning or end.

2. Distribution of Skills

Figure 3. Themes and Challenges



Beyond the outcome of shared co-creation, the strength of The Trinity Partnerships Co-creation Model is in the shared expertise and combined capacity. This allows a distribution of tasks and challenges. This Trinity Partnerships Co-creation Model addresses both the challenges that have been evident in literature review, as well as results that have arisen through primary research. Eight themes were extracted from the primary research interviews. Two of these also overlapped with literature as challenges. The set of eight themes were all plotted. The themes are plotted to fall directly under the capacity of the appropriate partner. This model allows an even distribution of all foreseeable aspects that need to be addressed. It is recommended for each of the three stakeholders to tackle one of the challenges that arose from the lit review and interviews;

- Nonprofit organization

The initial hurdle is a challenge that could be overcome by the nonprofit with some research and exploration. Nonprofits interested in adopting VR should be initiating the project. It is common for nonprofits to feel a general sense of confusion towards how VR is used, as well as where to begin with a nonprofit VR program. This model suggests that nonprofits can take the potential and ideas that have been lightly developed, and overcome the initial hurdle by reaching out to content creators and funders to collaborate with.

- Content creator

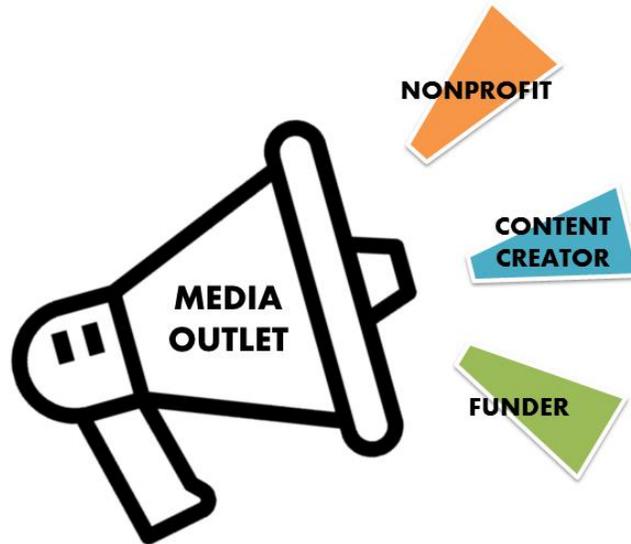
External consultants not only have the technical skill, but also all the equipment necessarily to overcome this challenge. As professional content creators, they can take the nonprofit's ideas further and develop realistic proposal. Compatibility of the level of versatile hardware needed, as well as customized software content can all be considered and explored with the content creator.

- Funder

Funders and donors are known to be the source of financial support for nonprofit work. Beyond this, this model emphasizes the collaboration and engaged decision making. This will allow flexibility in the project, depending on the need of access to various types of equipment and resources. As mentioned in literature, this moves from traditional sole creation to co-creation, with value creation as the outcome.

3. Notable Supplemental Recommendation

Figure 4. Media Outlets



A suggestion worth noting is the supplemental use of media outlets. This was first brought up by the Curry Senior Center, and later echoed by VR Content Creator Davis Schafer. Schafer believes that the accessibility of VR could be extended through media. He gave the example of widely publishing QR codes that could bring up websites showing 360 degree VR on mobile devices. This could be especially useful in the case of need for exposure, for example in marketing or fundraising. The Curry Senior Center experienced a successful use of media outlets for their VR programming. Their use of VR was published in media groups such as the Seattlepi and SF Gate. As a result, metrics showed that attendance at the senior center increased.

Section 6. Conclusion

Discussion

Due to the requirements and nature of this capstone project, the small sample size of the study was a limitation. The project recommended three interviewees, over fifteen individuals were contacted, and six responded and were ultimately interviewed. Many of the individuals contacted were VR content creators and nonprofit leaders. The lack of response could be due to a lack of interest in the adoption of VR in nonprofits. At the time the research was conducted, research in nonprofit VR was just surfacing. The number of VR projects created with a focus on social good was also limited. Future studies could potential study existing VR co-creation partnerships, and how each key co-creator is involved in the process of integration.

Participant demographics were also not collected due to this limitation. Demographics such as: age group, sex, gender identity, ethnicity, number of years in nonprofit, etc, would all be meaningful data in greater quantities. Future studies could include demographic surveys and look for correlations between themes and other variables collected.

Last but not least, not all interviews were recorded for this study. Notes were taken during all interviews, which have its limitations in both research exploration and reliability. A few participants requested to not be recorded. Others were not recorded due to technical challenges. Future studies would ideally have a dedicated and reliable recording device, and be IRB approved to guarantee data security and confidentiality.

Conclusion

Current events have shown a need for more virtuality in the way that humans interact with each other. Contrary to popular belief, virtuality does not replace reality, but is a tool that could extend our reality. Virtual Reality has become a tool across for-profit and nonprofit sectors alike.

Although nonprofits are usually hesitant to dive into adaptation of new technology, VR has proved its value and benefits in the literature and research previously presented. With the presented research findings and models, more nonprofits could consider harnessing the unique tool that is VR technology.

References

- Austin, J. E., & Seitanidi, M. M. (2012). Collaborative Value Creation: A Review of Partnering between Nonprofits and Businesses: Part I: Value Creation Spectrum and Collaboration Stages. *Nonprofit and Voluntary Sector Quarterly*, 41(5), 726-758.
<https://doi.org/10.1177/0899764012450777>
- Austin, J. E., & Seitanidi, M. M. (2012). Collaborative Value Creation: A Review of Partnering Between Nonprofits and Businesses. Part 2: Partnership Processes and Outcomes. *Nonprofit and Voluntary Sector Quarterly*, 41(6), 929-968.
<https://doi.org/10.1177/0899764012454685>
- Behm-Morawitz, E., Speno, A. G., & Pennell, H. (2016). The effects of virtual racial embodiment in a gaming app on reducing prejudice. *Communication Monographs*, 83(3), 396-418. <https://doi.org/10.1080/03637751.2015.1128556>
- Biocca, F., & Delaney, B. (1995). Immersive Virtual Reality Technology. In F. Biocca & M.R. Levy (Eds.), *Communication in the Age of Virtual Reality* (57-124). Hillsdale, N.J.: Routledge.
- Biocca, F., & Levy, M.R. (1993). Communication Applications of Virtual Reality. In F. Biocca & M.R. Levy (Eds.), *Communication in the Age of Virtual Reality* (127–157). Hillsdale, N.J.: Erlbaum.
- Borawska, A., Borawski, M., & Łatuszyńska, M. (2018). The Concept of Virtual Reality System to Study the Media Message Effectiveness of Social Campaigns. *Procedia Computer Science*, 126(2018), 1616–1626. <https://doi.org/10.1016/j.procs.2018.08.135>
- Brinker, S. (2016, November 6). *Martec's Law: the greatest management challenge of the 21st century*. Chief Martec. <https://chiefmartec.com/2016/11/martecs-law-great-management-challenge-21st-century/>

- Charities Aid Foundation of America (2020), Survey shows a third of nonprofits could close within a year due to COVID-19. *Nonprofit Business Advisor*, 2020(371), 6–8.
<https://doi.org/10.1002/nba.30817>
- de la Peña, N., Weil, P., Llobera, J., Giannopoulos, E., Pomés, A., Spanlang, B., Friedman, D., Sanchez-Vives, M.V., & Slater, M. (2010). Immersive Journalism: Immersive Virtual Reality for the First-Person Experience of News. *Presence*, 19(4), 291-301.
https://doi.org/10.1162/PRES_a_00005
- Eschenbrenner, B., Nah, F. F. H., & Siau, K. (2008). 3-D virtual worlds in education: applications, benefits, issues, and opportunities. *Journal of Database Management*, 19(4), 91-110. <https://doi.org/10.4018/jdm.2008100106>
- Evans, C., & Lewis, J. (2018). *Analysing semi-structured interviews using thematic analysis: Exploring voluntary civic participation among adults* [Data set]. SAGE Publications.
<https://dx.doi.org/10.4135/9781526439284>
- Fox, J., Arena, D., & Bailenson, J. N. (2009). Virtual Reality: A Survival Guide for the Social Scientist. *Journal of Media Psychology: Theories, Methods, and Applications*, 21(3), 95-113. <https://doi.org/10.1027/1864-1105.21.3.95>
- Tankovska, H. (2020). *Augmented reality (AR) and virtual reality (VR) market size worldwide from 2016 to 2020* [Data set]. Statista. <https://www.statista.com/statistics/591181/global-augmented-virtual-reality-market-size/>
- Alsop, T. (2020). *Augmented and virtual reality (AR/VR) forecast spending worldwide in 2020 (in billion U.S. dollars), by segment* [Data set]. Statista.
<https://www.statista.com/statistics/737615/ar-vr-spending-worldwide-by-segment/>
- Kandaurova, M., & Lee, S. H. (2018). The effects of Virtual Reality (VR) on charitable giving: The role of empathy, guilt, responsibility, and social exclusion. *Journal of Business Research*, 100, 571-580. <https://doi.org/10.1016/j.jbusres.2018.10.027>
- Lanier, J., & Biocca, F. (1992). An insider's view of the future of virtual reality. *Journal of Communication*, 42(4), 150-172. <https://doi.org/10.1111/j.1460-2466.1992.tb00816.x>

- McRoberts, J. (2017). Are we there yet? Media content and sense of presence in non-fiction virtual reality. *Studies in Documentary Film*, 12(2), 101–118.
<https://doi.org/10.1080/17503280.2017.1344924>
- Paiva, A. (2011). Empathy in social agents. *International Journal of Virtual Reality*, 10(1), 65–68. <https://doi.org/10.20870/IJVR.2011.10.1.2794>
- Prescient & Strategic Intelligence (2018). *Augmented Reality and Virtual Reality Market by Devices, by Component, by Application by Geography - Global Market Size, Share, Development, Growth, and Demand Forecast 2013 – 2023* [Data set]. Research and Markets. https://www.researchandmarkets.com/research/8q39tk/global_augmented?w=4
- Rosenberg R.S., Baughman S.L., & Bailenson J.N. (2013). Virtual Superheroes: Using Superpowers in Virtual Reality to Encourage Prosocial Behavior. *PLoS ONE*, 8(1): e55003. <https://doi:10.1371/journal.pone.0055003>
- Sanzo, M. J., Álvarez, L. I., García, N., & Rey, M. (2015). Business–Nonprofit Partnerships: Do Their Effects Extend Beyond the Charitable Donor-Recipient Model? *Nonprofit and Voluntary Sector Quarterly*, 44(2), 379–400. <https://doi.org/10.1177/0899764013517770>
- Sagawa, S., & Segal, E. (2000). Common Interest, Common Good: Creating Value through Business and Social Sector Partnerships. *California Management Review*, 42(2), 105–122. <https://doi.org/10.1177/000812560004200201>
- Shin, D. (2018). Full length article: Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior*, 78, 64–73. <https://doi.org/10.1016/j.chb.2017.09.012>
- Steuer, J. (1995). Defining Virtual Reality: Dimensions of Determining Telepresence. In F. Biocca & M.R. Levy (Eds.), *Communication in the Age of Virtual Reality* (33-56). Hillsdale, N.J.: Routledge
- Vaismoradi, M., & Snelgrove, S. (2019). Theme in Qualitative Content Analysis and Thematic Analysis. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 20(3). <http://dx.doi.org/10.17169/fqs-20.3.3376>

- Watson, R., Wilson, H. N., & Macdonald, E. K. (2018). Business-nonprofit engagement in sustainability-oriented innovation: What works for whom and why? *Journal of Business Research*. <https://doi.org/10.1016/j.jbusres.2018.11.023>
- Yoo, S.C., & Drumwright, M. (2018). Nonprofit Fundraising with Virtual Reality. *Nonprofit Management and Leadership*, 29(1), 11–27. <https://doi.org/10.1002/nml.21315>

Appendix A. Likely Range of Immersive Virtual Environments

Table 4.7 Likely Range of Immersive Virtual Environments

<i>Level</i>	<i>Characteristics</i>
Low level	<p>Sensory vividness: poor, nonimmersive or low resolution immersion mostly limited to visual and aural senses.</p> <p>Interactivity: poor to good, long lags, small movement volume, narrow range of input devices and applications.</p> <p>Sociability: most often restricted to a single user.</p> <p>Diffusability: tends to be good but will vary according to compatibility of the system and its user friendliness.</p> <p>Cost: relatively low, especially as the market matures.</p> <p>Possible markets and applications: arcades, video games, home consumers, “garage VR.”</p> <p>Evolution: likely to disappear as capabilities increase and prices decline.</p>
Midlevel	<p>Sensory vividness: immersive, fair to good sensory resolution, especially in the visual and aural sensory channels, but poor in tactile and proprioceptive channels.</p> <p>Interactivity: good range of input devices, but with noticeable lag and limitations. Broad range of interactive experiences.</p> <p>Sociability: multi-user capability, possible telecommunications capability.</p> <p>Diffusability: fair to good depending on market segment, but may be narrowly targeted.</p> <p>Cost: moderate to high. Affordable for institutions but prohibitive for individuals. Rental agreements may make it affordable as an entertainment system.</p> <p>Possible markets: engineering, telecommunication, medicine and rehabilitation, education, high-end consumer or consumer rental (e.g., location-based entertainment).</p> <p>Evolution: likely to become minimal acceptable level.</p>

High Level Sensory vividness: good to very good, high end of range. Well integrated support for tactile, force feedback, and other proprioceptive illusions. Emphasis on simulation.

Interactivity: wide range of input and output devices. Range of interactive experiences may be narrow due to high cost (e.g., high-end flight simulators).

Sociability: good to very good but dependent on need in application.

Diffusability: poor, likely to require highly specialized hardware, software, and programming support.

Cost: high to very high.

Possible markets: military and civilian flight simulators, military and industrial telepresence applications, high-end teleconferencing or location-based entertainment applications, scientific visualization, high-end medical and rehabilitation.

Evolution: will become *standard* level of VR. New high levels will incorporate more proprioceptive cues and other sensory interfaces.

Note. In all cases capabilities are rapidly increasing as costs decline. There is little likelihood of this trend changing.

Appendix B. Basic Criteria for Evaluating VR Platforms and Software

Table 4.6 Basic Criteria for Evaluating VR Platforms and Software

<i>Criterion</i>	<i>Description</i>
Sensory vividness	The capabilities of the base hardware and software, and not just the output devices, contribute to sensory vividness, a key component of the sense of presence. Sensory vividness includes such considerations as: (a) the number of sensory channels supported, (b) the sensory resolution within each sensory channel, (c) the level of coordination between sensory displays and illusions, and (d) realism.
Interactivity	Interactivity is also critical to the sense of presence. In VR the criterion can be defined as: (a) the number and forms of input and output, (b) the level of responsiveness to conscious and unconscious user actions and states, (c) the range of interactive experiences (including applications) offered by the system, and (d) conformance to user expectations.
Sociability	Sociability is defined as the number of users a system can support. The lowest level of sociability is the single user interacting with the contents of a virtual world. An example of a highly sociable system is the large military simulations (e.g, Simnet) that support hundreds of sites and users.
Diffusability	Diffusability is the likelihood that a system can be adopted and used by various business, educational, and personal users. Variables that can raise or lower diffusability include: (a) <i>hardware compatibility</i> : systems that run on computers that are commonly available in organizations (e.g., PC's & low end workstations) as opposed to those that require highly specialized computers (e.g., Pixel Planes); (b) <i>software compatibility</i> : systems that can import existing 2-D and 3-D models (e.g., CAD based models) are more likely to be diffused; (c) <i>Tool integration</i> : integrated systems with hardware support, modular software (i.e., applications) and catalogs of virtual objects and worlds are more likely to be diffusable; (d) <i>user friendliness</i> : systems that allow world building with minimal to moderate computing skills.
Cost	Cost is influenced by all of the variables above. We can anticipate the same pattern of development seen elsewhere in the computer industry: cost dropping as low-end systems "inherit" high-performance features previously available only on the most costly systems.

Appendix C. A two-tiered process of immersion

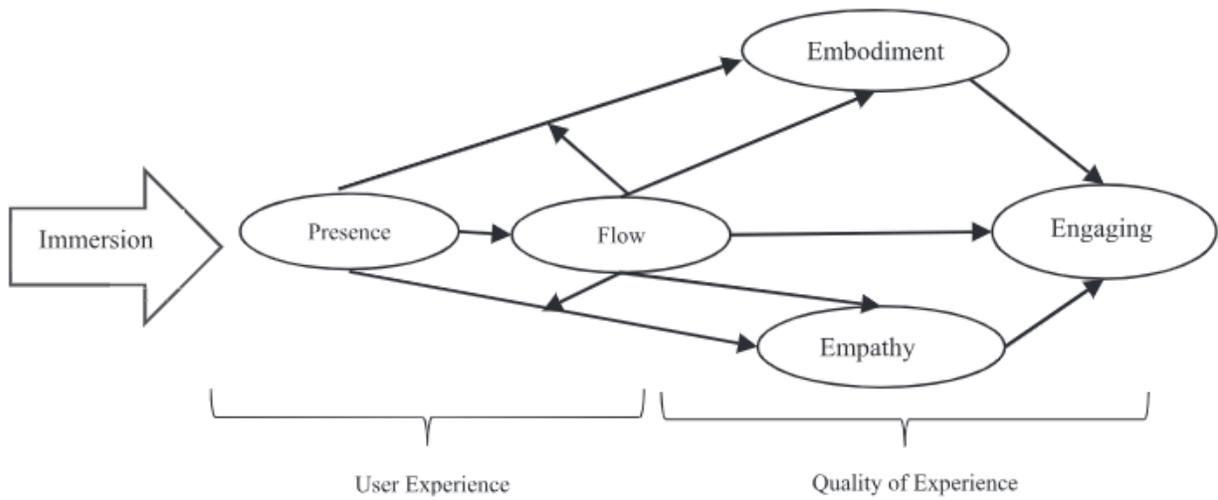
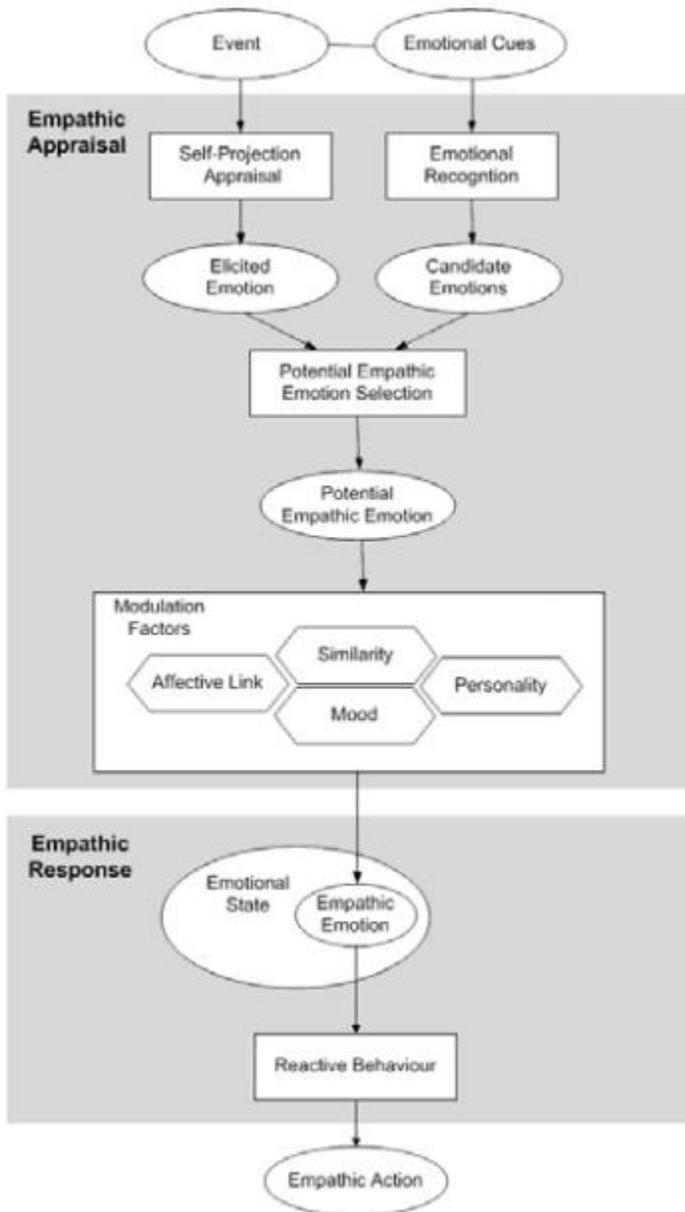


Fig. 4. A two-tiered process of immersion.

Appendix D. Empathic Appraisal and Response



Appendix E. The impact of medium

TABLE 3 The impact of medium

Measures	Tablet		Virtual reality (VR)	
	Mean	SD	Mean	SD
Vividness	5.13	.69	5.82	1.02
Interactivity	4.79	.91	5.43	.94
Donation intention	4.41	.31	5.48	.78
Social presence	4.22	.46	5.53	.40

Appendix F. CIMO-logic framework for business-nonprofit engagement in SOL

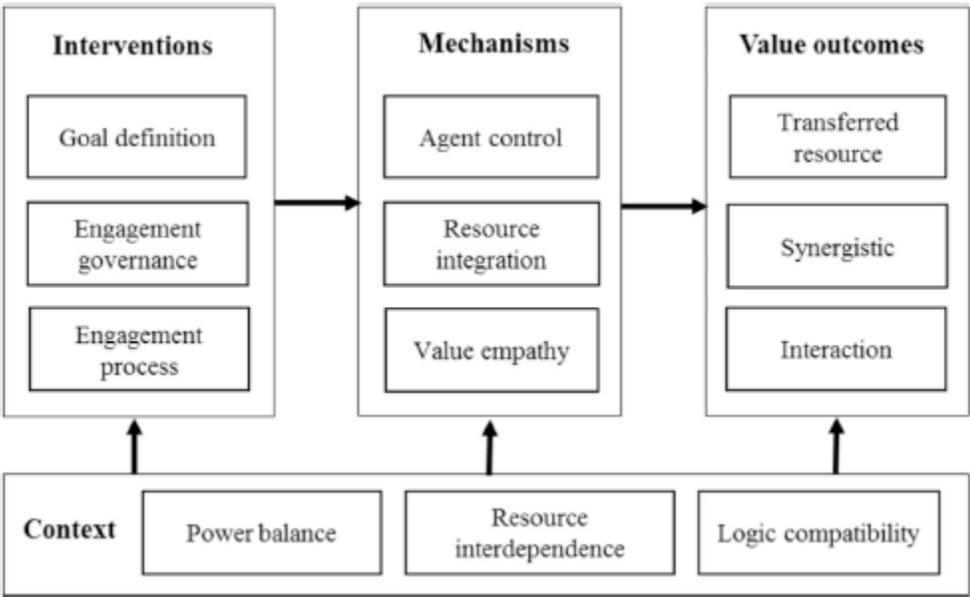


Fig. 1. CIMO-logic framework for business-nonprofit engagement in SOL.

Author's Bio

“Jenny” Jiefang Shen is a graduate student at the University of San Francisco, completing her Master of Nonprofit Administration. Shen is deeply passionate about service to community. She plans to bring the knowledge recently gained from school to implement at a purposeful workplace. Her favorite course in graduate school has been Social Impact Analysis, where she had the honor of helping the San Francisco Botanical Garden bring insight to their biggest annual event.

Shen has a long term goal of becoming a professor at a community college. There, she can stay rooted in the community while continuing her passion for teaching and research. Shen earned her BA in Psychology from UC Irvine. She plans on applying to Psychology PhD programs in Fall 2023. Her past research work includes: psychoacoustics, sleep, memory and development, and virtual reality. Shen is currently immersed in research topics on positive psychology and eco-psychology.

When Shen is not seen doing research or working in the community, she is probably out in backcountry. The Pacific Crest Trail is her second home.