



Addressing Emotions and Beliefs for Vulnerable Jobseekers with Virtual Reality

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Abstract

Virtual reality (VR) technologies have been shown to impact the affective and motivational dimensions of learning, for example increasing learners' enjoyment, confidence, and self-efficacy beliefs. While VR is increasingly being used for workforce development, research on these dimensions of learning in authentic workforce development contexts remains thin. This mixed-method case study addressed the need for more research on VR's affordances for engaging affective dimensions of learning. We investigated the impact of a job interview VR simulation on the emotions, confidence, and self-efficacy beliefs of jobseekers who have been impacted by the criminal justice system. By observing the implementation of this application in an authentic workforce development context, we also addressed questions about how VR use and facilitation vary among participants. We find compelling evidence that a VR job interview simulation tailored to the experiences of people impacted by the criminal justice system can alleviate some of the emotional toll the job search takes on this vulnerable population, but we did not find evidence of changes in their self-efficacy beliefs. We discuss ways participants described the simulation as authentic practice, and how its facilitation and use varied, emphasizing the importance of VR design as a tool within a broader instructional context.

Key words Virtual Reality · Workforce Development · Affective Dimensions of Learning

1 Introduction

Virtual reality (VR) technologies have a number of affordances for education and workforce development. The characteristics of the technology that immerse the user in a digital setting and allow for interactivity with virtual environments, objects, and people make immersive media powerful for learning. This includes visualizing unseen phenomena, situating learning in virtual contexts that feel real, practicing procedural skills in low-stakes environments, and tapping into learners' intrinsic motivation to engage

them (Dalgarno & Lee, 2010). For these reasons, a myriad of VR applications have been developed for workforce learning in recent decades and, as the technology becomes more cost effective and pervasive, new industries are looking to it as an important tool to enhance their workforce development programs (Xie et al., 2021).

One promising use of VR in workforce training is to engage the affective domain of learning, including emotional and motivational dimensions that are intertwined with cognition but often lacking in traditional instruction (Chaffar & Frasson, 2012; Martin & Reigeluth, 2013). VR can give users a strong emotional response including joy, fear, relaxation, awe, and curiosity (Chirico et al., 2017; Markowitz & Bailenson, 2021; Urban, 2022). Studies using VR for learning applications find it enhances motivational dimensions of learning, including intrinsic motivation and self-efficacy, or their belief in their own capabilities (Mayer et al., 2022; Queiroz et al., 2022), and specifically can increase confidence in workforce training (Abich et al., 2021). This study contributes to this line of research by exploring the impact of VR on such emotional and motivational dimensions of workforce development for jobseekers who have been impacted by the criminal justice system, a particularly vulnerable group who struggle with confidence in job interviews due to stigma of their backgrounds (Park & Tietjen, 2021).

Despite an increased interest in VR, research on its effectiveness for learning in authentic workforce development contexts remains nascent. The Immersive Learning Knowledge Tree initiative outlines how research on immersive learning has suffered from a techno-centric approach focused on devices, rather than “the actual uses, practices, and strategies taking place with immersive learning” (Beck et al., 2021, p. p.4). Reviews have found that most research on learning with VR has been conducted in lab experiments comparing VR to less immersive devices, has focused on gains in content knowledge retention or procedural skills, and without grounding its design in learning theories (Abich et al., 2021; Hamilton et al., 2021; Radianti et al., 2020). These studies find mixed results in terms of the impact of VR on learning (Wu et al., 2020), but more consistently document impacts of the technology on learners’ interest, attitudes, and enjoyment of learning over other devices (Huang et al., 2021; Makransky et al., 2019; Parong & Mayer, 2018). Additionally, studies of using VR for workforce training show that it increases learners’ confidence (Abich et al., 2021).

Therefore, questions remain about the most fruitful areas in workforce development to leverage the affordances of VR, as well as why their impact varies across contexts. We explored these questions by studying some of VR’s most promising affordances to address affective dimensions of workforce development for vulnerable jobseekers, namely their emotions and beliefs, and by looking at VR as a pedagogical tool within a broader instructional system. To do so, we conducted a mixed-method case study to investigate the impact of a job interview VR simulation on the emotions, confidence, and self-efficacy beliefs of jobseekers who have been impacted by the criminal justice system. By observing the implementation of this application in an authentic workforce development context, we also addressed questions about how VR use and facilitation vary among participants. The findings contribute to growing interest in using VR in workforce development by providing evidence on how learners experience such programs and suggesting ways the experiences can be more effectively incorporated in training programs. The study also contributes to the need for evidence on applications and practices of VR in authentic learning environments (Beck et al., 2021; Southgate, 2020).

2 Literature Review

2.1 Post-Incarceration Workforce Challenges

Getting a job is an important milestone for individuals who were formerly incarcerated or otherwise involved in the criminal justice system, as research shows a correlation between post-release employment and reduced recidivism (Lockwood et al., 2015). Yet of the more than 650,000 individuals released from prison every year in the US, it is estimated that two thirds are unemployed at any given time despite a strong desire to work (Carson et al., 2021; Wang & Bertram, 2022). People with criminal backgrounds face barriers to securing jobs due to a variety of factors, from lack of opportunities to gain experience, skills, and education to policies that prevent employers from hiring people with offenses on their records. In addition to these challenges, they face substantial stigma from employers and others in society.

Research has shown that overcoming the stigma of justice system involvement and being able to discuss it comfortably and confidently is a key part of successfully reentering the workforce (Park & Tietjen, 2021). Job interviews are one important context in which people impacted by the criminal justice system must explain their past. For example, social workers are trained in supporting formerly incarcerated individuals to prepare for anxiety-producing job interviews by “emphasizing how they have grown from their experience and what they would like to achieve in this new phase of their life” (Social Work License Map, 2021). Jobseekers’ beliefs, emotions, and confidence are important to being successful in interviews (Moynihan et al., 2003; Petruzzello et al., 2021; Tay et al., 2006), something with which people affected by the criminal justice system may particularly struggle.

2.2 Simulations for Job Interview Training

In workforce development, studies show that self-efficacy in interviewing, a person’s belief they can succeed in a job interview, can be improved by giving jobseekers practice and feedback (Petruzzello et al., 2021). Simulations have been used to help incarcerated individuals practice their job interviewing skills, such as the VR-Job Interview Training (VR-JIT) program. This computer-based program has increased participants’ confidence, interview skills, and employment outcomes (Smith et al., 2015). A recent study experimented with using the VR-JIT with incarcerated individuals and found positive impacts when used multiple times by participants at increasingly difficult levels (Smith et al., 2022). However, this program was not specifically tailored for justice-involved individuals to practice their specific challenges addressing their criminal record in an interview and has not been designed for use on a more immersive device like a VR head-mounted display.

2.3 Virtual Reality and Impacts on Emotions and Beliefs

VR is a technology that immerses users in an environment by surrounding them in a digital setting, typically with a head-mounted display, engendering a sense of “being there”

in a virtual place that is different from their physical location (Slater, 2009). This heightened immersion also provides users the ability to interact with objects and environments, situating learning in contexts and allowing for interactions that are difficult or impossible in typical classrooms (Dede, 2009). VR's affordances that make learners feel immersed in a task and give them agency over their actions and the environment can impact their self-efficacy beliefs, or their belief in their ability to achieve a goal, by giving them the feeling of having a mastery experience and of observing others deeply (Makransky & Petersen, 2021). VR has been shown to increase learners' self-efficacy in education and training programs (Abich et al., 2021; Hamilton et al., 2021).

VR has also been shown to consistently impact users' affective responses, including their mood, emotions, and interest (Jun et al., 2020; Markowitz & Bailenson, 2021). For example, VR experiences can evoke emotions such as joy, anger, and anxiety (Felnhofer et al., 2015), and can be used to make people feel relaxed (Serrano et al., 2016). VR is used for exposure therapy, in which people confront their emotions in response to phobias or trauma by engaging in virtual experiences that elicit and teach them how to manage them (Parsons & Rizzo, 2008). The effect of VR on participants' emotions may play an important role in how it can support jobseekers who have high levels of anxiety and low levels of self-efficacy, as studies suggest anxiety about the job search is related to jobseekers' self-efficacy (Deer et al., 2018). This may be helpful for people impacted by the criminal justice system, and computer-based simulations have decreased such participants' interview anxiety (Smith et al., 2022). The added emotional response and opportunity for mastery experiences in immersive VR holds promise to support vulnerable jobseekers to increase their confidence and self-efficacy in simulated interview practice.

While current evidence points to the promise of VR to increase learners' self-efficacy beliefs, attitudes, emotions, and interest, these learning domains have been less well-studied than cognitive and procedural skills (Hamilton et al., 2021). One of the challenges of studying the affective domains of learning with VR is how studies define and measure these constructs. For example, studies often measure self-efficacy in terms of the changes to learners' beliefs about their ability as defined by Bandura (1977) (e.g. Queiroz et al., 2022), while others refer to increases in learners' confidence (Abich et al., 2021; Smith et al., 2015). In some studies self-efficacy and confidence are used interchangeably while others have found them to be distinct constructs; such disagreements are often due to variation in how they are measured (Morony et al., 2013). Further, such beliefs can be influenced by a learner's positive or negative affective state, such as their enjoyment of an activity or their anxiety about a task (Bandura, 1977), which can also present challenges in measuring various types of outcomes related to the affective dimensions of learning.

2.4 Learning Design with Virtual Reality

While VR has affordances that can impact learners' beliefs, emotions, and learning outcomes, its effectiveness depends on how it is designed and implemented. Much research on learning with VR has evaluated the impact of hardware on learning outcomes by comparing a learning experience delivered on a VR headset to a different device like a

computer monitor (Abich et al., 2021; Hamilton et al., 2021; Radianti et al., 2020; Wu et al., 2020). However, recently more studies have focused on the design of learning experiences, such as incorporating more or less interactivity (Johnson-Glenberg et al., 2021; Petersen et al., 2022) as well as varying how information is presented (Moreno & Mayer, 2002). Other studies have focused on the design of the learning experience that includes activities conducted outside of VR, such as including a pre-training about the topic prior to using a VR application (Meyer et al., 2019) and adding reflective activities afterward (Parong & Mayer, 2018). These designs may facilitate best practices in experiential learning that allow learners to plan before and reflect after an experience (Kolb et al., 2014). Other studies have highlighted the importance of physical and social environments that provide people the conditions they need to learn from immersive experiences (Georgiou et al., 2021; Southgate, 2020), drawing attention to the importance of embedding VR within sound instructional design.

3 Research Questions

Based on this prior work, this study addresses gaps in the literature on using immersive technologies in workforce development, assessing a VR program that was implemented in an authentic workforce development program with vulnerable jobseekers and investigating its impact on emotions and beliefs related to the job search. Given the potential for VR to be a powerful tool for increasing learners' positive emotions, beliefs in their ability to succeed, and confidence in job interviewing, we asked how a VR simulation tailored to support jobseekers who have been impacted by the criminal justice system supported their workforce development. Specifically, we asked:

1. To what extent does participating in a VR job interview simulation decrease justice-involved individuals' negative emotions about their job search, and increase their positive emotions?
2. To what extent does participating in a VR job interview simulation increase justice-involved individuals' interview self-efficacy beliefs and confidence?
3. How do features of the VR application's design affect participants' emotions and beliefs?
4. How do features of the VR application's use, implementation, and facilitation of the program vary among participants?

4 Methods and Materials

To answer these questions, we conducted a case study of the implementation of Project OVERCOME, a VR application from Accenture that was piloted by Goodwill Industries International reentry programs in 2022. The case study employed concurrent mixed methods, in which both quantitative and qualitative data were collected at the same time (Creswell & Plano Clark, 2018). As a case study, the aim of this research is to explore the

experiences of this small sample to portray a rich picture of their experiences with and the impact of the VR program, without prioritizing causal inference and generalizability (Gerring, 2006). Our use of quantitative surveys combined with qualitative interviews was pragmatic in terms of answering research questions about whether participants experienced changes in their emotions, beliefs, and attitudes in a systematic way, as well as how the experience impacted them and to allow themes to surface that had not been previously hypothesized (Creswell & Plano Clark, 2018; Teddlie & Tashakkori, 2010). We were especially interested in triangulating findings between different data sources and analytical methods to assess their validity and raising questions for future research based on any disagreements.

4.1 Project OVERCOME

Project OVERCOME is a VR application designed by Accenture for the Meta Quest 2 headset. The application was specifically created for jobseekers who have been impacted by the criminal justice system to be used in reentry training programs. The application has two main parts: 1) Journeys, in which participants hear the stories of and advice from people who have successfully reentered the workforce post-incarceration, and 2) an interview simulation in which the participant receives advice from a career counselor and then participates in an interview with a hiring manager. The Journeys were produced by filming real people in volumetric capture telling their stories about post-incarceration. The career counselor was an actor, also filmed in volumetric capture, and provides pre-recorded advice on interviewing. In the interview simulation, participants play the role of Nadia, who is applying for a job in an industrial laundry facility after being released from incarceration. The career counselor also orients the participant to Nadia's story and the job they are interviewing for.

The interview simulation uses a branched narrative structure, in which the participant selects from three to four answer choices to each interview question, and the hiring manager responds based on how the participant answered, as depicted in Fig. 1. This was achieved by filming an actor playing the hiring manager in volumetric capture for each question asked and in response to each answer given by the participant. Therefore, the simulation is adaptive in a “choose-your-own-adventure” style of narrative, as the interviewer's questions and reactions are pre-recorded, but based on participants' answers there are thousands of possible paths through the simulation.



Fig. 1 Screenshots of Project OVERCOME: Left: an interview question response. Right: constructing an elevator speech

The application is voice controlled: the participant delivers their answer by reading it out loud to practice saying their responses. Based on how they answer the questions, the simulation will bring them to a section of the interview called the “elevator speech,” in which the participant constructs a brief explanation about their criminal past and how they are ready to move on. At the end of the simulation, the participant is shown their answers to all the questions, some of which provide feedback on how they should respond in an interview. They can choose to have this feedback emailed to them to review later as well.

4.2 Participants and Data Collection

We conducted a concurrent mixed methods case study (Creswell & Plano Clark, 2018) of the Goodwill Industries of Houston implementation of Project OVERCOME during a one-day expunction event in June 2022. Participation in the event lasted approximately one hour per participant, and multiple people participated in the activities concurrently. The VR program itself takes approximately 10–30 minutes to complete. During the event we recruited participants for the study as they waited for the expunction clinic and to use Project OVERCOME. In total, 27 people participated in the surveys. Of these participants, 24 completed both surveys, 2 only completed the pre-survey and 1 only completed the post-survey. Eight participants were interviewed and observed using the VR application, randomly selected from those who consented to participating in the study. Given the small sample their experiences may not be generalizable to the population of Project OVERCOME users, and those willing to participate in the study and be interviewed may differ from those who chose not to. This study was approved by the Harvard University Institutional Review Board.

Participants who consented to the study were given a pre-survey before meeting with the Project OVERCOME facilitator and were given a post-survey after using the VR. Pre- and post-surveys asked participants about their interviewing self-efficacy, how they valued work, their job search effort, their emotions related to their job search, and their prior experience with VR. The pre-post measures used for this study were interview self-efficacy, and their positive and negative emotions. The interview self-efficacy scale measured participants’ beliefs, (Tay et al., 2006) and asked participants 7 items that began “How confident are you that you can successfully...” and ended with, for example, “prepare for an interview,” and “discuss your past with a potential employer in an interview.” Participants rated their confidence on a scale from 1 (not at all confident) to 7 (highly confident), and the mean of 7 responses was taken to create a self-efficacy score out of 7 (*Cronbach’s alpha* =.89). This scale follows guidelines for constructing self-efficacy scales (Bandura, 2006), has been used in studies with globally diverse populations (Petruzzello et al., 2021; Tay et al., 2006), and similar scales have been validated in the context of interview simulations with vulnerable jobseekers (Smith et al., 2015, 2022). One item was added to the scale reported in Tay et al. (2006) to adapt the measure for justice-involved individuals: “...discuss your past with a potential employer in an interview?”

The Positive and Negative Affect Scale short form measured participants’ emotions (PANAS, Mackinnon et al., 1999), and asked participants to rate “The extent you feel this way about your job search right now” on a scale from 1 (very slightly

or not at all) to 5 (extremely), with five negative (afraid, nervous, scared, upset, distressed) and five positive (inspired, enthusiastic, determined, alert, excited) emotions. Negative PANAS scores were estimated by taking the mean of the 5 negative emotions, and Positive PANAS by taking the mean of positive emotions, creating a score on a 5-point scale (*Negative Affect Chronbach's alpha* = .89; *Positive Affect Chronbach's alpha* = .61). The PANAS has been widely used and validated with large and diverse samples (Crawford & Henry, 2004; Magyar-Moe, 2009; Thompson, 2007; Watson et al., 1988). The scale was applied to the participants' feelings about their job search at that moment.

The post-survey also asked participants to report what impact the application had on their confidence in their interviewing skills, to choose "I feel less/equally/more confident." They were asked how enjoyable they found the experience, rating from 1 (not enjoyable) to 5 (very enjoyable). The post-survey additionally asked if they found the application useful, what their criminal justice involvement was, their education level, employment status and history, age, and gender, ethnic, and racial identity. See Table 1 for a description of participants. The survey also measured their sense of presence in the virtual environment (mean (SD) 3.9 (1) on a 7-point scale), but the sample was too small to estimate its association with the other variables of interest. See the appendix for the full survey items.

Table 1 Descriptive Statistics of Survey Participants

Age	Mean (SD) = 43 (10.5) <i>N</i> (Missing) = 25 (2)
Gender	Female = 11 (48%) Male = 12 (52%) <i>N</i> (Missing) = 23 (4)
Race	Black or African American = 18 (82%) White = 3 (14%) Multiracial = 1 (5%) <i>N</i> (Missing) = 22 (5)
Type of Justice Involvement	Post-Release = 9 (39%) Other = 7 (30%) Diversion = 4 (17%) No Involvement = 3 (13%) <i>N</i> (Missing) = 23 (4)
Education Level	Less than High School = 3 (13%) High School = 8 (33%) Some College = 9 (38%) College = 4 (17%) <i>N</i> (Missing) = 24 (3)
Currently Employed	Yes = 14 (58%) No = 10 (42%) <i>N</i> (Missing) = 24 (3)
Used VR Before	Yes = 11 (50%) No = 11 (50%) <i>N</i> (Missing) = 22 (5)

Demographics collected on post-survey, completed by 27 participants

Table 2 Demographics and Experience of Interview Participants

Pseudonym	Gender	Age	Racial identity	Justice involvement type	Education	Employed type
Angela	Female	49	Black or African American	Post-release	Some college	No
Brian	Male	57	NA	Other	Some college	Yes
Casey	No Survey Completed					
Denise	Female	37	Black or African American	Other	Some College	Yes
Emma	Female	38	Black or African American	Other	Some college	Yes
Frank	Male	34	Black or African American	Post-release	Some college	No
Georgia	Female	33	Black or African American	Post-release	Some college	Yes
Heather	Female	34	White	Other	High School	No

We also conducted interviews with a subset of the participants (see Table 2), interviewing them before and after they used the application. Interviews were semi-structured, meaning they covered a set of topics with suggested questions and follow-up questions, but allowing the interviewer flexibility to rephrase or reorder the questions and follow up on additional questions to ensure coverage of the thematic topics while dynamically promoting a positive interaction (Kvale & Brinkmann, 2009).

Pre-interviews asked about their job experience, their beliefs and emotions about the job search and interviews. Post-interviews again asked about their beliefs and emotions about job interviews and how they felt while using the VR application, whether they felt present in the environment, and if the interview felt authentic. See the appendix for the interview guides. Interview participants were also observed as they used the application, with their in-headset activity projected onto a computer and recorded.

We report detailed demographics and experiences of the participants to provide a rich description of the sample. However, due to the small sample size we did not estimate the associations between these characteristics and participants' outcomes or variation in their experience with the VR simulation.

4.3 Analysis

We calculated descriptive statistics of participants' pre- and post-survey ratings and assessed any change over time by comparing means with paired t-tests to assess significant changes.

Interviews were transcribed and de-identified. Following a flexible thematic coding method that drew on *a priori* research questions about participants' interview self-efficacy and identities and also allowed for emergent themes (Bazeley, 2021; Braun & Clark, 2006). Three of the authors read all transcripts and agreed

on a broad set of themes for initial coding, described in Table 3. The broad code categories were identified based on prior research questions aligned to the interview guide, while the definitions of the codes and descriptions included emergent themes, such as the emotions they felt while using the VR simulation. The three authors coded each transcript for these themes, and the first author reviewed them all to ensure consistency of coding. The first and second authors then analyzed the coded passages across participants to identify common themes, which are presented in the below results. The themes focus on the emotions participants described which arose as a dominant aspect of all eight participants' experiences in terms of their job search, their experience of the interview simulation, and their feelings of confidence. The focus on emotions and feelings of confidence was also influenced by the quantitative findings. These strong emotional descriptions were evident to both authors also across the themes, such as challenges seeking employment, interview self-efficacy, and experience of the VR simulation.

Additionally, we qualitatively analyzed passages coded as relevant to participants' emotions and beliefs for changes from before to after using the VR simulation. We also ran the interview passages from pre- and post-interviews through the IBM Watson Natural Language Understanding tool (IBM, 2021) to explore differences in sentiment, tone, and emotion from pre- to post-VR. This Natural Language Processing (NLP) tool uses deep learning to analyze text and extract sentiment and emotion metadata. Specifically, it captures levels of fear, anger, joy, sadness, and disgust in written human language. We combined fear, anger, and sadness into a Negative Emotion Variable composite, and renamed joy as a Positive Emotion Variable. We do not report disgust levels as it is not a relevant emotion in this context and was not regularly identified by the NLP algorithm.

Table 3 Interview Analysis Codes

Interview Self-Efficacy	Participants describe their beliefs in their ability to be successful in job interviews, or their lack of confidence related to interviewing for jobs, in general or as changes in response to Project OVERCOME.
Challenges in Seeking Employment	Participants describe any challenges they are facing in finding employment, which could include performing in job interviews or other issues they face, including finding a pathway to the workforce.
Occupational Identities	Participants describe the type of work they identify with and how they think of themselves as a worker, for example which industries and roles they have worked in and feel most comfortable doing.
Work Contexts	Participants describe the contexts they have worked in in the past, where they are most comfortable working, or the types of contexts they seek to work in now.
Experience of the VR Simulation	Participants describe their experience of using the VR simulation in the post interview, such as their comfort or discomfort, emotions, sense of presence, the authenticity of the environment or task, and if it had an effect on them.

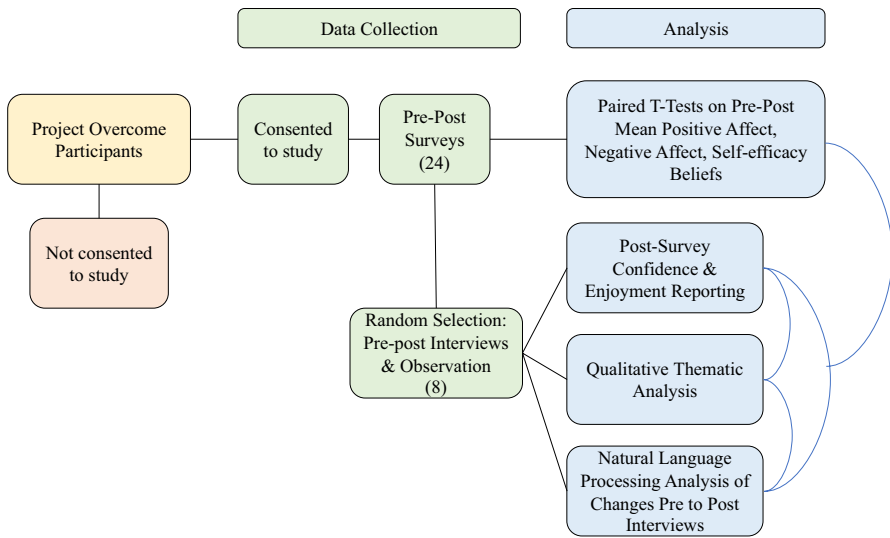


Fig. 2 Study design illustrating data collection and analysis. Curved lines indicate data triangulation.

The Negative Emotion and Positive Emotion variables were estimated as the pre-post difference between the percentage of the emotion reported.

We compared results from the surveys, qualitative analysis of interviews, and NLP analysis of interviews to triangulate and validate results across data sources (Maxwell, 2010). Figure 2 provides a snapshot of the study design, illustrating the varied sources of data collected and analysis methods used.

5 Results

Here we present results of our analysis pertaining to each of our four research questions.

1. To what extent does participating in a VR job interview simulation decrease justice-involved individuals' negative emotions about their job search, and increase their positive emotions?

Analysis of the survey data finds that participants' negative affect scores, which estimate their emotions related to the job search, decreased from before to after using the VR application. Figure 3 illustrates participants' pre-post scores. Participants' mean negative affect score was 2.1 before and 1.7 after using Project OVERCOME (see Table 4), meaning they were less likely to report feeling afraid, upset, scared, distressed, and nervous about their job search. On average, participants' negative affect scores fell by 0.6 points, and the difference from mean pre- to post- scores was statistically significant ($t(19)=2.88, p=.01$). While on average this appears to be a small

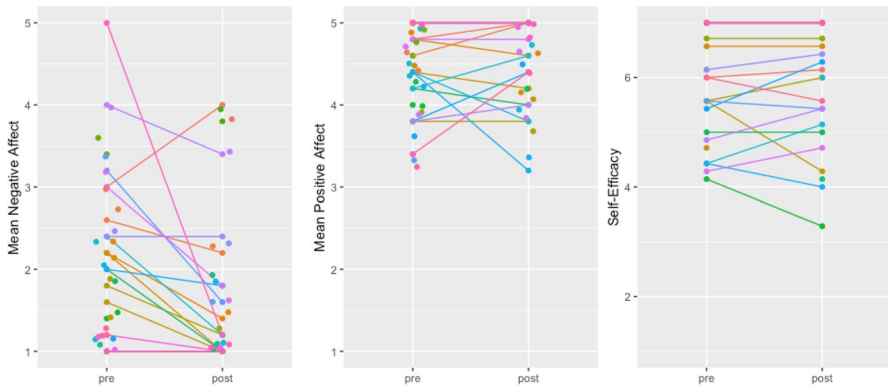


Fig. 3 Visualization of participants’ pre-post survey responses in negative affect (left), positive affect (center), and self-efficacy (right)

Table 4 Means and standard deviations of affect and self-efficacy on pre- and post-surveys

	Negative Affect	Positive Affect	Self-Efficacy
Pre-Survey Mean (SD)	2.1 (1.1)	4.5 (0.5)	5.9 (1.0)
Post-Survey Mean (SD)	1.7 (0.9)	4.5 (0.5)	5.8 (1.1)

change, for many participants the impact moved their negative affect from feeling these emotions “moderately” or “a little” to “very slightly or not at all.”

Results from the qualitative analysis comparing participants’ pre- to post- interviews supports this finding as well, in which we identified six of the eight participants indicated a reduction in nerves or anxiety, often described alongside an increase in comfort. Table 5 illustrates how participants described their emotions before using the VR and after, including how they felt “normal,” “better,” and “confident.” Furthermore, the NLP emotion, sentiment, and tone analysis also indicated a decrease in negative emotions for these same participants based on their pre- and post-interviews, indicating their language decreased in its level of fear, anger, and sadness, depicted in Table 6.

On the other hand, we did not find consistent evidence of increases in participants’ positive affect and emotions about their job search. Figure 3 and Table 4 illustrate how participants’ positive affect scores on the surveys remained stable from pre- to post-VR. However, the analysis of interviews found that participants did describe increased positive emotions like feeling more comfortable (see Table 5). NLP analysis triangulates the increase in positive emotions, also finding an increase in joy based on participants’ interview responses, depicted in Table 6.

Table 6 illustrates how the different sources of data triangulate our findings, as participants who reported decreases in their negative affect on the surveys also

Table 5 Participant quotes indicating reduced nervousness and anxiety or increased comfort

	Pre-Interview	Post-Interview
Heather	<p>“But since I’ve gotten in trouble, I haven’t been able to do that. So that’s probably the only thing I would honestly say is being timid and talking to an employer about that part”</p>	<p>“It really felt really good. So even when I was saying the words, because, man, like I would have never said anything like that, or had the courage to say something like that. Now I’m just like, I’m gonna go to everybody.... I feel definitely more comfortable. Started off like I would have started like maybe like a 2 or 3 and now I feel literally a 9 or 10.”</p>
Georgia	<p>“Sometimes I do get a little nervous. And especially if I walk into a company. And it wasn’t what I portrayed it to be when I walked in and it’s elegant, and everyone’s all, you know, like- [ooh, I’m sweating] a little.”</p>	<p>“Yeah, made me feel normal. You know, like, I could get this job like, I know, I’m gonna get this job. Yeah, I enjoyed it...It got me feeling like I can walk out of here and every interviewer that I feel is gonna want to offer me a job. Like, I thought it’d be so many job offers that I’m not going to know which one to choose. That’s how I feel right now”</p>
Frank	<p>“I’m nervous. I know I am a good worker. I know, if I’m hired, I’m exceeding expectations... [It’s the]initial meeting that that bothers me... [I’m] anxious.”</p>	<p>“That actually helped. That made me feel a little better.”</p>
Emma	<p>“Well, they asked about it, you know, if they ask about it, then I would let them know what happened, but I didn’t just really bring it up.”</p>	<p>“I thought it was pretty cool. I liked it. It kind of made me feel a little more confident about going to another interview. I enjoyed it.”</p>
Brian	<p>“Sometimes I’d be nervous. But the thing is, before I go in, and with- I say, once again, with my belief system, I put in my mind is the route. I’m going in. And I’m not going to over-talk my employer, but I’m going to listen, see, listening skills are very good.”</p>	<p>“Once you say prison, that’s when the scare comes in. But when you’re confident, and like I said, you get some practice with that thing on. When they say prison, you are ready for them, you know, you ready for that little thing coming.”</p>
Casey	<p>“One thing I’ve come to realize in life is if you’re a closed book that no one knows your story, and so they have to judge a book by its cover”</p>	<p>“It definitely made me feel a bit more confident and giving people what they said is the elevator speech”</p>

Table 6 Emotion and affect changes from surveys, qualitative interview analysis, and NLP interview analysis

	Survey Responses				Qualitative Interview Analysis	NLP Interview Analysis	
	Negative Affect Change	Positive Affect Change	Enjoyment Rating	Impact on Interview Confidence	Anxiety and Comfort Change	Negative Emotions Change	Positive Emotions Change
Angela	1	0.2	Very	Equally	No Shift	-0.17	0.04
Brian	-0.8	-0.2	Enjoyable	More	Slightly Positive Shift	-0.34	-0.07
Casey	NA	NA	NA	NA	Positive Shift	-0.30	0.14
Denise	-0.2	-1.2	Very	Less	No Shift	0.43	-0.04
Emma	0	0	Enjoyable	More	Slightly Positive Shift	0.40	0.25
Frank	-1.2	0	Very	More	Positive Shift	-0.38	0.50
Georgia	-0.2	0	Very	More	Positive Shift	-0.25	0.34
Heather	-3.8	0	Very	More	Positive Shift	-0.97	0.28

exhibited decreased anxiety in qualitative interviews, and NLP analysis also identified decreases in negative sentiment and tone such as fear, anger, or sadness. These participants' results are highlighted in green. We also find the results triangulate for the one participant who reported feeling less confident and whose negative affect increased, highlighted in red.

2. To what extent does participating in a VR job interview simulation increase justice-involved individuals' interview self-efficacy beliefs and confidence?

We also did not find consistent evidence of change in participants' self-efficacy beliefs and confidence from before to after using the VR simulation. Figure 3 and Table 4 illustrate how participants reported their self-efficacy beliefs as generally stable from the pre- to post-surveys. Yet when asked on the post-survey what impact the VR experience had on their confidence, participants reported mixed results, with 10 (44%) saying they felt more confident, 12 (52%) reporting they felt equally confident, and one reporting they felt less confident (4%). In the interview analysis, illustrated in Table 5, we find that five of eight participants responses suggested improvements in confidence and comfort, alongside the stronger finding of decrease in negative affective emotions such as anxiety and nervousness. The quotes in Table 5 help illustrate how participants described increases in their confidence but did not necessarily describe increased belief in their capabilities as self-efficacy would be defined. This raises questions about confidence as an emotion versus self-efficacy as a belief.

Table 7 Participant quotes describing emotions related to the job search, pre-interviews

Emotional Toll of the Job Search	<p>“[On that survey it says] please circle the number that indicates how you feel this way about your job search right now. And one of them was afraid. And I put quite a bit, you know, and like upset, and I put quite a bit. Um, and nervous, I put quite a bit. That’s because I feel like- what am I doing wrong? ... You know, it’s always like the rejection.”-Angela</p> <p>“Honestly, I don’t even apply. I don’t even I feel like- I don’t even apply myself because I’m like, no one’s gonna give me a chance.” -Heather</p>
Negative Emotions Related to Interviewing	<p>“I’m nervous...I know I am a good worker. I know, if I’m hired, I’m exceeding expectations... [It’s the] initial meeting that that bothers me... [I’m] anxious.” -Frank</p> <p>“Sometimes I do get a little nervous. And especially if I walk into a company. And it wasn’t what I portrayed it to be when I walked in, and it’s elegant... I know that what they’re probably expecting, you know...like, yeah, girl, I’m the black one.” -Georgia</p>

3. How do features of the VR application’s design affect participants’ emotions and beliefs?

Analysis of the interviews confirmed that participants had a high degree of negative emotions related to their job search and interviews, with many saying they feel nervous and anxious. Table 7 depicts interview quotes that illustrate the emotional toll of the job search, with Angela expressing fear and nervousness, Heather indicating hopelessness, and Frank and Georgia describing feeling nervous about job interviews specifically. These interviews referred to other emotions on the negative affect scale, illustrating how participants also felt afraid, upset, and at times distressed about the job search, including frequently wondering why they are not able to get job offers or promotion, such as Angela wondering “what am I doing wrong?”

In post-interviews, participants described how the VR simulation felt relaxing, put them at ease, and generally made them feel positive emotions (see Table 8). The way the simulation did this was by taking pressure off having to talk to a real person, as Emma described “knowing the person wasn’t actually directly in front of me.” The way participants described feeling in the VR simulation also indicated how it supported emotions on the positive affect scale, such as feeling alert, enthusiastic, or inspired. For example, Georgia’s post-interview quote in Table 5 illustrates how participants who exhibited increased confidence also felt more inspired and enthusiastic, as she described wanting to walk out of the training and apply for every job. Their experiences of the VR simulation itself also indicate a feeling of being alert, including how Brian describes feeling like the interviewer’s presence made him “want to sit up.”

Table 8 Participant quotes related to positive emotions in VR

Positive Emotions in the VR Simulation	<p>“It’s just different. It’s a different vibe. It’s just more relaxing... Um, I just felt like, when you’re talking to a person, you are more nervous.” -Denise</p> <p>“I guess knowing that the person wasn’t actually directly in front of me, it just gave me an opportunity to kind of relax.” -Emma</p> <p>“But it was a little bit more relaxed. It was like a relaxed, more relaxed state, and it wasn’t so stern and pristine.” -Angela</p> <p>“It seemed really calm, soothing, and, and comfortable.” -Heather</p> <p>“The atmosphere just seemed like it had a serene, you know, feel to it.” -Georgia</p> <p>“Something about it that makes you more at ease than the typical workplace interview.” -Frank</p>
----------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

When participants described their experiences with the VR application, they discussed how the responsiveness of the interviewer made it feel like an authentic task, and for most of them they felt the scenario and task felt authentic to them. For example, they described how his facial expressions and body language made it feel as though it was a real interview. They also described how answering the questions in the role of Nadia felt authentic because it related to their own situations and they could empathize with her (Table 9).

Table 9 Participant quotes related to ways the simulation felt real and evoked their emotions

Interviewer’s responses made the simulation feel real	<p>“You know, and the way [the interviewer] look[s] at you is like, he’s actually there. He’s going like, thanks for coming. And then he asked a question, he sits back, and he looks, and he changes his facial expressions... it makes you actually want to sit up.” -Brian</p> <p>“When he asked about my obstacles, what obstacles have held me back in the past? I believe that was the question that caught my attention, and the fact that he wanted to know more, you know, it made it at that moment, I knew okay, I was actually in an interview.” -Georgia</p>
Playing the role of Nadia felt authentic and raised emotions	<p>“I can understand it, because it’s like her situation... kind of touched on mine.” -Angela</p> <p>She was looking for a job. She was reintegrated back into society. She hadn’t, you know, been around people or she had made some mistakes that had caused her to have those setbacks and you’re nervous. I know she- I know she was nervous, scared. Yeah, I feel all those emotions. -Georgia</p>

4. How do features of the VR application’s use, implementation, and facilitation of the program vary among participants?

We observed variation in the facilitation and use of the VR program, summarized in Table 10. For example, only one of the facilitators encouraged participants to use the journeys portion of the VR application and reviewed the feedback with participants after they completed the interview simulation, resulting in two participants receiving this facilitation (Denise and Frank). This facilitator also asked participants to reflect on what they were seeing and hearing in the VR program before they started the simulation, asking what they thought about the people’s stories in the Journeys and what advice from the career counselor resonated with them. However, we observed the program did not accommodate this discussion as the voice activation of the VR application made it difficult for the facilitator to talk to the participant while the application was running. Other facilitators showed participants how to use the VR headset and start the application without any other engagement but did not instruct them to use the journeys and did not give them feedback during or after. Additionally, participants varied in whether they reached the elevator speech portion of the simulation, with five of the eight participants practicing the elevator speech. This shows how the branched narrative also contributes to variation in how participants use and experience the application.

The participants in this study are too small a sample to connect the characteristics of the facilitation and use of the program to their outcomes, as no clear pattern exists in the differences between use of journeys, the elevator speech, or feedback and changes in their beliefs, emotions, and confidence. However, the variation in facilitation and use raises questions about aligning the goals of a VR experience with what participants will engage in. During this implementation of Project OVERCOME, there were time constraints as facilitators attempted to get as many people as possible to use the program. If using the journeys and practicing the elevator speech are necessary to achieve the desired outcomes, however, these findings suggest participants need more time and potentially to use the application multiple times.

Table 10 Interview participants’ VR usage

	Journeys	Elevator Speech	Feedback during facilitation
Angela	No	No	No
Brian	No	No	No
Casey	No	Yes	No
Denise	Yes	Yes	Yes
Emma	No	Yes	No
Frank	Yes	No	Yes
Georgia	No	Yes	No
Heather	No	Yes	No

6 Discussion and Implications for Future Work

We find compelling evidence that a VR job interview simulation tailored to the experiences of people impacted by the criminal justice system can alleviate some of the emotional toll the job search takes on this vulnerable population. This impact was apparent across our data sources, from surveys, qualitative interview analysis, and NLP interview analysis. Because participants described negative emotions like anxiety and nervousness in interviews, this seems to be an especially promising use of immersive technologies in workforce development. This finding confirms prior research on the emotional impacts of VR experiences (Markowitz & Bailenson, 2021), and helps address calls for more research focused on the affective impacts of VR on learning and workforce training rather than a narrow focus on knowledge and procedural skills outcomes (Hamilton et al., 2021). It also addresses the need within immersive learning research go beyond a techno-centric view of the impact of VR on learning and instead provides a study of the technology within context that attends to a specific population of learners (Beck et al., 2021).

Additionally, the mixed method approach of this study goes beyond a “black box” approach of looking at the changes in participants’ outcomes from before and after using VR to also look at how its design and implementation affected their use and outcomes. We find that participants described the simulation feeling authentic both in the environment and the task. Interview responses suggest the branched narrative structure allowed for a realistic feeling as the interviewer was an actor filmed to respond to each interview answer in an authentic way. Participants also indicated the scenario of role playing someone who has been incarcerated spoke to their own experience and was relatable. Together, this suggests a personalized VR experience that is tailored to the needs of a specific population may be especially effective at making them feel relaxed, comfortable, and less anxious about job interviewing. Our findings that such a branched narrative structure can feel authentic to participants contrasts many in VR who call for experiences to be maximally interactive and freeform in order to make full use of the technology’s immersive qualities (Lanier, 2017), and rather supports work showing how narrative and symbolism drive immersion as well (Dede, 2009; Harrell, 2013; Slater, 2009).

On the other hand, we did not observe an increase in their self-efficacy, or more deeply held beliefs about their capability to perform well in an interview. These findings contradict other studies which have shown even brief VR experiences to have an impact on learners’ self-efficacy beliefs, motivation, and even identity (Johnson-Glenberg et al., 2023; Mayer et al., 2022; Queiroz et al., 2022). One explanation for the mixed findings is that the results are sensitive to whether the measures are capturing something more immediate like the emotional responses we identified, or more long-term and deeply held beliefs outside the VR experience itself. Another is that the population matters, as does the task they engage in using VR. Other studies have been conducted with younger learners or with less high-stakes activities than preparing for a job interview.

We also find that how the program is facilitated is likely to affect how participants use it, including whether they spend time reviewing feedback on their performance. This highlights the need to consider VR as a pedagogical tool best implemented within

a broader program. While some use cases of VR see it as a replacement for skills training, our findings suggest it be used to augment existing training. In the case of interview simulations for vulnerable jobseekers, this may be an intervention used to help alleviate participants' anxieties, akin to VR programs used in exposure therapy to treat phobias (Parsons & Rizzo, 2008). However, our observation of the use of this program suggests that participants also need instruction on interview techniques and skills practice with an instructor.

Our use of multiple methods to triangulate our findings also provides a promising way to measure participants' experiences and outcomes in larger samples by collecting both survey data and open-ended data that can be analyzed with NLP. Our findings suggest these methods are complementary, and that a simple survey measure asking participants if they feel more confident can be a meaningful measure that aligns with interview data. We therefore help contribute methods for researchers to measure the impact of VR on affective dimensions of workforce learning, in particular an application of the PANAS, measures of jobseekers' beliefs such as self-efficacy, and the usefulness of text analysis for analyzing qualitative data. In this way, our study also contributes to the Immersive Learning Knowledge Tree initiative, which calls for greater sharing of fruitful research methodologies and instruments for the study of VR in education and training (Beck et al., 2021).

These findings point to a number of implications for research on and implementation of VR in workforce development contexts. For one, future research should continue to use multiple methods to develop and validate measures of participants' emotions and beliefs in response to VR programs, including teasing apart the distinctions between emotions, beliefs, and confidence. Further, VR remains a technology suited to brief interventions, and it may not be as impactful as longer-term experiences. Our study raises questions about the appropriate "dosage" of job interview simulations, as well as the likelihood of transfer to an interview context. Future work should investigate whether workforce development VR programs are effective at shifting participants' skills and beliefs if used multiple times, especially if participants receive feedback and have time to implement it. This research would also help to address questions as to whether affective outcomes are impacted by the novelty of the technology similarly or differently from learning outcomes and sense of presence in VR (Huang et al., 2021). Future research should also investigate whether the emotional impacts of VR transfer to real interview environments, or if the relaxing and comfortable feelings only apply in VR because participants are aware it is not real. This would extend research on transfer in VR beyond narrow learning outcomes like content retention and procedural skills performance to the affective domain of learning (Hamilton et al., 2021). Drawing on VR exposure therapy treatments to help participants face their fears over time may be particularly fruitful (Parsons & Rizzo, 2008).

The findings also have implications for practice in suggesting ways VR can be most effectively implemented. An experiential learning framework may be particularly beneficial at helping participants prepare for the simulated interview (Petruzzello et al., 2021; Tay et al., 2006). For example, participants could receive instruction and coaching, plan what they will aim to achieve within the simulation, engage in the VR experience, and then receive and review feedback on their performance. They could then repeat this cycle by processing the feedback to plan new goals, engage in the simulation, and

receive feedback on their progress. The current implementation observed did not allow for the structure of planning and reflecting on feedback needed to engage in this cycle. The implementation of such immersive VR simulations could draw on less-immersive simulations with similar populations to do so, such as Smith et al. (2022) which allowed incarcerated individuals to use the simulation multiple times at increasing levels of difficulty.

This exploratory study does have limitations. The case study was not designed to isolate causal mechanisms, and therefore the effects observed may not be generalizable to other contexts, populations, and VR applications. We may not have observed statistically significant changes in self-efficacy and positive affect due to the small sample, or the measures may have been too blunt to capture changes, as participants' baseline levels were relatively high to begin with. Further research should assess the impact of job interview simulations on participants' emotions and beliefs on larger samples and in other contexts to replicate these findings, as well as measure learning outcomes to model the impact of changes in beliefs and emotions on interviewing skills. Additionally, this study is not able to validate longer-term changes in participant emotions or beliefs, nor can it account for any effect the novelty of the technology may have had on participant outcomes, as we were unable to track participant outcomes over time and the VR program was only offered to participants for a single session. Future research should investigate the usage of the VR and participants' outcomes over time to validate our findings of the impact of VR on jobseekers' emotions.

7 Conclusion

This study employed both quantitative and qualitative methods to investigate to what extent and how a VR job interview simulation impacts vulnerable jobseekers' emotions and beliefs. By conducting a case study of one site utilizing VR in an authentic workforce development program, it contributes to a need for more research in learning environments and focused on the actual use and practical application of VR in context. The findings highlight the promise of VR to help jobseekers reduce their negative emotions surrounding the job search and increase their feelings of confidence. On the other hand, we did not find consistent evidence that the simulation increased participants' self-efficacy beliefs, raising questions about the difference between confidence as an emotion and self-efficacy as a belief. This suggests the potential for VR to engage affective dimensions of learning depends on how such dimensions are defined and measured, the way the application is implemented including giving participants feedback and incorporating sound instructional design, and the length of an intervention in terms of its dosage. We conclude that future VR for workforce development designs should consider how they can impact the affective dimensions of learning such as easing negative emotions, and that such programs should consider incorporating VR into instructional models such as experiential learning. Our findings also raise questions for future research such as how to best measure changes in participants' affect and beliefs using surveys, interviews, and NLP, testing the association between VR simulations and participants' emotions at a larger scale, and assessing the impact of VR as its novelty wanes.

Appendix: Study Materials

Pre-Survey

This survey is to get to know more about you before you use the Project Overcome VR application. **There are no right or wrong answers, we just want to know more about you and how you think.** Your participation is voluntary, and will not affect your participation in the Goodwill programming and using Project Overcome. We will not use your name or identifying information in any publications from this research.

Please circle the number 1-7 that indicates the response for each of these statements that BEST describes yourself. There are no right or wrong answers, we just want to know more about you.

How confident are you that you can successfully...	Not at all confident			Somewhat confident			Highly Confident
	1	2	3	4	5	6	7
Prepare for an interview?	1	2	3	4	5	6	7
Persuade potential employers during the job interview to consider you for a job?	1	2	3	4	5	6	7
Market your skills and abilities during the job interview?	1	2	3	4	5	6	7
Make the best impression during the job interview?	1	2	3	4	5	6	7
Get your points across in the job interview?	1	2	3	4	5	6	7
Discuss your past with a potential employer in an interview?	1	2	3	4	5	6	7
Improve your interview skills through training and practice?	1	2	3	4	5	6	7

Circle the number 1-5 that indicates how much you agree or disagree with each of these statements. There are no right or wrong answers, we just want to know more about you.

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
Work is an important part of one’s daily life	1	2	3	4	5
Work is a source of satisfaction in one’s life	1	2	3	4	5
Work is important for more than just earning money.	1	2	3	4	5

Circle the response that indicates your current opinion about your job search. There are no right or wrong answers, we just want to know more about you.

If you try hard to get a job in the next four months, how likely is it that you will get one?	Extremely unlikely	Unlikely	Somewhat likely	Likely	Extremely likely
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In the next four months, how hard do you intend to try to find a job where you’d work over 20 hours a week?	Not hard at all	A little hard	Somewhat hard	Hard	Extremely hard
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Please circle the number 1-5 that indicates the extent you feel this way about your job search right now:

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Inspired	1	2	3	4	5
Afraid	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Nervous	1	2	3	4	5
Scared	1	2	3	4	5
Determined	1	2	3	4	5
Upset	1	2	3	4	5
Alert	1	2	3	4	5
Excited	1	2	3	4	5
Distressed	1	2	3	4	5

Please circle the response that best describes your familiarity with Virtual Reality technologies.

Rate your experience with Virtual Reality:

1. Never heard of it
2. Heard of it but never seen it
3. Seen it but not used it
4. Used it once
5. Used it more than once

Post-Survey

This survey is to get to know more about you before you use the Project Overcome VR application. **There are no right or wrong answers, we just want to know more about you and how you think.** Your participation is voluntary, and will not affect your participation in the Goodwill programming and using Project Overcome. We will not use your name or identifying information in any publications from this research.

Please circle the number 1-5 that indicates the extent you feel this way about your job search right now:

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Inspired	1	2	3	4	5
Afraid	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Nervous	1	2	3	4	5
Scared	1	2	3	4	5
Determined	1	2	3	4	5
Upset	1	2	3	4	5
Alert	1	2	3	4	5
Excited	1	2	3	4	5
Distressed	1	2	3	4	5

The following questions ask about how you felt during the VR experience, called the “virtual environment” and “virtual world.” Please rate the extent to which you felt the following:

	Not at all	Slightly	Moderately	Very	Extremely
It felt as if I was inside the virtual world.	1	2	3	4	5
It felt as if I was visiting another place.	1	2	3	4	5
It felt like I could reach out and touch the objects in the virtual environment.	1	2	3	4	5

Circle the number 1-5 that indicates how much you agree or disagree with each of these statements. There are no right or wrong answers, we just want to know more about you.

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
Work is an important part of one’s daily life	1	2	3	4	5
Work is a source of satisfaction in one’s life	1	2	3	4	5
Work is important for more than just earning money.	1	2	3	4	5

Please circle the number 1-7 that indicates the response for each of these statements that BEST describes yourself. There are no right or wrong answers, we just want to know more about you.

How confident are you that you can successfully...	Not at all confident		Somewhat confident			Highly Confident	
	1	2	3	4	5	6	7
Prepare for an interview?							

Persuade potential employers during the job interview to consider you for a job?	1	2	3	4	5	6	7
Market your skills and abilities during the job interview?	1	2	3	4	5	6	7
Make the best impression during the job interview?	1	2	3	4	5	6	7
Get your points across in the job interview?	1	2	3	4	5	6	7
Discuss your past with a potential employer in an interview?	1	2	3	4	5	6	7
Improve your interview skills through training and practice?	1	2	3	4	5	6	7

Circle the response that indicates your current opinion about your job search. There are no right or wrong answers, we just want to know more about you.

If you try hard to get a job in the next four months, how likely is it that you will get one?	Extremely unlikely	Unlikely	Somewhat likely	Likely	Extremely likely
-----------------------------------------------------------------------------------------------	--------------------	----------	-----------------	--------	------------------

In the next four months, how hard do you intend to try to find a job where you'd work over 20 hours a week?	Not hard at all	A little hard	Somewhat hard	Hard	Extremely hard
-------------------------------------------------------------------------------------------------------------	-----------------	---------------	---------------	------	----------------

What is your current employment status?

- Employed full-time (more than 35 hours/week)
- Employed part-time (less than 35 hours per week)
- Not employed but seeking a job
- Not employed and not seeking a job

If you are currently employed, what kind of job do you have? _____

In the past, what kind of jobs have you had? _____

In the past, what types of places have you worked? _____

How old are you? _____

How do you describe your gender identity? _____

How do you describe your ethnic identity? _____

How do you describe your racial identity? _____

What languages do you speak? _____

What is the highest level of education you have completed?

- Less than high school
- Some high school but did not receive a diploma
- Completed high school with a diploma or GED
- Some college but did not complete a degree
- Completed an associate's degree
- Completed a bachelor's degree or higher

Please choose the option that best describes your involvement in the criminal justice system:

- Post-release
- Diversion - (Prosecutor either dismisses the charges completely or does not bring any charges to begin with)
- No involvement
- Other : _____

Please write the report ID found in your performance summary email: _____

(Skip this question if you do not have a report ID)

How enjoyable was your OVERCOME experience? (Circle your response)

1 - Not enjoyable

- 2 - Somewhat enjoyable
- 3 - Neutral
- 4 - Enjoyable
- 5 - Very enjoyable

What impact did this VR experience have on your confidence in your interviewing skills? (Circle your response)

- 1 - I feel less confident
- 2 - I feel equally as confident
- 3 - I feel more confident

Do you think the Oculus Quest VR headset is useful for training purposes? (Circle your response)

- Yes
- No

Which of these options do you identify as? (Circle all that apply)

- Impacted by the Criminal Justice System
- Goodwill Employee
- Non-Goodwill Employee Partner
- Other

Is there anything that the facilitator could've done to improve your experience?

Is there anything you would recommend to make the OVERCOME experience more useful or effective?

Pre Interview

Participant’s ID Number: _____		Approx time of interview: _____
Total: 15 minutes	Interview Questions - <i>Potential Probing Questions</i>	Purpose
Warm-up ~2 minutes	Tell me about yourself and why you came to this event today? - <i>How did you hear about this event?</i> - <i>Are you engaged in Goodwill’s programs?</i>	Get to know a bit about them and their motivation for participating, build rapport
Work experience ~3 minutes	What kind of work experience have you had? - <i>Are you working now? Where? Part-time/full time?</i> - <i>Where have you worked in the past?</i> - <i>What kind of environment was that in? What did you do?</i> - <i>What kind of work are you most comfortable doing?</i> - <i>Do you identify as a _____ / a _____ kind of worker?</i>	Learn about the prior contexts of their work and their identity related to work
Job search ~5 minutes	Tell me about your current job search. - <i>What kinds of jobs are you looking for? Why?</i> - <i>What is your dream job?</i> How do you feel about the job search? - <i>Are you excited? Nervous? Why?</i> How do you feel about job interviews? - <i>Are you confident in your abilities?</i> - <i>What do you feel less confident about?</i> - <i>Do you think interviewing is something people can get better at with practice?</i> Are you in any education or training programs?	To learn about their job search and the feelings they have—their self-efficacy, anxiety, and skills related to searching for and interviewing for jobs.
Justice Involvement ~ 3 minutes	Have you been affected by the criminal justice system? - <i>How does that affect your job search?</i> - <i>Do you feel comfortable talking about that in your job search? Why or why not?</i>	To learn whether/how their prior experiences with the criminal justice system affects their feelings toward the job search
Wrap up ~ 2 minutes	Is there anything you want to add that I didn’t ask you about? Do you have any questions for me?	

Post-Interview Protocol

Participant's ID Number: _____		Approx time of interview: _____
Total: 15-30 minutes	Interview Questions - <i>Potential Probing Questions</i>	Purpose
Initial impressions ~2 minutes	What did you think of the VR experience? - <i>Can you tell me what you did or what you saw?</i>	To hear their initial thoughts and first impressions
Experience of VR ~5 minutes	How did the VR environment feel to you? - <i>Did it feel like a real place? Why or why not?</i> - <i>Did you feel like you could reach out and touch things?</i> - <i>Could you do the things you wanted to?</i> How did the interview feel to you? - <i>Is this how you expect a real interview would be?</i> - <i>Did you feel like yourself answering the questions, or did you feel like Nadia?</i> - <i>Were the questions difficult?</i> - <i>How did Nadia's story relate to your own experience?</i> Is this the kind of interview you expect you'll do in your own job search? - <i>Were you comfortable in the environment of an office/conference room?</i>	Authenticity of the environment- sense of "being there" Authenticity of the task of interview and the story they were playing Alignment of the context to their prior and desired work experience
Job search ~5 minutes	How do you feel about your job search now? - <i>Are you excited? Nervous? Why?</i> How do you feel about job interviews now? - <i>Are you more or less confident in your abilities? why?</i> - <i>What do you feel more/less confident about?</i> - <i>Do you think interviewing is something people can get better at with practice?</i> Does using this application change any of your attitudes about the job search?	To understand whether using the application changed their feeling and attitudes about the job search, or their self-efficacy.
Take-aways ~ 3 minutes	What are you taking away from this experience?	To learn what they are taking away- a change in attitude, skills, or something more surface level
Suggested Changes ~2 minutes	If you could talk to the creators of this VR experience, what would you tell them to change? Why?	
Wrap up ~ 2 minutes	Is there anything you want to add that I didn't ask you about? Do you have any questions for me?	

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Data availability The datasets generated during and analyzed during the current study are not publicly available due to the need to protect the identities of participants but may be available from the corresponding author on reasonable request.

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