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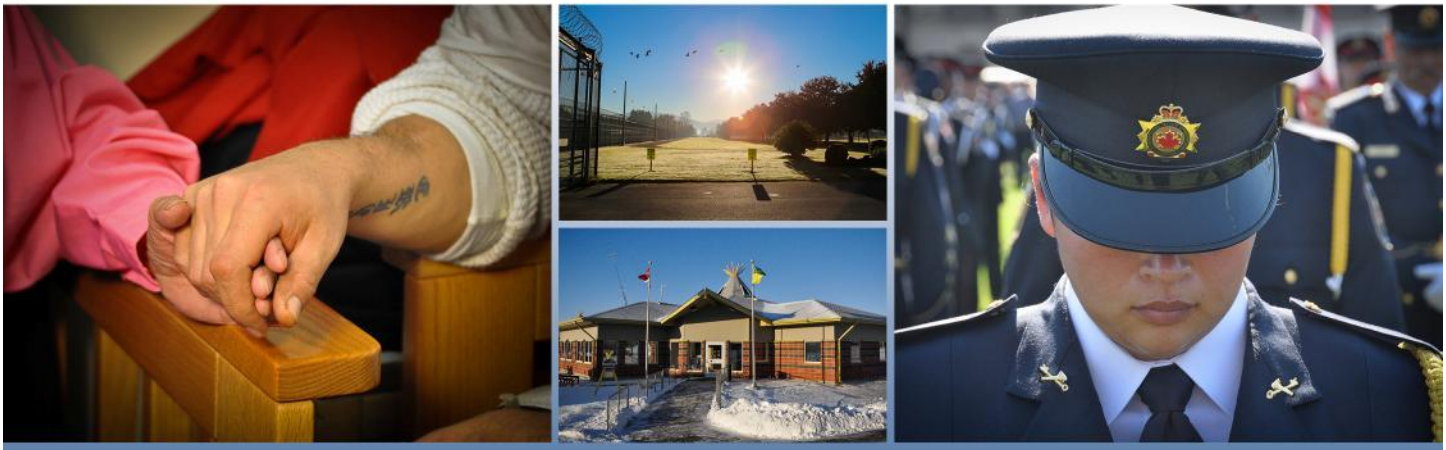

RESEARCH REPORT

Virtual Correctional Program Delivery: A Literature Review

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Virtual Correctional Program Delivery: A Literature Review

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Executive Summary

Key words: *virtual, corrections, program delivery, online learning, videoconferencing, teleconferencing, virtual reality.*

The Correctional Service of Canada (CSC) delivers in-person correctional programs to target offenders' criminogenic need areas. However, the COVID-19 pandemic acted as a catalyst to examine how these programs are delivered. To help inform the shift from delivering programs completely in-person to integrating the delivery of virtual correctional programming, the current literature review sought to answer three research questions:

(1) What is virtual correctional program delivery and what are the various formats it takes?
(2) What are the potential benefits and drawbacks of delivering correctional programs virtually?
(3) What are the principles of effective virtual delivery to a diverse offender population?

In order to answer these research questions, a comprehensive search of various databases, including JSTOR, Scholars Portal, ProQuest, PsycINFO, Criminal Justice Abstracts, government correctional agencies, and Google Scholar was conducted.

Our review of the literature indicated that virtual correctional program delivery (VCPD) is the incorporation of technology to replace or supplement the delivery of traditional classroom-based, face-to-face correctional programs. Furthermore, VCPD can be delivered via three methods: online learning platforms/pre-recorded lectures, teleconferencing and/or videoconferencing, and virtual reality (VR) technology. The limited amount of research in this area indicated that these delivery formats have produced equal effectiveness when compared to – and in some instances, greater effectiveness when *supplemented* with – traditional, in-person delivery formats.

Identified benefits of VCPD include tailoring programs towards offenders' unique learning styles, increasing access to and timely completion of programming, and assisting in the development of technology literacy, among others. However, potential drawbacks also need to be considered, such as security considerations, active program participation, and potential challenges with adequately addressing responsivity concerns.

Virtual correctional program delivery – like traditional, in-person program delivery – should follow the principles of risk, need, and responsivity (RNR). Additional principles of effective virtual delivery to diverse offender populations include ensuring that the material is accessible to all participants (e.g., using plain language, clean and organized slides, etc.) and promoting aspects of social interaction that might not come as naturally in virtual settings.

Overall, the emerging literature in this area provides promising evidence to support CSC's implementation of technology in its correctional programs.

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Introduction

In the Correctional Service of Canada (CSC), correctional programs are prioritized as a means of reducing recidivism and returns to custody while ensuring the safety of Canadian communities (CSC, 2021a). Correctional programs are structured interventions that target risk factors associated with criminal behaviour, teach skills for managing risk factors for crime, assist incarcerated individuals in understanding that they are accountable for their criminal behaviour, and help change criminal attitudes. Correctional programs at CSC are based on the risk, need, and responsivity (RNR) principles, which serve to effectively lower the risk of reoffending (Bonta & Andrews, 2017; CSC, 2021a). The programs adhere to the RNR principles in terms of:

1) delivering more intensive interventions (in terms of frequency and duration) to individuals assessed at higher risk to reoffend (Risk Principle);
2) prioritizing the treatment of criminogenic needs, such as attitudes, that have an empirical relationship with criminal behaviour (Need Principle); and,
3) employing cognitive-behavioural and social learning treatment approaches that are tailored to individuals' unique learning styles, as well as tailoring interventions to individuals' needs or characteristics to match their learning style, abilities, and motivation level (Responsivity Principle).

To respond to individuals' diverse risk and needs, CSC offers the Integrated Correctional Program Model (ICPM) for men, the Women Offender Correctional Program (WOCP) for women, and various culturally-relevant Indigenous program streams within the ICPM and WOCP program continuums for Indigenous men, Indigenous women, and Inuit men. There is also the Adapted Multi-Target stream which is used for offenders with deficits in functioning that may interfere with their ability to engage in traditional correctional programming. These deficits in functioning may include (but are not limited to) cognitive impairments, mental health concerns, and learning disabilities.

Correctional programs are primarily provided in-person by Correctional Program Officers (CPOs) or Indigenous Correctional Program Officers (ICPOs), are paper-based, and are delivered in groups (depending on the program, a program session could have a maximum group size of 6 to 12 participants). However, the COVID-19 pandemic prompted a shift in how correctional programs were delivered to CSC's incarcerated population. In particular, within

CSC, the delivery of correctional programs had been suspended during the pandemic as part of COVID-19 containment efforts since current program formats relied heavily on in-person and group formats, making it difficult for program officers and participants to comply with public health physical distancing requirements (CSC, 2022a). Furthermore, in some cases, program delivery may be unavailable or inaccessible to select offender groups in smaller and more remote institutions. Circumstances like these may have hindered offenders' ability to follow their correctional plan, which may have affected their rehabilitation and release dates. In fact, the Parole Board of Canada (PBC) has recently noticed a decrease in the percentage of offenders who complete their correctional program before their day parole eligibility date (DPED). In 2019-2020, approximately 50% of offenders completed correctional programming before going before the PBC; however, in 2020-2021, only 36% had completed programming before their DPED (Davidson, 2023).

CSC's Offender Programs and Reintegration (OPR) Branch is currently exploring ways to leverage virtual service delivery in order to reduce barriers to the provision of interventions and services, including correctional programs. The Virtual Correctional Program Delivery (VCPD) project aims to transform the traditional classroom-based, face-to-face correctional program delivery by introducing instructor-led training through video interaction with small groups of offenders, while leveraging existing technology and tools within institutions (e.g., classrooms, libraries, staff offices or meeting rooms; CSC, 2022b). Ultimately, this adaptive approach will help to ensure that correctional programs can continue to be offered and delivered in a virtual format despite any disruptions, such as the need to social distance. Additionally, this adaptive approach will help to expand program availability at smaller institutions, enabling incarcerated individuals to continue following their correctional plan and prepare for release.

Current Review

The purpose of this literature review is to summarize existing academic and grey literature on virtual program delivery within correctional settings to provide OPR additional information to assess the viability and potential effectiveness of using virtual program delivery for institutional correctional programs. Specifically, a discussion of the potential benefits of the availability of virtual correctional program delivery, as well as the principles of effective virtual delivery of correctional programs to a diverse offender population will be provided. A preliminary environmental scan revealed that literature on the virtual delivery of correctional

reintegration programs is scant. As a result, literature in related areas will be reviewed in order to explain the benefits and principles of effective virtual correctional program delivery, which may include approaches to developing and retaining the therapeutic alliance, as well as addressing and responding to criminogenic risk, needs, and responsivity. This will include a broad overview of virtual reality applications for individuals with intellectual/learning disabilities, mental health disorders, substance use disorders, cognitive behavioural therapy, and/or requiring cultural adaptation. The results will help OPR further define next steps, including guidelines and best practices to enhance correctional practices and virtual program delivery.

The research questions to be answered are as follows:

1. What is virtual correctional program delivery and what are the various formats that it takes?
    a. What technology has been used to deliver correctional programs virtually to offenders in institution?
2. What are the potential benefits and drawbacks of delivering correctional programs virtually?
    a. How do virtual correctional program delivery compare to in-person correctional programs?
3. What are the principles of effective virtual delivery to a diverse offender population?

Method

In order to identify material for this literature review, we conducted a search of several databases and search engines, including JSTOR, Scholars Portal, ProQuest, PsycINFO, Criminal Justice Abstracts, government correctional agencies, and Google Scholar. However, an initial search for studies and documents that focused on the virtual delivery of correctional programs in institutions yielded limited results. As such, the search parameters were broadened. A number of research areas were searched, including: (1) virtual educational program delivery (distance learning and education), (2) computerized substance use treatment, (3) virtual health services (e.g., tele- and videoconferencing in offender intervention programs, telehealth), (4) computerized cognitive behavioural therapy, and (5) virtual reality therapies. Keywords used to identify literature for the review included "virtual correctional programs," "virtual learning," "virtual education program", "computer-based learning", "web-based learning", "teleconference", "videoconference", "online learning", "virtual reality", and "computerized cognitive behavioural therapy" alone and in combination with the terms "inmate", "offender", "incarcerated", "prison", "correctional institution" or "penitentiary." To supplement selected literature and documents from the databases, additional relevant literature from the reference sections were examined and used. An in-depth content analysis was conducted to identify information and themes in the literature that responded to our research questions.

Results

What is virtual correctional program delivery and what formats does it take?

Broadly, virtual correctional program delivery (VCPD) is the incorporation of technology to replace or supplement the delivery of traditional classroom-based, face-to-face correctional programs to individuals in custody, ensuring offenders' timely access and completion of programs prior to their release (Wardrop & Sheahan, 2019). The virtual delivery of programs can include the use of web-based learning, teleconferencing, videoconferencing, computer and virtual reality technology, or a combination of methods with small groups of offenders, while also capitalizing on existing resources already in place within the institutions, such as classrooms, libraries, staff offices, or meeting rooms (CSC, 2022b; His Majesty's Prison and Probation Service [HMPPS], 2020; Wardrop & Sheahan, 2019). This can also include the use of secure, facility-issued tablets or laptops remotely or in meeting rooms/classrooms to gain access to internet-based platforms like Zoom and breakout rooms (Collica-Cox, 2022), or web-based educational platforms (e-learning) with access to program content like pre-recorded lessons, resources, and self-paced activities for asynchronous learning (Tolbert et al., 2015). Program participants may also be given e-readers with educational content or may take part in a traditional lecture-based course with the use of Smart Televisions to facilitate distant learning (Collica-Cox, 2022). However, for a single participant in need of programming, audio (telephone) or videoconferencing software can be used to deliver program contents (HMPPS, 2020). Lastly, programs can incorporate virtual reality (VR) technology to supplement learning (Alqahtani et al., 2017).

It is important to acknowledge that alternative program delivery formats (e.g., web-based, videoconferencing) do not aim to change the integrity or the goals of a program. Instead, they are intended to provide flexibility in program access. Where possible, in-person delivery is expected to be the primary delivery format and alternatives are to be considered only if in-person programming cannot be achieved. Furthermore, if alternative program delivery formats are selected, it is strongly advised that face-to-face methods be used to complement alternative program delivery where possible (HMPPS, 2020).

There are essentially three ways identified in the literature in which programs can be delivered virtually. The first is the use of pre-recorded lessons and online learning, which are the least interactive types of delivery methods whereby the participant watches a pre-recorded lesson

or partakes in a lesson that is delivered through an online platform, often self-paced. These delivery methods limit interactions with others and the immediate support provided by training staff (i.e., no one present to answer questions on the spot) and, as a result, it may be difficult to monitor offender progress and retention of key constructs. Ensuring that individual responsivity factors are considered may also be challenging in this environment. However, from an operational perspective, these methods of program delivery are easy to facilitate, do not require many resources, and can assist with or supplement the completion of programming in a timely fashion.

The second delivery method is the use of teleconferencing and/or videoconferencing. This is similar to delivering programs in a face-to-face setting, except that participants are either on a conference call (voice-only) or a video call, and are not sitting in the same room. In many cases of teleconferencing and/or videoconferencing, limited changes to programming are needed. That is, programming can still be facilitated by programming staff, group discussions can still occur, and program activities can still be utilized but may need to be refined for an online setting, such as the use of breakout rooms on a videotelephony software program (e.g. Zoom or Microsoft Teams) for group discussions. The main concern is that participants will require access to a computer and an adequate internet connection that also meets required security parameters.

The third delivery method that can be used is virtual reality (VR). VR delivery can be classified into 3 groups: immersive, non-immersive, and semi-immersive (augmented reality). These groups are distinguished based on their use of various physical technology tools such as the use of a head-mounted display, motion-recognition gloves, computer monitor, speakers and/or headphones (Alqahtani et al., 2017). One example of this technology is 360-degree, or immersive video. These are recorded using an omnidirectional camera which allow students to control the viewing direction and often includes a panorama (Smith, 2021). Augmented reality has been used for teaching students who are deaf, as well as teaching geometry, Indonesian sign language (SIBI), and enhancing learning with visuals and animation (Aditama et al., 2021; LiantoBuliani, 2021; Rusli & Ibrahim). Although limited research has focused on the use of VR in correctional settings, it has been suggested that in-class correctional programming (or videoconferencing) can be used in collaboration with VR technology. An advantage of VR is that it can be used to resemble role-playing activities in real-world settings to enhance various skills. However, research on VR in correctional settings is in its infancy.

Use of pre-recorded lessons and online learning

Pre-recorded lessons and online learning platforms had been used to deliver educational programming long before the COVID-19 pandemic. For example, in one study by Hagdu et al. (2016), exam scores among physiology students were compared between those who were enrolled in an asynchronous course (delivered via pre-recorded lectures) and those enrolled in a traditional live lecture. They found no significant differences in student performance between the two groups, indicating that pre-recorded lectures can be equally as effective as traditional live lessons. This pattern of equal educational outcomes appears to be relatively consistent across different educational contexts (Bos et al., 2016; Chirikov et al., 2020; Nilaad et al., 2022), and in some cases, asynchronous learning actually produces superior outcomes (e.g., Northey et al., 2015). Furthermore, evidence suggests that students who enrol in self-directed, pre-recorded lectures perceive their performance as equal to their in-person classmates (Topale, 2016). Overall, it appears as though pre-recorded lessons and online learning do not impair educational outcomes. Accordingly, it is likely that virtual correctional program delivery would also produce similar outcomes when compared to traditional program delivery; the next section focuses on the extant literature in this area.

Use of pre-recorded lessons and online learning with offender populations

Pre-recorded lessons and online learning have shown promising results among different offender populations. For example, the Motivational Assessment Program to Initiate Treatment (MAPIT) in the United States is a web-based intervention that aims to encourage people who use drugs to initiate treatment for their drug use (Walters et al., 2014). MAPIT consists of two 45-minute modules that target (1) substance use treatment initiation and engagement, (2) probation and future criminal involvement, and (3) human immunodeficiency virus (HIV) testing and other substance use-related care. Criminal justice clients involved in the pilot testing of MAPIT had positive feedback, including that the program was formatted well, it was personally accurate for their substance use needs, and that they felt the skills learned would be useful upon release.

Another computer-based intervention for people who use drugs is the Breaking Free Online (BFO) Health and Justice Program (Elison-Davies et al., 2023). The BFO program was piloted in an adult-male prison in the United Kingdom and aims to reduce drug and alcohol consumption and dependence. The program is based in cognitive-behavioural principles including mindfulness-based relapse prevention. BFO participants first complete the Recovery

Progression Measure (RPM; Elison et al., 2016), a psychometric assessment that examines functioning across six different domains (e.g., negative thoughts, emotional impact). Based on the RPM scores in each domain, participants are then given tailored intervention guides and strategies which include (but are not limited to) managing risky situations, understanding negative thoughts and emotions, and general information on alcohol and drugs (Elison-Davies et al., 2023). Research on BFO has found that, among participants who completed the program, quality of life scores improved, and severity of substance dependence and biopsychosocial impairment decreased post program completion (Garvey et al., 2021). Overall, the BFO program provides promising evidence regarding computer-based program delivery among offenders who abuse substances.

A similar intervention has been developed for offenders with convictions for drinking and driving in Australia. The Steering Clear program is a five module intervention that is delivered online – using a computer or mobile device – over the course of two hours. The goal of Steering Clear is to assist first time offenders of drinking and driving with becoming aware of their behaviours and ultimately prevent alcohol-related re-offences. Pilot testing of this program by Wilson et al. (2017) showed high endorsement for the program being easy to navigate, engaging, straightforward, and useful in real-life settings. Interestingly, there was also high endorsement among program participants with regards to the program being delivered online. That is, 93.3% of program participants preferred the online delivery over a face-to-face intervention.

There is a considerable amount of research on the use of online learning as a delivery method for male intimate partner violence (IPV) offenders. For example, the Journey to Change is a three-session computerized intervention that identifies the most common intervention practices for IPV offenders attending court-mandated batterer treatment and integrates these practices with the transtheoretical model of behavioural change (Prochaska & DiClemente, 1983). In one study by Levesque et al. (2012), participants were assigned to participate in usual care only or usual care along with Journey to Change. Results indicated that, when compared to those who participated in usual care only, participants who participated in both usual care and Journey to Change were significantly more likely to be in the “action” stage of the transtheoretical model and were significantly less likely to engage in physical violence during a 12-month follow-up period. The results of Journey to Change indicate that online methods of program delivery can be effective among male IPV offenders, especially when delivered

alongside additional programming.

While the above-mentioned programs were implemented prior to the COVID-19 pandemic and focused on incarcerated offenders and offenders who were on community supervision, more detention centres began using online learning at the onset of the pandemic to help simulate classroom learning (Hager, 2020; Hutwagner, 2021). One such example is CSC's Digital Education Pilot Project (DEPP) at the Joyceville and Bath Institutions[1], which brings technology into the classroom so that offenders (1) have greater opportunities to access learning materials and (2) become more technologically competent in advance of community release (i.e., gain foundational computer skills needed for increasing literacy levels; CSC, 2020). Specifically, the DEPP provides offenders with access to computers while they are participating in an education program within the classroom. These computers are connected to a controlled cloud-based learning management system (LMS; CSC, 2021b) with restricted internet access that enables online and blended learning. Students access their course materials on the digital platform and learn independently with the support of a teacher who provides guidance and promotes a collaborative learning environment. Currently, the DEPP offers grade 11 and 12 English and Math and can be modified/updated in real-time to better meet the needs of diverse offenders (i.e., Indigenous offenders, offenders with mental health and/or learning disabilities, etc.; CSC, 2020). Like all other methods of online learning for offender populations, more information is needed on the effectiveness of the DEPP; however, the implementation of this project "will be a key component in enhancing offender digital and computer literacy skills, which will in turn support offenders seeking employment opportunities in the community" (CSC, 2020, para. 6).

Overall, research in the area of virtual correctional program delivery demonstrates that pre-recorded lectures and online learning platforms are effective methods of delivering programming to offender populations, namely offenders who use substances (Garvey et al., 2021; Walters et al., 2014; Wilson et al., 2017) and those who perpetrate IPV (Levesque et al., 2012). Further research is required to assess the effectiveness of pre-recorded lectures and online learning among offenders in prison settings, diverse offender populations (e.g., Indigenous

[1] Note: Although the Digital Education Pilot Project was implemented at the onset of the COVID-19 pandemic, it was in development prior to the pandemic.

offenders, women offenders), offenders with specific criminogenic needs (i.e., criminal attitudes, associates, education/employment, etc.), and offenders with specific responsivity profiles (e.g., offenders with learning disabilities, psychiatric disorders, etc.), as this method of program delivery might not be effective for everyone. The next section focuses on an alternative method of virtual correctional program delivery – teleconferencing and videoconferencing.

Use of teleconferencing and videoconferencing

With the COVID-19 pandemic, there was a significant increase in the use of teleconferencing and videoconferencing technology for a variety of purposes including conducting work meetings, family and friend gatherings, education, visits to health care professionals, and various types of programming. Indeed, previous research has shown that tele- and videoconferencing are acceptable methods of facilitating education, mental health care, and substance use treatment. For example, synchronous, online, and instructor-led courses have yielded equal levels of educational performance among university students when compared to traditional face-to-face learning (Francescucci & Rohani, 2019). Similarly, cognitive behavioural therapies have been delivered via a computer interface or over the phone for individuals experiencing depression, anxiety, and obsessive-compulsive and phobic disorders (Kaltenthaler et al., 2004). Systemic reviews of mental health care treatment delivered via tele- and videoconferencing have found that both treatment options can reduce symptoms and are perceived as non-inferior when compared to face-to-face care (Chen et al., 2022). With regards to substance use, one randomized trial by King et al. (2014) compared counselling services for people participating in an opioid treatment program using the videoconferencing platform ‘eGetgoing’ to those who participated in person. Following a 12-week treatment period, they found that participants in both study groups had similar rates of drug-positive urinalysis tests and strong ratings of treatment satisfaction. Taken together, previous literature indicates that teleconferencing and videoconferencing are effective and reliable ways of delivering education, mental health care, and substance use treatment. As such, it is reasonable to predict that similar patterns of results would be observed among offender populations who receive correctional programming. In the next section, we turn to the available literature in this area to highlight how teleconferencing and videoconferencing have been used to deliver programming to individuals involved with the criminal justice system.

Use of teleconferencing and videoconferencing with offender populations

Videoconferencing has previously been utilized for incarcerated persons living with human immunodeficiency viruses (HIV). While incarcerated offenders living with HIV receive ample amounts of care for engagement and antiretroviral therapy adherence, this care declines after release from an institution (Brantley et al., 2019). To prevent a decline in care post-release, Brantley et al. (2019) identified people who were due to be released from prison within 180 days or less and were seeking a referral to an HIV/AIDS treatment program. Based on this inclusion criteria, 238 offenders with HIV were offered a videoconference with their case managers while incarcerated in a Louisiana prison. Among the 238 enrolled, 144 offenders successfully received a videoconference in time for their release; 94 did not. During the videoconferences, the offender worked with their case manager to capture their short- and long-term medical, financial, and social needs. In addition, offenders and case managers discussed strategies for locating and securing necessities, such as housing, clothing, and transportation. Overall, this study found that, among the 144 participants who received a videoconference, 74.3% (n = 107) were connected with HIV medical care within 90 days after their release from prison, highlighting the usefulness of videoconferencing with offenders who have specific health needs.

Previous literature has also demonstrated that virtual methods can be used among forensic mental health patients. More specifically, a paper by Sullivan et al. (2008) highlights the different ways in which Australia's Department for Correctional Services uses tele- and videoconferencing for justice-involved people with mental health issues. They highlight that virtual methods for justice delivery are often used for the purpose of conducting risk assessments and treatment delivery, as well as providing feedback, expert testimony, education, and inter-service planning. Australia's use of videoconferencing provides a connection to remote prisons, courts, and psychiatric clinics (Sullivan et al., 2008), thus allowing for a wide variety of correctional programming to be delivered to offenders in different contexts.

Another example is the "Thinking for a Change" (TFAC) program, which provides offenders with a cognitive behavioural therapy (CBT) curriculum that emphasizes the relationship between thoughts and actions, focuses on training pro-social skills and cognitive restructuring, and encourages alternative problem-solving methods (Golden et al., 2006; Lipsey et al., 2007). TFAC has been delivered in different ways, including having inmates co-facilitate the program and having staff lead the program in a more traditional delivery method. In an effort

to find more ways to deliver TFAC to offenders, LaPlant et al. (2021) examined the effectiveness of the program via videoconferencing. They recruited participants in high- and medium/low-security institutions in the state of Ohio who were on a waiting list for the program and prioritized those who were high-risk and had a criminogenic need for criminal thinking. The Social Problem Solving Inventory—Revised (SPSI-R; D'Zurilla et al., 2002), a measure of problem solving abilities and dysfunctional attitudes, was administered to offenders before and after completing the TFAC program via videoconference. LaPlant et al. found a significant increase in scores on the SPSI-R once treatment was complete, indicating a positive growth in problem solving skills. These findings show support for videoconferencing as a treatment delivery method among high-risk offenders with a need in relation to their criminal thinking.

Similarly, research has also demonstrated that program delivery via teleconferencing can be an effective approach for juvenile probationers. More specifically, research has been conducted on RealVictory, which is an American program that aims to reinforce goal setting and CBT concepts that were learned prior to community release (Burraston et al., 2012). For this program, once in the community, juvenile participants receive two automated calls every day that ask three questions: (1) Have you followed the rules of probation since your previous phone call? (2) How much effort have you put forth to accomplish one of the steps towards your probation goal? and (3) Have you produced any results, and if so, what are they? Responses are then provided using the keypad on their cellphones. If RealVictory participants indicate that they have made progress toward their probation goal, they hear a pre-recorded message of positive affirmation from a family member, friend, or another person of their choosing. If behavioural correction is required, a message of encouragement is played. Finally, if participants lose hope regarding their goal, or abandon their goal, they are asked to record why they think this occurred. Results from Burraston et al.'s program showed that nearly half (46.4%) of the RealVictory participants were not re-arrested over a one-year follow up period, compared to only 9.7% of the control group who were not re-arrested over a one-year follow-up period. Furthermore, among the RealVictory participants who were re-arrested, the first arrest tended to occur towards the latter part of the one-year follow up (median time to first re-arrest = 278 days) in comparison to the control group, whose median time to first arrest was 106 days. These findings indicate that use of a teleconference intervention can be effective for juvenile offenders in the short term. Further research would be required to determine whether this type of teleconferencing treatment

would be effective for adult offenders of different risk levels and criminogenic needs.

Overall, the existing literature on tele- and videoconferencing among offender populations yields promising results. This type of virtual correctional program delivery yields successful community and behavioural outcomes, even when compared to more "traditional" methods of correctional program delivery. However, further research on the effectiveness of teleconferencing and videoconferencing for treating specific risk factors (e.g., substance use, attitudes, education and employment), for use with diverse offender populations (e.g., women offenders, Indigenous offenders), and for use with offenders with different responsivity profiles (e.g., offenders with unique mental health needs, such as psychiatric disorders) would be beneficial. Furthermore, much of the extant literature in this area has been conducted in the community; therefore, additional research in prisons with different security parameters would also be beneficial.

Use of virtual reality technology

A variety of interventions use computer-simulated learning (CSL) technology, whereby a program is accessed via a desktop computer or tablet and the user interacts only with the software. The CSL technology is different from videogames as its simulation training programs teach the user different skills to apply to specific real world situations. In the simulation, users have a limited set of actions that they can take in order to complete a task and the situations change based on the actions that were taken by the user. One example is the Reactions on Display/Intimate Partner Violence (RoD/IPV) program, which is a program delivered using a computerized simulation technology that aims to facilitate change among men who are on probation for an IPV offence by allowing participants to practice non-violent reactions during a "typical" IPV incident (Sygel et al., 2014). Alongside the computerized portion of RoD/IPV, participants use visual cues and written text to reflect upon the feelings, thoughts, actions, and consequences that occur during the mock IPV incidents (Sygel et al., 2014). A pilot study revealed that RoD/IPV was well received and understood by program participants. Further, when it was supplemented with additional group-session IPV interventions (i.e., the Integrated Domestic Abuse Programme; IDAP), RoD/IPV participants chose less violent reactions during the computer simulation and showed significantly better interpretation of the simulated characters' emotions when compared to incarcerated participants who did not complete the IDAP supplement.

The CSL content, however, is often limited to the specific skills being taught and is geared towards specific goals (Ticknor, 2019). In contrast, intervention programs such as various drug and alcohol interventions, behaviour training, emotion recognition training, and aggression prevention therapy, use VR technology for delivery (Segawa et al., 2020; Seinfeld et al., 2018; Tuente et al., 2018). The VR used in these types of intervention programs is similar to the CSL technology, except that the user is not as restricted to specific decisions or actions. The virtual worlds and environments are typically much larger than those depicted in a videogame or specific CSL session (Ticknor, 2019) and can be multi-sensory, using visual, auditory and olfactory stimuli (Segawa et al., 2020).

One area that has commonly used VR has been addiction treatment programs. For example, a systematic review of 37 studies examined the use of VR technology in the assessment and treatment of substance use disorders and behaviour addictions and found that VR has been applied to treatment programs for smoking, alcohol, cocaine, cannabis, opioids, tobacco, nicotine, and methamphetamine, as well as for gaming and gambling (Segawa et al., 2020). In these instances, treatments use VR in conjunction with a variety of other forms of technology including functional Magnetic Resonance Imagining (fMRI) to measure prefrontal cortex activity, eye-tracking for cue sensitivity, skin conductance, heart rate, and body temperature. Given that the primary treatment focus for these addiction programs has been on cue reactivity, VR environments are well suited to these types of treatments because it uses multisensory cues such as visual, auditory and olfactory stimuli. For instance, for smoking interventions, there are several environmental cues[2], which include complex cues (e.g., exposure to smokers at a party or pub), proximal cues (e.g., exposure to lighter, ashtray, etc.), and contextual cues (e.g., being placed at a party, convenience store, etc.) that could induce cravings. Within the VR world, the contextual cues could include social pressure to smoke from an avatar, whereas proximal cues could include a pack of cigarettes on a counter. Furthermore, this systemic review found that VR for alcohol addiction used various cues to assist with managing cravings (Segawa et al., 2020). For example, cues that induced cravings for alcohol consumption included a bottle of alcohol

[2] Environmental cues can be classified as proximal cues, which are the most frequent type, often visual. There are also contextual cues, which refer specifically to the environment or context, with or without social interactions. Finally, there are complex cues which is a combination of proximal and contextual cues to provide a more complete picture.

(proximal cue), a bar (contextual cue), and a party with alcohol (complex cue). It is important to note that these examples of VR used within substance use and alcohol treatment programs are not specific to correctional settings or populations involved in the criminal justice system. However, it is possible that these techniques can be used to address substance use needs among those in custody or perhaps can be applied to other types of problematic behaviour including aggression, anger management, and impulsivity.

Use of virtual reality technology within offender populations

The use of VR technology within correctional settings has been limited. However, one study conducted by Seinfeld et al. (2018) examined the impact of perspective taking and empathy on emotion recognition among men who were convicted of a violent act against a woman. The sample were comprised of men in the community who were sentenced to attend an intervention program targeting domestic violence. This study used VR exposure as a way for offenders of domestic violence to experience domestic abuse from the point-of view of a female victim, with the goal of increasing the offenders' ability to recognize emotions. The results indicated that experiencing virtual domestic abuse from the perspective of a female victim can positively increase domestic offenders' sensitivity to recognize fear in facial expressions and can reduce domestic offenders' misclassification of facial expressions (e.g., no longer classifying facial expression as happiness rather than fear in fearful situations). Overall, these findings support the idea that experiencing different perspectives to one's own through VR technology can influence an individuals' perceptions, attitudes, and behaviours.

VR technology is also being examined within correctional settings to assist with targeting aggressive behaviour. For example, Virtual Reality Aggression Prevention Therapy (VRAPT; Tuente et al., 2018) is currently being tested through pilot studies in forensic settings to teach de-escalation to offenders with aggressive behaviour. This program aims to teach skills pertaining to self-control, impulsivity, and hostility, and the main goal is to increase participants' awareness of their aggressive tendencies and improve control over their aggression through social interactions in virtual environments (González Moraga et al., 2022). In these virtual environments, both settings and avatars are controlled by supervising therapists using voice morphing microphones. In these settings, offenders are faced with challenging behaviour from virtual characters and must apply de-escalating techniques and/or skills. Overall, this training involves the use of cue reactivity (i.e., a type of learned response) which includes responding behaviour,

psychophysiological responses, as well as the offender's galvanic skin response and real-time heart rate to measure arousal (Tuente et al., 2018).

Tuente et al. (2020) conducted a recent treatment outcome study examining the effectiveness of VRAPT on aggressive behaviour among forensic psychiatric inpatients in the Netherlands. The VRAPT consisted of 16 individual bi-weekly sessions that were approximately one hour in length and consisted of VR exercises to practice new behavioural skills. More specifically, the VRAPT allowed patients to practice (1) coping with their aggression in an adequate manner, (2) recognizing others' emotions, (3) rating the level of aggression of virtual characters' behaviours, and (4) reacting to situations in an appropriate manner (Tuente et al., 2020). Their findings revealed that participants self-reported a significant improvement in their hostility, anger control, and non-planning impulsiveness after completing VRAPT; however, these improvements were not maintained at the 3-month follow-up. As such, the results suggest that VRAPT does not decrease aggressive behaviour in forensic inpatients over time but does temporarily impact anger control skills, impulsivity, and hostility. More research is needed looking at varying levels of participation in VRAPT with increased frequency of participation across longer time periods.

Furthermore, VR technology has been used in correctional settings to teach inmates about life skills that can help them to succeed outside of correctional institutions upon release. Specifically, these types of programs[3] target those who were convicted as youth and aim to expose them to the various changes and technological advancements made in society over the past 20 years (Melnick, 2018). The VR technology includes the use of 360-videos to mimic a variety of everyday situations and can educate inmates on different important life skills including how to use a debit card, grocery shopping and using self-checkout at the grocery store, and doing laundry (Melnick, 2018). However, this technology has also been used to assist inmates with learning skills on how to de-escalate potential violent/aggressive confrontations. It is expected that in participating in this VR program, inmates, especially those who were incarcerated in their youth/early adulthood, will be released into community with knowledge of everyday life skills that can contribute to successful outcomes, although more research is needed examining the

[3] Note that while these programs are offered within correctional institutions, these programs are not 'correctional programs' as defined by CSC as they do not target the risk and need areas related to criminal behaviour.

outcomes of these types of programs.

Benefits and drawbacks of delivering correctional programs virtually

Limited research exists on virtual correctional program delivery, with research more commonly focused on the virtual delivery of substance use treatment, health services, and distance education learning (Wardrop & Sheahan, 2019). Nevertheless, there are different advantages and disadvantages to using virtual delivery for treatment and interventions. First, the potential benefits of delivering correctional programming virtually will be explored followed by potential drawbacks, which includes a discussion around use of pre-recorded sessions, online training platforms, use of teleconferencing and videoconferencing, and use of VR technology.

Potential benefits of delivering correctional programs virtually

Although limited research exists on the use of virtual correctional programming, a number of potential benefits can be inferred based on research conducted on virtual program delivery with non-offender populations:

1. ***Delivering correctional programs virtually can allow for programs to be tailored to individuals in order to meet their unique needs and match their individual learning style.***

Educational research has demonstrated that learners are classified into four groups based on the VARK model—visual learners, aural/auditory learners, read-write learners, and kinesthetic learners (Fleming & Baume, 2006). Research conducted by El-Sabagh (2021) compared regular e-learning to an adaptive e-learning approach, based on these four learning groups, to examine student engagement, participation/interaction, skills, and performance. It was found that students who used an adapted e-learning approach performed better, indicating that customized learning materials are important for increasing students' engagement, participation/interaction, and skill attainment (El-Sabagh, 2021). As such, using technology can be beneficial for incorporating a variety of supplemental correctional programming activities, using a variety of different mediums to support different learning styles and aid offender learning of key concepts. Furthermore, online learning and technology can also supplement or complement in-class programming and learning, allowing for further study of key concepts in a different way, rather than used as the primary means to conduct programming.

Moreover, offenders may have a number of different/diverse criminogenic needs or different severity of needs to be addressed prior to their reintegration back into the community.

Through the use of technology, further support can be provided to offenders to help address their criminogenic needs. Accordingly, the use of both videoconferencing programs and VR could potentially assist with mitigating offender risk and developing skills to address criminogenic factors and risk level. Videoconferencing provides a means of teaching key concepts and VR technology provides a safe space for offenders to use and practice learned skills through simulated real world interactions (Cornet & Gelder, 2020). For example, VR has applications for sex offender treatment for deviant sexual behaviours and those who abuse children. In these situations, VR can be used to expose offenders to certain high-risk situations, and bring out disorder-relevant behaviour in high-risk situations without risking the safety of others. This can be applied to behaviour training for high-risk situations where VR environments can be adjusted to address individual criminogenic needs (Fromberger et al., 2018).

2. Delivering correctional programs virtually can assist with increasing access to and/or completion of programming.

Using technology to deliver correctional programming can prevent delays in offenders' access to programming. Specifically, access to programming via videoconferencing or through an online learning platform can allow for offenders to participate in programming without having to wait for the program to be offered within their institution. This is especially true (1) within smaller institutions – where programming may only be offered a few times per year when there are adequate numbers of offenders enrolled in the program – and (2) among offenders who require specialized programming (e.g., the Inuit Integrated Correctional Program Model (IICPM)) or programming in a different language to what is being offered (e.g., offender from Quebec requiring English programming; offender from the Pacific region requiring French programming). Virtual delivery of correctional programs could allow offenders to participate in programming through another institution (if conducted via videoconferencing) or even at their own leisure/pace through an online learning platform (e.g., e-learning). Having ways for offenders to access their correctional programming sooner can assist CSC with providing timely access to programming, ideally allowing offenders to complete their programming prior to their day parole eligibility date, and potentially leading to increases in program completion rates. For instance, a recent report by CSC on their video-programming pilot project (2019) suggests that video-programming enhances the timely delivery of programs and the successful reintegration of offenders into the community.

The expansion of program delivery provides greater opportunity for offenders to participate in correctional programming who may not normally have been able to attend programs due to security related factors. For example, providing programming to incompatibles, offenders in Structured Intervention Units, women offenders in Secure Units, or to offenders in the Special Handling Unit may be especially challenging and could potentially result in delays in program participation. Having the option of attending programs virtually or through an online learning platform would allow offenders to participate in programming from their cells or living environment, rather than in a face-to-face, group setting, which could pose a security risk. Using technology to deliver programs can also reduce the resources required to conduct programming on a one-on-one basis with offenders in these specific environments. Furthermore, it can allow for access to programs during health and other institutional crises. Although the COVID-19 pandemic is one example of a health crisis, there are others that can take place in correctional institutions, including tuberculosis outbreaks. There can also be security related lockdowns which may interfere with correctional programming, leading to delays. Having the ability to use virtual programming, in some capacity, would allow offenders to continue their participation in correctional programs and hopefully maintain motivation and engagement.

3. Delivering correctional programs virtually could enhance CSC's ability to provide culturally-based programs to Indigenous offenders.

A report from CSC (2019) suggests that videoconferencing can provide a link between two institutions, which would allow for timely access to Indigenous programs and assist with meeting the criminogenic and cultural needs of offenders. For example, given that there are Indigenous-specific streams of programming that incorporate culturally-relevant teachings and Indigenous Elders, it is beneficial for Indigenous offenders to have access to these programs. However, in institutions where the number of Indigenous offenders is small, it may not be possible to run Indigenous specific programming on a frequent basis. Nonetheless, the use of online learning or videoconferencing could prevent course disruptions due to low enrollment related to insufficient numbers of Indigenous people at one site. Although delivering correctional programs virtually can enhance the availability of Indigenous-specific programming for offenders, it is important to ensure that Elders maintain direct involvement in programming sessions. For example, as noted in a pilot study which used technology to deliver community-based correctional programming (Wardrop et al., 2022), it was found that Elders were not

routinely involved in programming sessions. Where feasible, Elders should be directly involved and consulted regarding their interest in the programs, and whether the programs are held in culturally appropriate mediums.

4. ***Once implemented, virtual correctional program delivery can assist with program officer/staff shortages, resource issues and allocations, and financial constraints.***

Using technology to deliver correctional programming can effectively reduce costs and assist with staff resources over time, although there are initial costs associated with the initial implementation of such a model. For example, reducing inmate transfers for the purpose of accessing specialized resources diminish costs (as a result of minimizing lengthy and expensive transfers in secure transportation). Furthermore, using technology to deliver virtual programming, especially pre-recorded training, videoconferencing, and use of online platforms, can reduce the burden on staff resources, as well as reduce time allotted for program preparation and delivery. Online learning options and pre-recorded programming can be reviewed independently by the offender and reduces the need of correctional program officers to deliver the program each session. Alternatively, the use of videoconferencing can also maximize the number of offenders participating in programming at a given time, reducing the number of program sessions needed throughout the year and ensuring timely access. The use of technology of different forms is also cost effective and contributes to fiscal savings (Wardrop & Sheahan, 2019). In addition to being low in cost, technology-based and computer-administered interventions are beneficial as they require relatively little staff time and training to administer (Levesque et al., 2012). Overall, using technology to deliver programs may result in reductions in long-term human and financial resource allocations.

5. ***Virtual delivery of correctional programming can assist offenders with skills development to use upon community release.***

Generally, technology can be used to assist offenders with the acquisition of important life skills that will be useful outside of an institutional setting, including financial management, skills to aid future employment (such as enhancing interview skills), and even strengthening familial relationships through the use of virtual visitation (McDougall et al., 2017). Although these types of activities are not directly related to correctional programming, incorporating aspects of development in these areas can further assist with rehabilitation efforts as they map onto multiple dynamic risk domains (e.g., family and marital, community functioning, and

employment). Given the unique environment within a correctional facility and restricted access to the internet and technology, using technology to deliver correctional programming specifically, can also aid in the development of technology and computer literacy, which are one of the top nine skills that employers seek, and can assist with both obtaining and maintaining employment (Employment and Social Development Canada, 2021). For individuals who have been incarcerated for long periods of time, learning these everyday skills (such as financial management and computer literacy) can promote independence and assist in building self-confidence around completing basic day-to-day tasks upon release into the community.

Potential drawbacks of delivering correctional programs virtually

Although there are several advantages to delivering programming virtually, there are also a number of potential drawbacks and challenges that may result from introducing the use of technology. The potential drawbacks, considerations, and challenges will be discussed in relation to the use of pre-recorded sessions, online training platforms, use of teleconferencing and videoconferencing, and use of VR technology.

1. Virtual delivery of correctional programming may lead to challenges with communication, engagement, and active participation.

Although there are a number of ways that virtual delivery of correctional programs may enhance the effectiveness of programming, there are also some considerations that need to be taken into account. First, in online environments (including videoconferencing and online learning platforms), there is a lack of direct social interaction with other offenders and with the program delivery officer(s), which could result in less engagement. Research conducted by Brosens et al. (2014) which examined the influence of social networks on participation among incarcerated offenders found that having more personal contact and enlarging one's social network were motivating factors for participation. As such, removing the social aspect from correctional programming (particularly when it comes to online learning platforms or pre-recorded lessons) can potentially lead to reduced engagement and motivation. Ensuring participants are engaged and motivated are essential to programming because therapeutic change requires offenders to be active participants rather than passive recipients of programming (Drieschner et al., 2004).

It may also be difficult for program coordinators to build rapport with offenders when programming is conducted virtually. Research has established that a key element to enhancing

the effectiveness of correctional programs and rehabilitation efforts is to ensure that relationships between correctional staff, including program officers, parole officers, and correctional officers, should be of high quality and characterized as open, warm, non-judgemental, sympathetic, and engaging (Andrews, 2000). Educational research has found that relationship building in a face-to-face setting poses fewer challenges in comparison to building relationships in a virtual or online setting (Zelihic, 2014). In particular, Kurtzberg and colleagues (2009) found that facial expressions and posture play an important role in effective communication. As such, conducting correctional programming via teleconference or videoconference may hinder the program delivery officer's ability to foster a high quality interpersonal relationship with the offenders participating in the program, due to limited perceptions of body language and facial reactions, and difficulty with having an engaging conversation. For example, with videoconferencing, developing rapport with clients can be affected by technological features such as the quality of image, poor audio feed, bandwidth issues, and delayed transmissions. This can result in fragmented and/or repeated requests for clarification, which can affect the flow of communication in social interactions (Sullivan et al., 2008) and lead to less engagement and limited participation. In-person delivery circumvents the challenges of facilitators missing participants' behavioural cues, which are often unseen in a virtual environment, as it is difficult to read body language cues, especially when video is off or there are problems with audio-visual quality (Wardrop & Sheahan, 2019).

2. Virtual delivery of correctional programming may pose security concerns as well as network or connection issues.

Virtual delivery of programming can include videoconferencing and online learning platforms, which require use of the internet and other forms of technology. As such, there are a number of security concerns that need to be accounted for. For instance, some offenders may be highly skilled in information technology (IT), including those who are incarcerated for IT- or "hacking"-related offences (e.g., phishing scams, telemarketing scams), and those who commit offences in virtual worlds (Hoppe, 2019; Kerr, 2008). In fact, the CSC's Commissioner's Directive 705-3 outlines security literacy as an immediate need that should be documented by CSC staff in the Offender Management System (OMS). Therefore, although technology illiteracy might raise responsivity issues, the opposite issue of technology literacy warrants consideration by CSC staff as a potential security concern.

Regarding CSC's network security specifically, it would be imperative for internet browsers and links available to offenders to be firewalled and restricted to the sites, servers, or ports that CSC directly controls so that correctional programming can be delivered with as much protection as possible (Scarfone & Hoffman, 2009). Certain activity must also be restricted (e.g., social media access, forums, email) as per CSC requirements. Further, it is imperative to ensure that discussions and work around sensitive issues are safely contained within the program session and are not recorded and/or saved in an accessible area. This protected information must meet security standards to minimize risk of harm to both program participants and CSC staff.

In addition to security concerns, there are also challenges with networks and/or connections that need to be considered. For one, there would need to be a reliable and high speed internet connection, with sufficient bandwidth at each site in order for programming to be provided in a virtual setting. Internet or network connection issues or even a general weak internet or network connection can result in interruptions to programming and can be time consuming for staff to resolve. For instance, frequent technology issues (such as issues logging in or network updates), can result in staff resources being allocated to resolving IT issues, and delayed completion of programming by offenders, as well as frustration and lack of engagement by offenders. Other technology setbacks can include the timing required to train staff on how to use the online platform, videoconferencing platform, or VR technology, as well as how to monitor computer or tablet usage (Washington State Department of Corrections, 2022), potentially resulting in a temporary increase in staff workload.

Notably, the VCPD pilot project conducted by CSC has had several challenges related to security and network challenges. At the institutional level there were concerns around the supervision of offenders when using technology, as well as concerns around staff being able to operate the technology, and lack of support from facilitators on the virtual delivery methods (CSC, 2022c). At the community level there were several difficulties. For example, some participants had difficulty using the devices, some had network and/or connectivity issues, and some had issues with slow internet and bandwidth in correctional residential facilities and community correctional centres. Tablets had been purchased, but were not frequently used as expected. In addition, it was difficult to find a private location during programming where the offender could focus and feel comfortable engaging/participating (CSC, 2022c).

Although security concerns certainly need to be considered when implementing VCPD,

we must note that they should not be used as a reason to dismiss virtual delivery of programming altogether. Many jurisdictions have successfully incorporated the use of technology to deliver programming to offender populations. For example, certain Australian jurisdictions have successfully implemented the use of tablets among offender populations without citing security concerns as an issue (Thaler et al., 2022). Similarly, several American jurisdictions have taken appropriate steps to ensure that institutional security is not compromised by tablet use (Ruth & Sosorburam, 2022). Additionally, there has been research summarizing best practices for dealing with security challenges that can be used for reference purposes (for example, see Ruiz Salvador, Alvarez Llerena, & Nguyen, 2021 for a summary of security challenges and best practices specific to online learning platforms). As such, CSC's institutions could refer to lessons learned from neighbouring jurisdictions to ensure that security concerns are minimized and security threats are reduced. It is also important to recognize that as the technology landscape continues to change and the resulting risks that these changes may pose, it will be imperative to find ways to adapt and consider mitigation strategies to deal with the possibility of new security threats.

3. Offenders with low technology literacy may face challenges with completing correctional programming in a virtual setting.

While the use of technology to deliver programming has grown in frequency of use over the last few years in all areas within the general population, there are considerations when it comes to the offender population. For instance, technology is constantly advancing and technological devices and applications change quite rapidly. As such, the offender population, especially those who have been incarcerated for a long period of time, may not be aware of how to use technology or be familiar with the technological advancements that exist, let alone have had much exposure to technology, generally. Offenders with cognitive impairments, intellectual deficits or learning disabilities may have particular difficulty with completing correctional programming in a virtual setting as a result of low technology literacy as well as impairments in attention control, strategic goal planning, interpersonal and communication skills, cognitive flexibility, and organizing/adaptively using information stored in their working memory (American Psychiatry Association, 2013; Morgan & Lilienfeld, 2000).Offenders with low technological literacy may be overwhelmed or lack motivation to learn how to use a computer or access programming virtually. This can ultimately have an impact on an offender's level of engagement and level of motivation, as well as increase the amount of time that staff must spend

teaching the technological skills required to access the programming in a virtual setting.

4. When delivering correctional programming virtually, there may be challenges with addressing responsivity concerns.

Within the offender population, it is also important to consider various responsivity needs of the offender (Bonta & Andrews, 2017). In fact, research has indicated that barriers to addressing offender responsivity needs can significantly decrease program effectiveness (Howells & Day, 2003; Ward et al., 2004). Responsivity factors can include a range of individual factors, including demographic characteristics, such as age, gender, and culture, as well as cognitive, emotional and interpersonal skills, personality factors, motivation, and personal strengths (Andrews & Bonta, 2010). This also includes factors such as mental health concerns, cognitive impairments, intellectual deficits, learning disabilities, and exposure to adversity.

i. Mental health, well being, and virtual delivery of programs

There may be challenges with using technology (such as videoconferencing technology) with individuals who have certain mental health issues. It is recommended that clinicians and/or program delivery officers, at the very least, conduct a cursory assessment of prior videoconferencing use and comfort with each client, regardless of their presenting concerns or cognitive abilities (Batastini et al., 2020). Gauging client familiarity and potential concerns with the use of videoconferencing technology prior to starting programming may reduce resistance to, anxiety around, and poor engagement with videoconferencing technology (Batastini et al., 2020). For example, it may be counter-therapeutic to use videoconferencing technology with someone who is paranoid about government interference or surveillance via telecommunications. In this case, the use of virtual program delivery may not be warranted or may require increased discussions around confidentiality and security concerns.

One important area to focus on is offenders with Attention Deficit Hyperactivity Disorder (ADHD) and the virtual delivery of programming. Research has demonstrated a link between ADHD and criminality whereby ADHD has been associated with high rates of recidivism (Young et al., 2011) and an increased risk of imprisonment (Mohr-Jensen & Steinhausen, 2016). As such, it is not surprising to find that a larger proportion of incarcerated individuals meet the diagnostic criteria for ADHD than the general population (25.5% versus 2.5%; see meta-analysis conducted by Young et al., 2015). Given the large proportion of offenders with ADHD, it is important to consider the unique challenges that virtual delivery of programming may create for

these individuals. ADHD is a neurodevelopmental disorder that can be characterized by inattention (easily distracted, difficulty focusing), hyperactivity (difficulty sitting still), and impulsivity (acting without thinking, interrupting). Because of these symptoms, individuals with ADHD could experience increased negative effects from spending time interacting with others via videoconferencing or through online learning platforms. The National Institute of Mental Health (2021) and Medical News Today (2021) have suggested that videoconferencing and use of technologies to deliver services and programs can result in increased challenges for individuals with ADHD which include feeling overstimulated, difficulty sitting and paying attention for long periods of time, causing interruptions when on video- or teleconferencing, and generally having more difficulty engaging in comparison to programs delivered in-person. Furthermore, in online learning settings, individuals often lack familiarity with other program participants which may further pose challenges to individuals with ADHD including reduced motivation and poor learning performance (over and above individuals without ADHD; He et al., 2021).

In order to support offenders with ADHD, more encouragement to take an active role in their case management may be required, including having increased access to a number of services and agencies (e.g., pharmacological treatment, mental health services, additional treatment planning supports, etc.; Young et al., 2018). The structure of correctional programming may also require some modifications—especially when delivered virtually. For example, there may be a requirement for more hands-on learning or activities to promote learning key concepts. One example of this is the use of videogames and videogame therapy, which has been especially beneficial for juveniles and adults with ADHD (Ticknor, 2019). Videogames have been used in residential treatment programs because they help maintain participant engagement in therapy (Ceranoglu, 2010). Similarly, VR simulations have been used to enhance willingness to participate through active engagement and it can be useful to help participants learn and practice new skills in the virtual environment. Furthermore, ensuring the offender is completing programming in a space that is comfortable but with limited distractions can also assist those with ADHD. Perhaps allowing the use of fidget tools or adding movement where possible, as well as more regular breaks can assist with maintaining focus and engagement. Finally, it has been suggested that allowing individuals with ADHD to assist with the development and design of the program can assist with ensuring that not only are the perspectives of those with ADHD

included but that different strategies and approaches for information management and learning are considered (Spiel et al., 2022).

ii. Women offenders and virtual delivery of programs

Research has found that there is a relationship between positive social support and well-being, and this is particularly prominent for women (Bedrov & Gable, 2023). One common finding among women offenders is that most do not have a support system (Hale, 2001). Building a sense of community and connection is important for incarcerated women, as many have faced trauma and adversity, and have had antisocial relationships (Belknap, 2015). As such, it is important to provide opportunities for women to build connections and support systems where possible. One potential concern is that programming conducted virtually may restrict women from being able to make strong connections and build supportive relationships. Particularly, research has found that relationship building in a face-to-face setting poses fewer challenges in comparison to building relationships in a virtual or online setting (Zelihic, 2014). Therefore, it is likely that completing programming in person can assist with developing friendships more organically through face-to-face interactions, allowing women to further develop their communication and relationship skills in a more natural way than in a virtual environment.

iii. Additional responsivity concerns and virtual delivery of programs

Learning disabilities, age, and sensory impairments are three contributing factors that may lead to or increase difficulties with using technology and navigating online interfaces effectively. For example, research has found that students with learning disabilities tend to report difficulties with online learning (e.g., Goegan & Daniels, 2022; Kent, 2016), including challenges navigating various online learning platforms (Burgstahler, 2015), engaging with group work and/or the instructor (Goegan & Daniels, 2022), and having increased distractions (Hollins & Foley, 2013). Additionally, for individuals with learning disabilities, it is especially important to ensure that the amount of information being presented is manageable; too much information presented may be overwhelming and make it difficult for participants to interact with the material effectively (especially in a virtual context). Research has suggested that it is important to ensure that reasonable accommodations are provided to address individual needs, and when designing the learning environments, tools, and devices, accessibility should be

considered (Petretto et al., 2021).

Moreover, offenders who are older may have increased difficulties navigating the virtual environment. For example, older offenders may not know how to use technical equipment properly (Burraston et al., 2010), especially if they have been incarcerated for a long period of time. This will require additional support and/or training to ensure that they are able to access and navigate the programming and virtual environment. Research conducted by Haase et al. (2021), which examined the facilitators and barriers to using technology for socialization purposes among older adults (aged 65 and up), found that older adults presented a lack of interest in using or learning new technology as well as some physical barriers that stem from ailments including arthritis. It was also found that older adults relied on others for support to help them navigate the virtual environment and suggested that access to resources (including access to courses on technology), would be beneficial.

It is not unreasonable to assume that people with sensory impairments, such as those who are hearing or visually impaired, would also experience difficulties with online learning platforms, video- and teleconferencing, and virtual reality technology. A literature review by Aljedaani et al. (2022) found that students who are deaf or hard-of-hearing experienced challenges with technology, education, and health-related issues at the onset of the COVID-19 pandemic. Hearing devices were unavailable, students were unable to work alongside their interpreters due to physical distancing measures, and anxiety and loneliness levels were elevated due to isolation from their classmates. Similarly, educators who worked alongside students who were blind or visually-impaired reported that students' needs were not adequately addressed, and family members were overly-relied on to deliver educational services that would otherwise have been possible for educators to do in-person (Correa-Torres & Muthukumaran, 2022). Taken together, research on educational delivery to those with sensory impairments highlights the potential issues that certain offenders might face when virtually interacting with correctional programming material. As such, CSC would have to consider how to best accommodate offenders in order to best serve their needs.

5. Specific Considerations around Virtual Reality

There are a number of VR-specific considerations that should be mentioned including physical and mental health considerations and resource considerations. First, there are physical concerns that need to be carefully considered. In particularly, VR requires a relatively large

amount of space to prevent physical injuries. There is also a chance that participants may get VR sickness (similar to motion sickness where participants can experience symptoms of dizziness, malaise and/or nausea; Barbe et al., 2022; Ticknor & Tillinghast, 2011), thus use may not be appropriate with all individuals. As mentioned in the previous section, there are also mental health considerations that need to be regarded prior to using this technology—participation should be considered on a case-by-case basis.

There are also a host of resource requirements, including costs, training requirements, time constraints, and the consideration of individualized needs. For example, the cost to purchase the VR technology across institutions and train staff on how to properly use the technology may be quite substantial. This would require training psychologists and other professionals, as well as IT staff on how to make changes to the VR world, etc. Further, given that the use of VR is a solo activity, this may offer limited participation. Use of VR is time consuming and is not ideal for use with a large amount of people, especially as there may be a requirement to tailor various environments to match an individual's specific needs. As such, this may further limit offenders from receiving timely access to programming and/or timely completion of programming compared to correctional programming offered in group settings. Finally, it should be noted that even though VR can assist with learning and developing new skills, it remains to be an artificial environment which does not capture all the nuances of reality. Thus, even with the creation of a virtual world that could resemble the experiences that offenders will encounter when outside of corrections, this may not fully capture the reality of situations that offenders will face.

A final limitation regarding the general use of VR technology is public perception (Heimo et al., 2014), which might extend to correctional programming specifically. Given the high costs associated with VR headsets and other accessories (Dunne, 2022), as well as the increased demand for VR technology for simulated training purposes in other areas (Shared Services Canada, 2019), it is possible that the public's perception towards VR technology is that government funding should first be allocated to other public safety initiatives, such as weapons training among front-line officers. Therefore, until VR technology use is more widespread throughout other public safety initiatives, and has been more thoroughly researched on how best to incorporate use with offender populations, it may be preferable to prioritize the implementation of VCPD through other methods first (e.g., online learning/tele- and videoconferencing).

How do correctional programs delivered virtually compare to in-person correctional programs?

In order to substantiate the use of virtual correctional program delivery at CSC, VCPD must produce equal (i.e., non-significant) or improved outcomes when compared to traditional face-to-face program delivery. In fact, research in non-correctional justice settings has demonstrated that technology can produce such outcomes. For example, McDonald et al. (2016) recruited criminal defendants to participate in pre-trial consultations with their defence attorneys either in person or via videoconference. They found no significant differences in defendants' ratings on perceptions of working alliance, trust, procedural fairness, and satisfaction with attorney services between the two study groups. Further, defendants in the videoconferencing group indicated that they believed videoconferencing was an acceptable method of facilitating attorney-client pre-trial consultations. Research on parole hearings, however, has demonstrated that remote hearings pose greater challenges to participation and that in-person hearings are perceived as superior when compared to remote hearings (Peplow & Phillips, 2023).

Regarding programming specifically, there is mixed evidence on the effectiveness of virtual delivery as it compares to traditional, face-to-face program delivery. For example, Garvey et al. (2021) compared the Breaking Free Online (BFO) program to an in-person, practitioner-led group program for incarcerated men in the United Kingdom. They found that, when compared to BFO, the traditional in-person program had significantly higher rates of improvement across measures of quality of life, severity of substance dependence, and biopsychosocial impairment.

However, the Thinking for a Change (TFAC) videoconferencing program that was discussed previously yielded no significant differences in pro-social skill-related outcomes between those in the videoconferencing and those in the traditional delivery groups (LaPlant et al., 2021). Inversely, the RealVictory program that used a cellphone-based intervention for juvenile offenders demonstrated significant differences between traditional programming and traditional programming that was supplemented with teleconferencing (i.e., a phone call). More specifically, when compared to participants who received standard programming, (1) the median days to first re-arrest was 2.9 times longer and (2) the percentage of participants who were never re-arrested were highest among RealVictory participants whose programming was supplemented with teleconferencing (Burraston et al., 2012).

Tuente et al. (2020) randomly assigned forensic psychiatric inpatients to either treatment-as-usual or Virtual Reality Aggression Prevention Therapy (VRAPT) in addition to treatment as

usual. The findings from their study in the Netherlands revealed that, compared to individuals assigned to treatment as usual, those who participated in VRAPT had lower levels in observed and self-reported aggressive behaviour. Although these differences were not significant, the findings demonstrate that using VR technology as a treatment method among forensic psychiatric inpatients can produce equal outcomes in aggression when compared to traditional treatment delivery methods.

Taken altogether, these findings indicate that using online learning platforms, tele- and videoconferencing, and virtual reality to deliver programming to offenders can yield similar – but not significantly better – results to traditional methods and show promise for other forms of virtual correctional program delivery in the future. However, given the limited research available, further examination is required specifically focusing on correctional program delivery and with various subgroups of the offender population.

What are the principles of effective virtual delivery to a diverse offender population?

Virtual program delivery can be applied to a variety of diverse offender needs including in the form of substance use programming, skills training, behaviour training, and offense-specific interventions. This provides a greater range of opportunities for interventions at correctional institutions (Cornet & Gelder, 2020). For example, technology can be used for offender re-integration by teaching social skills and simulating real world interactions (Cornet & Gelder, 2020; Melnick, 2018), and can be adjustable to individual criminogenic needs (Fromberger et al., 2018). In terms of substance use needs, technology can be used to help offenders address substance use related challenges before being released (Cornet & Gelder, 2020; Segawa et al., 2020). Similarly, online learning platforms and VR technology can be used to address antisocial/aggressive behaviour by teaching de-escalating techniques and skills to offenders with behavioural issues (Tuente et al., 2018). As such, virtual delivery of programming can be tailored to meet the unique needs of the individual, whereby online learning platforms, videoconferencing, pre-recorded lessons, and/or VR technology can supplement in-class learning to further strengthen specific skills and further target specific need domains. However, there is not enough evidence to suggest that technology can fully replace in-class learning; further research is needed on the overall effectiveness of technology and virtual program delivery in correctional settings.

Regardless of delivery format, it is imperative that correctional programs are based on the

risk, need, and responsivity (RNR) principles, which serve to effectively lower the risk of reoffending (Bonta & Andrews, 2017; CSC, 2021a; HMPPS, 2020). That is, programs must be clearly defined in terms of who is being targeted (i.e., in terms of risk level; the needs that are being targeted; the offender or offence types; etc.), regardless of the delivery format chosen (HMPPS, 2020). Efforts must be made to match the delivery method to the participant (HMPPS, 2020), whereby the individual's responsivity factors are considered. Therefore, knowledge of both the program content and approach, and the participant's circumstances is critical to ensure there is a good fit. Additionally, in order to respond to responsivity factors, structured behavioural, social learning, and cognitive behavioural influence strategies must be incorporated regardless of the type of delivery method being used. These strategies may include prosocial modelling, acquiring skills through role playing, and cognitive restructuring (Andrews, 2000). Importantly, specific responsivity factors to consider may include personality, ability, motivation level, areas of strengths, age, gender, ethnicity/race, language, and any barriers to participation (Andrews, 2000). As such, the use of technology to deliver correctional programs is not a one-size-fits-all approach and requires individualized intervention planning.

Individualized intervention planning

At CSC, one way in which individuals' responsivity factors are addressed are through the adapted correctional program streams. The adapted correctional program streams are used to provide additional support to offenders who have unique responsivity factors that may affect their ability to participate in correctional programming. These responsivity factors can include: mental health issues, learning disabilities, intellectual disabilities, Fetal Alcohol Spectrum Disorder, Acquired Brain Injury, or other mental health disorders or issues. For instance, for offenders in men's institutions, there are adapted versions of the ICPM Multi-Target Moderate Intensity Program and the ICPM Sex Offender Moderate Intensity Programs. These adapted correctional programs teach offenders skills that help reduce risk and criminogenic factors, but do so at a slower pace and are delivered in shorter time periods with overall smaller groups. This allows program facilitators to provide additional tailored individual support. As such, when delivering programs virtually, the same considerations should be given to those who may require additional supports. In a virtual setting, this may look like: increased time to complete tasks, having additional one-on-one virtual sessions or breakout-space when using videoconferencing or online learning platforms, or even utilizing an adapted online platform based on the users'

needs that may incorporate different types of tasks, additional content to review, or direct access to a chat with a program officer.

It is also important to determine whether or not remote access/virtual programming is suitable for the participant and how to best deliver the program in that format to maximize the program benefits and increase the chances of success (HMPPS, 2020). For example, while there is a growing body of research, currently there is a lack of evidence to support the use of remote-access delivery for groups and individuals with complex behaviours such as emotional control problems, risk management issues, learning disabilities, or significant interpersonal and personality issues (HMPPS, 2020). In fact, given that the offender population has such diverse needs, some clients may be more difficult to engage because of limited comprehension and impaired concentration. Offenders with specific learning disorders or intellectual and developmental disabilities may first require a formal assessment of reading level to determine their responsivity to intended interventions and need for modifications to materials, as well as their ability to navigate technology independently or to what extent direct assistance is required (Batastini et al., 2020). Research suggests that remote access delivery of programs may be best suited to short-term psychoeducational work and relapse prevention. It is suggested that virtual delivery of programming cannot replace face-to-face delivery options without further understanding what works and what does not work with diverse populations (HMPPS, 2020).

Although not specific to correctional populations, there is some evidence to suggest that virtual delivery of programming can be conducted in a way that continues to consider and address individuals' unique needs and responsivity factors. For instance, in 2007 the United Kingdom's Virtual Campus was developed to enhance classroom educational opportunities, individualize student learning, and engage students who were struggling in the traditional classroom setting (Tolbert et al., 2015). While there are opportunities to individualize student learning, remote classes should remain smaller, as it is more difficult for the professor to support students when not physically near those students (Collica-Cox, 2022). That is, keeping classes small can allow for more individualized attention, although smaller classes are not the only way to support students—additional resources may also be required by professors and/or program delivery officers to assist learners when needed (Collica-Cox, 2022). Program delivery officers should also be provided with clear guidelines for the latitude given to program participants to ensure appropriate arrangements are made to avoid distracting environments.

In clinical settings, therapists using videoconferencing technology must individualize intervention protocols to work with challenging behaviours and unique personality characteristics (Batastini et al., 2020). Research has shown that clinicians have successfully introduced humor, direct therapeutic challenges, and motivational techniques such as "rolling with resistance" through videoconferencing technology as a way to help clients recognize their extreme thinking styles or problematic behaviours (Batastini et al., 2020). As such, in virtual settings, clinicians must be able to project openness, interest, and inquisitiveness by expressing exaggerated postures and thoughtful inflections when speaking. It is important for program delivery officers to also project openness, interest and inquisitiveness when conducting correctional programming through the use of videoconferencing to maintain interest, motivation, and build trusting relationships where offenders feel encouraged to share and participate.

Similarly, a pilot study conducted by CSC, which provided virtual programming to offenders in the community, found that challenges with offender participation can be avoided through awareness of the offender's rating on motivation and engagement, as it can enable correctional program officers to develop and implement strategies early on to increase and maintain motivation and engagement throughout the course of the program (Wardrop et al., 2022). Offenders who are motivated to participate are more likely to take action and find solutions to challenges with remote delivery as they arise (Wardrop et al., 2022).

General guidelines and best practices for virtual training

It is important to recognize that not all activities that work in a classroom setting will work in a virtual setting. However, there are a number of general guidelines and best practices that have been established through research, although these are not specific to offender populations. As detailed throughout this report, establishing and maintaining engagement and motivation is fundamental to a successful virtual training or programming session. Although it is not always easy to detect level of motivation and engagement in virtual settings, participants' responsiveness can provide insight to their understanding in lieu of the traditional visual cues of a classroom. Strategies for engagement and discussions to confirm that participants are still alert and learning key concepts throughout the program session can also be enforced. Some strategies include asking questions, both open-ended and closed, or even conducting poll-type questions to gauge retention and understanding of key concepts. Some research suggests that being "camera-on" all the time can lead to fatigue (Shockley et al., 2021); as such, another strategy to increase

engagement includes allowing participants to turn their cameras off periodically.

When conducting programming through videoconferencing, it is also important to keep slides simple—including the use of plain and inclusive language, as well as clean and organized slides that do not contain too much information. It is also important to use colours and fonts effectively, as slides should be easy to read and clear for all participants. This could mean using large, standardized dark font against a light background. However, it is also important for videoconferencing materials and online learning platforms, for that matter, to be engaging, which may include the use of photos or other images, videos, or other forms of activities. Some of these activities may include virtual break-out room activities (when using videoconferencing platforms), or even whole-group discussions using polling or chat. There is also the option of incorporating live coaching by turning over live application sharing to a participant who "drives" the presenter's demo or whiteboard for the group, allowing the participant to teach a key concept to the rest of the group. Online learning platforms should also use an abundance of activities to promote learning key concepts. This can include scenario-based activities, quizzes, polls, videos, and even potentially online games or videogames to help demonstrate and practice key concepts. A major obstacle with offender populations is keeping them engaged during the program session and using videogames has been shown to be successful in doing this (Ceranoglu, 2010).

Finally, adapting in-person education to online learning is not easy. Studies show that interactions from teachers-to-students and students-to-peers is essential for successful student learning. When these relationships are disconnected, learners will struggle and will not retain key concepts being taught (Hutwagner, 2021). As such, it is imperative that programs promote some aspect of social interaction—which can mean a hybrid approach (in-class learning mixed with online learning, which may be particularly useful if using VR technology, pre-recorded lessons, or online learning platforms which are typically used solo) or ensuring that programming contains opportunities for different types of engagement (particularly when utilizing videoconferencing or even teleconferencing).

Limitations

Based on the existing literature on virtual correctional program delivery, online learning, tele- and videoconferencing, and virtual reality are all feasible approaches to providing programming to assist with reducing aggression, hostility, and in some cases, re-offending

(Burraston et al., 2012; Tuente et al., 2018). However, there are several limitations that may affect the generalizability of our findings, which in turn, are described in detail.

First, the findings presented here are predominately from published literature. A common critique of citing published literature is that it creates a publication bias whereby significant and preferable findings are reported on more frequently than null, but otherwise valid, findings (Franco et al., 2014). We must consider that there are likely studies that have been conducted – but not published – in the area of virtual programming due to insignificant findings or findings that have trended in a direction opposite as to what was hypothesized. Without knowing the results from studies that have not been made publically available, we do not know the *true* nature of VCPD effectiveness.

Second, literature in this area is only starting to emerge within the field of corrections and offender management. As a result, there are very few studies that have examined how virtual delivery of programming can reduce recidivism, which is the primary goal of CSC's correctional reintegration programming (CSC, 2021a). We had to consult research on technology use in other areas, including education, medicine, and law more generally to make inferences about what pattern of results might be observed in a correctional setting. However, without much literature to draw conclusions specifically regarding recidivism reduction, we cannot state with certainty that the use of VCPD would assist offenders to become law-abiding citizens by reducing reoffending, a main corporate priority of CSC (CSC, 2022d). Future research examining the reoffending outcomes of VCPD is required to bridge this gap in the literature.

Further, the start of the COVID-19 pandemic acted as a catalyst for institutional needs into VCPD, and consequently, a *research* need in this area as well. However, it is important to note that a well-planned approach to delivering VCPD might yield different outcomes when compared to programming implemented due to an immediate and urgent need. Because of these potentially different approaches to implementing VCPD (e.g., well-planned vs. immediate need), it is important to note that the applicability of any research done on these different approaches might differ. More information on the effectiveness and applicability of VCPD will likely become available within the next several years as (1) researchers publish studies and make their findings available to the public and (2) more institutions move towards formal implementation of VCPD approaches.

Fourth, many of the studies reported here were conducted in America or outside of North

America more generally (i.e., Europe, Australia), or focused on a very specific offender sub-population (e.g., offenders with a substance use disorder, offenders of IPV, driving offences, etc.). Because of this, the findings reported here might not be generalizable to *all* offenders under the supervision of CSC. Future research should focus on the effectiveness of VCPD among Indigenous, women, older, neuro-divergent, and other diverse offender populations.

Finally, given the limited research available specific to virtual program delivery in correctional contexts, it was not possible to fully disentangle how correctional programs delivered virtually compared to in-person correctional programs; specifically in terms of frequency of programming required, length of programming sessions required, and most promising method of delivery, as well as the challenges posed by the operational reality of virtual program delivery within a correctional context. Given that this area of research is in its infancy, it was also not possible to determine principles of effective virtual delivery to a diverse offender population. Future research may include conducting a systematic review and/or a meta-analysis examining the treatment outcomes of various virtual delivery methods, once more research becomes available.

Conclusion

In conclusion, there are three primary methods in which correctional programming can be delivered virtually: (1) pre-recorded lessons and online learning platforms, (2) teleconferencing and videoconferencing, and (3) virtual reality technology. According to the literature, all three methods appear to be promising approaches of delivering programming (LaPlant et al., 2021; Melnick, 2018; Walters et al., 2014). Preliminary findings regarding videoconferencing and VR technology have demonstrated equal outcomes (LaPlant et al., 2021; Tuente et al., 2020), and research on teleconferencing in particular suggests that supplementing traditional, face-to-face program delivery with technology can produce superior outcomes when compared to traditional delivery alone (Burraston et al., 2012). Although there are limitations of using VCPD that need to be considered (e.g., network connectivity issues, responsivity concerns, etc.) and principles of effective delivery need to be followed for diverse populations, the potential benefits (e.g., increasing completion of programming, assisting with skill development, etc.) reinforce the idea that virtual methods of implementing correctional programming should be explored for use with offender populations. While the COVID-19 pandemic has presented an immediate need to

consider VCPD, the emerging literature in this area – coupled with the ever-changing nature of correctional operations and the offender population – present a unique opportunity to integrate the use of virtual delivery in CSC's correctional programs.

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